Final

Site Construction Report
Remedial Action
For the Corrective Action at
Underground Storage Tanks 257-261
Facility Identification Number #9-089118,
Building 430
Fort Stewart, Georgia

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Savannah District
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List of Acronyms

°F	Degrees Fahrenheit
AAFES	Army and Airforce Exchange Service
ACE	Anderson Columbia Environmental, Inc.
ACLs	Alternative Cleanup Levels
AS	Air Sparging
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
CAP	Corrective Action Plan
COC	Contaminants of Concern
DPW	Fort Stewart Directorate of Public Works
EPA	Environmental Protection Agency
FPM	Feet Per Minute
FSP	Field Sampling Plan
GA EPD	Georgia Environmental Protection Division
ISC	Initial Site Characterization
JJSA	J. J. Sosa and Associates
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
RPM	Revolutions per Minute
SAIC	Science Applications International Corporation, Inc.
SCFM	Standard Cubic Feet per Minute
SVE	Soil Vapor Extraction
USACE	U. S. Army Corps of Engineers
VOA	Volatile Organic Aromatics

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Final

Site Construction Report

1.0 Introduction

J.J. Sosa and Associates, Inc. (JJSA) have been tasked by the United States Army Corps of Engineers (USACE), Savannah District to install, operate, and optimize a groundwater and soil quality remediation system at the location of former Underground Storage Tanks (USTs) 257-261 located near Building 430 at Fort Stewart, Georgia. Remedial action efforts have been employed onsite to mitigate groundwater and soil quality contamination at the site related to historical petroleum releases on the site. The Georgia Environmental Protection Division (GA EPD) facility identification number for the site is #9-089118. The site is located at the Army and Airforce Exchange Service (AAFES) Car Care Center located on Hero Road at Fort Stewart, Georgia (Figure 1).

2.0 Site History (Contamination Assessment, Corrective Action Plan, and Remedial Feasibility Testing)

According to operational information provided by the Fort Stewart Directorate of Public Works (DPW), former UST's 257, UST 258, UST 259, and UST 260 each had a capacity of 10,000 gallons and were used to store gasoline for onsite commercial dispensing purposes. The former tanks were constructed of asphalt coated steel or bare steel, and the associates piping consisted of galvanized steel. The former USTs were installed on or about January 1, 1982 and were removed from the site during March 1993. UST 261 was located next to Building 430 and had a capacity of 500 gallons. Former UST 261 was used to store waste oil generated on the site. UST 261 was constructed of asphalt coated steel or bare steel and the associated piping consisted of galvanized steel. This tank was installed during January 1982 and was removed during June 1996.

Initial Site Characterization (ISC) assessments were conducted by Anderson Columbia Environmental, Inc. (ACE) during the removal of the former UST systems during March 1996 (USTs 257-260) and June 1996 (UST 261). Results of the ISC denoted petroleum contamination near the former tank systems in excess of state petroleum cleanup standards.

Following the completion of the ISC investigations, Science Applications International Corporation, Inc. (SAIC) was retained to conduct a Corrective Action Plan (CAP)-Part A Investigation of the site. The CAP-Part A reports for USTs 257-260 and UST 261 were submitted to the GA EPD UST Management Program during March 1999. Based upon the results of the ISC and the CAP-Part A investigations, a CAP-Part B investigation was determined to be necessary to define and characterize the extent of petroleum contaminated groundwater and soil and to collect additional geologic and hydrologic information to characterize the subsurface site conditions.

The CAP-Part B site investigation was conducted by SAIC during late 1999. The results of the CAP-Part B investigation recommended that active remediation be conducted at the site to restore local soil and groundwater quality conditions. In addition to the aforementioned remedial approach, removal of the remnant fuel system piping associated with USTs 257-260 was also recommended to eliminate any additional sources of continued contamination during construction of the remedial system. The corrective action plan recommended a combination of soil vapor extraction (SVE), air sparging (AS) and groundwater extraction to mitigate site soil and groundwater contamination related with releases from the former UST systems.

After regulatory approval of the remedial approach presented within the CAP-Part B investigation, SAIC prepared an addendum to the workplan entitled "Addendum 13 to Work Plan for Preliminary Groundwater and Corrective Action Plan-Part A/Part B Investigations at Former Underground Storage Tank Sites, Fort Stewart, Georgia" dated December 2001. Site efforts presented as part of the addendum report were used as the basis to conduct site-specific pilot tests for the design of the recommended groundwater pump and treat system, the air sparge system, the vapor extraction system and the combined soil vapor extraction and air sparging systems remedial components. Pilot test activities were conducted during January 2002. In addition to the aforementioned pilot tests, a percolation test was also conducted to provide design information for the placement of a reinfiltration gallery north of the site during remedial construction efforts.

Data generated during the pilot test efforts were used as the basis for the design of the existing remedial system currently operating at the site. Site-specific remedial design information compiled during the pilot tests and the percolation test are presented within the June 2002 report prepared by SAIC and JJSA entitled "Field Sampling Plan for the Corrective Action at Underground Storage Tanks 257-261, Facility Identification Number #9-089118, Building 430, Fort Stewart, Georgia".

2.1 Soil Vapor Extraction Design

Upon review of the remedial design information presented within the June 2002, Field Sampling Plan (FSP) document, three (3) soil vapor extraction (SVE) wells were recommended for installation to remediate residual soil quality contamination. Each soil vapor extraction well was proposed to be constructed of fifteen feet, two inch diameter, schedule 40 polyvinyl chloride (PVC) blank riser and attached to a twelve foot section of well screen. The proposed placement of the soil vapor extraction wells is presented on Figure 2.

Based upon the results of the pilot test investigation, the estimated flow rate designed for each soil vapor extraction well was estimated to be 60 standard cubic feet per minute (scfm). Flow from each of the soil vapor extraction wells is routed to the remedial treatment facility located north-northwest of the existing fuel canopy at the site. Given a design flow of 60 scfm from the three vapor extraction wells, the remedial system equipment purchased for the remedial effort was selected to provide a vacuum inducted flow in excess of 180 scfm.

2.1.1 Soil Vapor Extraction Wells Installation

Soil vapor extraction wells 76-SV-1, 76-SV2, and 76-SV3 were installed June 21, 23, and 25, 2002, by Miller Drilling, Inc (Table 1). The borehole advanced at each soil vapor extraction well location measured 8.25-inches in diameter. Each well was installed to a depth from 14.8 to 15.2 feet below existing ground surface using standard hollow stem drilling techniques. Each soil vapor extraction well is equipped with a two-inch diameter twelve-foot long section of schedule 40 PVC well screen. The slot size installed at soil vapor extraction wells 76-SV1, 76-SV2, and 76-SV3 consisted of 0.10-inch factory cut slots. The remaining well construction consisted of 2.0-inch diameter schedule 40 blank PVC riser. Well construction diagrams provided by an SAIC field geologist are presented in Appendix A. Soil boring log data collected during the installation of each vapor extraction well is also presented in Appendix A.

At grade, soil vapor well 76-SV1 was completed within a 19-inch by 19-inch diamond plated well vault equipped with a specialized hex keyed lock. Soil vapor wells 76-SV2 and 76-SV3 were installed within a 29-inch by 30-inch diamond plated well vaults equipped with hex keyed locks. Each well vault installed at the referenced soil vapor well locations is equipped with a 14-inch to 29-inch steel plate constructed subsurface apron set in a concrete pad which extends approximately one foot from the edge of each well vault. Each concrete pad was constructed using 3,000-psi concrete.

The annular space around each soil vapor extraction well was filled with DSI#2 (40/30) sand pack materials. Above the sand pack, 0.6 to 0.5 feet of high yield bentonite slurry was placed with the borehole annulus to seal the wells to the local formation. Above the bentonite seal, the remaining borehole annulus was filled with Portland Type I Cement and bentonite slurry to the bottom invert of the surface protector vault.

After installation, each soil vapor extraction well was connected to a 2.0-inch diameter schedule 40 PVC tee capped with a schedule 40 PVC threaded plug. The port exiting the tee was connected to a segment of 2.0-inch diameter schedule 40 PVC blank tubing connected to a schedule 40 PVC gate valve. After the gate valve, each well was connected to 2.0-inch blank PVC, which was routed through a flanged port cut into the side of each well vault apron. Soil vapor system piping routed from each well vault was buried approximately 1.0-feet deep from each well vault to the remedial treatment compound. Section 2.4 of this report presents the site construction details related with the installation of the buried remedial system piping. Figure 3 presents the detail of the remedial system wellhead piping and the well vault construction details related with the soil vapor extraction wells installed at the AAFES Car Care Center Facility.

2.2 Air Sparge Remedial Design

Data compiled during the pilot tests investigation was evaluated as part of the FSP to yield a design that required the placement of twelve air sparging wells on the site at distinct locations (Figure 4). Upon review of the FSP, each air sparge well was proposed to be installed to a depth from 30 to 35 feet below grade to provide oxygen to the upper portions of the surficial aquifer, locally. The radial influence induced by each air sparge well was calculated to be approximately 25-feet at a maximum pressure of 11.5 pounds

per square inch (psi). Figure 4 presents the locations of the air sparge wells based upon the remedial design presented within the FSP.

2.2.1 Air Sparging Wells Installation

Air sparge wells 76-AS1 through 76-AS12 were installed on June 19, 20, 21, 22, and 24, 2002, by Miller Drilling, Inc (Table 1). The borehole advanced at each air sparge well location measured 8.25-inches in diameter. Each well was installed to a depth from 35.4 to 34.2 feet below existing ground surface using standard hollow stem drilling techniques. Each air sparging well is equipped with a two-inch diameter five-foot long section of schedule 40 PVC well screen. The slot size installed at each air sparge well location consisted of 0.10-inch factory cut slots. The remaining well construction consisted of 2.0-inch diameter schedule 40 blank PVC riser. Air sparging well construction diagrams provided by an SAIC field geologist are presented in Appendix A along with soil boring data collected at each air sparging well location.

At grade, air sparge wells 76-AS-1, 76-AS-2, 76-AS4, 76-AS5, 76-AS6, 76-AS8, 76-AS9, 76-AS10, 76-AS-11, and 76-AS12 have been completed within an 19-inch by 19-inch diamond plated well vault. Air sparging wells 76-AS8 and 76-AS7 were installed within 29-inch by 30-inch diamond plated well vaults. Each well vault is equipped with a lock that can only be opened with a specialized hex head key. Vaults installed at the referenced air sparge wells locations are equipped with a 14-inch to 29-inch steel plate constructed subsurface apron set within a 3,000-psi concrete pad.

The annular space around each air sparge well is filled with DSI#2 (40/30) sand pack materials. Above the sand pack, 2.0 to 5.0 feet of high yield bentonite slurry was placed with the borehole annulus to seal the air sparge wells to the local formation. Above the bentonite seal, the remaining borehole annulus was filled with Portland Type I Cement and bentonite slurry to the bottom invert of the surface protector vault box.

After installation, each air sparge well was connected to a 2.0-inch diameter schedule 40 PVC tee capped with a schedule 40 PVC tapped threaded flush plug. An oil-filled vacuum gauge is attached to each threaded tap plug to monitor vacuum influence at each air sparge well location. The port exiting the tee is connected to a 1.0-inch to 2.0-inch PVC swage/reducer fitting. After the reducer fitting, a segment of 1.0-inch schedule 40 PVC blank tubing is connected to a schedule 40 PVC gate valve. After the gate valve, each well is connected to 1.0-inch schedule 40 blank PVC that is routed through a flanged port cut into the side of each well vault apron. Air sparge system piping routed from each well vault is buried approximately 1.0-feet deep from each well vault to the remedial treatment compound. Section 2.5 of this report presents the site construction details related with the installation of the buried remedial system piping. Figure 5 presents the detail of the remedial system wellhead piping and the well vault construction details related with the air sparge wells installed at the AAFES Car Care Center Facility.

2.2.2 Air Sparging Wells Development

After installation of each of the air sparging wells, SAIC and JJSA field technicians conducted well development to remove residual sediments and clastics from the

emplaced sand packs and hydraulically connect the well screened sections to the local formation. Well development efforts were conducted during June 23 (76-AS5, 76-AS6), June 24 (76-AS4, 76-AS12), June 26 (76-AS1, 76-AS2, 76-AS10, 76-AS11), June 28 (76-AS7, 76-AS9), and June 29 (76-AS3, 76-AS8), 2002. Each soil vapor extraction well was developed with an electrical downhole centrifugal pump followed by surging with a 1.75-inch diameter surge block. Well purge water generated during well development efforts was containerized onsite within a trailer mounted polypropylene tank provided by SAIC. After the tank was filled, the recovered purge water was transported to the on-base decontamination and equipment storage area and treated through virgin activated carbon prior to discharge to the sanitary sewer. Well development information provided by the SAIC field technician is presented in Appendix B. During development of the air sparge wells, a total volume of approximately 1,560 gallons of purge water was generated for disposal.

2.3 Groundwater Extraction Well Design

In addition to the placement of the soil vapor extraction wells and the air sparge wells, pilot test data compiled as part of the FSP recommended the placement of five groundwater recovery wells on the site at discrete locations. The rationale for placement of the groundwater extraction wells was predicated on inducing drawdown within the upper surficial aquifer to control further migration of the contaminant plume to downgradient locations.

Based upon the results from the pilot tests, flow from each proposed groundwater extraction well was estimated at 2.5 gallons per minute in order to maintain a drawdown to negate further contaminant plume migration. Figure 6 presents the proposed capture zones inducted by pumping of the groundwater extractions wells at a flow rate of 2.5 gallons per minute given the evaluation completed within the FSP. Given the combined flow rate of 2.5 gallons per minute, a total liquid flow rate to the remedial system was calculated to be 12.5 gallons per minute. This data was used to size and select the groundwater treatment system purchased for the site. The primary water treatment remedial system component selected for the system was a Nepcco Model HT-363 Turbo Tray Low Profile air stripper.

Upon review of section 3.3.3.3 of the FSP, two groundwater extraction wells (76-EX-4 and 76-EX-5) were installed at the eastern edge of the groundwater contaminant plumes to capture the leading edges of the plumes. Extraction wells 76-EX-1, 76-EX-2, and 76-EX-3 were installed within the groundwater contaminant plume boundaries to control contaminated groundwater migration from the source locations.

2.3.1 Groundwater Extraction Wells Installation

Each groundwater extraction well installed during remedial site construction activities was advanced to depths ranging from 49.2 to 54.5 feet below ground surface (bgs). Extraction well 76-EX1 installed as part of the remedial feasibility tests during January 2002 was converted into a groundwater extraction well and incorporated into the remedial design. Extraction well 76-EX1 was installed on January 17, 2002 by Miller

Drilling, Inc. Extraction wells 76-EX-2, 76-EX3, 76-EX-4, and 76-EX5 were installed by Miller Drilling, Inc. from June 20, 2002 through June 24, 2002 (Table 1).

Each groundwater extraction well was installed to a depth ranging from 45.8 to 50.0 feet bgs using standard hollow stem drilling techniques. The borehole advanced at each groundwater extraction well location measured 12.25-inches in diameter. With the exception of well 76-EX1, each groundwater extraction well is equipped with a 4.0-inch diameter five-foot section of schedule 40 PVC well screen. Extraction well 76-EX1 is equipped with a 30-foot section of slotted well screen. The slot size installed at each extraction well location consisted of 0.10-inch factory cut slots. The remaining well construction consisted of 4.0-inch diameter schedule 40 blank PVC riser. Extraction well construction diagrams provided by an SAIC field geologist are presented in Appendix A along with soil boring log data collected during well installation activities.

At ground surface, extraction wells 76-EX1 and 76-EX2 are completed within a 19-inch by 19- inch diamond plated well vaults equipped with a specialized hex keyed lock. Extraction wells 76-EX 3, 76-EX4, and 76-EX5 are installed within a 29-inch by 30-inch diamond plated well vaults equipped with a hex keyed lock. Each well vault installed at the referenced groundwater extraction well locations are equipped with a 14-inch to 29-inch steel plate constructed subsurface apron set in a concrete pad within extends approximately one foot from the edge of each well vault. Each concrete pad was constructed using 3,000-psi concrete.

The annular space around each groundwater extraction well was filled with DSI#2 (40/30) sand pack materials. Above the sand pack, 2.2 to 0.5 feet of high yield bentonite slurry was placed with the borehole annulus to seal the wells to the local formation. Above the bentonite seal, the remaining borehole annulus was filled with Portland Type I Cement and bentonite slurry to the bottom invert of the surface protector vault.

After installation, each groundwater extraction well was connected to a schedule 40 PVC collar capped with a liquid tight neoprene access port. Electrical lines, pump support cables, and groundwater recovery tubing is routed through the liquid tight well cap within each of the vault locations. Pump support cables are attached to a stainless steel clevis mounted on the sidewall of each vault. Installation of the pump support cable and the clevis at each extraction well location was conducted to adequately support or hang the groundwater extraction pumps within each extraction well allowing for elevational adjustment during remedial operation. Fifty feet of 1.0-inch diameter petroleum resistant rubber tubing connected to each groundwater depression pump is attached to a camlock fitting mounted on the side of each well vault. The camlock fittings are connected to 1.0-inch diameter PVC piping routed from the vaults to the remedial treatment compound. Electrical leads from each on the groundwater depression pumps are connected to liquid tight switches mounted within each vault location.

Section 2.5 of this report presents the site construction details related with the installation of the buried remedial system piping. Figure 7 presents the detail of the remedial system

wellhead piping and the well vault construction details related to the groundwater extraction wells installed at the AAFES Car Care Center Facility.

2.3.2 Groundwater Extraction Wells Development

After installation of each of the groundwater extraction wells, SAIC and JJSA field technicians conducted well development to remove residual sediments and clastics from the emplaced sand pack and hydraulically connect the well screened sections to the local formation. Well development efforts were conducted on July 26, 2002 (76-EX1) and July 28 through July 30, 2002 (76-EX2, 76-EX3, 76-EX4 and 76-EX5).

Each groundwater extraction well was developed with an electrical downhole centrifugal pump followed by surging with a 3.75-inch diameter surge block. Well purge water generated during well development efforts was containerized onsite within a trailer mounted polypropylene tank provided by SAIC. After the tank was filled, the recovered purge water was transported to the on-base decontamination and equipment storage area and treated through virgin activated carbon prior to discharge to the sanitary sewer. Well development information provided by the SAIC field technician is presented in Appendix B. During development of the extraction wells, a total volume of approximately 1,665 gallons of purge water was generated for disposal.

2.4 Soil Cuttings Management

During well installation, all generated soil cuttings were containerized onsite within 55-gallon drums. After the completion of each day of drilling effort, all drums were transported to the on-base decontamination and equipment storage area and secured within a locked fenced compound. A total of 27 drums of waste soil cuttings were generated during the course of the construction activities for the remedial action as a result of well installation efforts.

All drummed soil cuttings were disposed of by Waste Management, Inc as a special waste after the completion of well installation efforts. Final manifests and transportation bill of lading information was transferred to the DPW by SAIC.

2.5 Subsurface Piping Installation

After the completion of the well installation efforts, JJSA and SAIC commenced with the installation of the subsurface piping network associated with the remedial system. Remedial system piping was installed June 26, 2002 through July 25, 2002. All system piping installed at the site was placed within shallow trenches and installed with a rubber-tired backhoe. Prior to installation and excavation of the trenches, the layout of the remedial system piping was located and drawn on the existing pavements and a gas powered concrete/asphalt cutting machine was used to cut and score the existing asphalt and concrete pavements. All surface pavements within the required excavation areas were removed with the backhoe bucket and placed within roll-off dumpsters provided by Waste Management, Inc. for offsite disposal as construction/demolition debris.

Piping installed as part of the soil vapor extraction system was routed from each well vault location to common utilities trench located northeast of the existing canopy. Piping

installed within the common system utilities trench was routed to the treatment compound located northwest of the canopy. Piping installed for air sparge well 76-AS2 was installed southwest of the canopy. Figure 8 presents the locations of the soil vapor extraction piping installed at the site relative to the existing structures and well locations.

All soil vapor extraction piping installed within the trenches consisted of 2.0-inch diameter PVC. Sections of PVC tubing were labeled during installation and connected using glued schedule 40 PVC couplings. Each soil vapor extraction well was equipped with separate piping/conduit directly to the remedial system compound. No manifolds were installed to group these wells. All system piping was buried between depths of one to one and one half feet below existing grade.

Piping associated with the installation of the air sparge wells consisted of 1.0-inch diameter schedule 40 PVC routed from each well installation vault to the common utilities trench. At the common utilities trench, the 1.0-inch diameter pipes were connected to 2.0-inch diameter schedule 40 PVC piping manifolded into a network of individual air sparge well locations. Three segments (Line 1, Line 2 and Line 3) of 2.0-inch diameter PVC air sparging system piping were routed from the common utilities trench to the remedial system compound. Sections of PVC tubing installed as part of the air sparge system were labeled during installation and connected using glued schedule 40 PVC couplings. All system piping was buried between depths of one to one and one half feet below existing grade.

Air sparge wells 76-AS1, 76-AS3, 76-AS8 and 76-AS9 were connected to soil vapor extraction line number 1; air sparge wells 76-AS4, 76-AS5, 76-AS6, and 76-AS7 were connected to soil vapor extraction line number 2; and air sparge wells 76-AS2, 76-AS10, 76-AS11, and 76-AS12 were connected to soil vapor extraction line number 3. Figure 8 presents the locations of the air sparge system piping installed at the site relative to the existing structures and well locations.

Piping associated with the installation of the groundwater extraction wells consists of 1.0-inch diameter schedule 40 PVC routed from each well vault to the common utilities trench. Piping associated with each well was routed through the common utilities trench directly to the remedial system compound. Sections of PVC tubing installed as part of the groundwater extraction system were labeled during installation and connected using glued schedule 40 PVC couplings. All system piping was buried between depths of one to one and one half feet below existing grade. Figure 8 presents the locations of the groundwater extraction system piping installed at the site relative to the existing structures and well locations.

After the completion of remedial system piping installation, all trenches were filled within fine sand fill materials and compacted to approximately three inched below grade. Fill materials were placed within the trenches in six-inch loose lifts and compacted using a mobile plate compactor. After the completion of backfilling efforts, all trench locations were capped with new asphalt.

2.6 Remedial Treatment Compound Installation

The following subsections present the details related with the installation of the remedial system compound currently employed onsite to remediate groundwater and soil quality conditions.

2.6.1 Remedial Equipment Pad Installation and Well Abandonment

During installation of the wells, JJSA field personnel commenced with the installation of the remedial system equipment pad. Equipment pad installation efforts commenced on June 19, 2002 and were completed on June 23, 2002. Installation of the equipment pad was completed in three phases consisting of forming, footers construction, and final concrete pad finishing.

The initial phase of the pad construction efforts consisted of the installation of the forms and minor site grading efforts. Prior to the installation of the forms, Miller Drilling under the supervision of an SAIC geologist abandoned existing shallow well MW 76-30 since this well was located under the proposed pad location. Well abandonment efforts were conducted on June 19, 2002, by filling the well with 3/8-inch chipped bentonite. After the placement of the bentonite, JJSA physically removed the protective well casing with the backhoe bucket.

After the completion of well abandonment efforts, ¾ inch thick plywood forms were installed around the perimeter of the equipment pad location. After installation of the forms, JJSA field personnel placed #4 rebar within the footers and constructed a rebar-enforced beam that was placed midway between the northeastern and southeastern edges of the pad layout. After placement of the rebar and the forms, JJSA retained Mobile Concrete of Hinesville, Georgia to deliver and pour concrete into the forms to complete the installation of the footers and structural beam construction. After a period of 48 hours, the space between the footers and the central support beam were filled with imported sandy fill materials and compacted in place. After the completion of backfilling and compaction efforts, Mobile Concrete was again contacted to deliver additional concrete to the site to complete the installation of the upper 6-inch section of the equipment pad. Prior to pouring the upper section of the pad, JJSA installed a 4.0-inch by 4.0-inch wire mesh underlayment beneath the upper portion of the pad for addition structural support. All concrete used for the installation of the equipment pad consisted of 3,000-psi fiber-enriched concrete. After placement and curing of the pad, the upper surface was brush finished to provide a skid resistant surface and all structural forms were removed. The final remedial equipment pad measures 22-feet long by 16-feet wide.

2.6.2 Electrical Service Installation

During installation of the remedial equipment during June and July 2002, electrical three-phase electrical service was installed near the southwest corner of the equipment compound area. Electrical service to the remedial equipment was connected to a nearby utility pole located northwest of the equipment compound across 5th Street northwest of the site. Overhead electrical lines and service were connected to a power pole installed by JJSA's electrical contactor, ProLectric, Inc. All power lines routed from the newly

installed pole to the remedial system master power control box were subsequently buried by JJSA after the completion of remedial system installation.

The main remedial system control box mounted on the exterior of the shed consists of a NEMA 4 weather tight enclosure. All of the remedial system controls, switches, and timers are located within the enclosure. System controls are connected to an EOS Procontrol II remote control system that is equipped with a remote telemetry interface and a computer modem. The telemetry system was installed to allow for remote monitoring of the remedial system operations.

In addition to the installation of electric service to the remedial equipment compound, subsurface conduit was also installed within the shallow remedial system piping installation trenches from the treatment shed to each of the groundwater extraction wells. Piping installed consisted of 1.0-diameter PVC Schedule 40 electrical conduit equipped with PVC street elbows to allow for electrical wire installation. During placement of the piping SAIC and JJSA pulled 14 gauge insulated wire through the pipes which was subsequently connected to the system control panel and each groundwater extraction pump. All lines were tested by JJSA personnel prior to the commencement of trench backfilling efforts.

2.7 Remedial System Installation

Soil vapor extraction, air sparging, and groundwater pump and treat remedial equipment were supplied and designed by Nepcco Systems, Inc. (Nepcco) of Ocala, Florida. All remedial equipment components were assembled at Nepcco's remedial assembly facility located at 2140 N.E. 36th Avenue in Ocala, Florida location prior to delivery to the AAFES Car Care Facility. Prior to delivery, JJSA's principal design engineer inspected the system to assure that system construction was in compliance with the operational requirements for the remedial action. Based upon the approved design, JJSA arranged for and accepted delivery of the remedial system to the site on July 24, 2002. Upon arrival of the equipment to the site, JJSA immediately commenced with final installation of the soil vapor extraction piping, air sparge piping, and groundwater extraction piping to the system.

The major remedial system components installed at the site consist of the following:

- (1) Nepcco Model HT-363 Low Profile Air Stripper
- (1) Nepcco Model AWS-115 Air Water Separator
- (2) Rotron Regenerative Blowers Model EN-808BA72MXL
- (1) Roots Model URAI-42 Positive Rotary Blower
- (1) American Fan Model AF-15-1105 Blower
- (5) Master Meter Totalizing Flow Meters (3/4" by 3/4" model)
- (1) Master Meter Flow Transmitter
- (2) Solberg Model FS-31P-200 Filter Silencers
- (2) Myers Model CT-10FAB Water Transfer Pumps
- (2) Dwyer Magnahelic Pressure Differential Indicator Gauge
- (2) Solberg Model CSL-235P-300 Particulate Filters

- (1) Solberg Model FS-18P-150 Particulate Filter
- (3) Micron Tech Model H802EB150CS2B520 Particulate Filter
- (7) Pressure indicators
- (1) Dwyer Model 1004E-A1-J Pressure Switch
- (1) Dwyer Model 1910-1 Pressure Switch
- (2) Stoddard Model PD13-2 Silencers
- (1) Grainger Model 6F60 Silencer
- (4) 55-Gallon Drum Size Liquid Phase Activated Carbon Vessels
- (3) Dwyer Model 0-250F Temperature Indicators
- (1) Dwyer Model RRT225OU Temperature Switch
- (1) Dwyer Model 1950-P2 Vacuum Switch
- (1) Colcraft 10' by 20' Steel Constructed Equipment enclosure with Double Doors
- (1) Thermal Sensor Exhaust Fan
- Numerous Hoses and Dwyer Oil Filled Pressure and Vacuum Gauges.

Remedial system "as-built" drawings and electrical engineering data sheets provided by Nepcco are presented in Appendix C. ***The remedial system operation and maintenance manual provided by Nepcco is submitted under separate cover to supplement the Final Construction Report.***

2.7.1 Groundwater Treatment System

The primary remedial system treatment component for recovered groundwater consists of a Nepcco Model HT-363 Turbo Tray low-profile air stripper. The Nepcco Model HT-363 Turbo Tray low-profile air stripper installed onsite measures 5 feet, 9-inches tall by 36 inches in diameter. The air stripper is mounted to a steel skid frame within the enclosure and is bolted to the floor. The air stripper consists of four turbo trays and a sump. The air stripper designed and selected for the remedial action is able to sustain treatment of upto 22 gallons per minute of influent water volume at a maximum blower air flow rate of 250 scfm. Each tray is equipped with quick release clips to aid in stripper disassembly for cleaning. The sump of the stripper is also equipped with a three way level alarm probe used to monitor the height of the water within the sump of the unit during operation. During operation, the level of water within the sump activates a discharge pump which routes water from the sump to the activated carbon vessels for final polishing and treatment prior to discharge to the reinfiltration gallery. Normal operation of the stripper occurs between the low and high sensor levels, which turn the effluent transfer pump on and off. Should the sump flood or overfill with water during operation, the sensor is equipped with a high-high level sensor that when activated will shut the entire system down and activate and alarm. The Nepcco Model 363 Turbo Tray air stripper is also equipped with a mist eliminator and a magnahelic gauge to monitor pressure differentials within the unit during operation. Should the pressure differential within the unit exceed a value of 10 psi or fall below a value of 2 psi during operation, the sensor will shut the entire system down and activate an alarm.

Groundwater entering the Turbo Tray air stripper is routed through an influent manifold located within the interior of the remedial system shed. Groundwater extraction lines entering the shed are routed through ball valves and totalizing flow meters so total volume, flow rates and adjustment may be conducted and recorded during system operation. After the manifold, groundwater is routed through a series of bag filters to remove any residual clastic sediment from the waste stream. After passing through the bag filters, water is routed to the Turbo Tray air stripper for primary treatment.

2.7.2 Air Sparge Treatment System

A Roots Model URAI-42 Positive Rotary Blower mounted to the floor of the remedial system shed controls the air sparging system. The motor for the blower consists of a 5-horsepower, 230-volt, three-phase baldor motor and associated belt drive assembly. The air sparge blower measures 4-foot by 6-foot and is rated for a maximum speed of 3,600 rpm, 15 inches of mercury and a temperature of 240°F. Air to the air sparge wells is routed through a galvanized steel manifold used to cool the air stream mounted on the exterior of the building. Air from the manifold is routed to into three PVC pipes connected to the air sparge wells network (Lines 1, 2 and 3). System settings associated with the air sparge system are controlled by a series of steel gate valves installed on each air discharge pipes. Each air sparge pipe is equipped with a pressure gauge to fine tune pressure settings with the valves. No pressure settings above 11.5 psi are permitted during operation of the remedial equipment.

2.7.3 Soil Vapor Extraction Treatment System

The soil vapor extraction unit consists of a knockout tank to separate air and water within the influent vapor flow, a particulate filter to remove fine clastic sediments, and a blower to provide the vacuum influence to drive the remedial process. Vapor phase contaminants recovered from the soil vapor extraction wells are routed to the treatment compound via the soils vapor extraction wells and the shallow piping. Once at the shed, vapors are routed through a PVC manifold equipped with ball valves and vacuum gauges. The ball valves and gauges located at the main SVE manifold are used to make fine adjustments to the soil vapor extraction system during remedial system operation. After passing through the manifold, vapors are routed through the knockout tank, the particulate filter then through the main system blowers prior to discharge to the atmosphere.

If encountered liquid condensate within the knockout tank is routed through the bag filter and the air stripper for treatment.

2.7.4 Groundwater Extraction Pump Installation

In addition to the aforementioned remedial system components, five (5) Grundfos Model 5E8 (½ Horsepower) 240-volt groundwater depression pumps were delivered to the site for installation into the groundwater extraction wells. Each pump is connected to fifty feet of petroleum resistant reinforce rubber hose and associated stainless steel support cable. The groundwater depression pumps were installed in the wells on July 26 and 27, 2002 and Nepcco's remedial field technician completed final electrical connections immediately after the completion of pump placement.

Each pump has been set at a depth of 43 to 45-feet below grade to bracket the screened interval at each extraction well location.

2.7.5 Security Fence Installation

After the completion of the equipment hookup and calibration, JJSA contraction with Nations Fence, Inc. to install a stockade security fence around the remedial treatment compound. Installation of the six to eight foot tall wood stockade fence commenced on August 19, 2002 and was completed on August 20, 2003. Two access gates have been installed within the fence enclosure. The primary access gate is located on the southwest side of the stockade. A secondary gate is located on the southeastern side of the stockade near the edge of the existing canopy. Both gates are locked and only DWP, USACE and JJSA personnel have keys to the locks.

2.8 Reinfiltration Gallery Installation

During installation of the remedial system piping, JJSA installed an effluent reinfiltration gallery northeast of the remedial system compound. Figure 9 presents the location of the reinfiltration gallery and the associated discharge piping exiting the treatment compound. Reinfiltration gallery design information is presented within the Section 4.1.17 of FSP.

Liquid effluent generated by the onsite remedial treatment activities is routed to the reinfiltration gallery via one-inch diameter schedule 40 PVC piping. The PVC piping is installed within a shallow trench running northeast of the treatment compound then northwest Building 430 crossing 5th Street (Figure 9).

As part of the reinfiltration gallery installation, JJSA installed six (6) thirty-foot segments of buried sewer drainpipe within the gallery installation area. Each segment of pipe was connected to a buried dispersion manifold consisting of 4.0-inch diameter schedule 40 PVC. Four-inch schedule 40 PVC elbows and street tees were used to connect the drain piping to the manifold. Trenches excavated during installation of the gallery measured 32 feet in length, 1 foot wide by 2 foot deep. After excavation of the trenches, one foot of washed pea gravel was placed within the trenches after which the drainpipe was installed above the basal gravel layer. After placement of the drainpipe within each trench, 6 to 8 inches of pea gravel was placed above the drainpipe. Fine mesh filter fabric was placed on top the gravel and the excavated soils were thin spread over the gallery installation area.

In addition to the effluent discharge piping, a second one-inch diameter PVC pipe was installed within the gallery discharge trench to provide a conduit for electrical supply lines to energize a high level sensor installed within well 76-GA-01 installed east of the gallery. Well 76-GA-01 was installed to a depth 14.9 feet below grade to monitor water table mounding during gallery operation (Table 1). Well 76-GA-01 is equipped with a ten foot section of 0.10-inch slotted well screen set within a DSI #2 (40/30) sandpack. Above the sandpack, two feet of bentonite was placed within the annular space to seal the well to the native formation. After placement of the bentonite seal, the observation well was grouted to one foot below surface and set within an eight-inch diameter steel flush-

mount well protector. Miller Drilling, Inc. installed well 76-GA-01 on June 24, 2002 under the supervision of an SAIC field geologist. Well installation information and log of boring data provided by SAIC is presented in Appendix A.

The high liquid level float sensor installed within well 76-GA-01 is connected to the remedial system control panel and the EOS Procontrol II panel via 14 gauge wiring installed within 1.0-inch diameter PVC pipe. Should the water table ever trip the sensor due to a high water table condition induced by failure of the gallery, the remedial system will shut down and all flow to the gallery will be terminated immediately.

2.9 Former System Piping Removal and Disposal

During installation of the remedial system piping, JJSA removed all accessible segments of the former fuel distribution piping associated with former USTs 257, 258, 259, 260, and 261. The former system piping was found to be located approximately 4 to 6 feet northeast of the eastern edge of the onsite canopy structure at a depth ranging from three to four feet below grade. The former system piping east of the canopy consisted of three-inch diameter steel piping encased within a yellow epoxy resin coating. The three-inch diameter fuel system piping appeared to be in good to excellent condition.

From the primary trunk piping, two inch diameter bare steel piping was routed to the southwest towards each of the former pump islands under the existing canopy. Concrete above each of these pipes was removed and the dispenser piping at each pump island was physically extracted during remedial construction efforts. Piping removed near the pump islands appeared to be in relatively poor condition and displayed visual evidence of severe corrosion and pitting.

All former fuel distribution system piping removed from the site was drained, cleaned, and disposed of offsite as demolition debris.

Former system piping located in close proximity to wells 76-EX2, 76-AS3, 76-SV1, 76-AS1, and monitoring wells MW-76-21 and MW-76-41 could not be safely removed without potentially damaging the wells. After a meeting with DPW, USACE, SAIC, and JJSA personnel on June 26, 2002, the decision was made to decontaminate the residual system piping encountered near the aforementioned wells in place then, fill the former pipes with pressure grout slurry. As such, approximately 80 linear feet of the former system piping was cleaned with a drum vacuum, sprayed with a high-pressure washer, and grouted in place. Figure 10 presents the locations of the former system piping removed from the facility. Onsite piping decontamination and cleaning effort generated one 55-gallon drum of waste fluids that was labeled and moved to the on-base waste storage location for staging for disposal.

U.S. Liquids of Georgia, Inc disposed of the liquid waste material generated during cleaning of the former fuel distribution system piping.

2.10 Petroleum Contaminated Soils Removal and Disposal

During removal of the former fuel distribution piping and installation of the remedial system piping, petroleum contaminated soils were excavated and placed within lined roll-off dumpsters for offsite disposal. Excavation efforts conducted during removal of the former fuel system product lines were advanced approximately three feet beyond the inverts and sides of the former system piping to effectively remove the soil contamination. The total volume of soil removed from the site for offsite disposal was 191.01 tons. All petroleum-contaminated soil excavated from the site during construction efforts were transported and disposed of offsite at the Superior Landfill & Recycling Center located at 3001 Little Neck Road, Savannah, Georgia.

2.11 Site Grading and Resurfacing

After the completion of the removal of the former system piping, the removal of the former fuel distribution pipelines and the installation of the remedial system piping, JJSA commenced with final site grading and resurfacing efforts. Concrete beneath the islands removed to excavate the former fuel system piping was repoured to match the existing concrete pavements and structures. Trenches cut to install the remedial system piping and/or removed the former fuel distribution piping were cut and resurfaced with three inches of asphalt. The area in and around the reinfiltration gallery was seeded with hybrid grass seed.

2.12 Discharge Permitting

Prior to the commencement of the remedial action, the Georgia Environmental Protection Division granted an Underground Injection Control Permit (UICP) for the facility. A copy of the UICP #156 for injection of treated ground water and ambient air is presented in Appendix D for reference. The UICP sets conditions related with reporting, maximum air and treated groundwater injection volumes, compliance requirements related with discharge standards, and regulatory notification requirements associated with operation of the remedial system. The UICP was received by JJSA on September 9, 2002. Upon receipt of the UICP, all remedial system components were placed within an automatic operational mode and active remedial system operations formally commenced.

3.0 Conclusions

This report presents the site-specific information related with the installation and design of the remedial system at the AAFES Car Care Center located at Building 430, Fort Stewart, Georgia. Detailed information related with the operation of the remedial system and all associated groundwater and air monitoring data compiled during the first six months of remedial system operation are presented within JJSA's supplemental technical report entitled "First Semi-Annual Remedial Monitoring Report" dated August 2003.

4.0 References

J.J. Sosa and SAIC (Science Applications International Corporation), *Corrective Action Plan Part B for the Corrective Action at Underground Storage Tanks 257-261, Facility Identification Number #9-089118, Building 430, Fort Stewart, Georgia,* June 2000.

J.J. Sosa and SAIC (Science Applications International Corporation), *Addendum #13 to Work Plan for Preliminary Groundwater and Correction Action Plan – Part A/Part B Investigations at Former Underground Storage Tanks Sites Fort Stewart, Georgia,* December 2001.

J.J. Sosa and SAIC (Science Applications International Corporation), *Field Sampling Plan for the Corrective Action at Underground Storage Tanks 257-261, Facility Identification Number #9-089118, Building 430, Fort Stewart, Georgia,* June 2002

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SAIC (Science Applications International Corporation) 1996a. *Work Plan for Preliminary Groundwater and Corrective Action Plan-Part A/Part B Investigations at Former Underground Storage Tanks Sites, Fort Stewart, Georgia.* Oak Ridge, Tennessee, August.

SAIC (Science Applications International Corporation) 1996b. *Site Safety and Health Plan for Preliminary Groundwater and Corrective Action Plan-Part A/Part B Investigations at Former Underground Storage Tanks Sites, Fort Stewart, Georgia.* Oak Ridge, Tennessee, August.

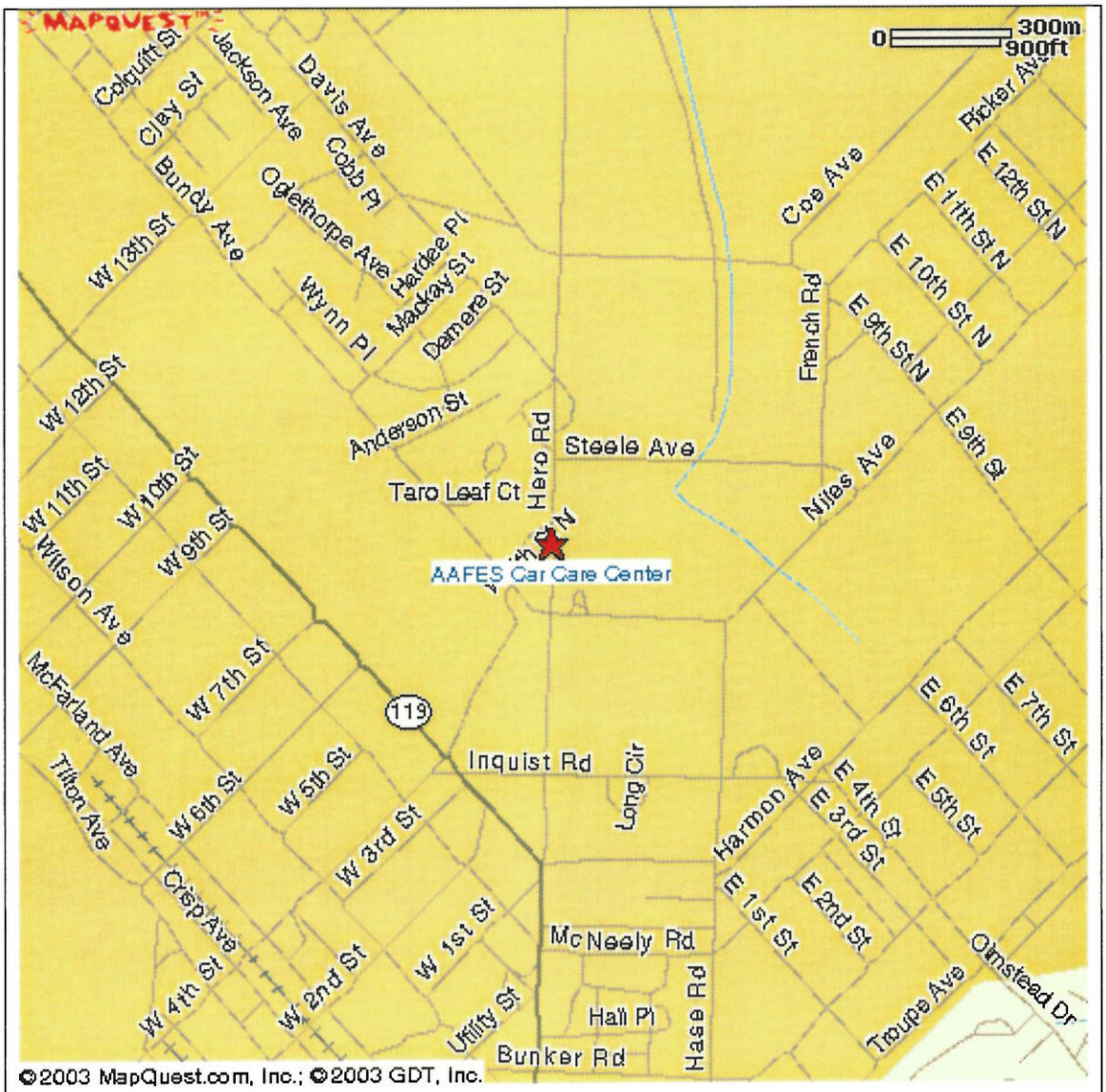
SAIC 1999a. *Corrective Action Plan-Part A for USTs 257-260, Facility ID 9-089037, Building 430, Fort Stewart, Georgia.* Oak Ridge, Tennessee, March.

SAIC 1999b. *Corrective Action Plan-Part A for UST 261, Facility ID 9-089118, Building 430, Fort Stewart, Georgia,* Oak Ridge, Tennessee, March.

SAIC 2000. *Corrective Action Plan – Part B for USTs 257-261, Facility ID 9-089118, Building 430, Fort Stewart, Georgia.* Oak Ridge, Tennessee, January.

USACE, Scope of Work (SOW), Remedial Action at the Former AAFES Gas Station (BLDG 430) Fort Stewart, Georgia, Final September 24, 2001.

Figures



J.J. SOSA & ASSOCIATES, INC.
5811 MEMORIAL HIGHWAY,
SUITE 207 TAMPA, FL 33615
(813) 888-6525 Fax: (813) 881-1285

FIGURE 1
SITE MAP
UST's 257-261, Building 430
Facility ID # 9-089118
Fort Stewart, Georgia

FIGURE 1	USACE dwg	Scale: 1"=1150 ft
Proj. No: 01-082	PM: FGP	5/21/03

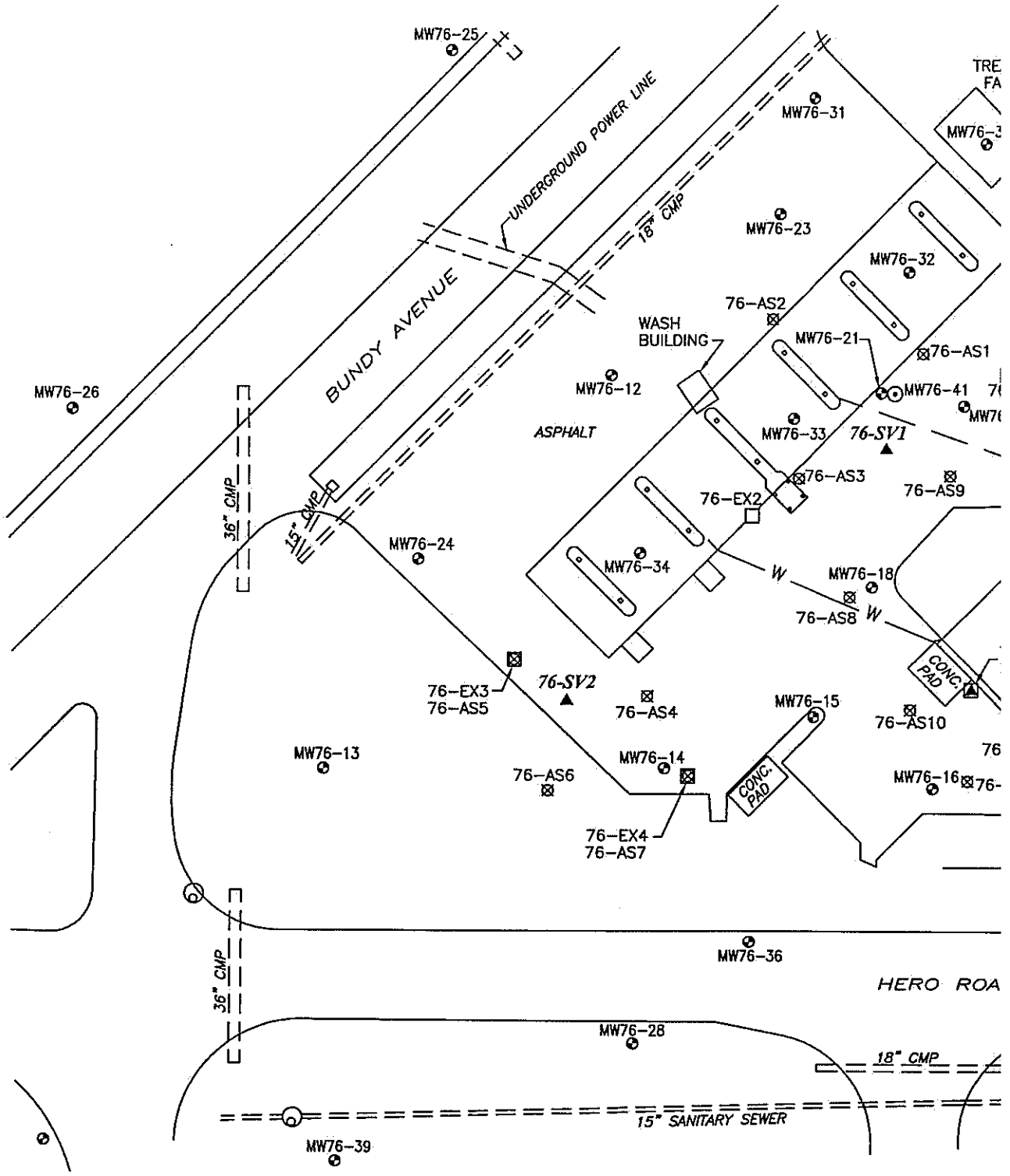


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Figure 2	USTs 257-261, BUILDING 430 FACILITY ID # 9-089118 WELL LOCATIONS FORT STEWART, GEORGIA	SOIL VAPOR EXTRACTION INSTALLATION LOCATION

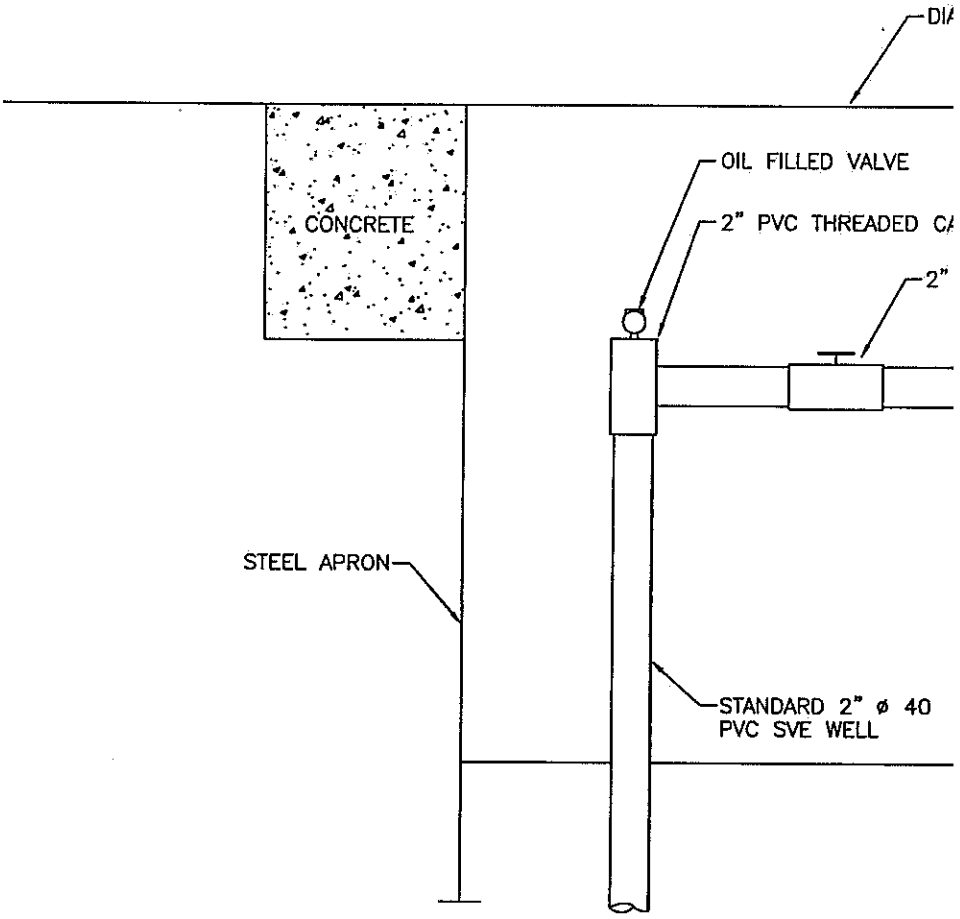


Figure
3

USTs 257–261, BUILDING 430
FACILITY ID # 9–089118
WELL LOCATIONS
FORT STEWART, GEORGIA

SOIL VAPOR EXTRACTION
VAULT CONSTRUCTION DE

PLOTTED:

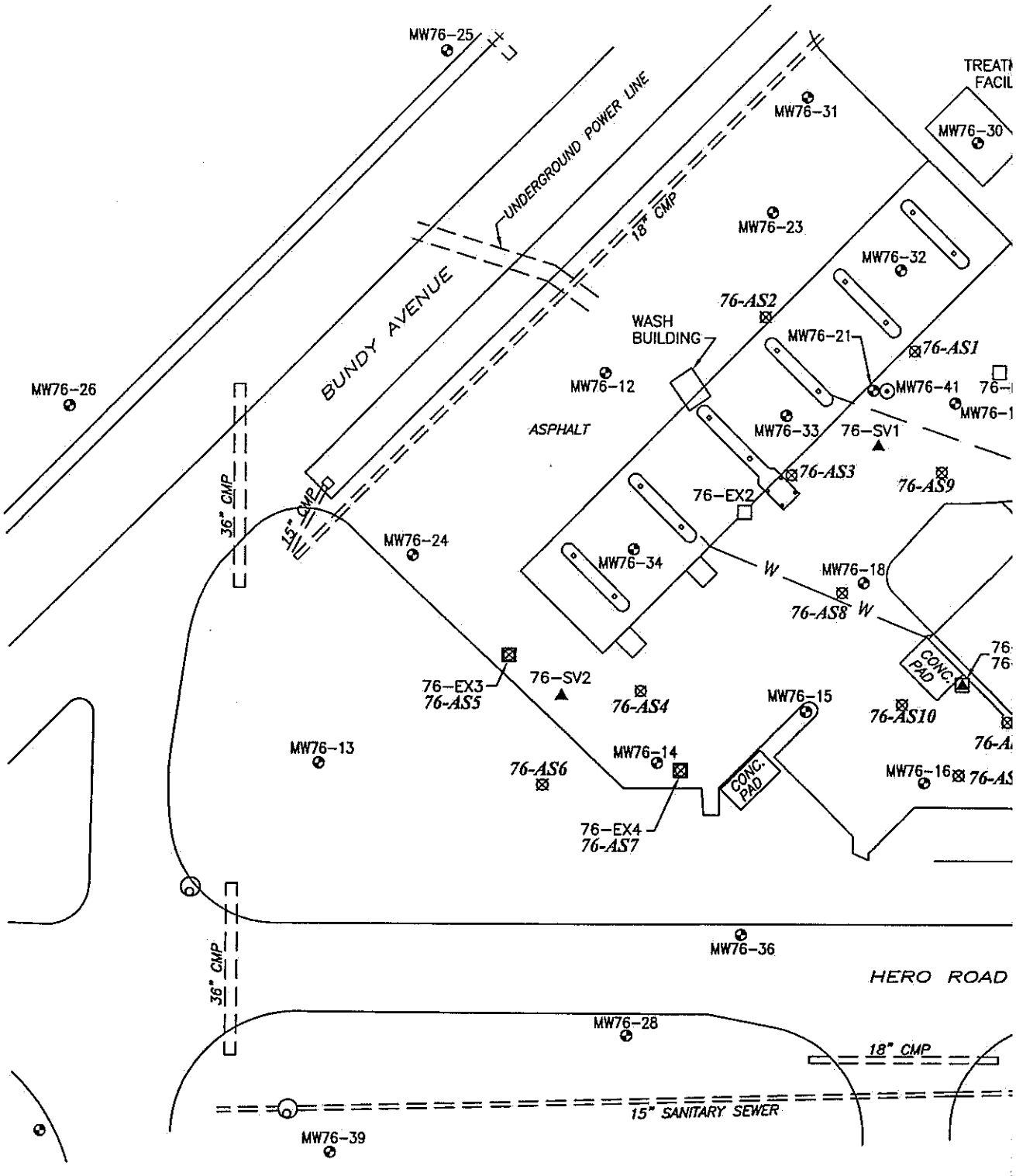


Figure 4	USTs 257-261, BUILDING 430 FACILITY ID # 9-089118 WELL LOCATIONS FORT STEWART, GEORGIA	AIR SPARGE WELL INSTALLATION LOCATIONS

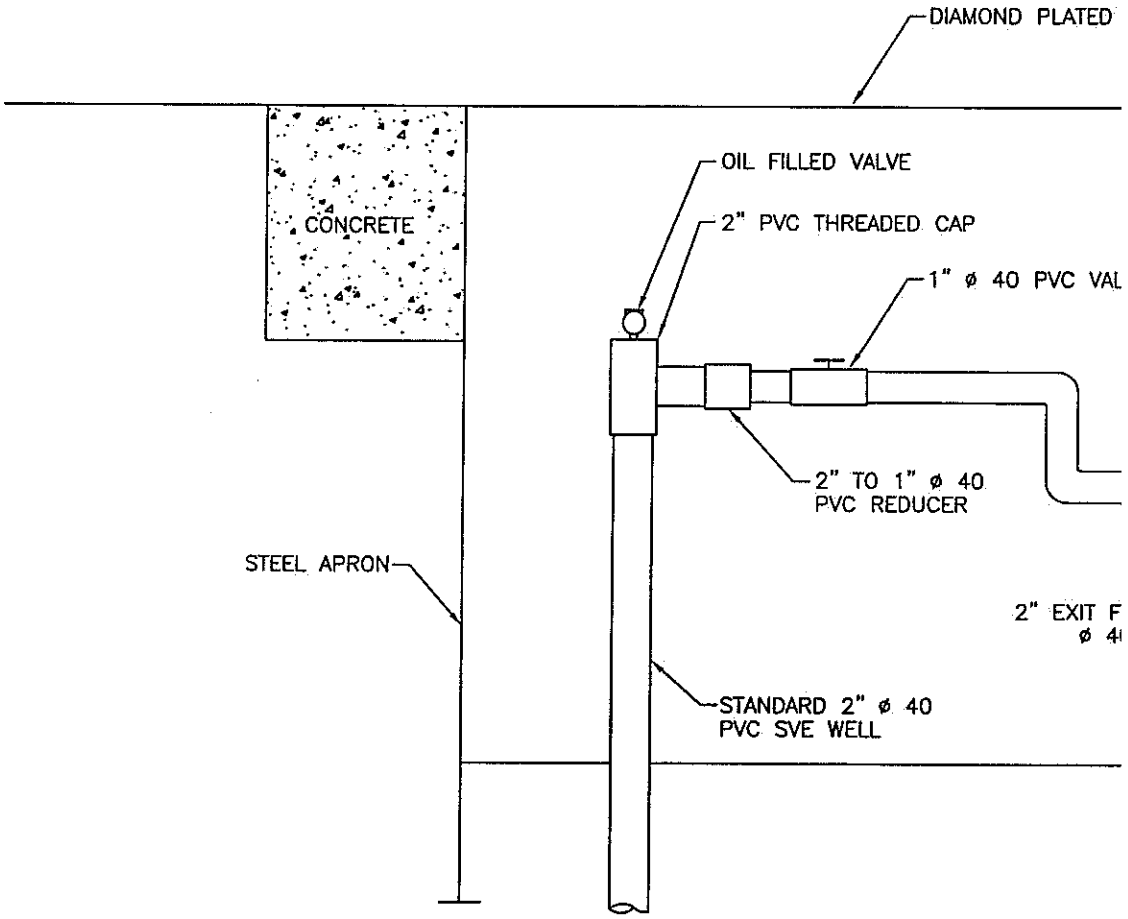


Figure
5

USTs 257–261, BUILDING 430
FACILITY ID # 9–089118
WELL LOCATIONS
FORT STEWART, GEORGIA

AIR SPARGE WELLS
VAULT CONSTRUCTION DET

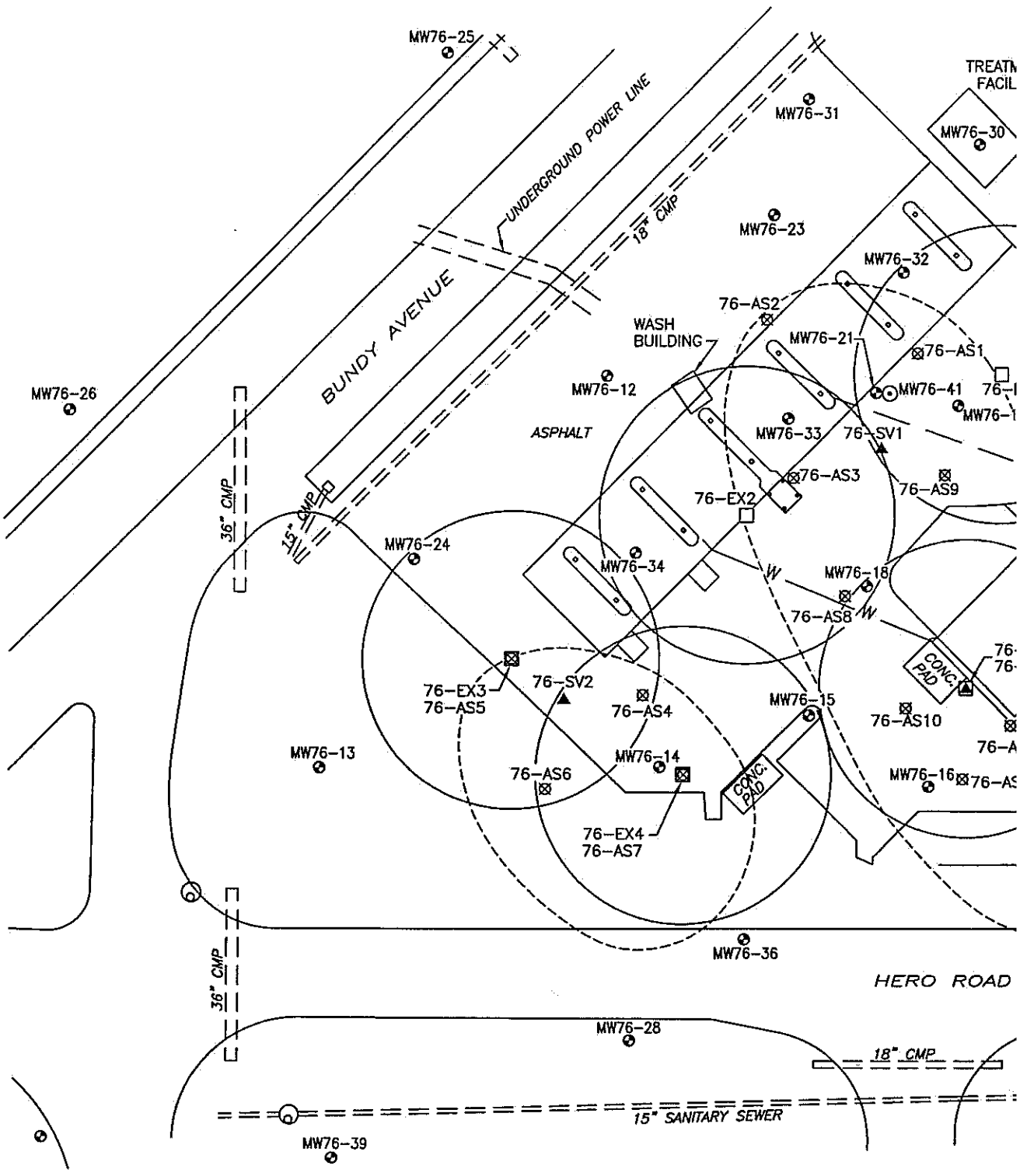


Figure 6

USTs 257-261, BUILDING 430
FACILITY ID # 9-089118
WELL LOCATIONS
FORT STEWART, GEORGIA

PROPOSED EXTRACTION WE
CAPTURE ZONES

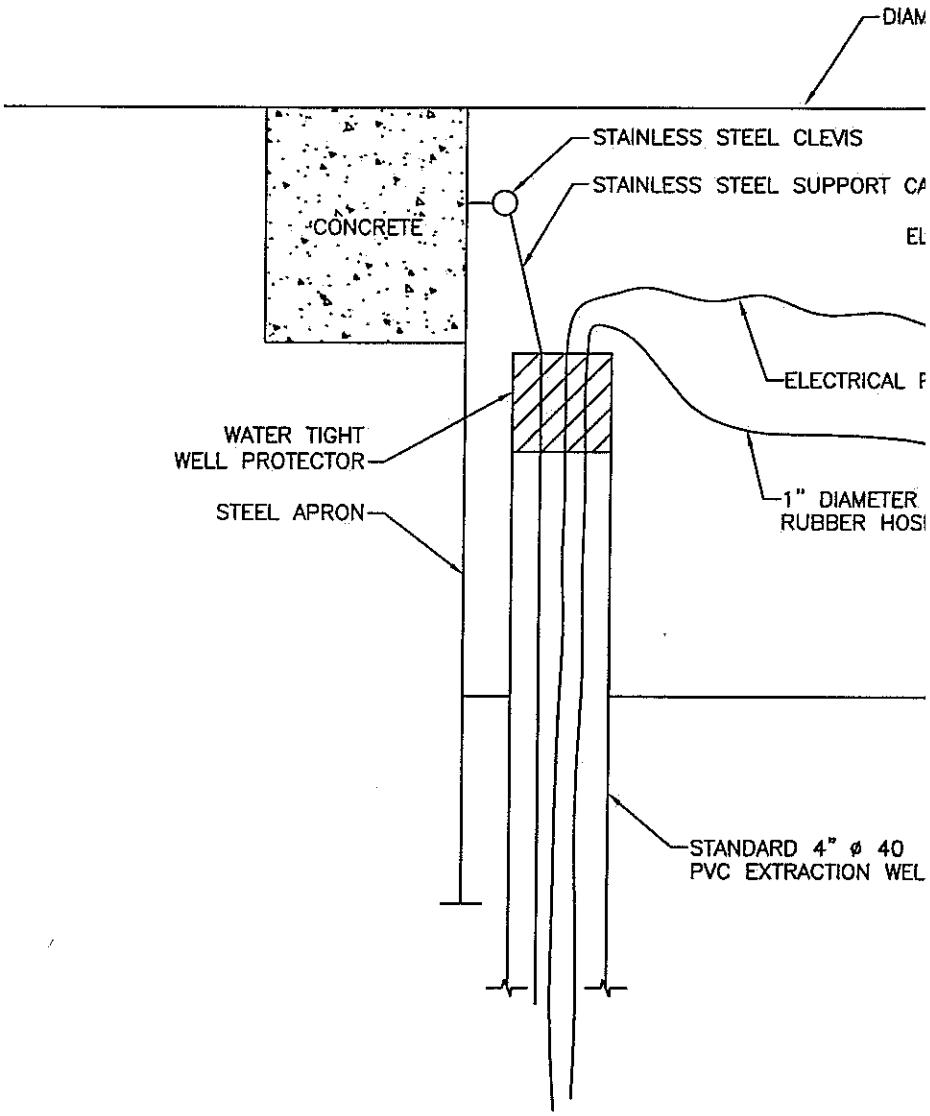


Figure 7

USTs 257–261, BUILDING 430
FACILITY ID # 9–089118
WELL LOCATIONS
FORT STEWART, GEORGIA

EXTRACTION WELLS
VAULT CONSTRUCTION DET.

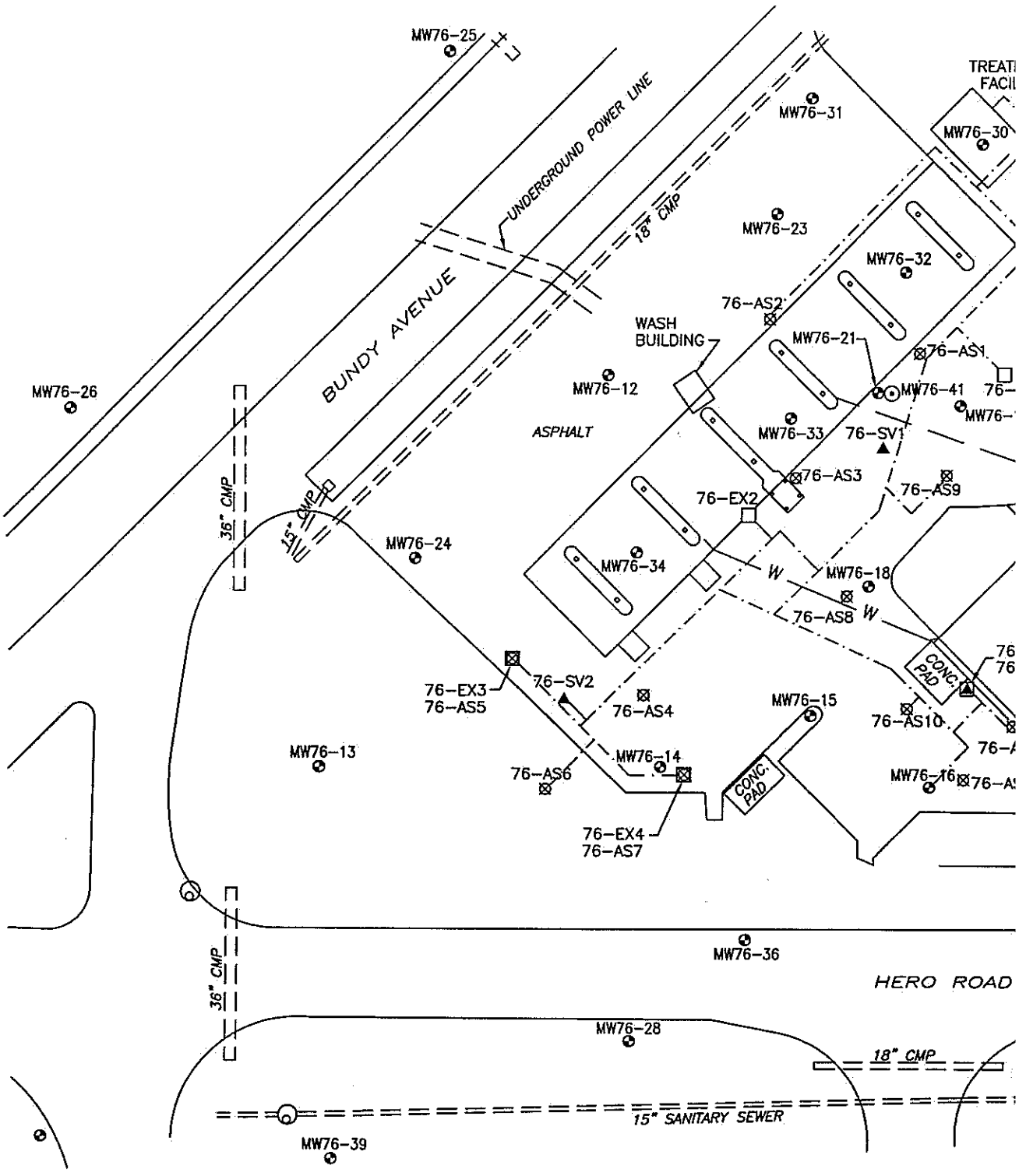


Figure 8

USTs 257-261, BUILDING 430 SYSTEM PIPING LOCATIONS
FACILITY ID # 9-089118
WELL LOCATIONS
FORT STEWART, GEORGIA

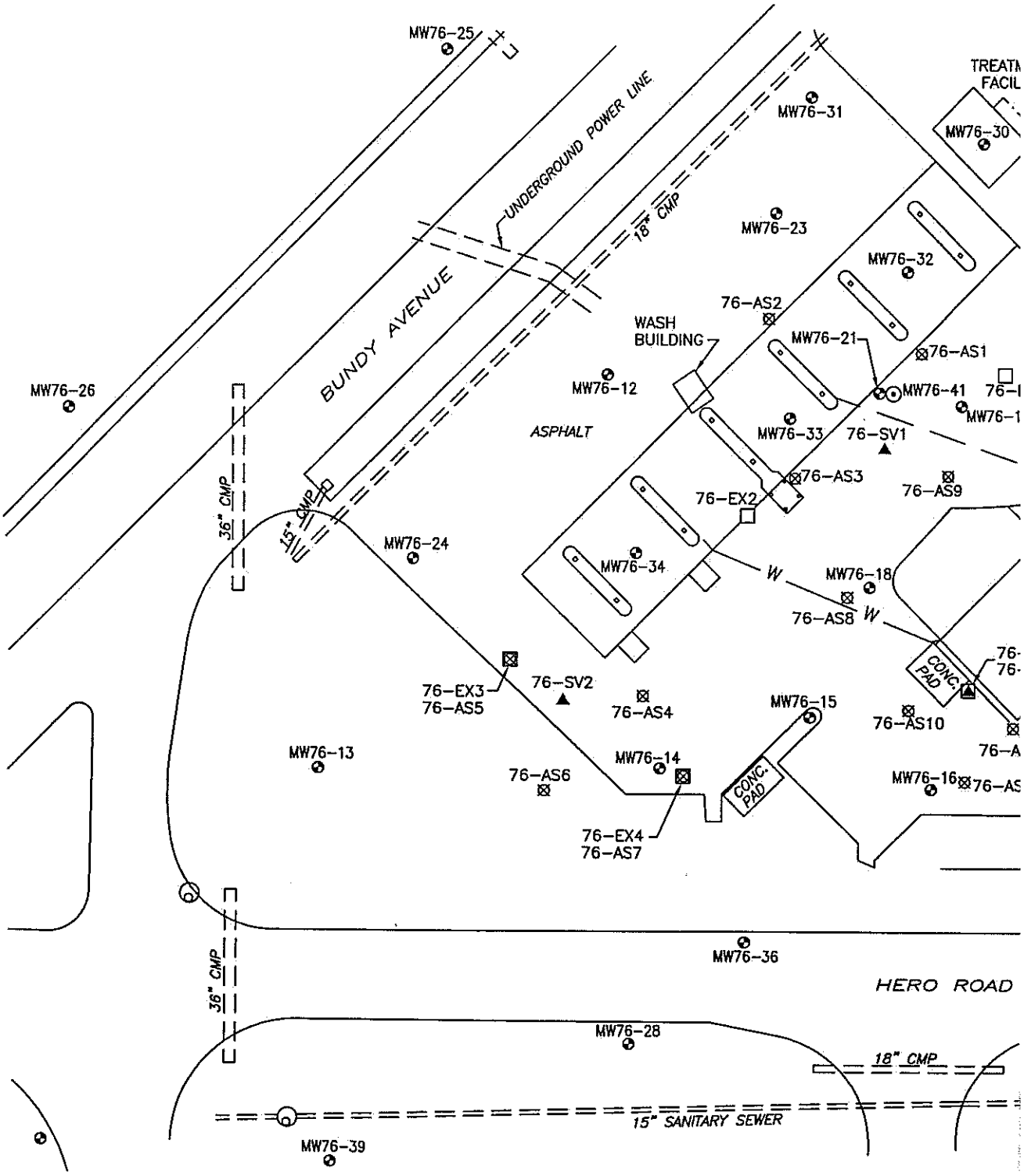


Figure 9	USTs 257-261, BUILDING 430 FACILITY ID # 9-089118 WELL LOCATIONS FORT STEWART, GEORGIA	REINFILTRATION GALLERY INSTALLATION LOCATIONS

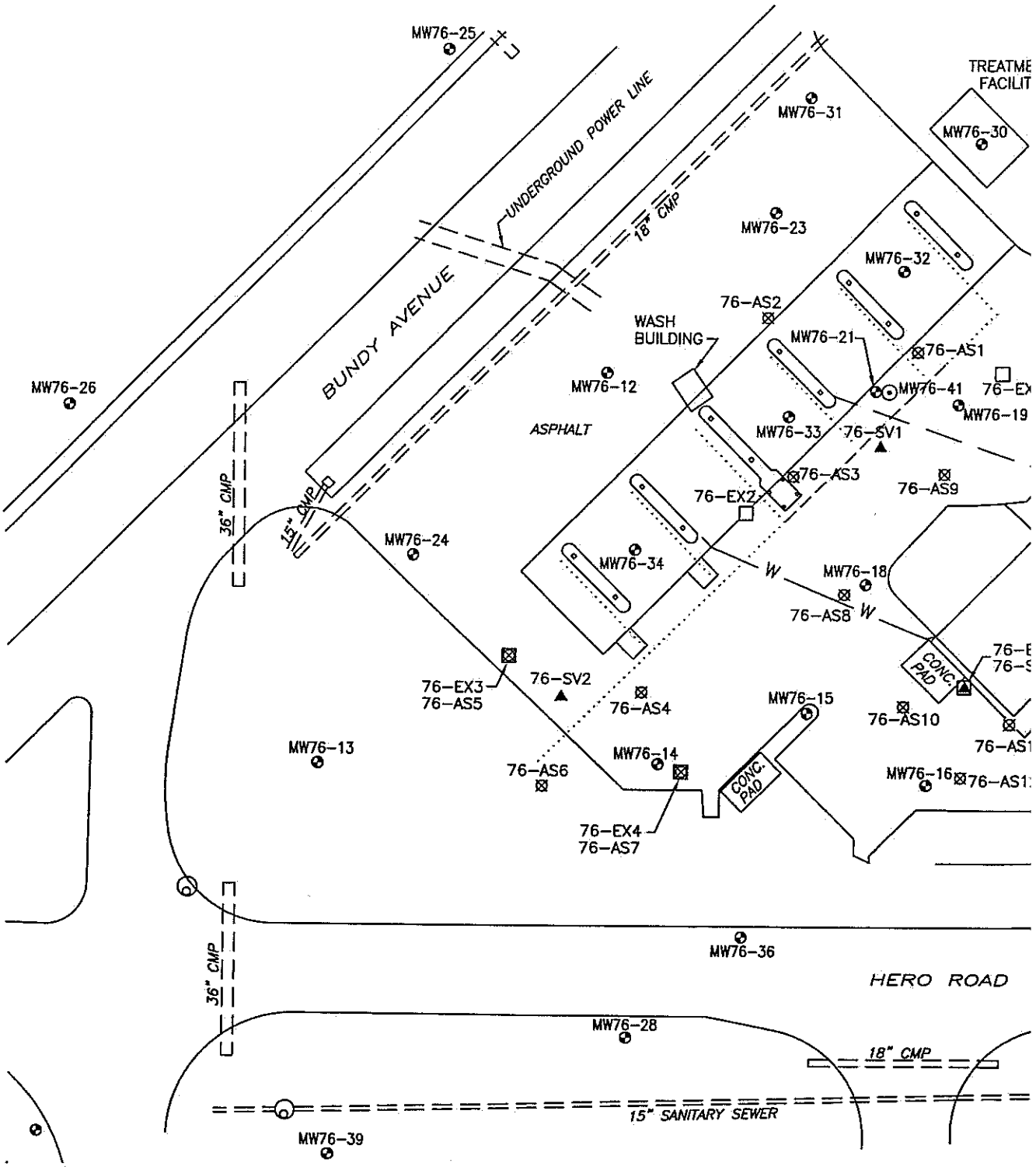


Figure 10

USTs 257-261, BUILDING 430 PIPELINE REMOVAL LOCATIOI
FACILITY ID # 9-089118
WELL LOCATIONS
FORT STEWART, GEORGIA

Tables

Table ,
Air Sparging, Soil Vapor Extraction and Groundwater Extraction Wells Construction Information
AAFES Car Care Facility
Building 430
Corrective Action at USTs 257-261
Facility Identification #9-089118
Ft. Stewart, Georgia

Well Designation	Installation Dates		Total Borehole Depth	Borehole Diameter	Bottom of the Screened Interval	Top of Well Screened Interval	Well Screen Length	Top of the Sand Pack	Top of the Bentonite Seal
	Start	Finish	(ft. bgs)	(inches)	(ft. bgs)	(ft. bgs)	(ft.)	(ft. bgs)	(ft. bgs)
Air Sparge Wells									
76-AS1	06/20/02	06/20/02	40.5	8.25	35	30	5	27.6	23.1
76-AS2	06/24/02	06/24/02	38	10 to12	35	30	5	27	19
76-AS3	06/20/02	06/20/02	35	8.25	34.5	29.5	5	27	25
76-AS4	06/20/02	06/20/02	35	8.25	34.2	29.2	5	27	23
76-AS5	06/20/02	06/21/02	34.7	12.85	34.5	29.5	5	27.5	24.2
76-AS6	06/19/02	06/19/02	36	8.25	34.6	29.6	5	27.8	26
76-AS7	06/22/02	06/25/02	38	8.25	35	30	5	28	24.9
76-AS8	06/21/02	06/22/02	37	8.25	34.7	29.7	5	27.5	21.9
76-AS9	06/22/02	06/22/03	36	8.25	35.4	30.4	5	27.5	25.5
76-AS10	06/20/02	06/20/02	35.5	8.25	34.9	29.9	5	27	23
76-AS11	06/19/02	06/19/02	35.5	8.25	35.28	30.28	5	28	26
76-AS12	06/20/02	06/20/02	35.5	8.25	34.78	29.78	5	25	23
Vapor Extraction Wells									
76-SV1	06/21/02	06/22/02	15.5	8.25	14.88	2.88	12	2.5	1.9
76-SV2	06/25/02	06/25/02	16	8.25	15.2	3.2	12	2.5	2
76-SV3	06/23/02	06/23/02	15.2	8.25	15	3	12	2.5	2
Grounwater Extraction Wells									
76-EX1	01/17/02	01/18/02	47	12.25	45.8	15.8	30	12.5	8.9
76-EX2	06/24/02	06/24/03	49.2	12.25	49	39	10	37.2	32.2
76-EX3	06/20/02	06/21/02	51.5	12.25	49.8	39.8	10	38.1	35.9
76-EX4	06/22/02	06/25/02	54	12.25	50	40	10	38	33
76-EX5	06/23/02	06/23/02	54.5	12.25	49	39	10	36.8	32.3
Infiltration Gallery Observation Well									
76-GA-01	06/24/02	06/24/02	15.5	8.25	14.9	4.9	10	3.8	1.9

Appendix A

Soil Boring Logs and Well Construction Diagrams
(Field Data)

TRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller	HOLE NUMBER EX-1
		SHEET 1 OF 2

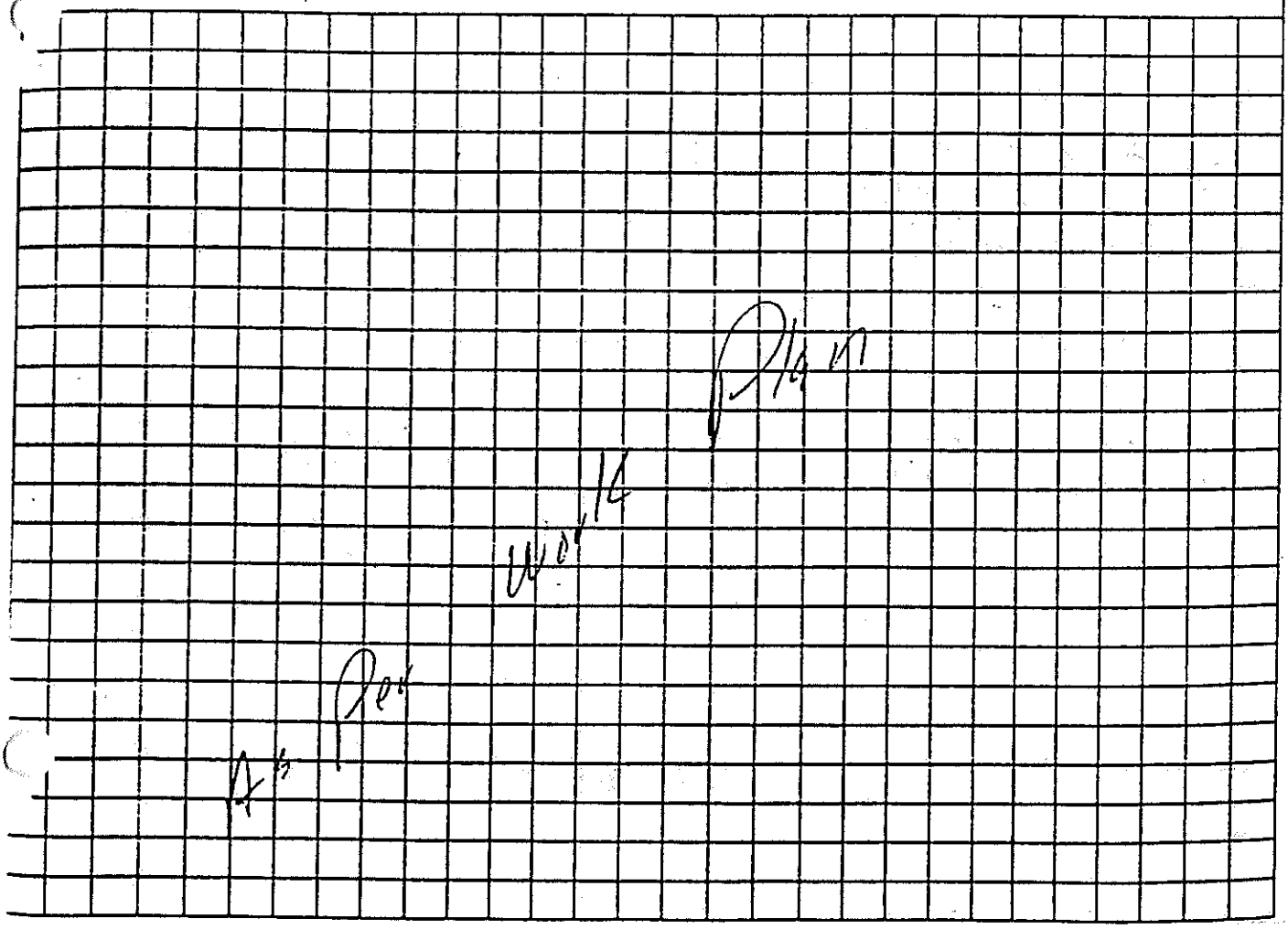
3. PROJECT: Fort Stewart	4. LOCATION:
5. NAME OF DRILLER: S. Gentry	6. MANUFACTURERS DESIGNATION OF DRILL:
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 8" Hollow Stem Auger	8. HOLE LOCATION: Ex Cave Center
	9. SURFACE ELEVATION:
	10. DATE STARTED: 01/17/02 — 11. DATE COMPLETED: 01/18/02
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 470. BLS	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 %
—	Y	—	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
—	—	Y	—	

LOCATION SKETCH/COMMENTS — SCALE:



HTRW DRILLING LOG

HOLE NUMBER 76-EY-02

PROJECT: Fort Stewart USTs | INSPECTOR Lloyd Hall | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Grab Sample 0.0 - 0.3 Split Spoon #1 0.3 - 4.0 3.0/3.7				30 ppm Core
	2	0.3 - 2.2 Clayey Sand (SC) Grayish Gray 5Y 5/1 medium grained subangular firm				70 ppm Core
	3	2.2 - 3.3 Silty Sand (SM) Light gray N6 medium grained subangular moist soft.				500 ppm Core
	4					
	5	Split Spoon #2 4.0 - 8.0 3.7/5.0 Silty Sand (SM) Light Gray 10YR 7/2 TO Black 10YR 2/1 medium grained subangular				293 ppm Core
	6	moist TO wet				870 ppm Core
	7	more organics at ± 7.0 BLS				720 ppm Comp 250 ppm Core
	8					
	9					
	10	Drill out	70	47.0 BLS		

HTRW DRILLING LOG

HOLE NUMBER 63

PROJECT: Fort Stewart USTs

INSPECTOR

SHEET OF

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

60

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008

MONITORING WELL ID: 76-E1

INSTALLATION START: DATE: 01/17/02 TIME: 1345

INSTALLATION FINISH: DATE: 01/18/02 TIME: 1108

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 34 bags

BENTONITE SEAL: TYPE: 3/8 uncoated pellets QUANTITY: 4 buckets

GROUT: TYPE: Portland Cement QUANTITY: 8 bags

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.02 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: ______

OUTSIDE DIAMETER: 4" NOMINAL INSIDE DIAMETER: ______

SCHEDULE/THICKNESS: 40 COMPOSITION: ______

MANUFACTURER: ______

'YPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter pack natural Formation

)ESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 4" NOMINAL INSIDE DIAMETER: ______

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: ______

OINT DESIGN AND COMPOSITION: ~~[illegible]~~ WHP 01/17/02 Flush Threaded

ENTRALIZERS DESIGN AND COMPOSITION: None

ESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: ______ None COMPOSITION: ______

'ECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

None

ıs all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, .)? YES [✓] NO [ ]

's all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical akage and/or defects? YES [✓] NO [ ]

leformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and ieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

ANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 50 gallons

:ORDED BY: [signature]

QA CHECK BY:

69

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008

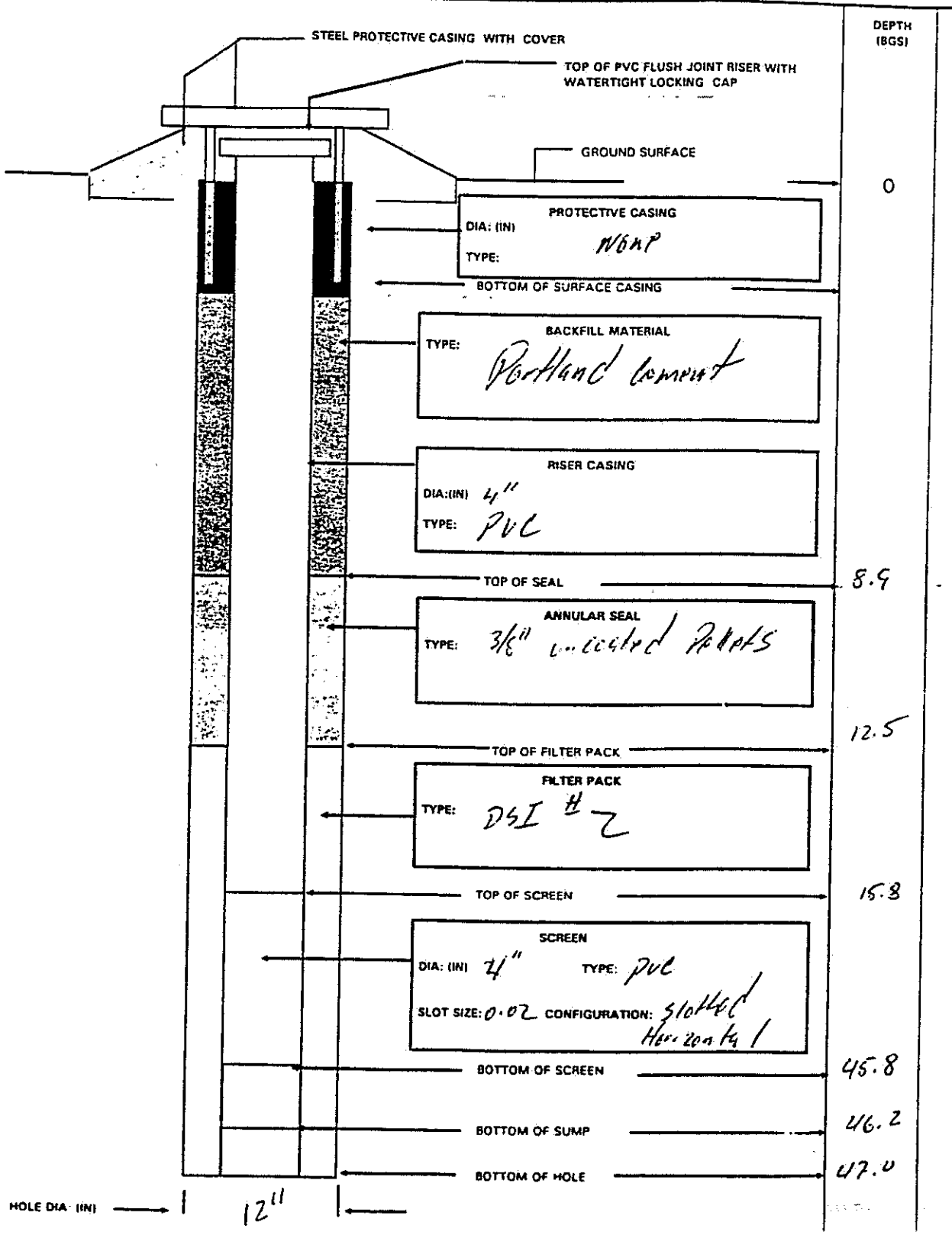
WELL NUMBER: 76-E1

BEGIN: 01/17/02 END: 01/18/02

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNIT



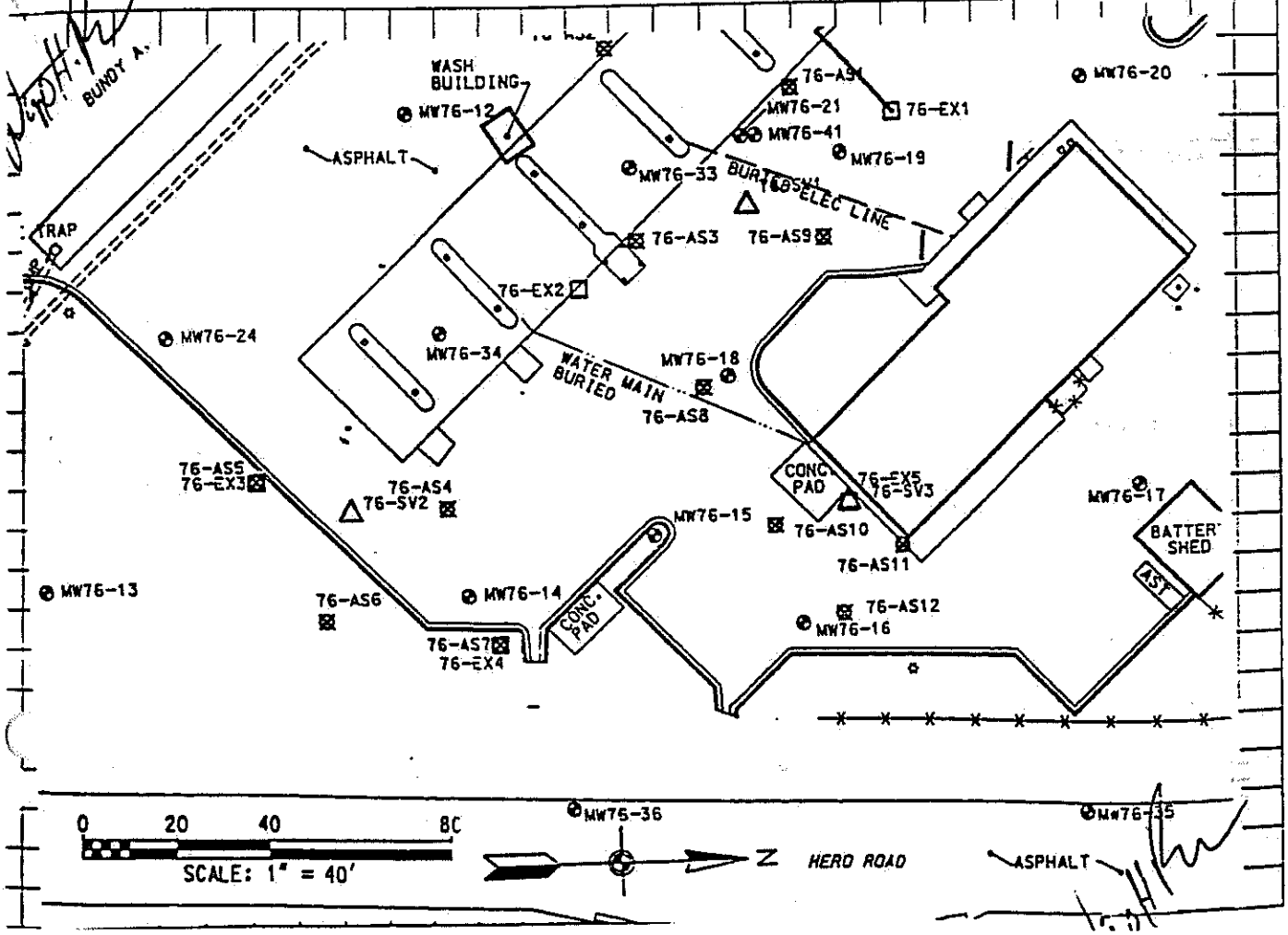
RW DRILLING LOG

	DISTRICT: USACE - Savannah	HOLE NUMBER: 76-EX2
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 2
PROJECT: AAFES Car Wash Center	4. LOCATION: See Map Below	
NAME OF DRILLER:	6. MANUFACTURERS DESIGNATION OF DRILL: Mobil B-57	
SIZES AND TYPES OF DRILLING & SAMPLING EQUIPMENT: Mobil B-57 8¼ (OD) Hollow Stem Auger and CME Spoon Bucket Drill with 12¼ OD Augers	8. HOLE LOCATION: See Map Below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 6/24/02	11. DATE COMPLETED: 6/24/02
OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:	
DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
TOTAL DEPTH OF HOLE: 55 BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	En Core					
DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
Extraction Well						

TION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

PROJECT: AAFES CCC | INSPECTOR [signature] | HOLE NUMBER 76-EX2 | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		0.0 – 0.3 3.5/5.0 spoon #1 0.3 – 2.0				
	1	Clayey sand Greenish grey 10G 6/1 medium to fine grained moist, firm subangular	core = 8.0 ppm HS = 935 ppm			
	2	2.0 – 3.5 silty sand Light greenish gray 10Y 7/1				
	3	fine grained, subangular moist soft	core = 11.0 ppm			
	4		HS 2.5–5.0 635 ppm			
	5	spoon #2 4.0/5.0 ~~4.0–5.0~~ 5.0–6.0 wAP 06/24/02				
	6	same as above 6.0 – 9.0 silty sand Black N1	core = 85 ppm HS = 1261 ppm			
	7	fine grained, subangular, soft moist to saturated				
	8					
	9		core = 105 ppm HS = ↑ 2000 ppm			Water table ≈ 10.0 BGS

HTRW DRILLING LOG

HOLE NUMBER	
SHEET	OF

ECT: | INSPECTOR

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

Wayne L. Pam 06/24/96

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

MONITORING WELL ID: 76-EX2

INSTALLATION START: DATE: 06/24/02 TIME: 0815

INSTALLATION FINISH: DATE: 06/24/02 TIME: 1800

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 650 lbs

BENTONITE SEAL: TYPE: sure gel QUANTITY: 100 lbs

GROUT: TYPE: Portland / Bentonite QUANTITY:

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.010 #10 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN:

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter/Formation pack

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

JOINT DESIGN AND COMPOSITION: Flush Threaded

CENTRALIZERS DESIGN AND COMPOSITION: NONE

DESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: COMPOSITION:

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Formation was heaving into Augers during installation of filter pack and seal

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Was deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 50 gallons

RECORDED BY: [signature] 06/24/02 QA CHECK BY:

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

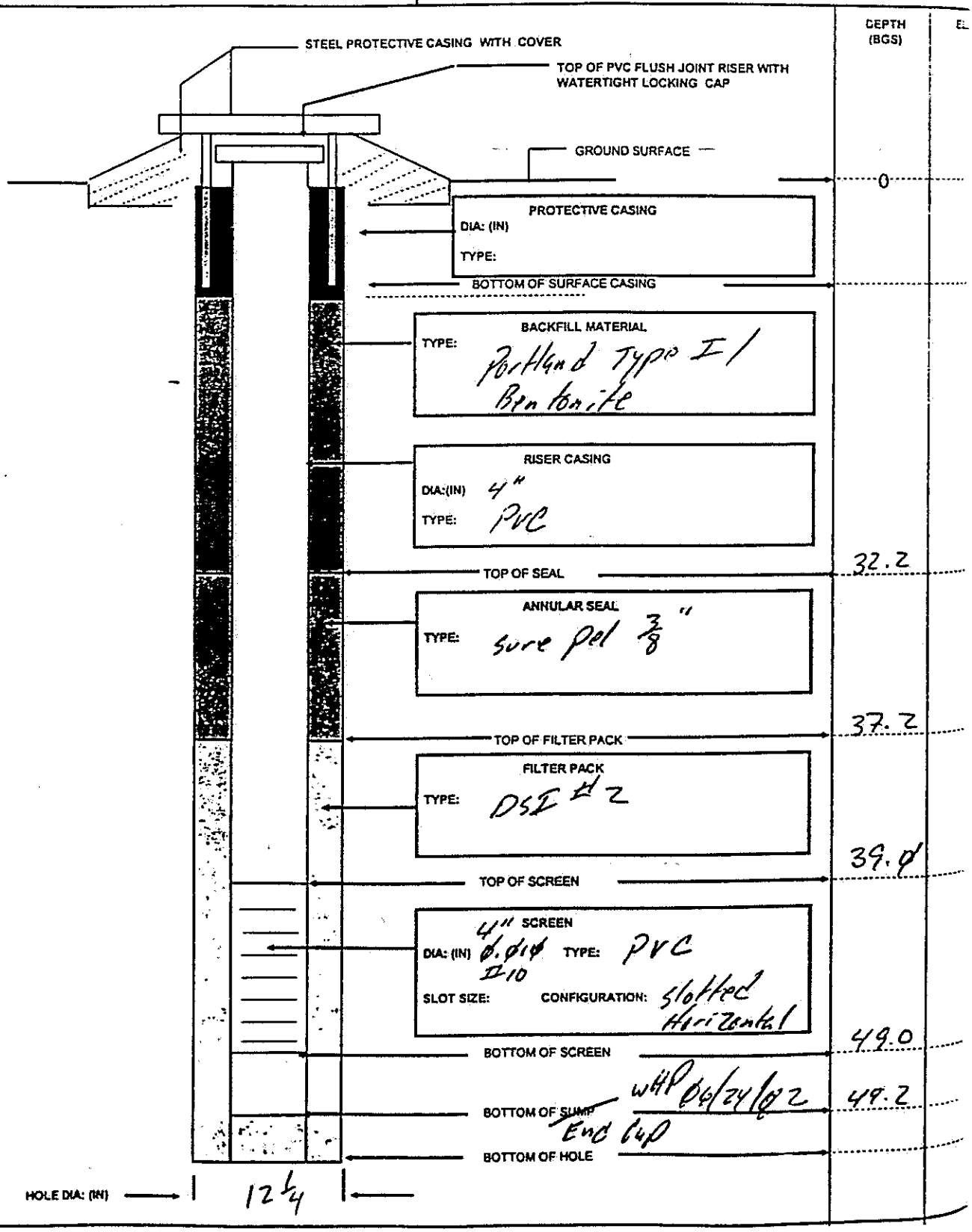
WELL NUMBER: 76 - EX 2

BEGIN: 06/24/02 END: 06/24/02

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:



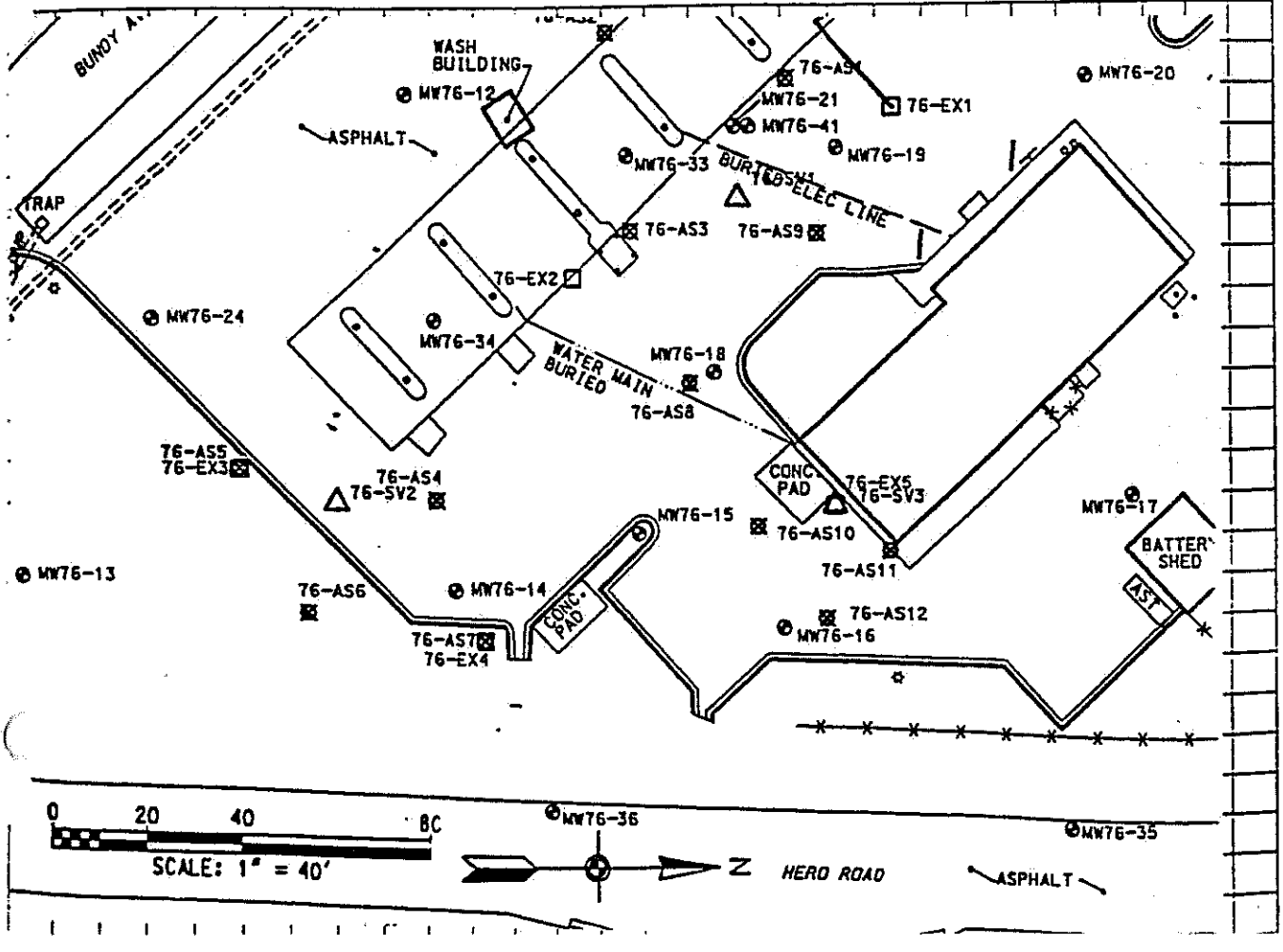
35

RW DRILLING LOG

DISTRICT: USACE - Savannah		HOLE NUMBER: 76-AS5/EX3
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 3
PROJECT: AAFES Car Care Center	4. LOCATION: See Map below	
NAME OF DRILLER:	6. MANUFACTURERS DESIGNATION OF DRILL:	
TYPES AND TYPES OF DRILLING & SAMPLING EQUIPMENT: Mobil B-57 8¼ (OD) Augers with CME Spoon over drill with 12¼ Augers to install well	8. HOLE LOCATION: See Map below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 06/20/02	11. DATE COMPLETED: 06/21/02
OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ± 0 BLS	
DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
TOTAL DEPTH OF HOLE: 51.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY: NA
	Enlore					
DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
Monitor well		✓				

ON SKETCH/COMMENTS — SCALE:



HTRW DRILLING LOG

PROJECT: AAFES CCC	INSPECTOR: [signature]	HOLE NUMBER 76-AS5
		SHEET 2 OF 3 EX3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1					
	2					
	3–5	Post hole out TO ≈ 4.0 Drill out 4-5				
	5–7	1.0/5.0 Silty sand Black fine grained moist subangular soft	Core = 120ppm HS = <2000 ppm			
	8					
	9					

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HTRW DRILLING LOG

HOLE NUMBER 76-AS5

SHEET 3 OF 3

EX 3

CT: AAI ES LCC

INSPECTOR

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
11	2.5/5.0 Silty sand Black 5YR 2.5/1 to dark reddish brown 5YR 3/2 fine, subangular saturated,	core 10.0 ppm HS = < 2000		collect sample	water table ≈ 10.0-11.0
12					
13					
14					
15					
16					
17	Drill out to 51.5				
18					
19					

76-AS5

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

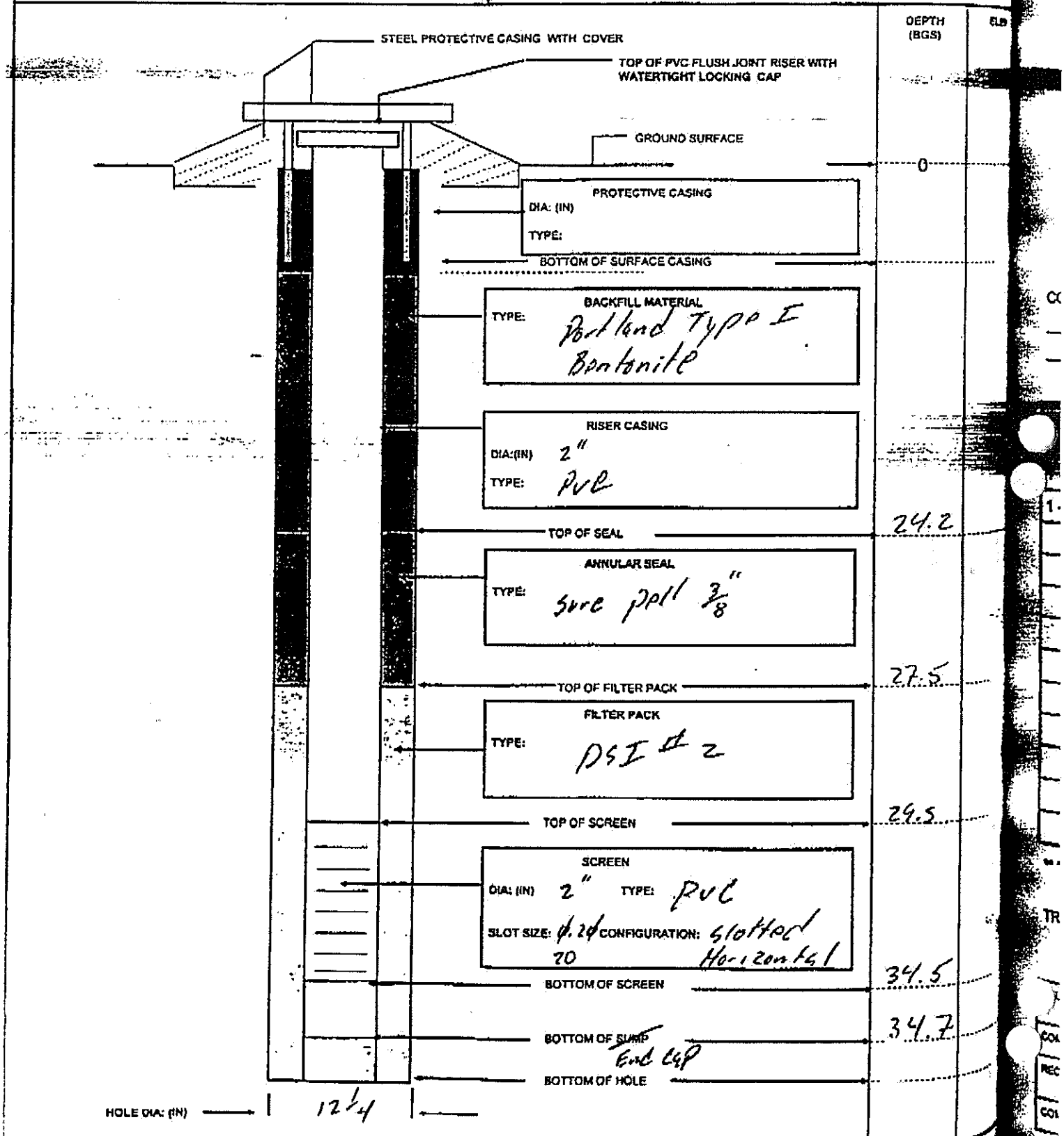
WELL NUMBER: 76-A55

BEGIN: 06/20/02 END: 06/21/02

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:



MONITORING WELL

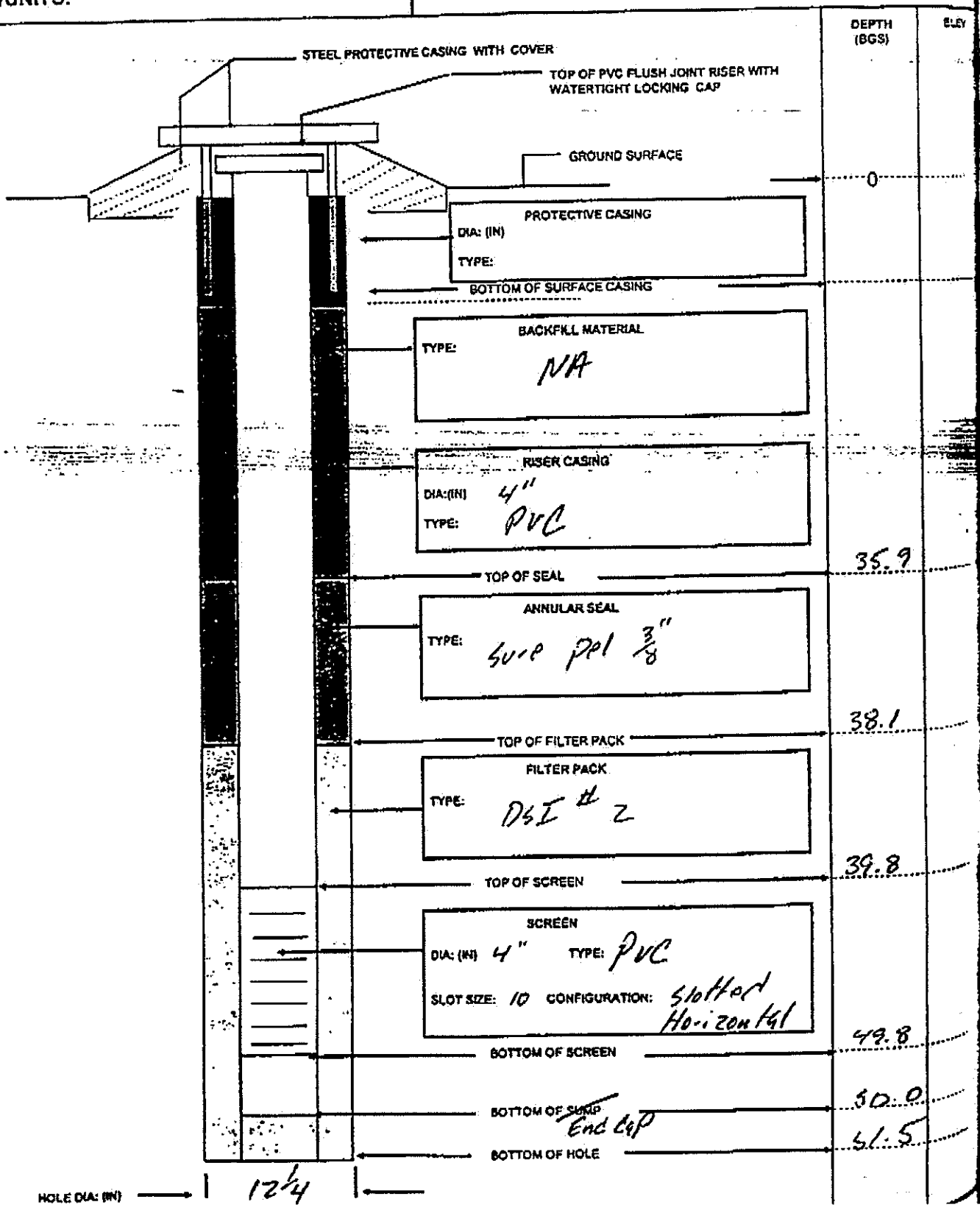
PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76 - EX 3 BEGIN: 06/20/02 END: 06/21/02

COORDINATES: N: E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:



TRW DRILLING LOG

COMPANY NAME: SAIC	DISTRICT: USACE - Savannah	HOLE NUMBER: 76-EX4/AS7
	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 2

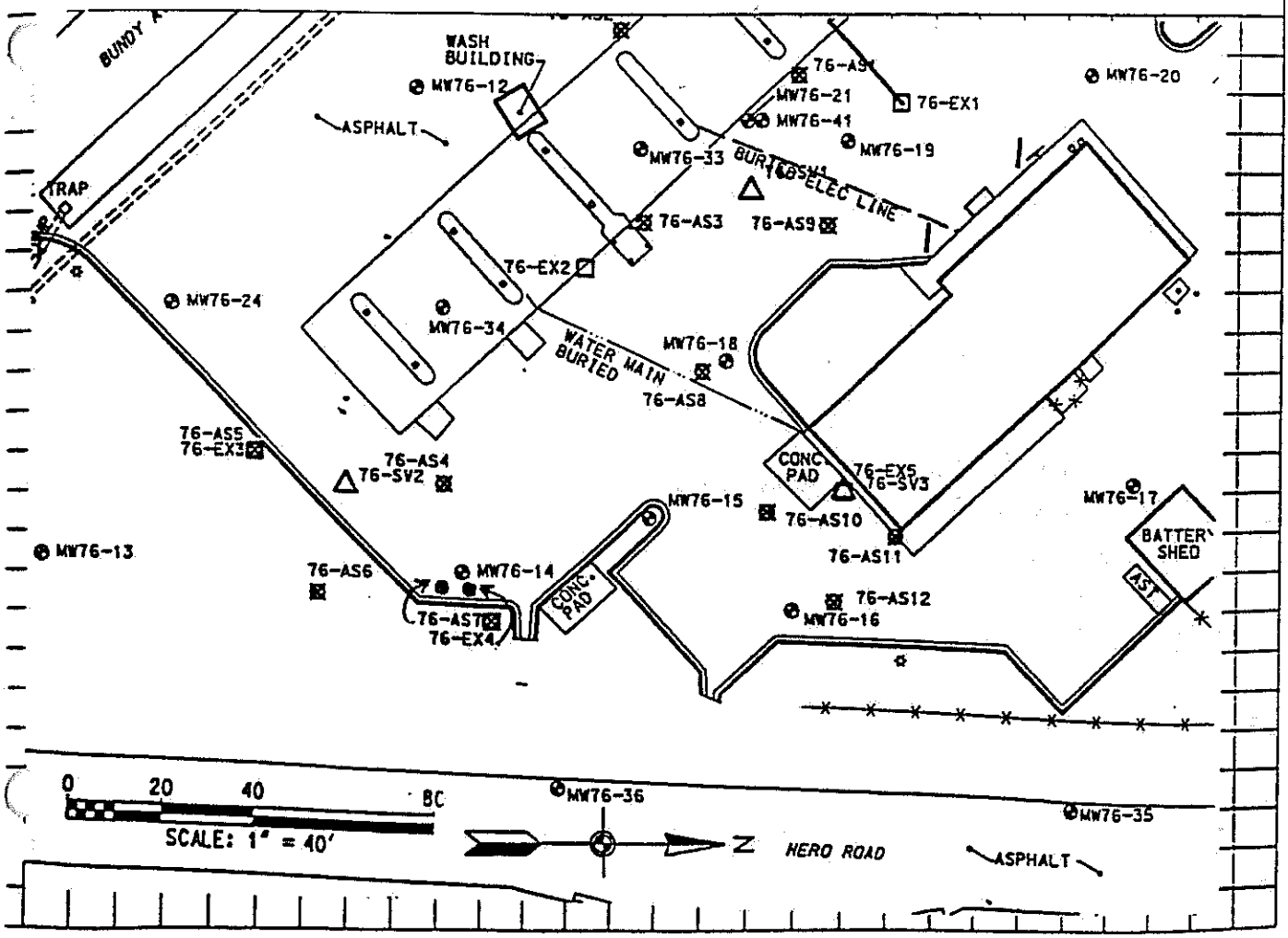
3. PROJECT: AAFES Cure Care Center	4. LOCATION: See Below
5. NAME OF DRILLER: Paul Gibson	6. MANUFACTURERS DESIGNATION OF DRILL: B-57
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 8¼ OD Auger with CME Spoon to water table w/well over drilled with 12¼	8. HOLE LOCATION: See Below
	9. SURFACE ELEVATION:
	10. DATE STARTED: 06/22/92 — 11. DATE COMPLETED: 06/25/92
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 56.9 / 54.0 / 38.9	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 %
YES	Encore					

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Extraction well				

LOCATION SKETCH/COMMENTS — SCALE:



HOLE NUMBER 76-EX4/AS7

HTRW DRILLING LOG

PROJECT: ARFE Cargo Center | INSPECTOR Wardell Fr | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		spoon #1 asphalt 0.0-0.5 ϕ-5.ϕ 3.9/5.0	core 15ppm			
	1	0.5 to 2.0 sand with silt Light gray 7/1 10YR fine grained to medium grained subangular moist	9.1ppm = HS			
	2	2.0 - 3.5 sand with silt Light brownish gray 10YR 6/2				
	3	fine grained subangular, moist poorly graded	core 42ppm HS = 162ppm			
	4					
	5	spoon #2 5.0-10.0 5.0/5.0 5.0-5.5 same as above				
	6	5.5 - 10.0 silty sand ≈ 35% silt, Black wc	core 75ppm [illegible]ppm			
	7	fine grained subangular, moist to saturated	HS			
	8					
	9		HS = 1054ppm core 957ppm			water table

HTRW DRILLING LOG

HOLE NUMBER	
SHEET	OF

PROJECT: INSPECTOR

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

WHP 06/22/92

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

MONITORING WELL ID: 76-EX4

INSTALLATION START: DATE: 06/22/02 TIME: 0800

INSTALLATION FINISH: DATE: 06/25/02 TIME: 1430

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 100 lbs

BENTONITE SEAL: TYPE: High yield Bentonite QUANTITY: 25 gallon / slurry

GROUT: TYPE: Cement Type II Bentonite QUANTITY: _____

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.010 # 10 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

JOINT DESIGN AND COMPOSITION: Flush threaded

CENTRALIZERS DESIGN AND COMPOSITION: NONE

DESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: _____ COMPOSITION:

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

76-EX4/AS7 was to be a stacked pair but because of heaving sands AS7 was installed in a seperate hole

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Was deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 100 Gallons

RECORDED BY: [signature] QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

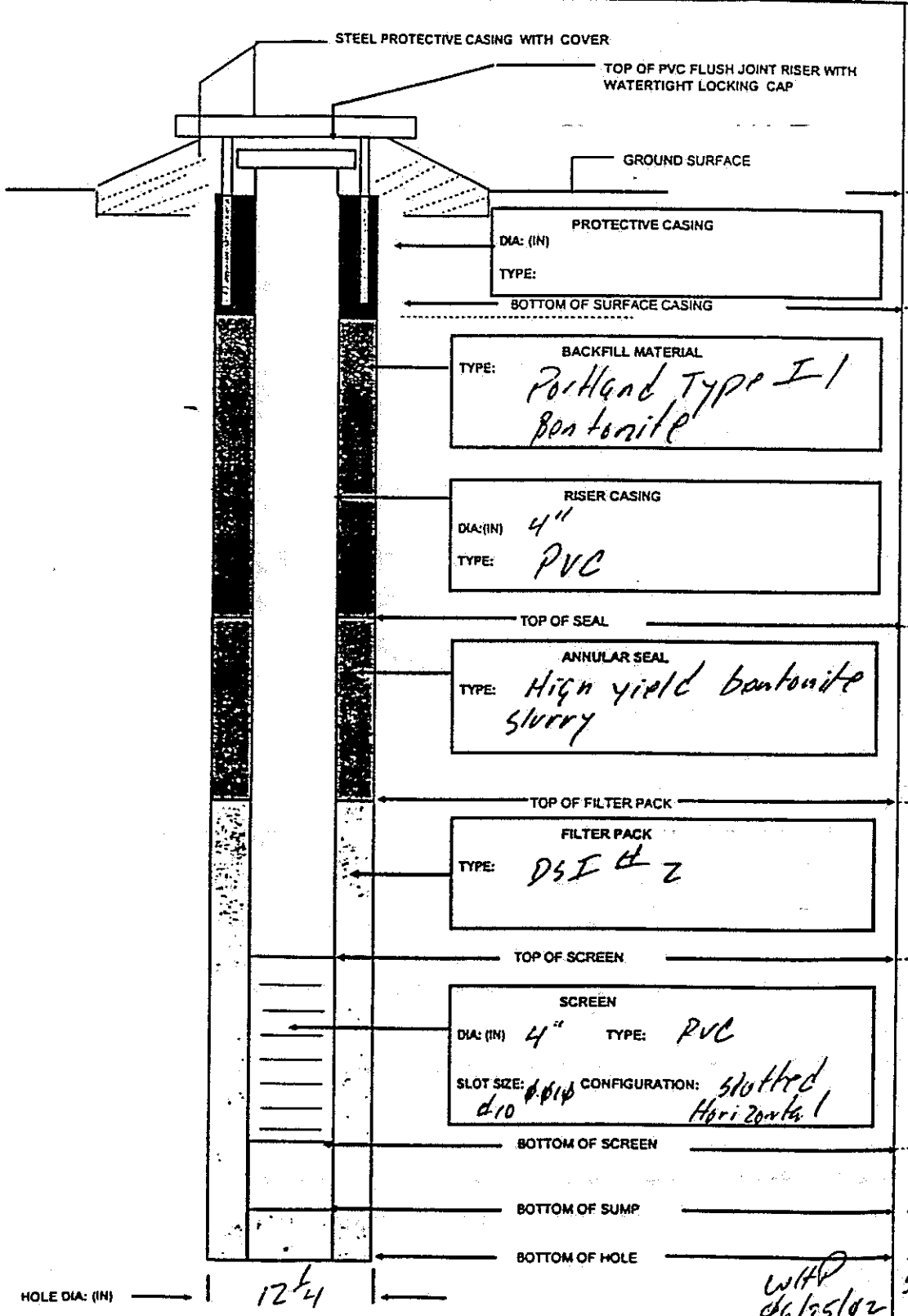
WELL NUMBER: 76-EX4

BEGIN: 06/22/92 END: 06/23/92

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS:



MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

MONITORING WELL ID: 76-AS7

INSTALLATION START: DATE: 06/22/02 TIME: 0800

INSTALLATION FINISH: DATE: 06/25/02 TIME: 1655

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 150 lbs

BENTONITE SEAL: TYPE: Sure Gel QUANTITY: 50 lbs

GROUT: TYPE: Portland Type I/Bentonite QUANTITY:

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: NA

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: PVC SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter pack/Formation

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

JOINT DESIGN AND COMPOSITION: Flush Threaded

CENTRALIZERS DESIGN AND COMPOSITION: NONE

DESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: COMPOSITION:

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical leakage and/or defects? YES [✓] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT:

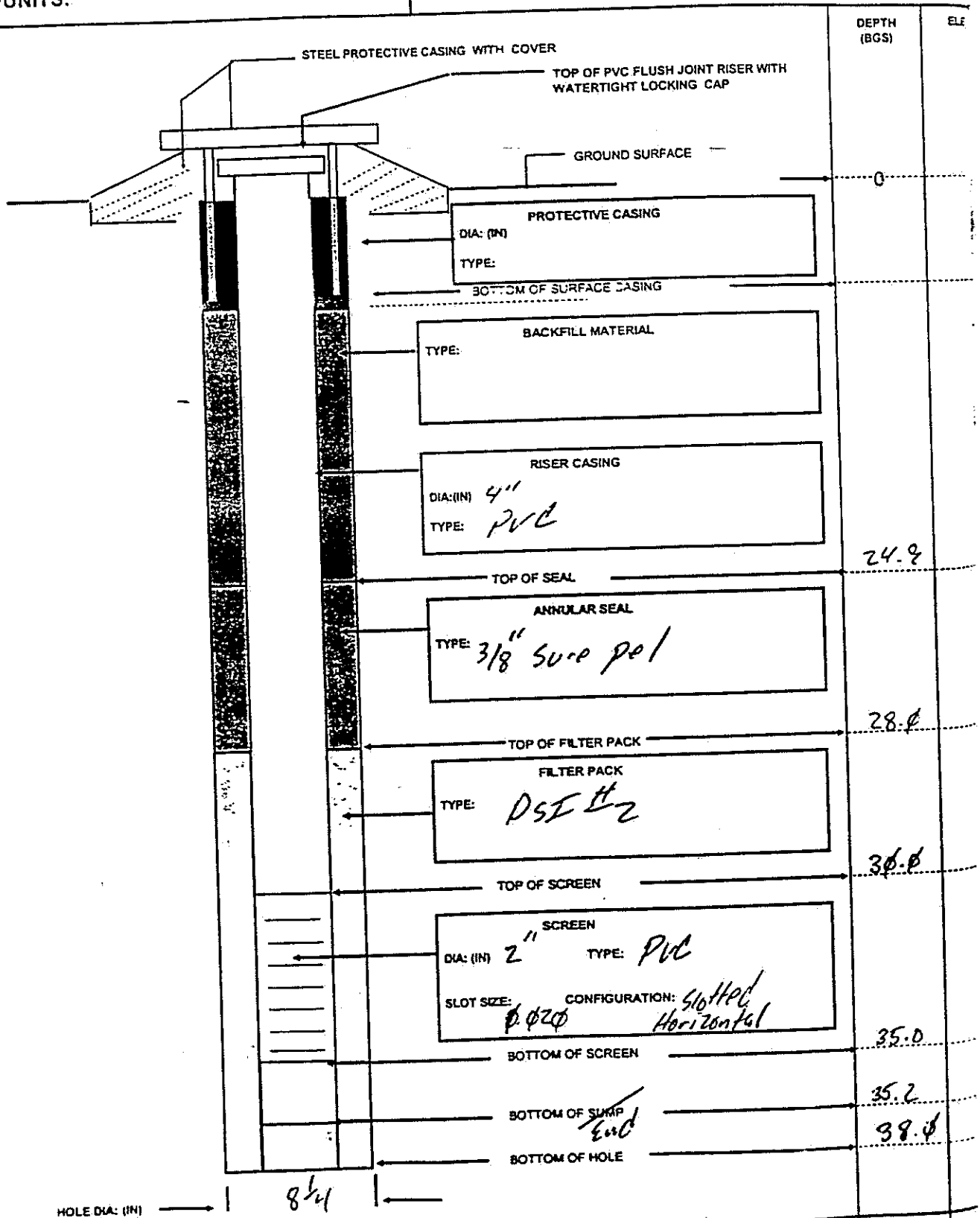
RECORDED BY: (Signature & Date)

QA CHECK BY: (Signature & Date)

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-A57	BEGIN: 06/22/02	END: 06/25/02
COORDINATES: N: E:	REFERENCE POINT: ELEVATION:	DATUM/UNITS:
DATUM/UNITS:		



..RW DRILLING LOG

DISTRICT: USACE - Savannah

HOLE NUMBER: 76-SU-01

SHEET 1 OF 1

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Miller

3. PROJECT: UST's 257-261

4. LOCATION: AAFES Car Care

5. NAME OF DRILLER: T. Worrad

6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 8¼" Hollow Stem Augers; 5' CME Continuous Samplers

8. HOLE LOCATION:

9. SURFACE ELEVATION:

10. DATE STARTED: 6-21-02

11. DATE COMPLETED: 6-22-02

12. OVERBURDEN THICKNESS: NA

13. DEPTH DRILLED INTO ROCK: NA

14. TOTAL DEPTH OF HOLE: 15.5'

15. DEPTH GROUNDWATER ENCOUNTERED: 12.1'

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA — DISTURBED | UNDISTURBED

19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	Lead				

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
			Soil Vapor Extraction (Well)	Kenneth Gardner

LOCATION SKETCH/COMMENTS: See Map, page 5

SCALE:

HTRW DRILLING LOG

PROJECT: UST's | INSPECTOR JKh | HOLE NUMBER A-SVL01 | SHEET 1 OF 1

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Asphalt & Gravel				Auger to 3' with sampler
	1	CLAYEY SAND (SC) 10% clay, medium grained, subangular, fair moist, 10YR-5/6 Yellowish Brown	9.6 ppm 1730			
	2	No Recovery				
	3	Bottom of hole 3.0'				Hit active water line
	4					
	5					
	6					
	7					
	8					
	9					

HTRW DRILLING LOG

HOLE NUMBER T-SE-01

...T: LST's 257-261 | INSPECTOR JKL | SHEET 2 OF

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	Asphalt				Offset from first hole ~2' and auger to 3' with sampler
1	CLAYEY SAND (SC), 10% clay, medium grained, sub-angular, firm, moist, Olive Gray 5Y-4/2				
2	SILTY SAND (SM) 30% silt, fine to very fine grained, soft, dry, Dark Brown, 10YR-3/3	>3000 ppm 1207			
3	No Recovery				
	SAND (SP), very fine to fine grained, very soft, dry, Yellow, 10YR-7/6	>3000 ppm 1213			Auger to 8' with sampler
4	No Recovery				
5					
6					
7					
8	SILTY SAND (SM) 20% silt, very fine grained, firm, moist, Dusky Red - 10R-3/3	>3000 1220			Auger to 13' with sampler
9					

HTRW DRILLING LOG

OJECT: VST's 257-261 | INSPECTOR JKL | HOLE NUMBER [illegible]-SU-01 | SHEET 1 OF

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO.	REMARKS (G)
	11		73000 ppm 1231		76 V.0121	
	12	SANDY SILT (ML), 40% very fine sand, soft, moist, Black, 10YR-3/1. Wet at 12.1'				∇
	13					Discontinue Sampling and auger to 15.5'
	14					
	15					
	16	Bottom of hole 15.5'				
	17					
	18					
	19					

MONITORING WELL INSTALLATION LOG

OJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

NITORING WELL ID: 76-SV-01

TALLATION START: DATE: 6-21-02 TIME: 1700

TALLATION FINISH: DATE: 6-22-02 TIME: 1330

NULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: #2 Sand QUANTITY: 9 50lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: ½ of 5 gal. bucket

GROUT: TYPE: Portland Cement Grout QUANTITY: _____

SCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020" SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

E OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN:

PTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

NT DESIGN AND COMPOSITION: Flush Threaded

ITRALIZERS DESIGN AND COMPOSITION: NA

SCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15" x 15" square COMPOSITION: Steel Flush Mount

CIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

leaving sands - flushed down with water

all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

? YES [✓] NO [ ]

all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

kage and/or defects? YES [✓] NO [ ]

formation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

TITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: _____

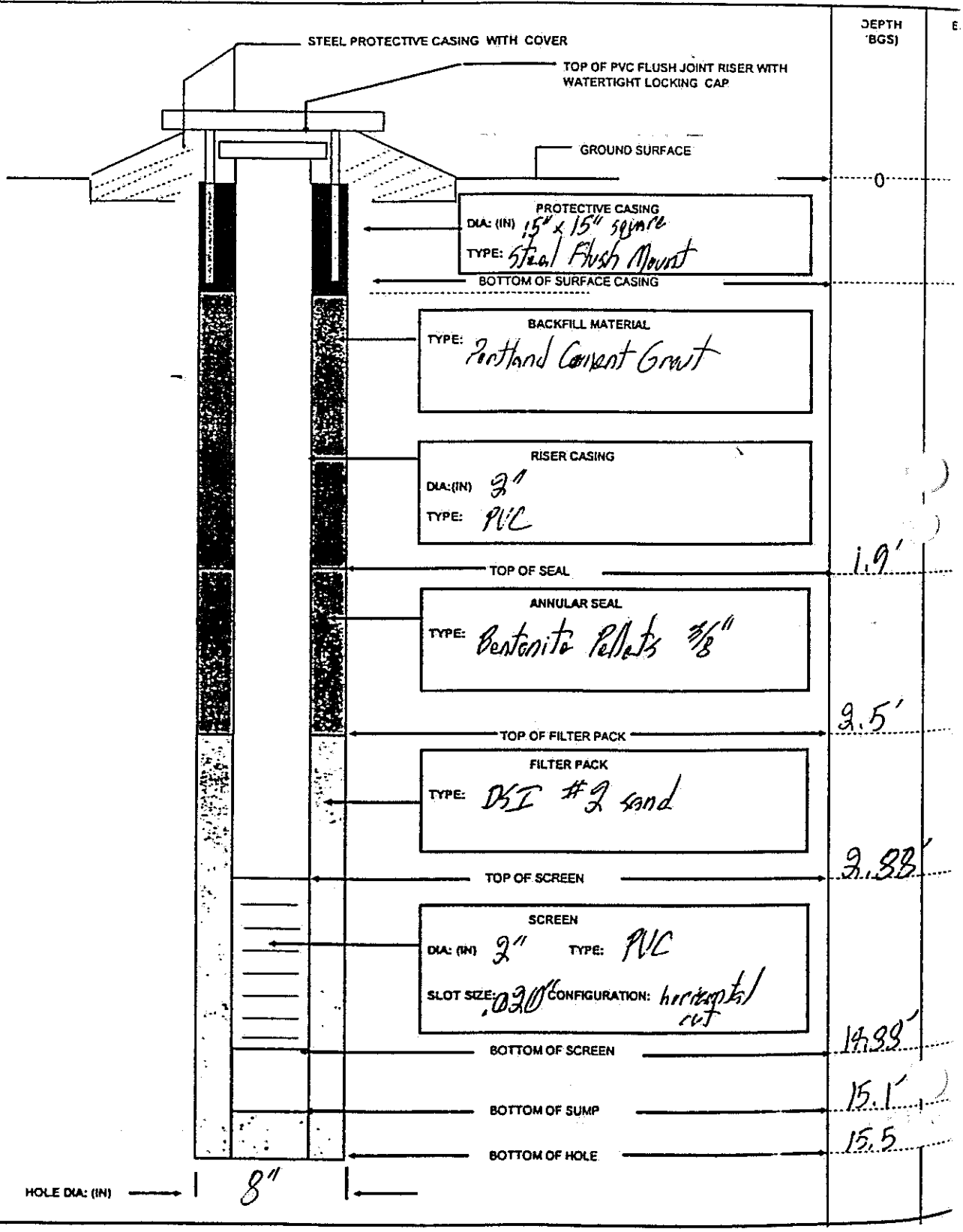
ORDED BY: _____ (Signature & Date)

QA CHECK BY: _____ 8/1/02 (Signature & Date)

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-SV-01	BEGIN: 6-21-02 1700	END: 6-22-02 1330
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



SC

.W DRILLING LOG

DISTRICT: USACE - Savannah

HOLE NUMBER: 76 - SV2

COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Miller Drilling

SHEET 1 OF 2

PROJECT: AAFES Car Care Center

4. LOCATION: See map below

NAME OF DRILLER: Paul Gibson

6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57

SIZES AND TYPES OF DRILLING & SAMPLING EQUIPMENT: 8¼ Hollow Stem Auger and CME Spoon

8. HOLE LOCATION: See map below

9. SURFACE ELEVATION:

10. DATE STARTED: 6/6/02

11. DATE COMPLETED: 6/25/02

12. OVERBURDEN THICKNESS

15. DEPTH GROUNDWATER ENCOUNTERED:

13. DEPTH DRILLED INTO ROCK: NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

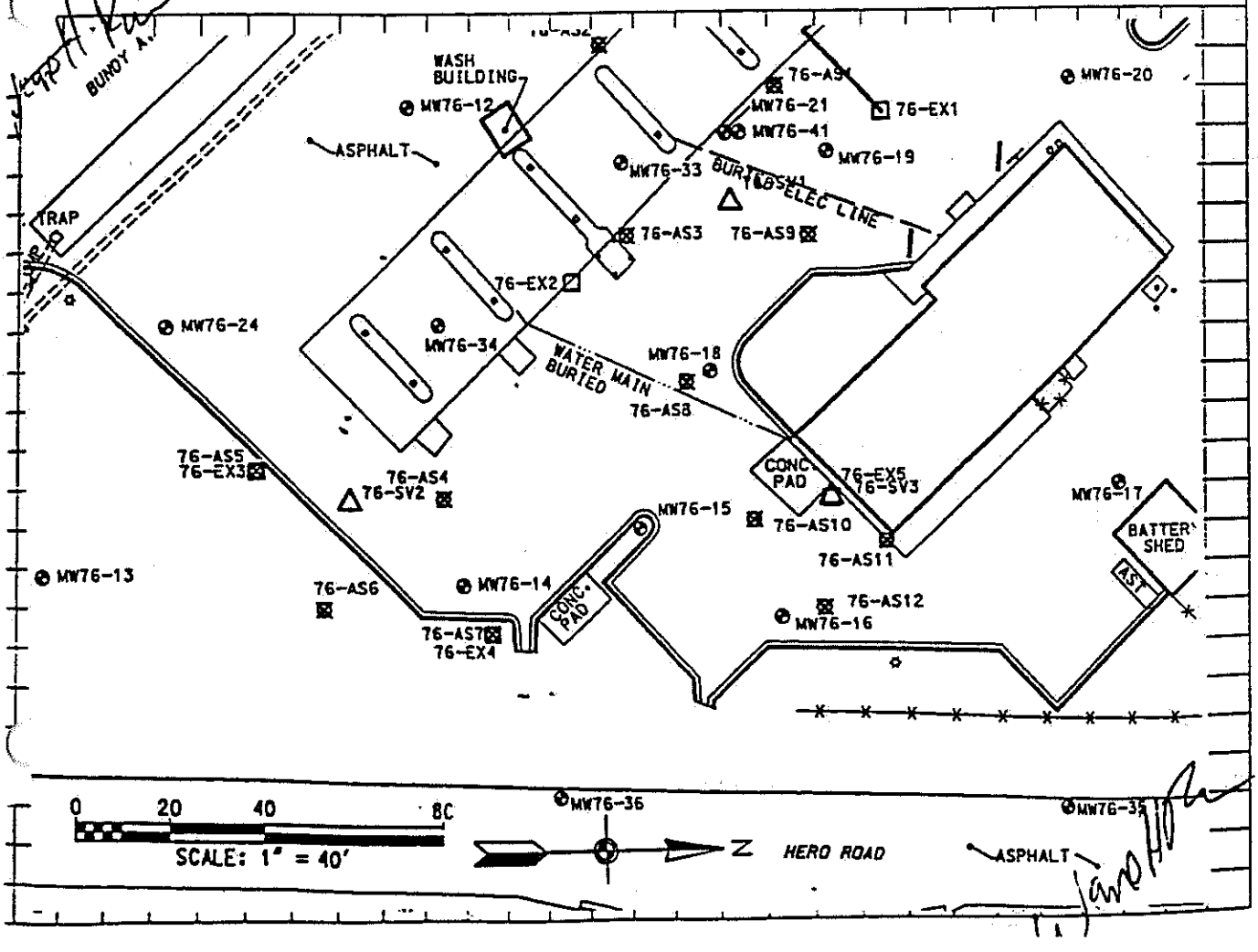
14. TOTAL DEPTH OF HOLE: NA

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER SPECIFY	21. TOTAL CORE RECOVERY %
	Enter					
DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	22. SIGNATURE OF INSPECTOR		
Monitor well	X					

LOCATION SKETCH/COMMENTS: Soil vapor

SCALE:



S1

HTRW DRILLING LOG

HOLE NUMBER 76-SB2

OJECT: INSPECTOR Wyatt Rice SHEET 2 OF 2

EV. AI	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	0.6-0.5 Asphalt 0.8/4.5 Sand with silt Black fine grained subangular moist to dry poorly graded	Comp 20.5 ppm HS= 420 ppm			
	2					
	3					
	4					
	5					
	6	4.0 5.0-7.5 Sand with silt pinkish gray 7.5YR 7/2 fine grained subangular	Comp= 275 ppm			
	7	moist 7.5-9.0 Silty Sand Black N1	HS= 2666 ppm			
	8	fine grained subangular / saturated to moist				
	9		Comp= 575ppm HS= 2000 ppm			Water table @ 10.0 BGS

HTRW DRILLING LOG

HOLE NUMBER

SHEET OF

...JECT: INSPECTOR

...LEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (E)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

MONITORING WELL INSTALLATION LOG

ROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

)NITORING WELL ID: 76-SV2

STALLATION START: DATE: 06/25/02 TIME: 0840

STALLATION FINISH: DATE: 06/25/02 TIME: 0955

NULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 175 lbs

BENTONITE SEAL: TYPE: Sure Gel QUANTITY: 20 lbs

GROUT: TYPE: N/A QUANTITY: N/A

SCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

PE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand

SCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

INT DESIGN AND COMPOSITION: Flush threaded

NTRALIZERS DESIGN AND COMPOSITION: NONE

SCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: _____ COMPOSITION:

ECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Well installed on 06/26/02 was drilled out because surge block broke in well and could not be recovered

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

akage and/or defects? YES [✓] NO [ ]

eformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

eval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

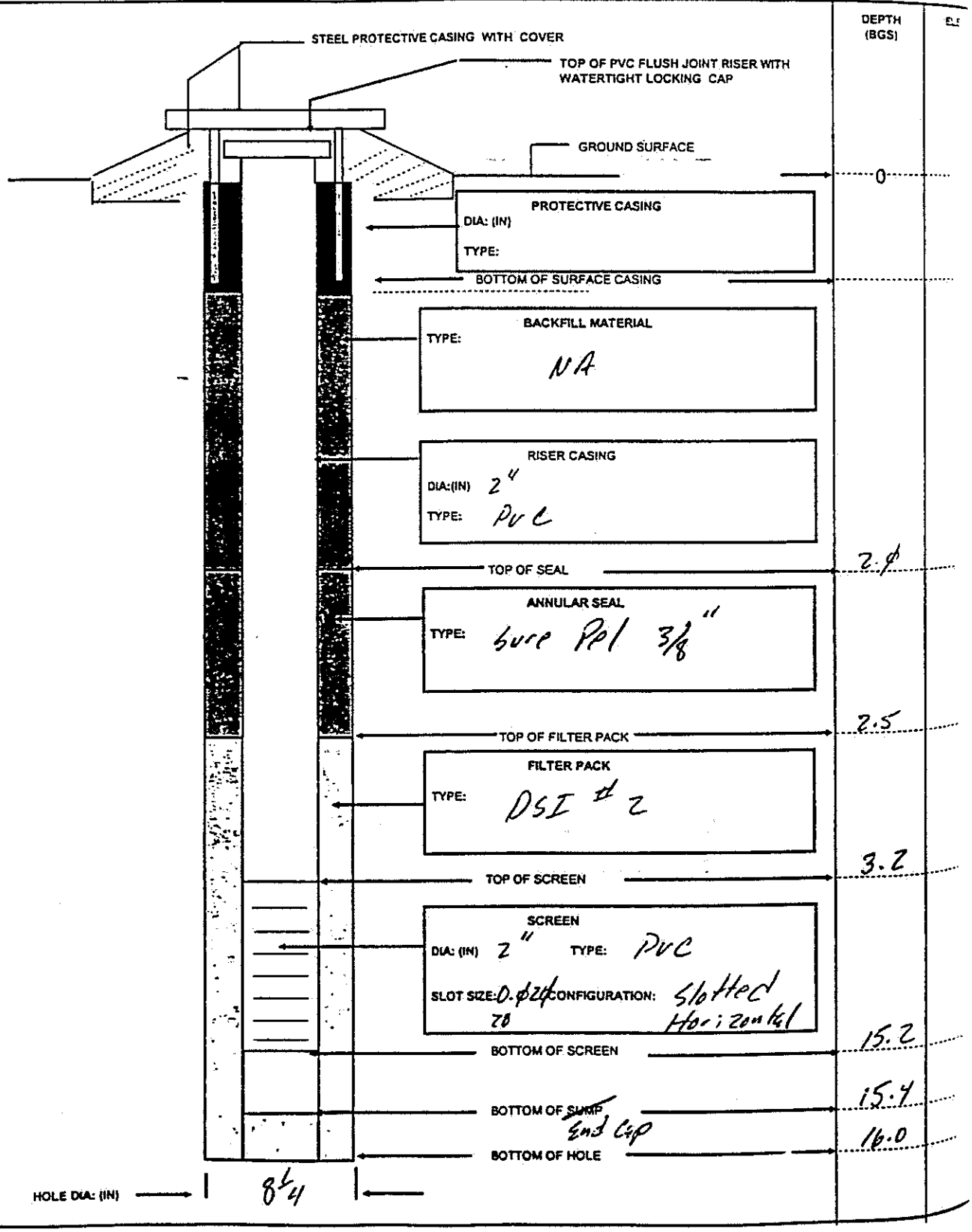
ANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 0

CORDED BY: [signature] QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-SV-2	BEGIN:	END:
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



?W DRILLING LOG

DISTRICT: USACE - Savannah		HOLE NUMBER: 26-AS-01
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: M. Iler	SHEET 1 OF 1
3. PROJECT: UST's 257-261	4. LOCATION: AAFES Car Care Center	
NAME OF DRILLER: T. Warren	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57	
7. TYPES AND TYPES OF DRILLING & SAMPLING EQUIPMENT: 4¼" hollow stem augers; CME 5' continuous samplers	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 6-20-02	11. DATE COMPLETED: 6-20-02
OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 8.9'	
DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
TOTAL DEPTH OF HOLE: 40.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: NA			
SAMPLES FOR CHEMICAL ANALYSIS:	VOC: BTEX	METALS: Lead	OTHER (SPECIFY):	OTHER (SPECIFY):	OTHER (SPECIFY):	21. TOTAL CORE RECOVERY %
DISPOSITION OF HOLE:	BACKFILLED	MONITORING WELL: 2" Ac Screening well	OTHER (SPECIFY):	22. SIGNATURE OF INSPECTOR: Kenneth Lankford		

ON SKETCH/COMMENTS: See map, page 5

SCALE:

HTRW DRILLING LOG

ECT: UST's 357-361 | INSPECTOR JKL | HOLE NUMBER GW-01 | SHEET 1 OF 1

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	Asphalt & gravel				Augered to 3'
1	CLAYEY SAND (SC) 10% clay, medium grained, firm, moist, low plasticity, Brown, 10YR-5/3	496 ppm 1639			
2					
	SAND (SP), very fine to fine grained, dry, soft, Light Gray 10YR-7/1				
3	Same as above				Augered to 8'
4					
	Grading to Moist				
5					
6	SANDY SILT (ML) 30% very fine sand, firm, moist, Very Dark Brown, 10YR-2/2	>2000 ppm 1651 JKL			
7	No Recovery				
8	Same as above	>2000 ppm 1708			Augered to 13'
9	Wet at 8.9'				▽

10-UST-GW-01

52

HTRW DRILLING LOG

HOLE NUMBER 96-16-01

USTs 257-261 | INSPECTOR SKL | SHEET 2 OF 4

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
11					
11.2–13	SILTY SAND (SM) 20% silt, fine to medium grained, firm, wet, Dark Red 10R-3/6				
12					
13					Discontinue sampling and auger to 35.5' with a wooden plug in the lead auger
14					
15					
16					
17					
18					
19					

10-16-01

HTRW DRILLING LOG

ECT: USTs 357-361	INSPECTOR JKH	HOLE NUMBER [illegible]
		SHEET 3 OF 4

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
					no description
21					
22					
23					
24					
25					
26					
27					
28					
29					

53

SIT-UST 357-361

10-18-96

54

HTRW DRILLING LOG						HOLE NUMBER 10-AS-01
PROJECT: UST's 257-261			INSPECTOR JKL			SHEET 4 OF 4
ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
		Bottom of hole - 35.5' - JKL				
	36					
	37					
	38					
	39					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

MONITORING WELL ID: 16-AS-01

INSTALLATION START: DATE: 6-30-03 TIME: 1620

INSTALLATION FINISH: DATE: 6-30-03 TIME: 1915

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DST #2 sand QUANTITY: 6 50lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: 1/2 bucket

GROUT: TYPE: Portland Cement Grout QUANTITY: _____

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020" SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: #2 sand

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

JOINT DESIGN AND COMPOSITION: Flush Threads

CENTRALIZERS DESIGN AND COMPOSITION: NA

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15" x 15" square COMPOSITION: Steal Flush Mount

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Augered too deep – filled in with filter pack sand.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

dirt)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical damage and/or defects? YES [✓] NO [ ]

Was deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and removal of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 40 gal

RECORDED BY: [signature]

QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

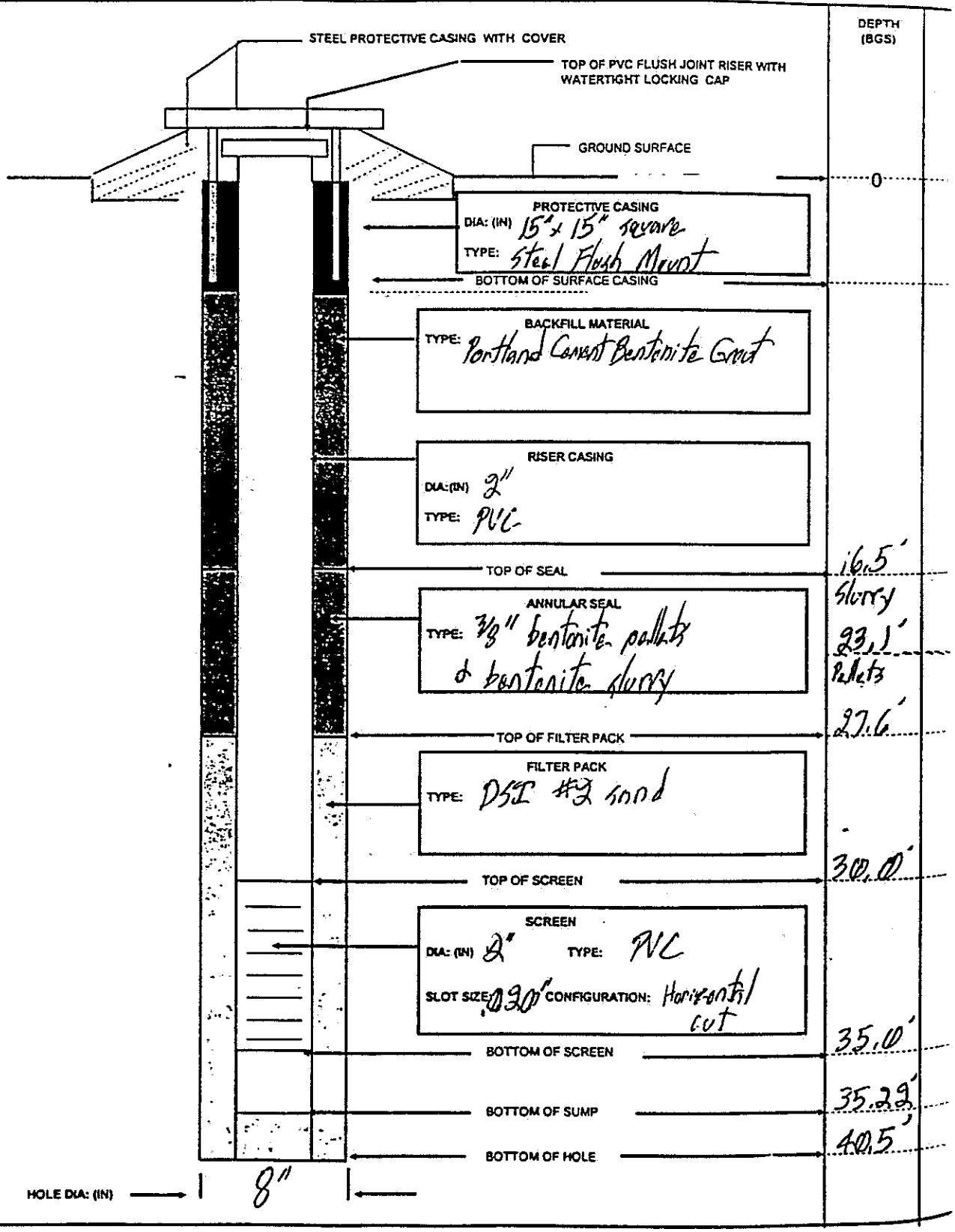
WELL NUMBER: 76-A5-01

BEGIN: 6-20-02 1620 END: 6-20-02 1915

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNIT



HTRW DRILLING LOG

1. COMPANY NAME: SAIC	DISTRICT: USACE - Savannah	HOLE NUMBER: K-AC-02
2. PROJECT: UST's 257-261	3. DRILL SUBCONTRACTOR: M. Hess	SHEET 1 OF 1
4. LOCATION: AAFES Car Care Center, Ft. Stewart, GA		
5. NAME OF DRILLER: T. Warren	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" hollow stem Augers	8. HOLE LOCATION:	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 6-24-02	11. DATE COMPLETED: 6-24-02
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
14. TOTAL DEPTH OF HOLE: 35'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: NA			
20. SAMPLES FOR CHEMICAL ANALYSIS: NA	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		
		2" PVC Air Sparging well		[signature]		

LOCATION SKETCH/COMMENTS: See map on page 5

SCALE:

HTRW DRILLING LOG

HOLE NUMBER 76-AS-02

PROJECT: UST's 251-261 | INSPECTOR TH | SHEET 1 OF 5

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	This is a re-drill, no samples collected for Geologic Description.				Hole open to 9.5' Re-drill 76-AS-02 due to a problem with the installation.
	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					

57

HTRW DRILLING LOG

ECT: UST's 257-261	INSPECTOR TKL	HOLE NUMBER 96-16-03
		SHEET 2 OF 5

EV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						no logging done on 7/30/02
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

HTRW DRILLING LOG

PROJECT: UXTS 257-261	INSPECTOR JKL	HOLE NUMBER FE-AS-02
		SHEET 3 OF 5

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						no logging on 7/30/02
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

HTRW DRILLING LOG

PROJECT: UST's 257-261	INSPECTOR JKL	HOLE NUMBER U-AS-023
		SHEET 4 OF 5

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38	Bottom of hole 38'				
	39					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO:** 008; 2

MONITORING WELL ID: 16-AS-02 (D)

INSTALLATION START: DATE: 6-24-02 TIME: 1250

INSTALLATION FINISH: DATE: 6-24-02 TIME: 1655

ANNULAR SPACE MATERIALS INVENTORY: Bentonite slurry - 5 gal.

GRANULAR FILTER PACK: TYPE: DSI #2 sand QUANTITY: 3 3½ 50lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: 1 5 gal. bucket

GROUT: TYPE: Portland Cement QUANTITY: _____

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): ~~.20~~ .02" SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19" NOMINAL INSIDE DIAMETER: .17"

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: DSI #2 sand

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19" NOMINAL INSIDE DIAMETER: .17"

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

JOINT DESIGN AND COMPOSITION: Flush Threaded

CENTRALIZERS DESIGN AND COMPOSITION: NA

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15" x 15" square COMPOSITION: steel

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

heaving and sloughing sands - Tremied bentonite slurry through heaved sands onto top of sand pack, and then placed bentonite pellets on top of slurry.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical leakage and/or defects? YES [✓] NO [ ]

Was deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 50 gal

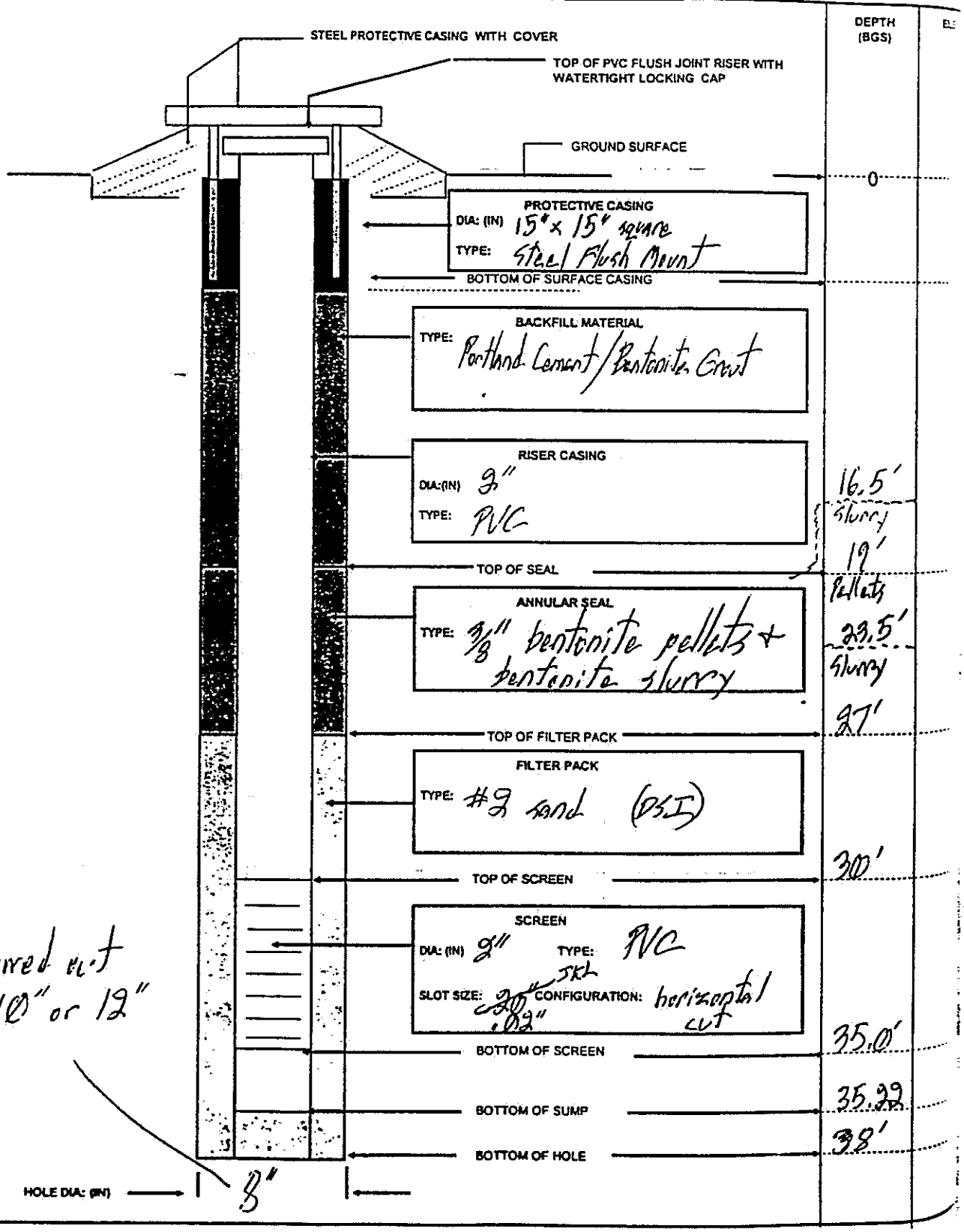
RECORDED BY: [signature] 6-24-02

QA CHECK BY: [signature] 7/30/02

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS-02	BEGIN: 6-24-02 1350	END: 6-24-02 1655
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



8C

RW DRILLING LOG

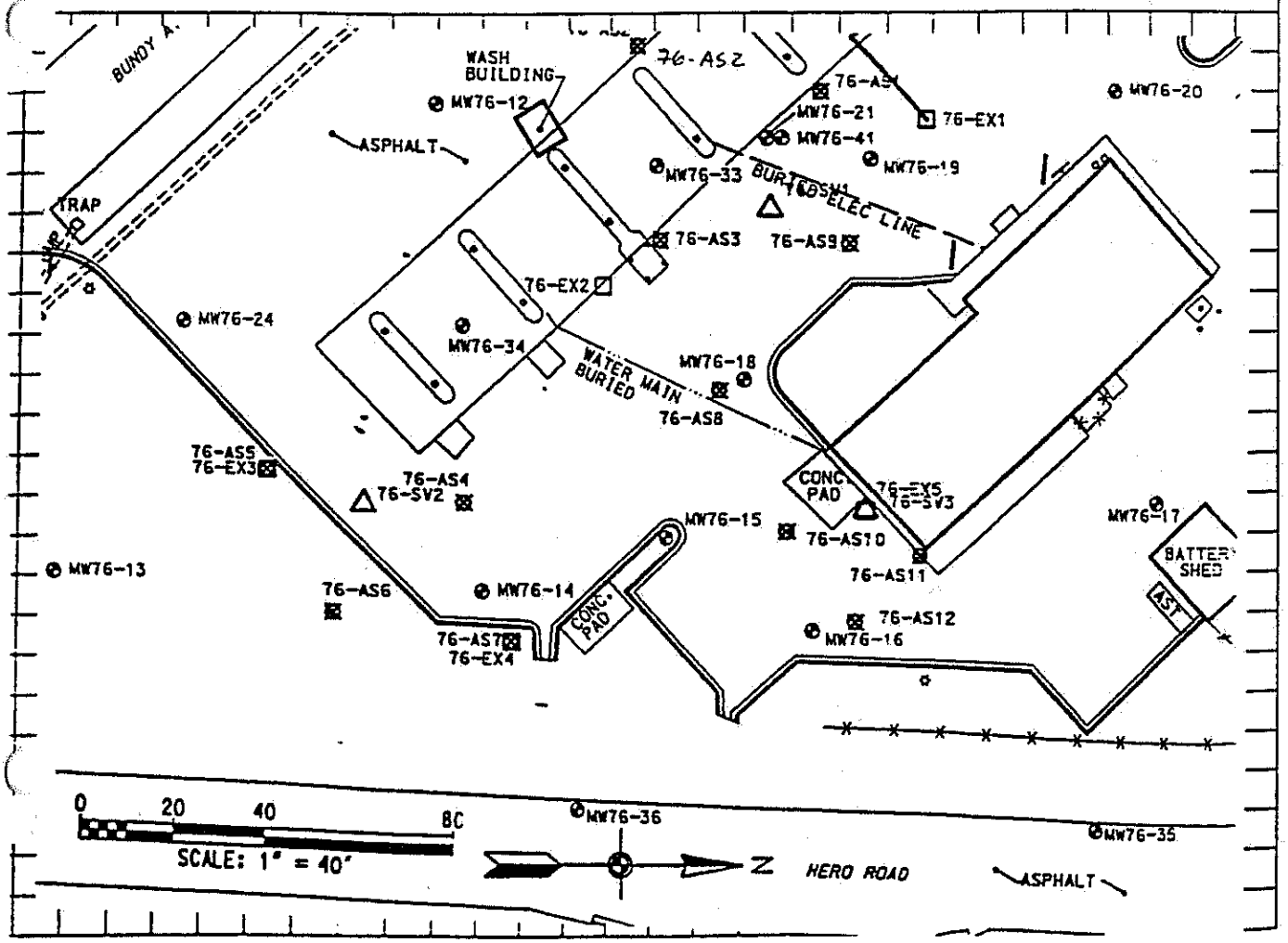
DISTRICT: USACE - Savannah		HOLE NUMBER: 76-AS2
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET: 1 OF 2

1. PROJECT: AAFES Exchange Center	4. LOCATION: See Map
3. NAME OF DRILLER: Virgil Gibson	6. MANUFACTURERS DESIGNATION OF DRILL: Mobil B-57
5. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: B-57 8¼ (OD) Augers Hollow Stem and Core Spoon	8. HOLE LOCATION: See Map
	9. SURFACE ELEVATION:
	10. DATE STARTED: 06/21/02 11. DATE COMPLETED: 06/21/02
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: NA WHP 35 BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. SAMPLES FOR CHEMICAL ANALYSIS	DISTURBED: VOC	METALS	OTHER (SPECIFY)	UNDISTURBED: OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	19. TOTAL NUMBER OF CORE BOXES / 20. TOTAL CORE RECOVERY %
	Encore						
22. DISPOSITION OF HOLE: Air Sparging well	BACKFILLED: ✓	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Wayne H. Penn			

LOCATION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

PROJECT: AAFES Car Care Center INSPECTOR Wright-Pierce

HOLE NUMBER 76-AS2

SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	0.0-0.5 Asphalt				
	1	0.5-1.5 3.5/5.0 Clayey sand ± 30% clay, light greenish gray 10G 7/1 Subangular firm to, soft, moist	20.0 ppm core HS = 114 ppm			
	2					
	3	1.5-4.0 Silty sand light gray 7.5YR 8/1 Subangular soft moist.	15.0 ppm core HS = 21			
	4					
	5	4.0/6.0 5.0-6.0 same as above				
	6					
	7	6.0-9.0 Silty sand Black N1 Subangular moist to saturated soft.	HS = 36 ppm 0.0 ppm core			
	8		HS = 42 ppm 0.0 ppm core			
	9					

HTRW DRILLING LOG

HOLE NUMBER
SHEET OF

[PROJ]ECT:	INSPECTOR

[EL]EV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

Ward A. Parr 06/21/02

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO:** 008; 2

MONITORING WELL ID: 76-AS87

INSTALLATION START: DATE: 06/21/02 TIME: 1530

INSTALLATION FINISH: DATE: 06/21/02 TIME: 1815

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 150 lbs

BENTONITE SEAL: TYPE: Sure Gel QUANTITY: 50 lbs

GROUT: TYPE: NA QUANTITY: NA

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DST

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter pack

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DST

JOINT DESIGN AND COMPOSITION: Flush threaded

CENTRALIZERS DESIGN AND COMPOSITION: NONE

DESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: _____ COMPOSITION:

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Formation caved Above Filter pack and seal ± 27.0 BLS TO 20 BLS Well pulled and installed at latter date

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

ıkage and/or defects? YES [✓] NO [ ]

eformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

eval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

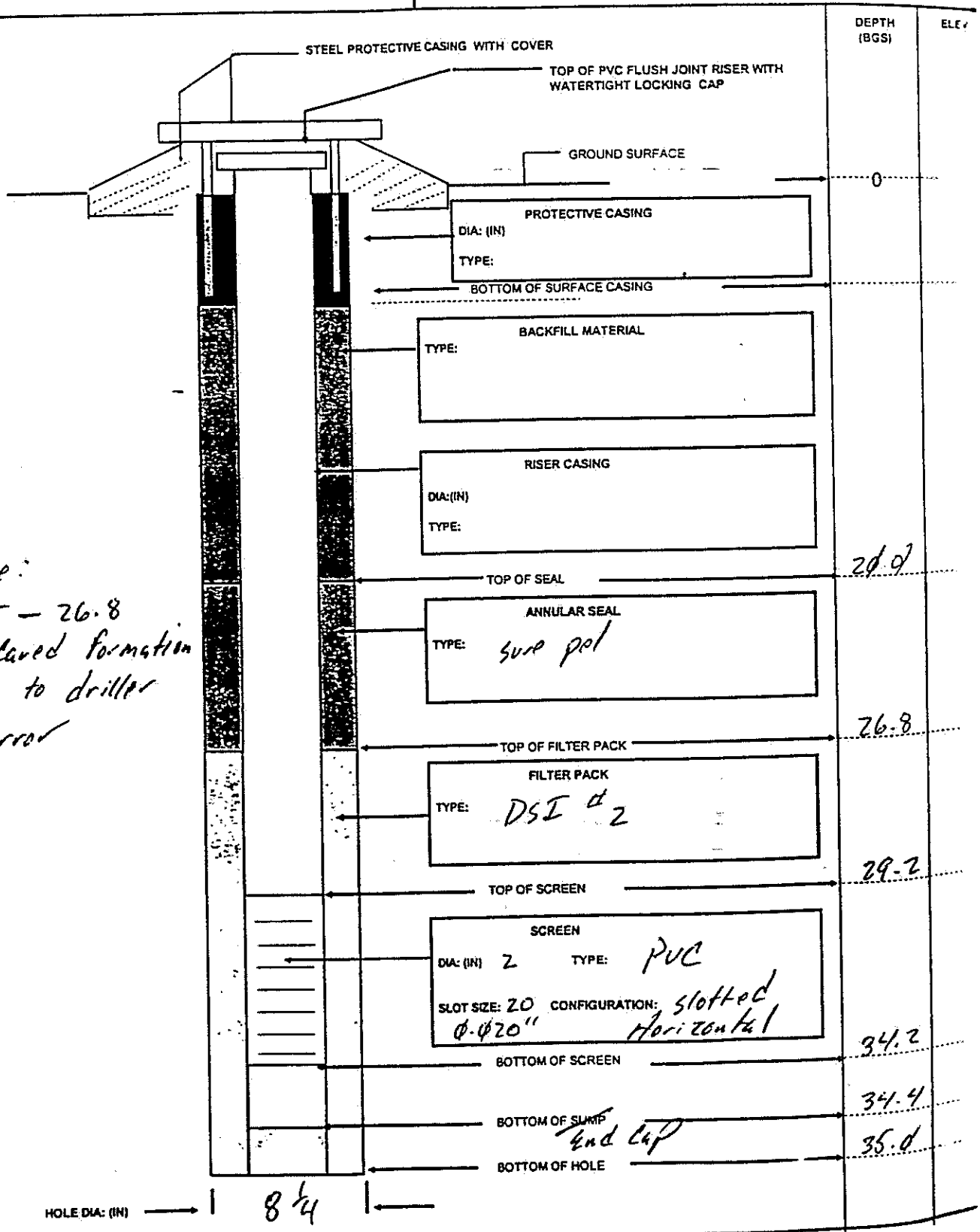
QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 20 gallons

RECORDED BY: _____ QA CHECK BY: _____

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS-2	BEGIN:	END:
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS:
DATUM/UNITS:		



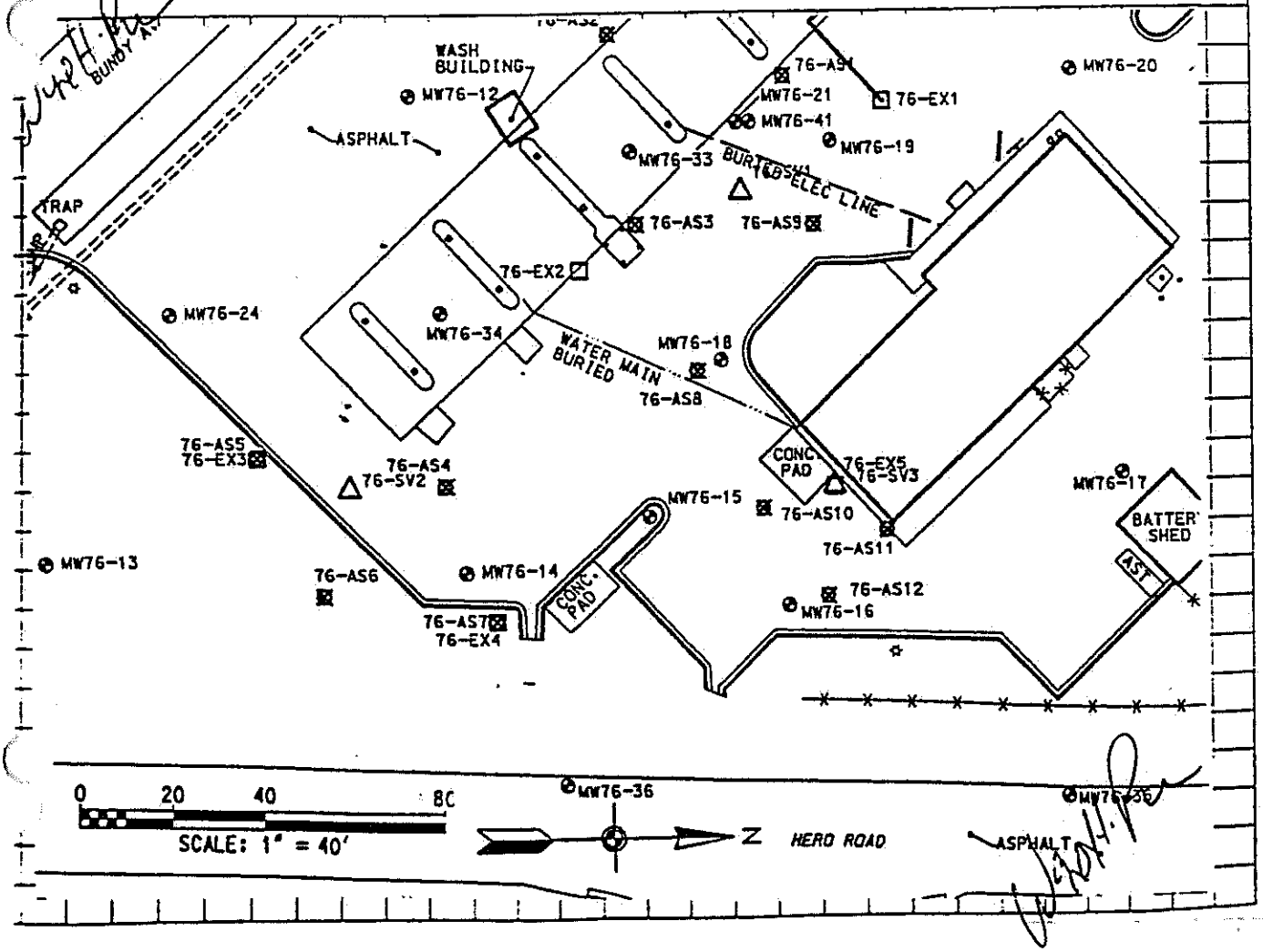
W DRILLING LOG

DISTRICT: USACE - Savannah		HOLE NUMBER: 76-AS3
COMPANY NAME: SAIC	3. DRILL SUBCONTRACTOR: Muller Drilling	SHEET 1 OF 2
2. PROJECT: AAFES Car Care Center	4. LOCATION:	
5. NAME OF DRILLER: Paul Gibson	6. MANUFACTURERS DESIGNATION OF DRILL: Mobil, B-57	
7. SIZES AND TYPES OF DRILLING / SAMPLING EQUIPMENT: B-57 Hollow Stem Augers, with CME Spoon (8¼ OD)	8. HOLE LOCATION: See map below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 06/20/02	11. DATE COMPLETED: 06/24/02
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
14. TOTAL DEPTH OF HOLE: 35.0 BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

GEOTECHNICAL SAMPLES	DISTURBED		UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %	
	Encore						
22. DISPOSITION OF HOLE: Air Sparging Well	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Wayne H. Pierce			

LOCATION SKETCH/COMMENTS

SCALE:



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HTRW DRILLING LOG

PROJECT: AAFES CCC | INSPECTOR Wright · Pa | HOLE NUMBER AS3 | SHEET 2 OF 2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	1.0/5.0 Sand with silt Black to Grey Poorly graded Subangular soft moist fine grained	Core 20 ppm HS= 69 ppm			
	2					
	3					
	4					
	5	3.5/5.0 5.0 – 6.25 sand with silt Light brownish grey fine grained subangular soft moist Poorly Graded	Core 0.0 ppm HS= 64 ppm			
	6					
	7	6.25 – 8.5 Silty sand Black N1 fine grained Subangular soft moist to saturated poorly graded	Core 120 ppm HS= 825 ppm			
	8					
	9					
	10					

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HTRW DRILLING LOG

HOLE NUMBER

PROJECT:

INSPECTOR

SHEET OF

(B) DEPTH	(C) DESCRIPTION OF MATERIALS	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	(F) ANALYTICAL SAMPLE NO	(G) REMARKS
11					
12					
13					
14					
15					
16					
17					
18					
19					

Wing Ft. Pier 6/26/87

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

ONITORING WELL ID: 76-AS3

NSTALLATION START: DATE: 06/24/02 TIME: 1600

NSTALLATION FINISH: DATE: 06/24/02 TIME: ____

NNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 175 lbs

BENTONITE SEAL: TYPE: Sure pel QUANTITY: 45 lbs

GROUT: TYPE: Portland type I and Bentonite QUANTITY: ____

ESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: ____

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

YPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand

ESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

OINT DESIGN AND COMPOSITION: Flush threaded

ENTRALIZERS DESIGN AND COMPOSITION: NONE

ESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: ____ COMPOSITION:

PECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

____

____

____

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical akage and/or defects? YES [✓] NO [ ]

eformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and eval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

ANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 20 gallons

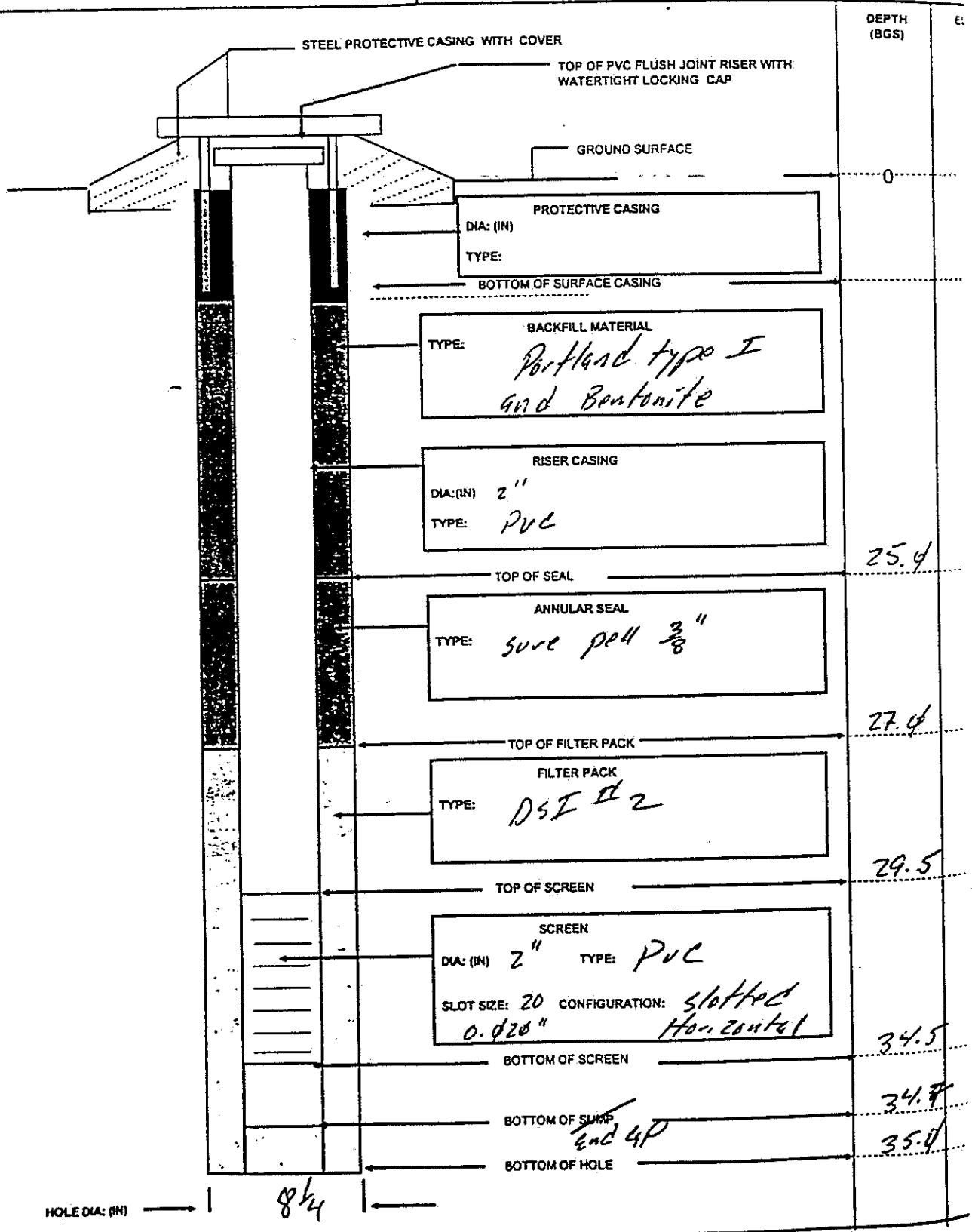
CORDED BY: [signature]

QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS3	BEGIN: 06/20/02	END: 06/20/02
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



2C

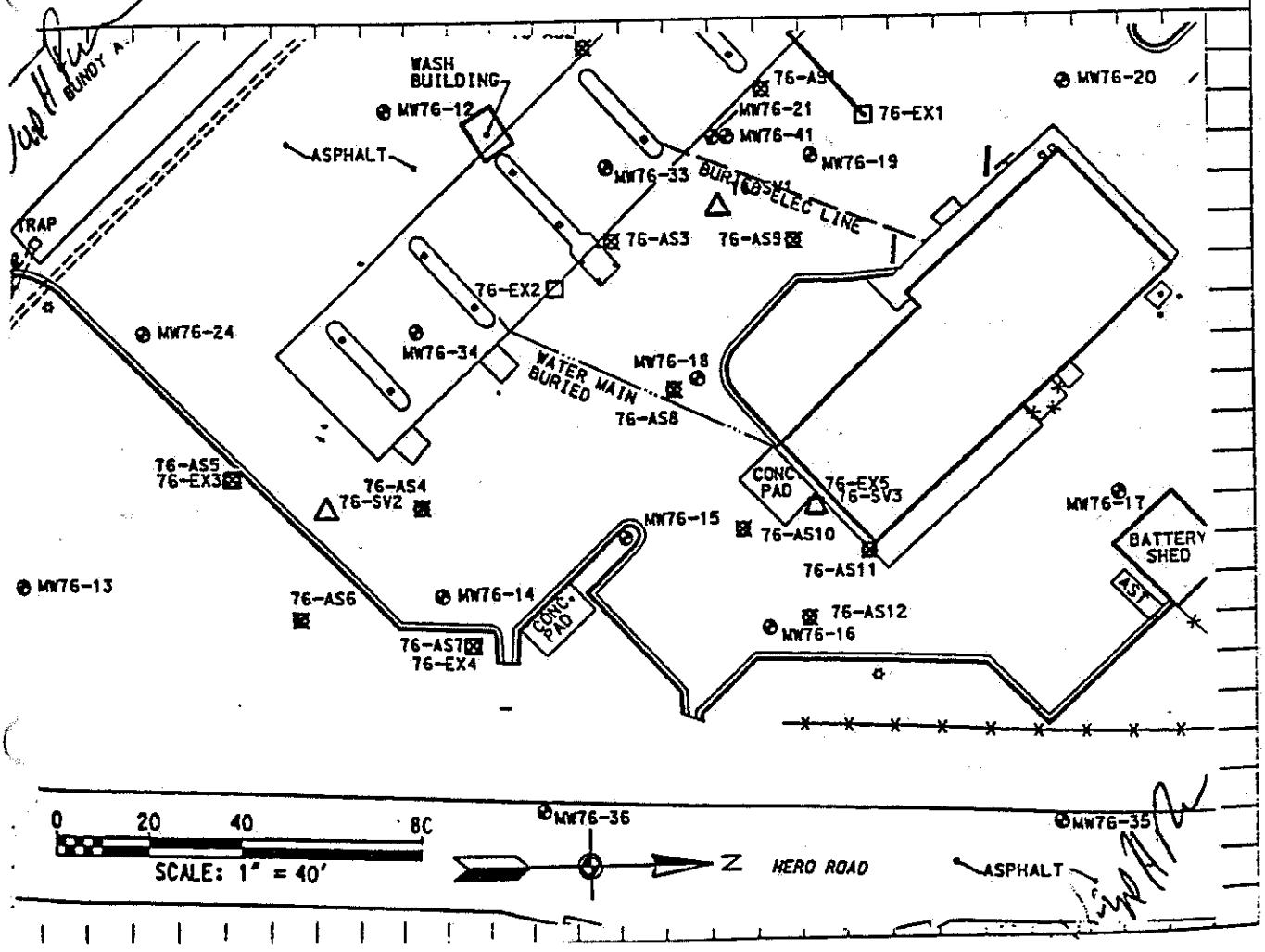
N DRILLING LOG	DISTRICT: USACE - Savannah	HOLE NUMBER: 76-AS4
MPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 3

OJECT: AAFES CCC VSTs 257-261	4. LOCATION: See map Below
ME OF DRILLER: Paul Gibson	5. MANUFACTURERS DESIGNATION OF DRILL: mobile
E AND TYPES OF DRILLING MPLING EQUIPMENT: Mobile B-57 Hollow stem 4¼ ID Auger and CME Spoon	6. HOLE LOCATION: See map Below
	9. SURFACE ELEVATION:
	10. DATE STARTED: 06/20/02 11. DATE COMPLETED: 06/20/02
VERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ± 10 BLS
EPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
OTAL DEPTH OF HOLE: 35 BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

EOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
MPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	EnCore					
SPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Wayne H. Pierce		
monitor well						

N SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

HOLE NUMBER 76-AES4

PROJECT: AAFES CCC | INSPECTOR Wipplinger | SHEET 2 OF 3

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	0.0 - 0.5 Asphalt 0.5/1.5 Sand with silt Black 2.5N 10 Light Brownish gray 10YR 6/2 Fine grained soft moist	Core 12.0 ppm HS = 207 ppm			
	2					
	3	Sample fell out of spoon Same as above ~~Left with~~ 11/26/02	Core 209 ppm			
	4					
	5	4.0/4.0 4.0 - 4.5 Sand with silt Black 2.5N fine grained subangular moist 4.5 - 5.0 Same as above except light Grey 10YR 7/1	Core 210 HS = < 2000 ppm			
	6					
	7	1.5/2.0 silty sand Black 2.5N fine grained subangular moist soft	Core = 280 HS = < 2000 ppm			
	8					
	9	2.0/2.0 Same as above	Core = 10.0 HS < 2000 ppm			

HTRW DRILLING LOG

HOLE NUMBER	76-AS4
SHEET	3 OF 3

AAFES CCC — INSPECTOR [signature]

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	2.0/2.0 Same as above	Core = 5.0ppm HS = 185ppm			water Table ≈ 10.0 BLS
11					
12					
13					
14	Drilled out with wood plug To 35 BLS				
15					
16					
17					
18					
19					

76-AS4 - EX3

26

MONITORING WELL INSTALLATION LOG

)JECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

ITORING WELL ID: 76 - AS4

ALLATION START: DATE: Ø6/2Ø/Ø2 TIME: Ø755

ALLATION FINISH: DATE: Ø6/2Ø/Ø2 TIME: 1Ø3Ø

JLAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 175 lbs

BENTONITE SEAL: TYPE: Sure Pel QUANTITY: 75 lbs

GROUT: TYPE: Bentonite / Portland QUANTITY: ____

:RIPTION OF WELL SCREEN:

SLOT SIZE (inches): Ø.Ø2Ø SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: ____

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: DSI

OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand

:RIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: DSI

Γ DESIGN AND COMPOSITION: Flush treaded

RALIZERS DESIGN AND COMPOSITION: NONE

RIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: ____ COMPOSITION:

IAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

l well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

YES [✓] NO [ ]

' well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

ge and/or defects? YES [✓] NO [ ]

mation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

l of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

TITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 20 gallons

RDED BY: [signature] 06/20/02 QA CHECK BY:

76-AS5 EY3

76-SVØ2

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

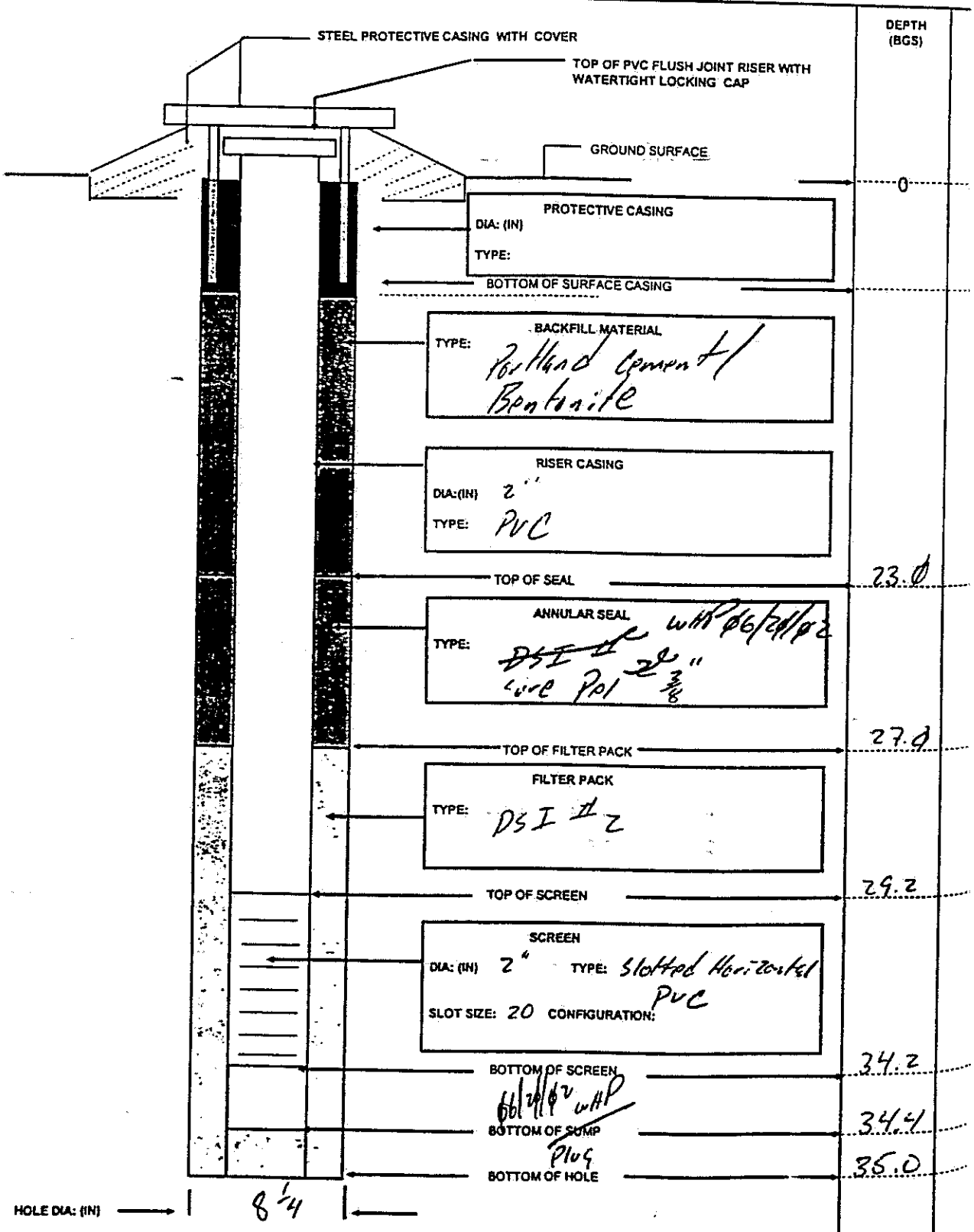
WELL NUMBER: 76-AS4

BEGIN: 06/20/02 END: 06/20/02

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNIT



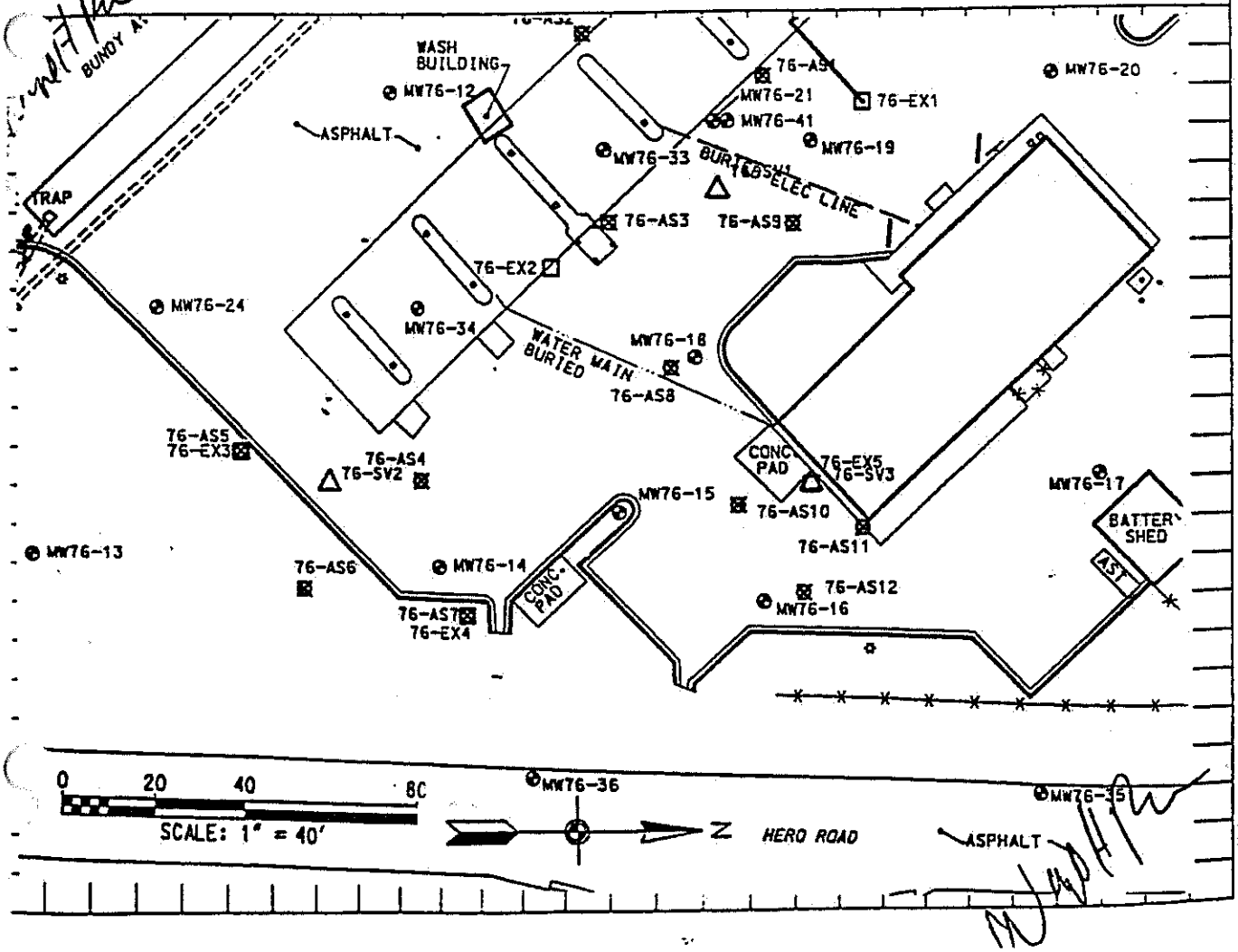
5

N DRILLING LOG	DISTRICT: USACE - Savannah	HOLE NUMBER: 76-AS6
PANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 3
ROJECT: AAFES Car Care Center	4. LOCATION:	
AME OF DRILLER: Paul Gibson	5. MANUFACTURERS DESIGNATION OF DRILL: Mobil	
PES AND TYPES OF DRILLING SAMPLING EQUIPMENT: B-59 Mobil CME Spoon and 8¼ OD Auger	6. HOLE LOCATION: See map Below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 06/19/02	11. DATE COMPLETED: 06/19/02
OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ≈ 10 BLS	
DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
TOTAL DEPTH OF HOLE: 36.0 BLS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
AMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	X					
SPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	22. SIGNATURE OF INSPECTOR		
Monitor well Air sparging		X				

CATION SKETCH/COMMENTS

SCALE:



HTRW DRILLING LOG

HOLE NUMBER 76-A56

PROJECT: AAFES CCC | INSPECTOR [signature] | SHEET 2 OF 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	1.5/2.0 Sand with silt very dark brown 7.5YR 1/ fine grained Dry, subangular moderately graded soft	5.6ppm FID HS = 85ppm			
	3	1.0/2.0 Same as Above	23 ppm FID HS = 51ppm			
	4	2.0/2.0 Sand with silt yellowish orange fine grained subangular/ poorly graded, soft	180 FID HS = 1927ppm			
	6	1.7/2.0 6.0-6.8 same as above 6.8-7.2 Black silty sand fine grained well graded subangular moist soft	155 FID >2000ppm FID		sample @ 6-8 interval ~~5-10~~ 6-8	with PG/15/02
	8	1.5/2.0 Same as above	862ppm PID >2000ppm FID			

HTRW DRILLING LOG

HOLE NUMBER 76-AS6

SHEET 3 OF 3

AAFES ECC

INSPECTOR Wright Pan

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (E)	REMARKS (G)
11	Same as above	25ppm >2000ppm			water table @ 10.0 BGS
12					
13					
14					
15	Drill out to 55.5				
16					
17					
18					
19					

MONITORING WELL INSTALLATION LOG

ROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

ONITORING WELL ID: 76 - AS6

STALLATION START: DATE: 06/19/02 TIME: 1420

STALLATION FINISH: DATE: 06/19/02 TIME: 1830

NULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 175 lbs

BENTONITE SEAL: TYPE: Sure gel 3/8" QUANTITY: 40 lbs

GROUT: TYPE: Bentonite/Portland QUANTITY:

SCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Horizontal slot

TOTAL OPEN AREA PER FOOT OF SCREEN: NA

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: DSI

PE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand

SCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19' NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: 40 COMPOSITION:

MANUFACTURER: DSI

NT DESIGN AND COMPOSITION: Flush threaded

NTRALIZERS DESIGN AND COMPOSITION: None

SCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: COMPOSITION:

CIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

YES [✓] NO [ ]

all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

age and/or defects? YES [✓] NO [ ]

formation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

val of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

NTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 20 Gallons

ORDED BY: QA CHECK BY:

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

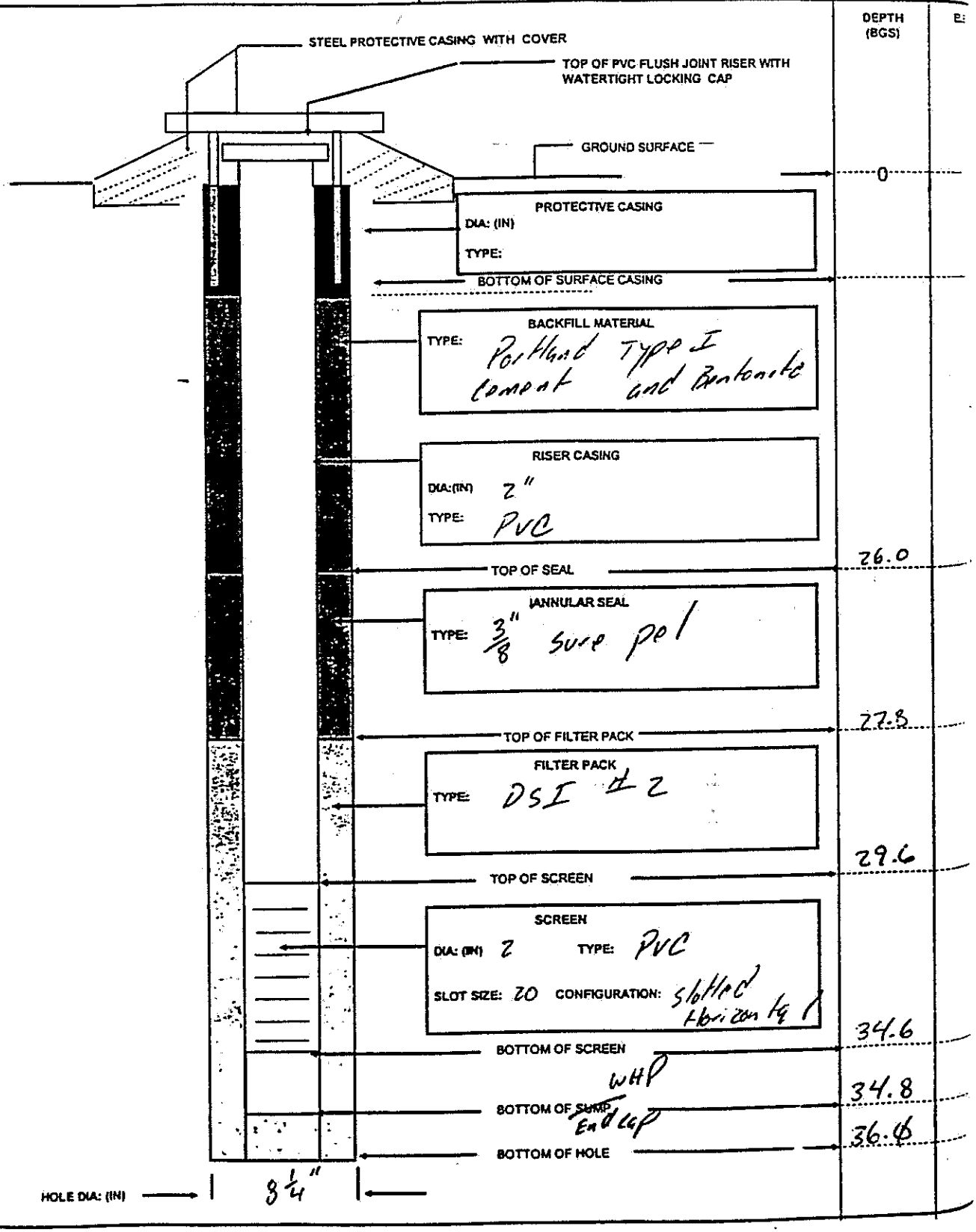
WELL NUMBER: 76-AS6

BEGIN: 06/19/02 END: 06/19/02

COORDINATES: N:
E:

REFERENCE POINT: ELEVATION: DATUM/UNITS:

DATUM/UNITS:

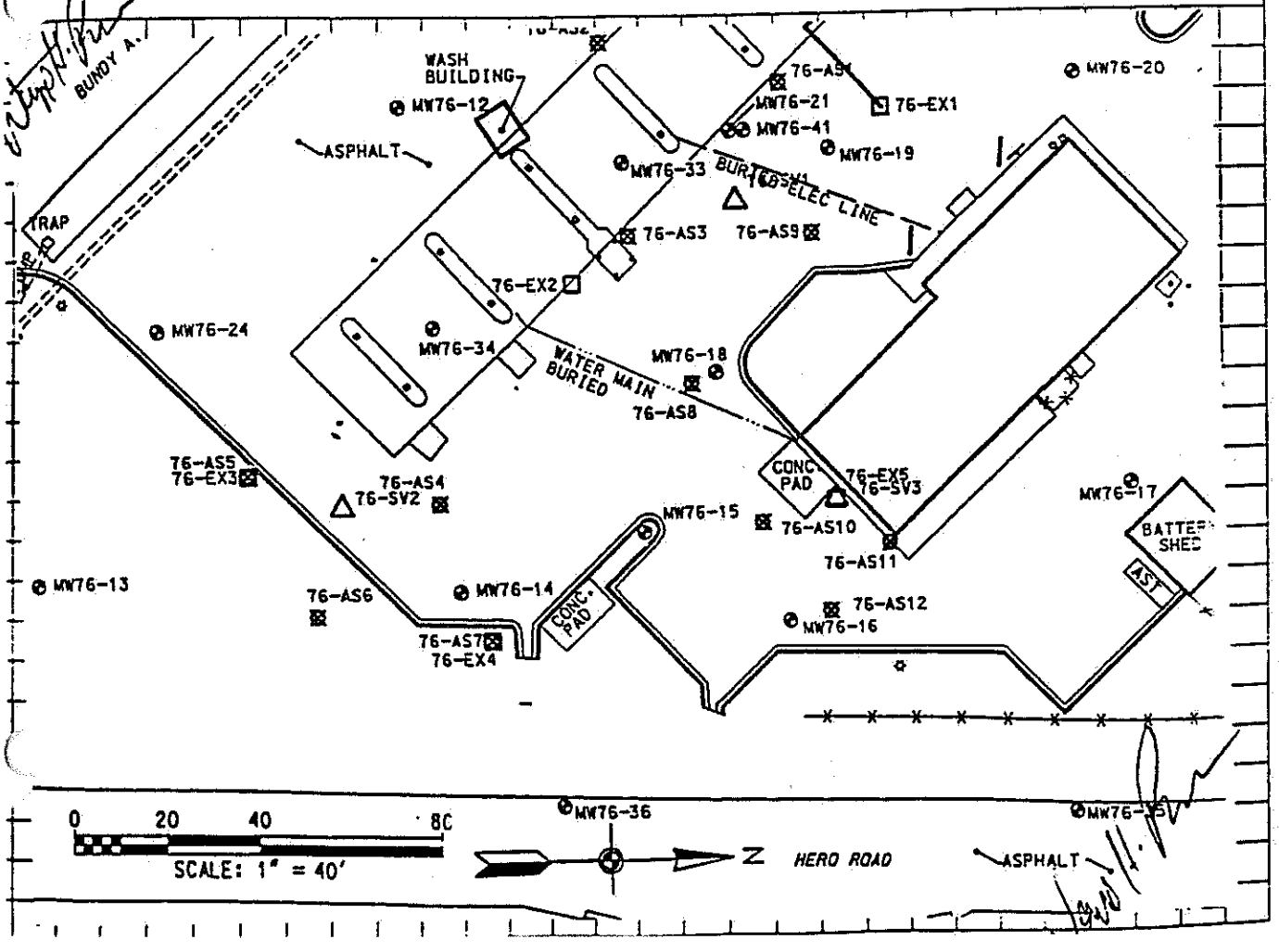


‹W DRILLING LOG

DISTRICT: USACE - Savannah		HOLE NUMBER: 76-EX3/SV3
COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling	SHEET 1 OF 3
PROJECT: AAFES Car Care Center	4. LOCATION:	
NAME OF DRILLER: Paul Gibson	6. MANUFACTURERS DESIGNATION OF DRILL: Mobil B-57	
TYPES AND TYPES OF DRILLING / SAMPLING EQUIPMENT: B-57 12¼ Hollow Stem Augers CME Spoon	8. HOLE LOCATION: See Map below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 06/23/02	11. DATE COMPLETED: 06/24/02
OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:	
DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
TOTAL DEPTH OF HOLE: 57.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	En Core					
DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Wayne H. Pa		
Extraction Well / SVE vapor well						

LOCATION SKETCH/COMMENTS — SCALE:



HTRW DRILLING LOG

HOLE NUMBER 76-EXS/SV3

PROJECT: RAFES CCC | INSPECTOR [illegible] | SHEET 2 OF 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Spoon #1 0.0 - 0.4 Asphalt Debris out 0.4/5.0 0.4 - 2.4 Clayey Sand Light Gray 5YR 7/1 Mottled reddish brown 2.5YR 5/4, fine grained, moist Subangular to suborended firm 2.4 - 4.4 Silty Sand Light gray 10YR 7/1 To Black N1 fine grained, moist firm to soft	Core = 15 ppm HS = 0.0 ppm Core = 40 ppm HS = 304 ppm			
		Spoon #2 5.0 - 10.0 4.5/5.0 5.0 - 6.5 Same as above 6.5 - 9.5 Silty Sand Black N1 fine grained, moist firm	Core = 180 ppm HS = ↑2664 ppm Core = 225 ppm HS = ↑2945 ppm			

HTRW DRILLING LOG

HOLE NUMBER 76-EXS/SV3

INSPECTOR Wayne H. Pan

SHEET OF

T:

(A) DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
10	Spoon # 3 24/2.5 10.0 - 12.0 Silty Sand Black N1 fine grained, subangular, saturated	Core = 0.0 ppm			water table ≈ 10.5
11					
12					
13					
14					
15					
16					
17					
18					
19					

Wayne H. Pan 06/23/92

MONITORING WELL INSTALLATION LOG

OJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

ITORING WELL ID: 76-EX5

'ALLATION START: DATE: 06/23/02 TIME: 0800

'ALLATION FINISH: DATE: 06/23/02 TIME: 1630

ULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 450 lbs

BENTONITE SEAL: TYPE: Sure Pel QUANTITY: 150 lbs

GROUT: TYPE: Portland Type I and Bentonite QUANTITY:

CRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 #10 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN:

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

E OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter Sand

CRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.35 NOMINAL INSIDE DIAMETER: 0.33

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

T DESIGN AND COMPOSITION: Flush Threaded

TRALIZERS DESIGN AND COMPOSITION: NONE

CRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: COMPOSITION:

IAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

l well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

YES [✓] NO [ ]

l well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

ge and/cr defects? YES [✓] NO [ ]

rmation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

l of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

TITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 50 Gallons

RDED BY: [signature] 6/23/02 QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

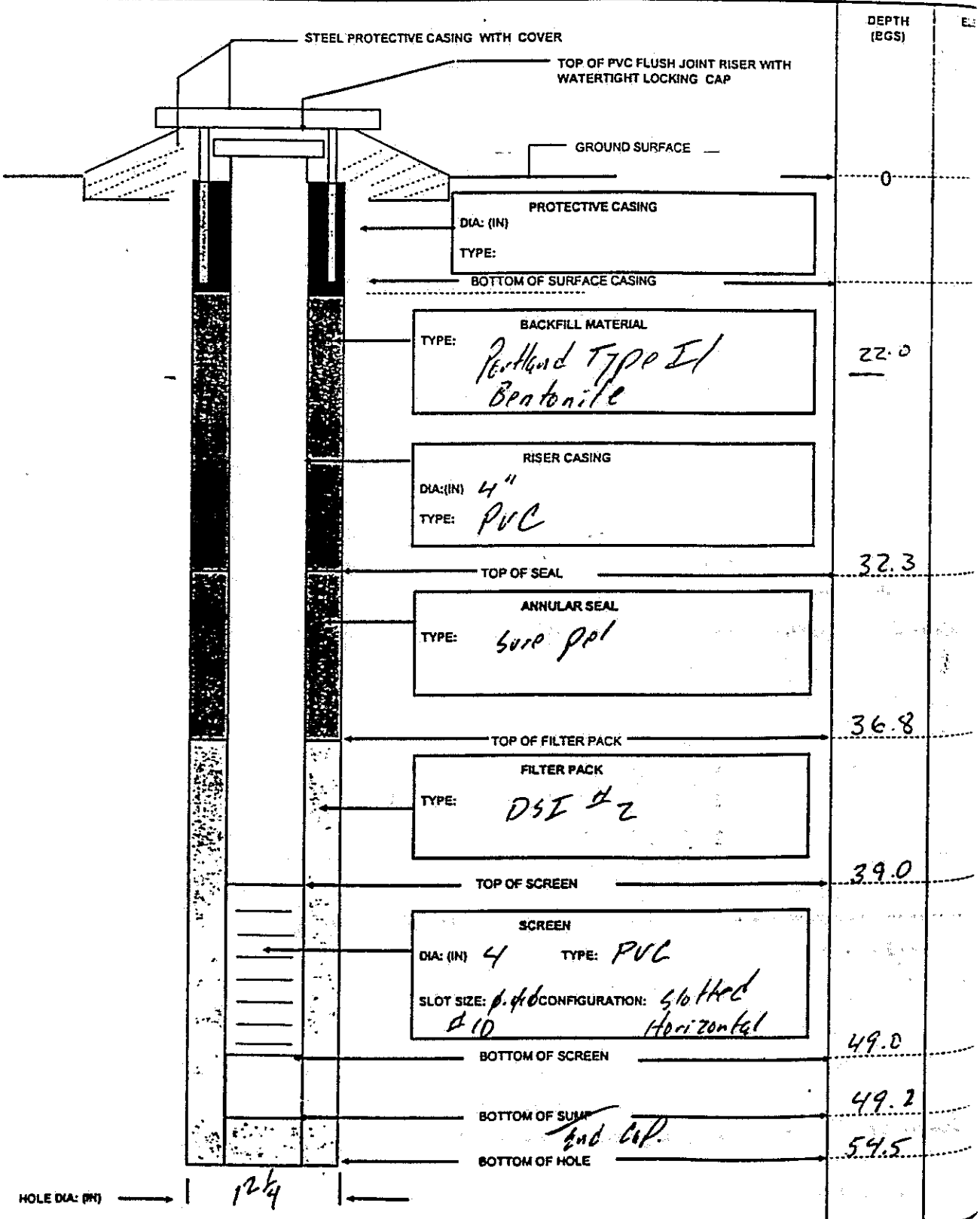
WELL NUMBER: 76 - EX5

BEGIN: 06/23/02 END: 06/23/02

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS



MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 06/24/02 DELIVERY ORDER NO: 008; 2

MONITORING WELL ID: ~~76-EX5~~ with ~~76-SW2~~ 76-SV3

INSTALLATION START: DATE: 06/23/02 TIME: 0830

INSTALLATION FINISH: DATE: 06/24/02 TIME: 0850

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 800 lbs

BENTONITE SEAL: TYPE: Sure Pel QUANTITY: —

GROUT: TYPE: NA QUANTITY: NA

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): 0.020 SLOT CONFIGURATION: Slotted Horizontal

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter sand 22-15 BLS

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: 0.19 NOMINAL INSIDE DIAMETER: 0.17

SCHEDULE/THICKNESS: SCH 40 COMPOSITION: PVC

MANUFACTURER: DSI

JOINT DESIGN AND COMPOSITION: Flush threaded

CENTRALIZERS DESIGN AND COMPOSITION: NONE

DESCRIPTION OF PROTECTIVE CASING: NONE

NOMINAL INSIDE DIAMETER: _____ COMPOSITION:

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

akage and/or defects? YES [✓] NO [ ]

eformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

eval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: NONE

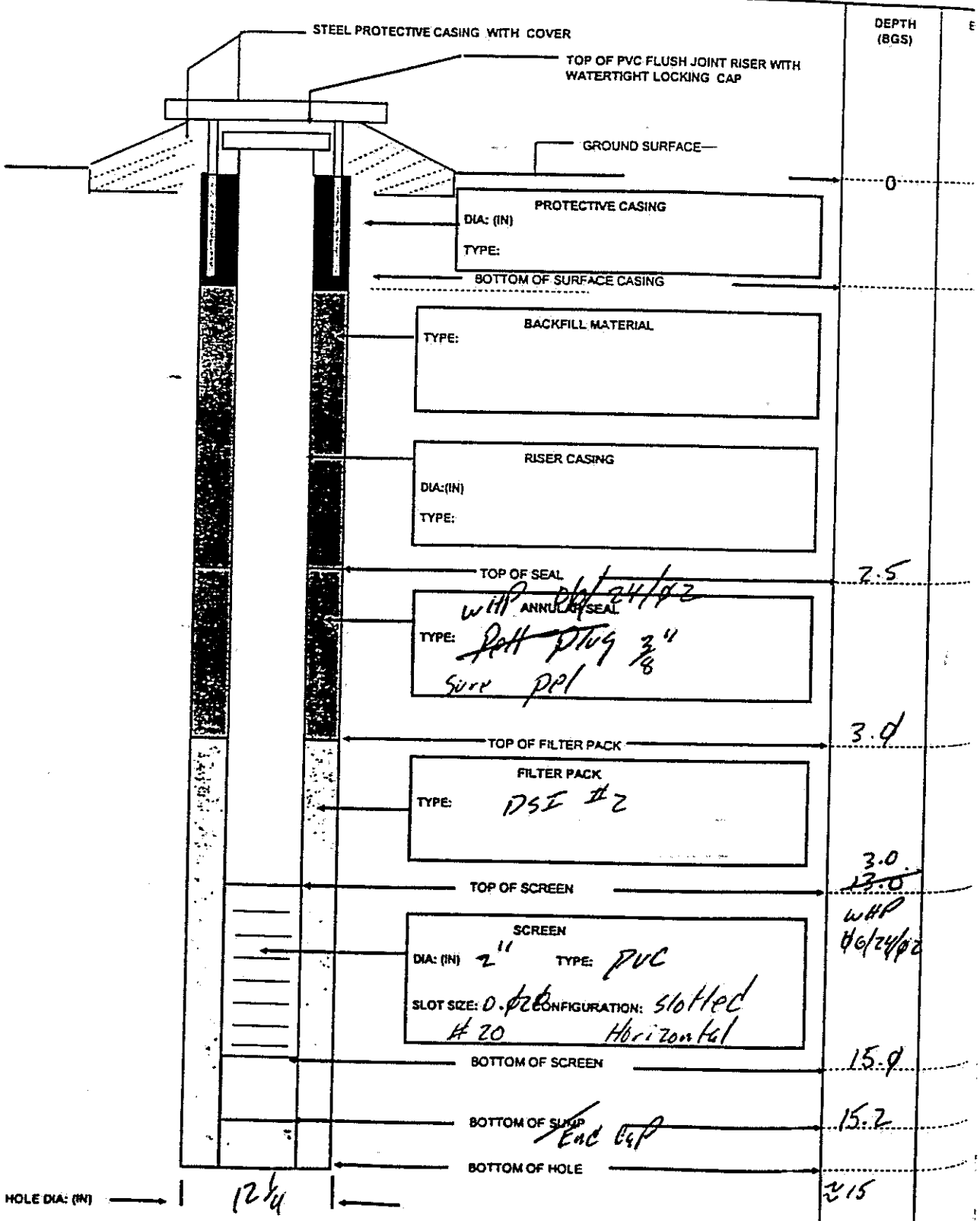
RECORDED BY: _____ (Signature & Date)

QA CHECK BY: _____ (Signature & Date)

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 — DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-SV3	BEGIN: 06/23/02	END: 06/23/02
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



TW-AS-03

TRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller	HOLE NUMBER: TW-AS-03
	DISTRICT: USACE - Savannah	SHEET 1 OF 1

3. PROJECT: VST's 257-261	4. LOCATION: JAFES Car Care Center
5. NAME OF DRILLER: T. Warren / T. Neal	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6¼" hollow stem augers, 5' CME Continuous Samplers	8. HOLE LOCATION:
	9. SURFACE ELEVATION:
	10. DATE STARTED: 6-21-03 / 11. DATE COMPLETED: 6-22-03
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED:
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 35.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES: NA			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC: BTEX	METALS: Lead	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL: 2" PVC Air Sparging well	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR: Thomas Gallagher		

LOCATION SKETCH/COMMENTS: See map, page 5

SCALE:

HTRW DRILLING LOG

PROJECT: UST's 357-361 | INSPECTOR: JKL | HOLE NUMBER: 26-05-003 | SHEET 1 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Asphalt + Gravel				Augered to 3' with sampler
	1	CLAYEY SAND (SC) 10% clay, fine to medium grained, soft, moist, low plasticity, Yellowish Brown, 10YR-5/6	0.0 ppm 1745			
	2	No Recovery				
	3	SAND (SP), fine to very fine grained, very soft, Dry, Pale Brown, 10YR-6/3	1755 0.0 ppm			Augered to 8' with sampler
	4–8	No Recovery				
	8–10	No Recovery; sampler sides smeared with very fine sandy silt, wet the entire length of the sampler.				

HTRW DRILLING LOG

HOLE NUMBER	[illegible]
SHEET	3 OF 4

ECT: VLF's 357-361 | INSPECTOR JKL

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					Discontinue sampling and auger down to 35.5' with a wood plug in the lead auger.
	14					
	15					
	16					
	17					
	18					
	19					

HTRW DRILLING LOG

HOLE NUMBER 16-AS-08

PROJECT: UXO 257-261 | INSPECTOR JKL

SHEET 3 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						no description
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

HTRW DRILLING LOG

HOLE NUMBER: K-AS-08

PROJECT: UST's 257-261 | INSPECTOR: JKL | SHEET 4 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
	36	~~Bottom of hole 35.5'~~	JKL			
	37	Bottom of hole 37.0'				
	38					
	39					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

MONITORING WELL ID: 76-75-03

INSTALLATION START: DATE: 6-21-03 TIME: 1737

INSTALLATION FINISH: DATE: 6-22-03 TIME: 1035

ANNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 sand QUANTITY: 4 5lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: 3/4 5 gal bucket

GROUT: TYPE: Portland Cement Grout QUANTITY: ______

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020" SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: ______

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: ______

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: Filter Pack sand & formation sand

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: ______

JOINT DESIGN AND COMPOSITION: Flush Threaded

CENTRALIZERS DESIGN AND COMPOSITION: NA

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15" x 15" square COMPOSITION: Steel Flush Mount

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Heaving sands — overdrilled & used lots of water.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retrieval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 100 gal

RECORDED BY: [signature] QA CHECK BY: [signature] 8/1/03

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

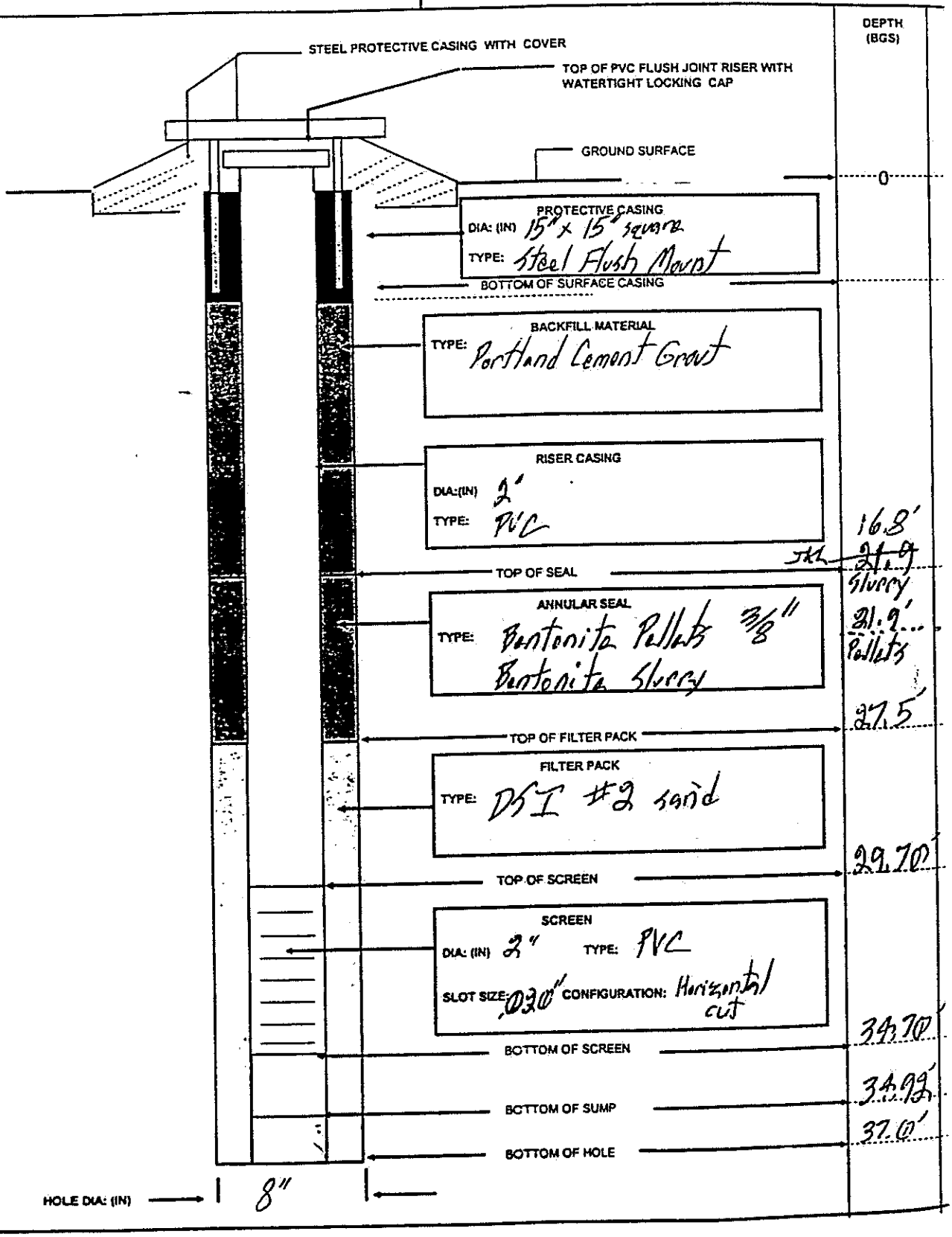
WELL NUMBER: 76-AS-08

BEGIN: 6-21-02 1737 END: 6-22-02 1035

COORDINATES: N: E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNI



HTRW DRILLING LOG

DISTRICT: USACE - Savannah

HOLE NUMBER: 76-AS-09

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Miller

SHEET 1 OF 1

3. PROJECT: UST's 257-261

4. LOCATION: AAFES Car Care Center

5. NAME OF DRILLER: T. Warren / T. Neel

6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4 1/4" hollow stem augers; 5' CME Continuous Samplers

8. HOLE LOCATION:

9. SURFACE ELEVATION:

10. DATE STARTED: 6-22-01

11. DATE COMPLETED: 6-22-01

12. OVERBURDEN THICKNESS: NA

15. DEPTH GROUNDWATER ENCOUNTERED: 12.6

13. DEPTH DRILLED INTO ROCK: NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

14. TOTAL DEPTH OF HOLE: 36.0'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

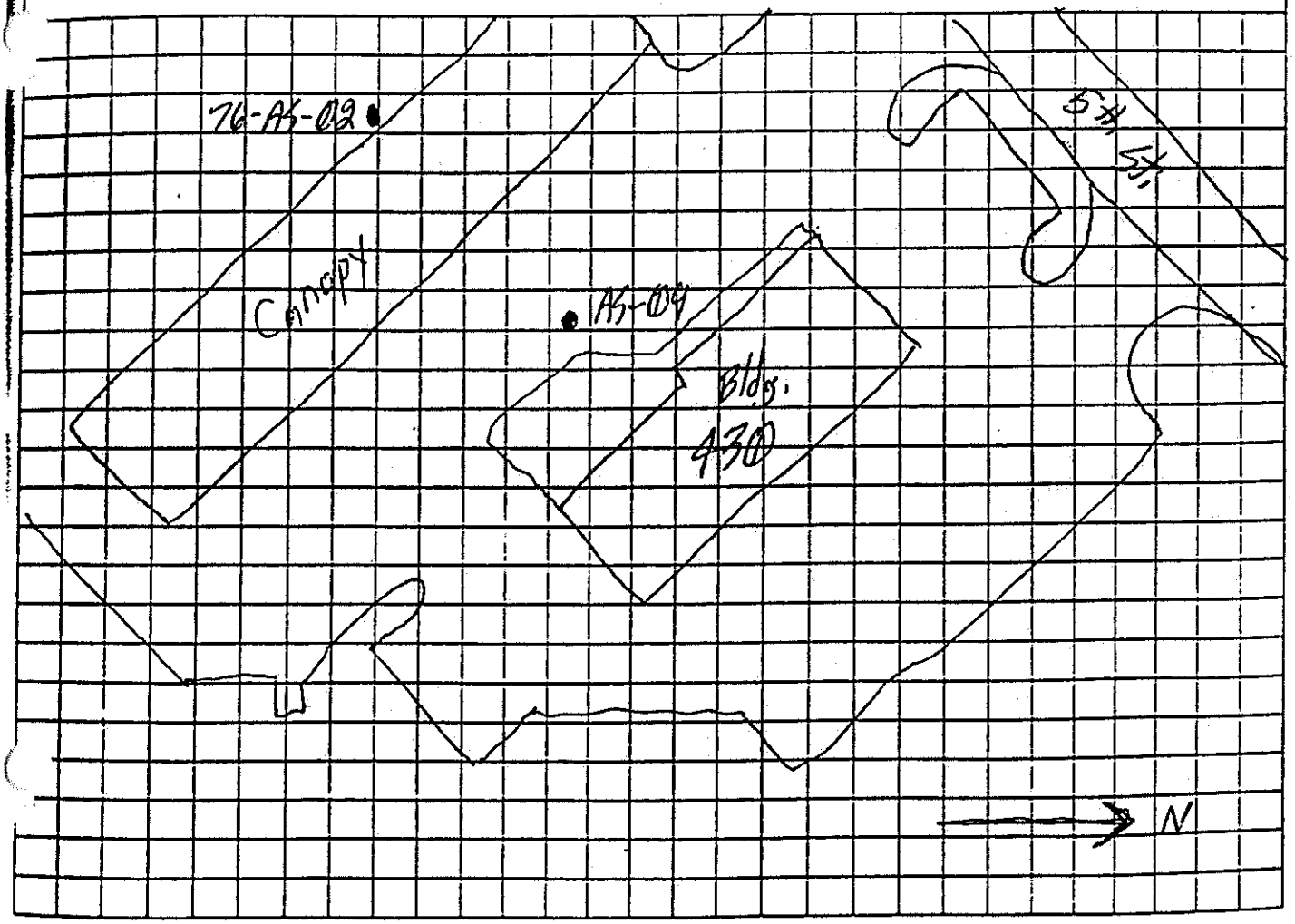
18. GEOTECHNICAL SAMPLES: NA | DISTURBED | UNDISTURBED | 19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	Lead				

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		2" PVC Air Sparging Well		Kevin Franklin

LOCATION SKETCH/COMMENTS

SCALE: NTS



HTRW DRILLING LOG

HOLE NUMBER 76-AS-[illegible]

PROJECT: IST's 357-361 | INSPECTOR JKL | SHEET 1 OF 5

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Asphalt + Gravel				Auger to ~~13~~ 3' with sampler
	1	CLAYEY SAND (SC), 20% clay, low plasticity, fine to medium grained, firm, moist, Yellowish Brown, 10YR-5/6	1425 >2000 ppm			
	2	SANDY SILT (ML) 30% very fine sand, soft, dry, Very Dark Gray, 10YR-3/1				
	3–5	SILTY SAND (SM) 30% silt, very fine grained, soft, dry, Yellowish Brown 10YR-5/4	1435 >2000 ppm			Auger to 8' with sampler
	6	SANDY SILT (ML) 10% very fine sand, soft, moist, Very Dark Gray, 10YR-3/1				
	7	No Recovery				
	8–9	Same as above	1450 >2000 ppm		76A091A	Auger to 13' with sampler

HTRW DRILLING LOG

HOLE NUMBER 256-09

SHEET 3 OF 5

ECT: UST's 257-261 INSPECTOR JKL

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (E)	REMARKS (G)
	11		~~1452~~ 1455 1048ppm			
	12	Grading to Dark Reddish Gray 10R-3/1				▽
	13	Wet at 12.6'				Discontinue sampling and auger down with plug to 35.5'
	14	No samples collected for Geologic Description below 13'.				
	15					
	16					
	17					
	18					
	19					

HTRW DRILLING LOG

HOLE NUMBER A-109

PROJECT: KT 257-36 | INSPECTOR JK | SHEET 3 OF 5

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					no samples collected for description, auger to 35.5'
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

HTRW DRILLING LOG

PROJECT: UST 257-261	INSPECTOR JKL	HOLE NUMBER TE-95-09
		SHEET 4 OF 5

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
		Bottom of hole 35.5'				
	36					
	37					
	38					
	39					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

MONITORING WELL ID: 76-AS-09

INSTALLATION START: DATE: 6-22-02 TIME: 1400

INSTALLATION FINISH: DATE: 6-22-02 TIME: 1613

ANNULAR SPACE MATERIALS INVENTORY: Bentonite Slurry QUANTITY: 8 gal.

GRANULAR FILTER PACK: TYPE: DSI #2 sand QUANTITY: 5 50lb bags

BENTONITE SEAL: TYPE: 3/8" Bentonite Pellets QUANTITY: ½ 5 gal bucket

GROUT: TYPE: Portland cement QUANTITY: _____

DESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020 SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

TYPE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: #2 sand

DESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

JOINT DESIGN AND COMPOSITION: Flush Threaded

CENTRALIZERS DESIGN AND COMPOSITION: NA

DESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15"x15" COMPOSITION: Steel Flush Mount Box

SPECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Heaving sands - flushed down with water.

Was all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease, etc.)? YES [✓] NO [ ]

Was all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical breakage and/or defects? YES [✓] NO [ ]

Is deformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and retreval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

QUANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 35 gal

RECORDED BY: [signature] QA CHECK BY: _____

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-A5-09

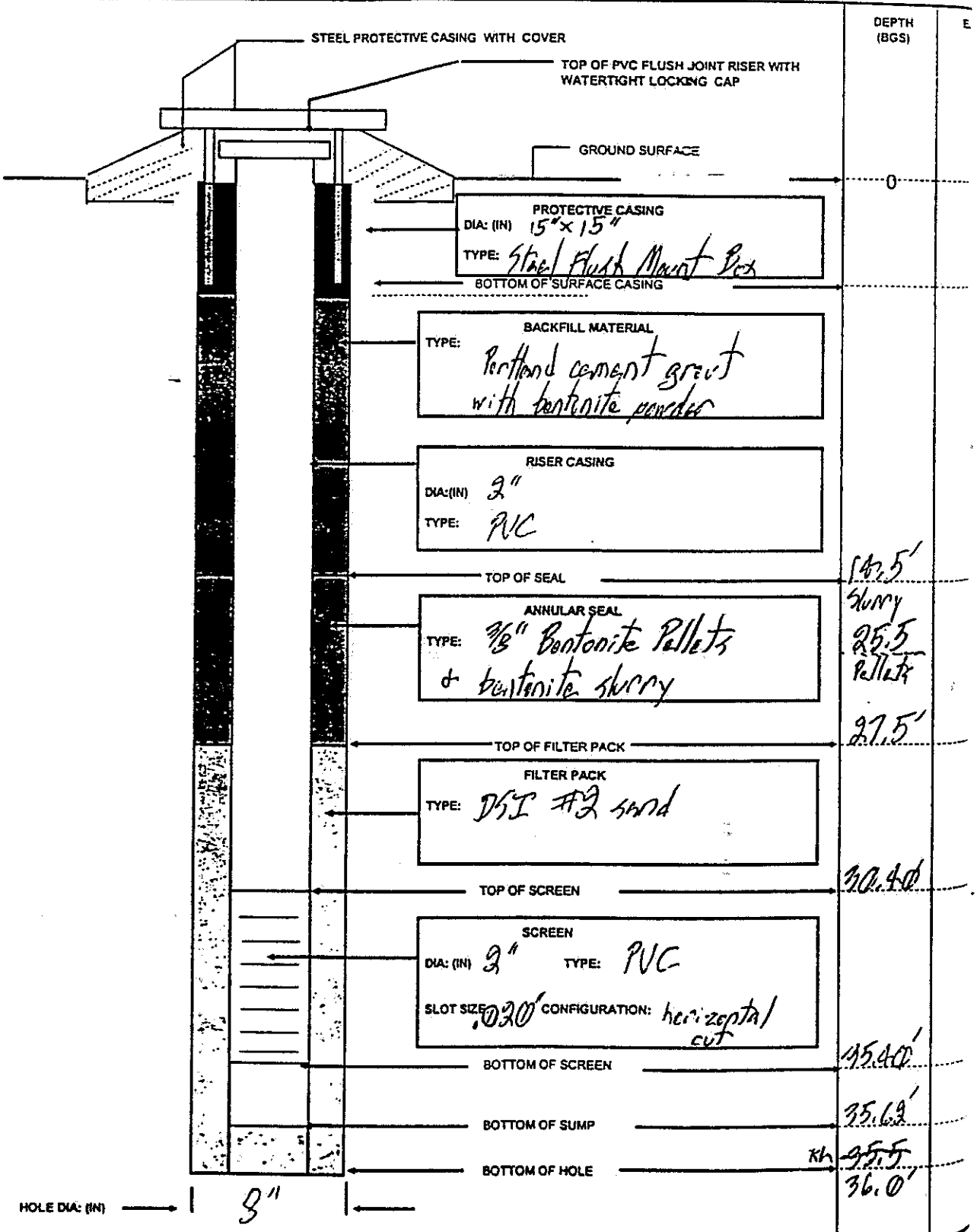
BEGIN: 6-22-01 1400

END: 6-22-01 1613

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS



?W DRILLING LOG

DISTRICT: USACE - Savannah

HOLE NUMBER: 26-AS-10

COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Miller

SHEET 1 OF 1

3. PROJECT: AAFES UST's 257-261

4. LOCATION: AAFES Car Care Center

5. NAME OF DRILLER: B. Ketron

6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" augers, hollow stem; 5' CME Continuous samplers

8. HOLE LOCATION:

9. SURFACE ELEVATION:

10. DATE STARTED: 6-20-02

11. DATE COMPLETED: 6-20-02

12. OVERBURDEN THICKNESS: NA

15. DEPTH GROUNDWATER ENCOUNTERED: 9.7'

13. DEPTH DRILLED INTO ROCK: NA

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

14. TOTAL DEPTH OF HOLE: 35.5'

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18. GEOTECHNICAL SAMPLES: NA — DISTURBED — UNDISTURBED — 19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	Lead				

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		8" Air Sparging Well		Kenneth Lakin

LOCATION SKETCH/COMMENTS: See map, page 5

SCALE:

HTRW DRILLING LOG

PROJECT: VST's 257-361 | INSPECTOR JKL | HOLE NUMBER RAB-10 | SHEET 1 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Asphalt + Gravel	0.0 ppm			Augered through asphalt, inserted CME sampler and augered to 3'
	1	CLAYEY SAND (SC), 15% clay, fine to medium grained, firm, moist, Reddish Yellow, 5YR-6/6, low plasticity.				
	2	SILTY SAND, (SM) fine to medium grained, 10% medium, 10% silt, dry, soft, Gray, 5YR-5/1				
	3	Same as above	0.0 ppm			Augered sampler to 8'
	4	Grading to SAND (SP), fine to very fine grained, dry, soft, Gray, 10YR-6/1				
	5					
		SANDY SILT (ML) 25% very fine sand, firm, moist, Black, 10YR-3/1				
	6	No Recovery				
	7					
	8	Same as above	0.0 ppm		76A101A	Auger sampler to refusal at 11'
	9					
		Wet + ...				∇

36

37

HTRW DRILLING LOG

HOLE NUMBER	7c-K-10
SHEET	2 OF 4

-T: UST's 257-261 | INSPECTOR JKL

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		No Recovery				
	11					Discontinue sampling, Auger down to 35.5
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					

38

HTRW DRILLING LOG

JECT: VST's 257-261 | INSPECTOR TA | HOLE NUMBER [illegible] | SHEET 3 OF 4

V.	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					No description
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

10-HS-01

HTRW DRILLING LOG

HOLE NUMBER	96-AS-10
...CT:	1'5'i'3 357-361
INSPECTOR	JK
SHEET	4 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
		Bottom of hole 35.5'				
	36					
	37					
	38					
	39					

MONITORING WELL INSTALLATION LOG

OJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

NITORING WELL ID: 76-AS-10

TALLATION START: DATE: 6-20-02 TIME: 1320

TALLATION FINISH: DATE: 6-20-02 TIME: 1558

ULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 sand QUANTITY: 2 50lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: ½ of a 5gal bucket

GROUT: Portland Cement Bentonite Grout QUANTITY: _____

CRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020 SLOT CONFIGURATION: Horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

E OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN:

CRIPTION OF WELL CASING: DSI #2 sand

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

T DESIGN AND COMPOSITION: Flush Threads

TRALIZERS DESIGN AND COMPOSITION: NA

CRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15"x15" square COMPOSITION: Steel / Flush Mount

CIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Heaving sands – flushed down with water

ll well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

YES [✓] NO [ ]

ll well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

ge and/or defects? YES [✓] NO [ ]

rmation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

al of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

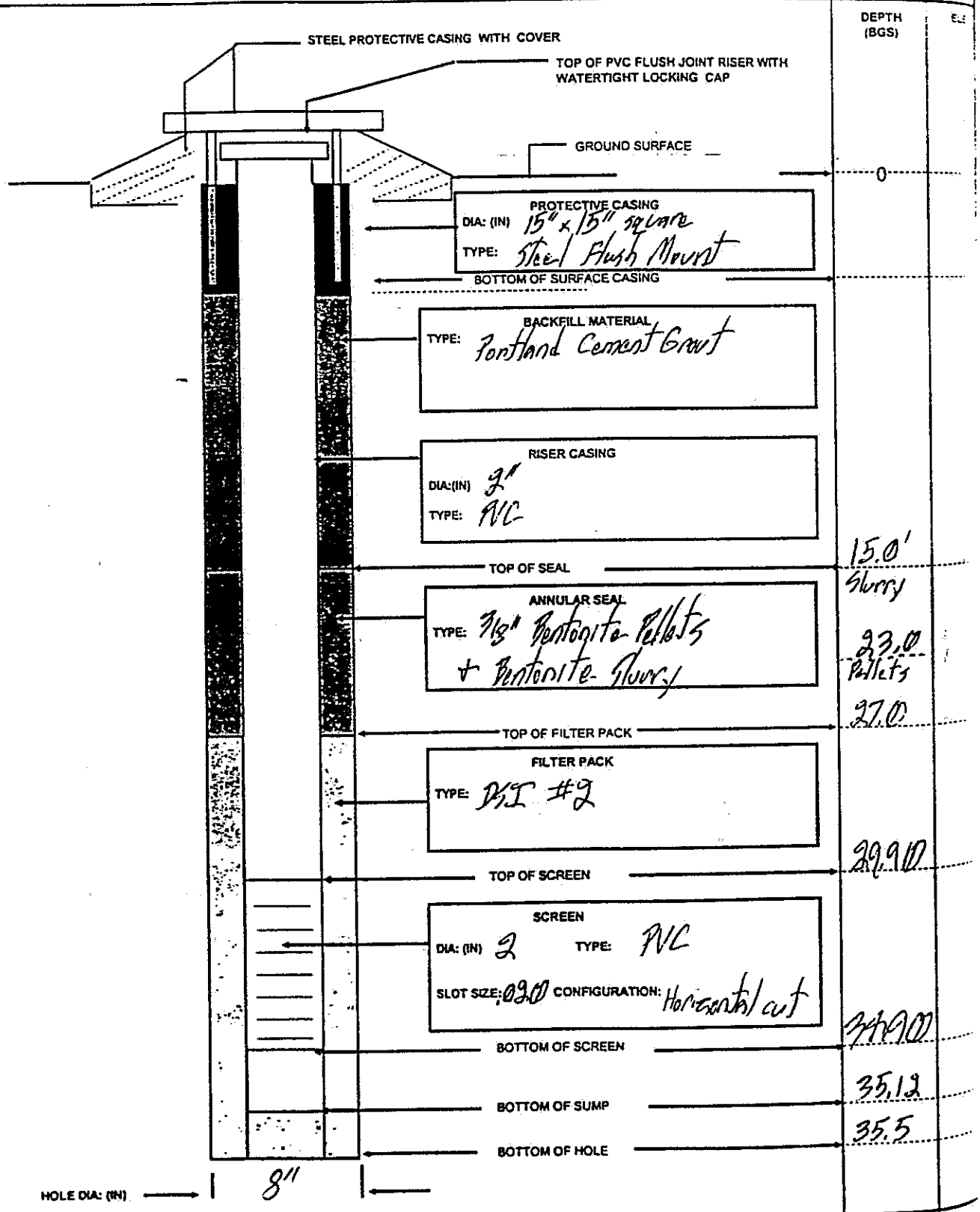
ITITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 50 gal

RDED BY: _____ QA CHECK BY: _____

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS-10	BEGIN: 6-20-02 1320	END: 6-30-02 1558
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS.
DATUM/UNITS:		



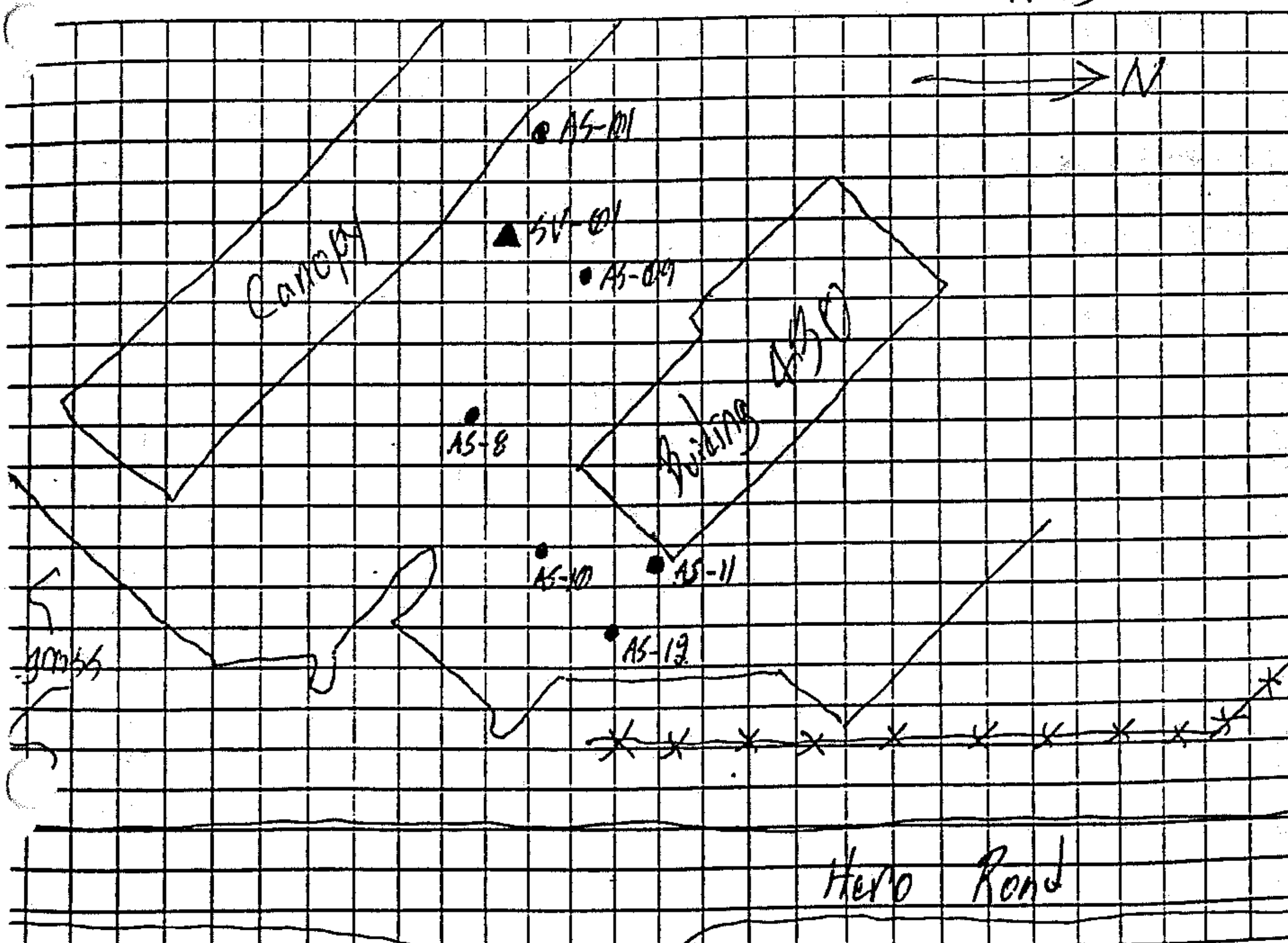
RW DRILLING LOG

RW DRILLING LOG	DISTRICT USACE - Savannah	HOLE NUMBER 76-AS-11
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller	SHEET 1 OF 1

3. PROJECT: AAFES Car Care Center	4. LOCATION: AAFES Car Care Center
5. NAME OF DRILLER: B. Ketron	6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" hollow stem Augers; CME 5' continuous samplers; 2' split spoons	8. HOLE LOCATION: 76-AS-11
	9. SURFACE ELEVATION:
	10. DATE STARTED: 6-19-03 — 11. DATE COMPLETED: 6-19-03
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ~13'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 35.5'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 6.45' BTOC 6-20-03 0945

18. GEOTECHNICAL SAMPLES NA	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES NA			
20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	Lead				
22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR		
		2" PVC	Air Sparging Well	[signature]		

LOCATION SKETCH/COMMENTS — SCALE: NTS



HTRW DRILLING LOG

HOLE NUMBER 76-A-11

PROJECT: AAFES Car Care Center | INSPECTOR JKL | SHEET 1 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Asphalt & gravel				
	1	No Recovery				
	2	SILT with SAND (ML), 10% fine sand, soft, dry, Black 10YR-2/1			76AIIIA	
		CLAYEY SAND, (SC), 10% sand, fine to coarse grained, subangular, moist, Low plasticity, Firm, Yellowish Red, (5YR-5/8)				JKL
	3	No Recovery				
	4	Discontinued soil sampling due to problems with sampling equipment and began augering.				
	5	Cuttings consist of dense black silt described above.				
	6					
	7					
	8					
	9					

Swap

HTRW DRILLING LOG

HOLE NUMBER K-45-11

PROJECT: AAFES Car Care Center | INSPECTOR JKL | SHEET 2 OF 4

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13	Wet cuttings at a depth of ~ 13'				
	14					
	15					
	16					
	17					
	18					
	19					

HTRW DRILLING LOG

HOLE NUMBER MW-11

PROJECT: AAFES Car Care Center | INSPECTOR JKL | SHEET 3 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					no description
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

HTRW DRILLING LOG

HOLE NUMBER 76AS-11

SHEET 4 OF 4

ROJECT: AA-Eh Car Care Center INSPECTOR JKL

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
		Bottom of hole 35.5'				
	36					
	37					
	38					
	39					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

ONITORING WELL ID: 76-AS-11

STALLATION START: DATE: 6-19-02 TIME: 1410

STALLATION FINISH: DATE: 6-19-02 TIME: 1630 seal installed

NNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 4.5 bags (50 lb each)

BENTONITE SEAL: TYPE: Bentonite Pellets & Slurry QUANTITY: 3 gal pellets, 5 gal slurry

GROUT: TYPE: Portland Cement QUANTITY: _____

ESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020" SLOT CONFIGURATION: horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: 4" .19" NOMINAL INSIDE DIAMETER: 4" .16" .17"

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

PE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: #2 sand

ESCRIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19" NOMINAL INSIDE DIAMETER: 4" .17"

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

INT DESIGN AND COMPOSITION: NA 4" Flush Threaded

ENTRALIZERS DESIGN AND COMPOSITION: NA

ESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15" x 15" square COMPOSITION: Steel Flush Mount

ECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

1 pipe, moved location; soil came up augers, re-augered with plug.

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

akage and/or defects? YES [✓] NO [ ]

efcrmation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

eval of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

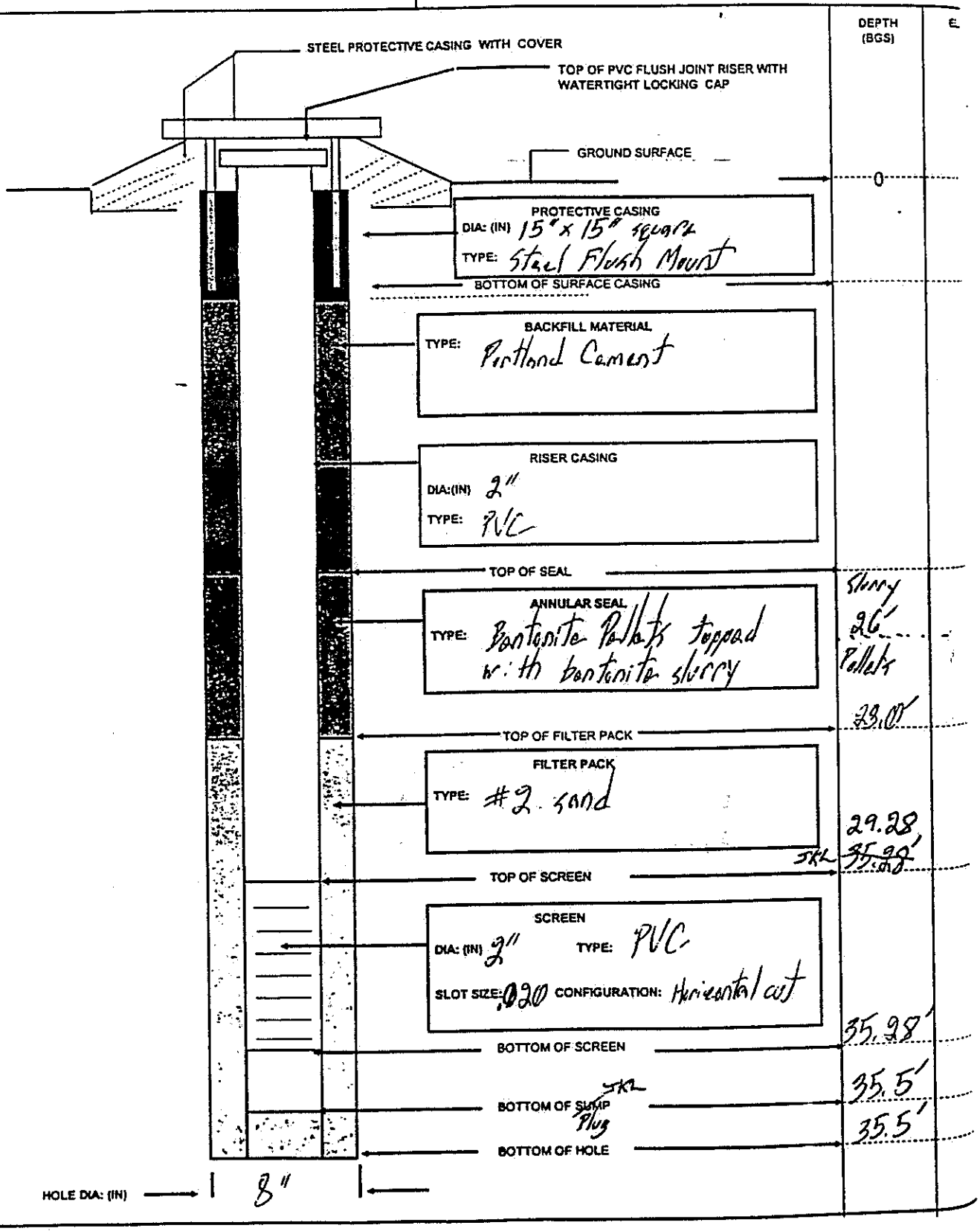
ANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 15 gal

CORDED BY: [signature] QA CHECK BY: [signature]

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS-11	BEGIN: 6-19-02 1410	END: 6-19-02 1630
COORDINATES: N: E:	REFERENCE POINT:	ELEVATION: DATUM/UNITS
DATUM/UNITS:		



LATS 257-261 HTRW DRILLING LOG — HOLE NUMBER: K-K-12

PROJECT: AAFES Car Care Center — INSPECTOR: JKL — SHEET 1 OF 2

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
0	Asphalt		N/A		Augered 0-3'
	Gravel				
1	No Recovery, chunk of asphalt blocked sampler				
2					
3	CLAYEY SAND (SC), 70% fine to coarse sand, firm, dry, low plasticity, Yellowish Red, (5YR-5/6)				Augered 3' to 8'
	SILT with sand, 10% fine sand, soft, dry, Black, 10YR-2/1 0.0 ppm				
4	SAND, (SP), fine to medium grained, soft, dry Yellow, 10YR-7/6				
5	No Recovery				
6					
7					
8					
	Same as above	0.0 ppm		K6A131A	Augered 8' to 11.5' Short run due to difficulty pushing sampler through dense sandy silt.
9	SANDY SILT, ML, 30% fine sand, firm, dry to moist, Very Dark Brown, 10YR-2/2				
10					

USTs 252-261 HTRW DRILLING LOG HOLE NUMBER A-16-12

PROJECT: AAFES Car Care Center INSPECTOR JKL SHEET 2 OF 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (E)	REMARKS (G)
	11	Wet at 11.0'				▽
	12					Discontinue sampling and auger down to 35.5 with a wood plug in the lead auger.
	13					
	14					
	15					
	16					
	17					
	18					
	19					

HTRW DRILLING LOG

JA 257-361

PROJECT: AAFES Car Care Center

INSPECTOR JKL

HOLE NUMBER 16B-12

SHEET 3 OF 7

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					

CTO's 257-361

HTRW DRILLING LOG

HOLE NUMBER	E-15-13
SHEET	4 OF 4

PROJECT: AAFES Car Care Center | INSPECTOR: JKL

ELEV.	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSAPCE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	31					
	32					
	33					
	34					
	35					
	35.5	Bottom of hole 35.5'				
	36					
	37					
	38					
	39					

MONITORING WELL INSTALLATION LOG

OJECT: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO: 008; 2**

NITORING WELL ID: 76-AS-12

TALLATION START: DATE: 6-20-02 TIME: 0805

TALLATION FINISH: DATE: 6-20-02 TIME: 1257

NULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 QUANTITY: 5 50lb bags

BENTONITE SEAL: TYPE: Pellets & Slurry QUANTITY: ½ 5gal. bucket

GROUT: TYPE: Portland Cement QUANTITY: _____

SCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .020 SLOT CONFIGURATION: Horizontal cut

TOTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

E OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: #2 sand

IPTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

NT DESIGN AND COMPOSITION: Flush Threaded

ITRALIZERS DESIGN AND COMPOSITION: NA

CRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: 15"x15" square COMPOSITION: Steel Flush Mount

CIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Ser came out with the augers. Re-augered and placed well again.

all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

YES [Y] NO [ ]

all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical age and/or defects? YES [Y] NO [ ]

ation or bending of the installed well screen and casing minimized to the point of allowing the insertion and of a 1.0-inch bailer throughout the entire length of the completed well? YES [Y] NO [ ]

NTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 30 gal.

ORDED BY: [signature] 6-20-02

QA CHECK BY: [signature] 6/11/02

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-AS-12

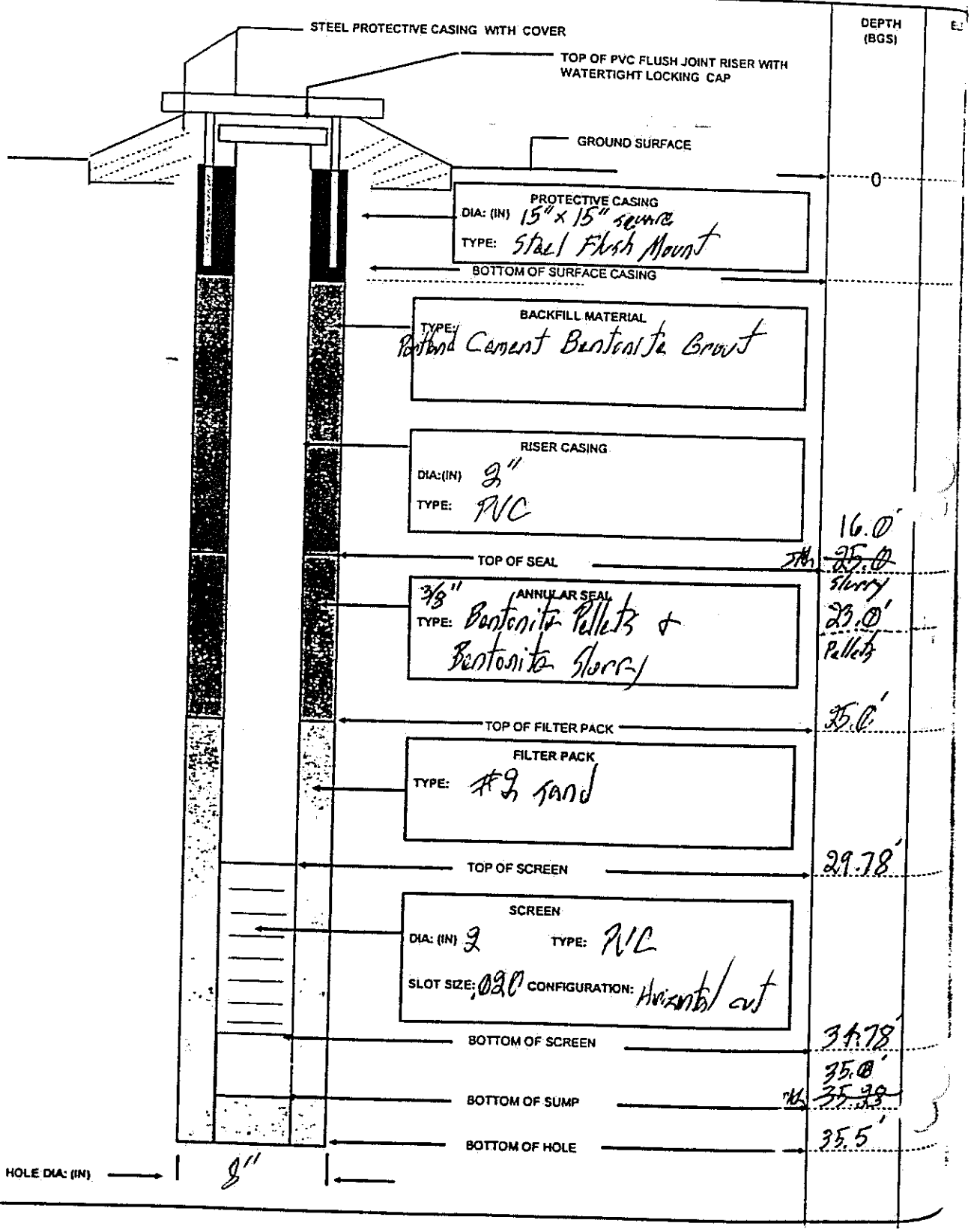
BEGIN: 6-20-02 0905

END: 6-20-02 1257

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS



HTRW DRILLING LOG

DISTRICT: USACE - Savannah

HOLE NUMBER: 76-GA-01

SHEET 1 OF 1

1. COMPANY NAME: SAIC

2. DRILL SUBCONTRACTOR: Miller

3. PROJECT: UST's 257-261

4. LOCATION: AAFES Car Care Center

5. NAME OF DRILLER: T. Warren

6. MANUFACTURERS DESIGNATION OF DRILL: Mobile B-57

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" Hollow Stem Augers

8. HOLE LOCATION:

9. SURFACE ELEVATION:

10. DATE STARTED: 6-24-02

11. DATE COMPLETED: 6-24-02

12. OVERBURDEN THICKNESS: NA

13. DEPTH DRILLED INTO ROCK: NA

14. TOTAL DEPTH OF HOLE: 15.5

15. DEPTH GROUNDWATER ENCOUNTERED:

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

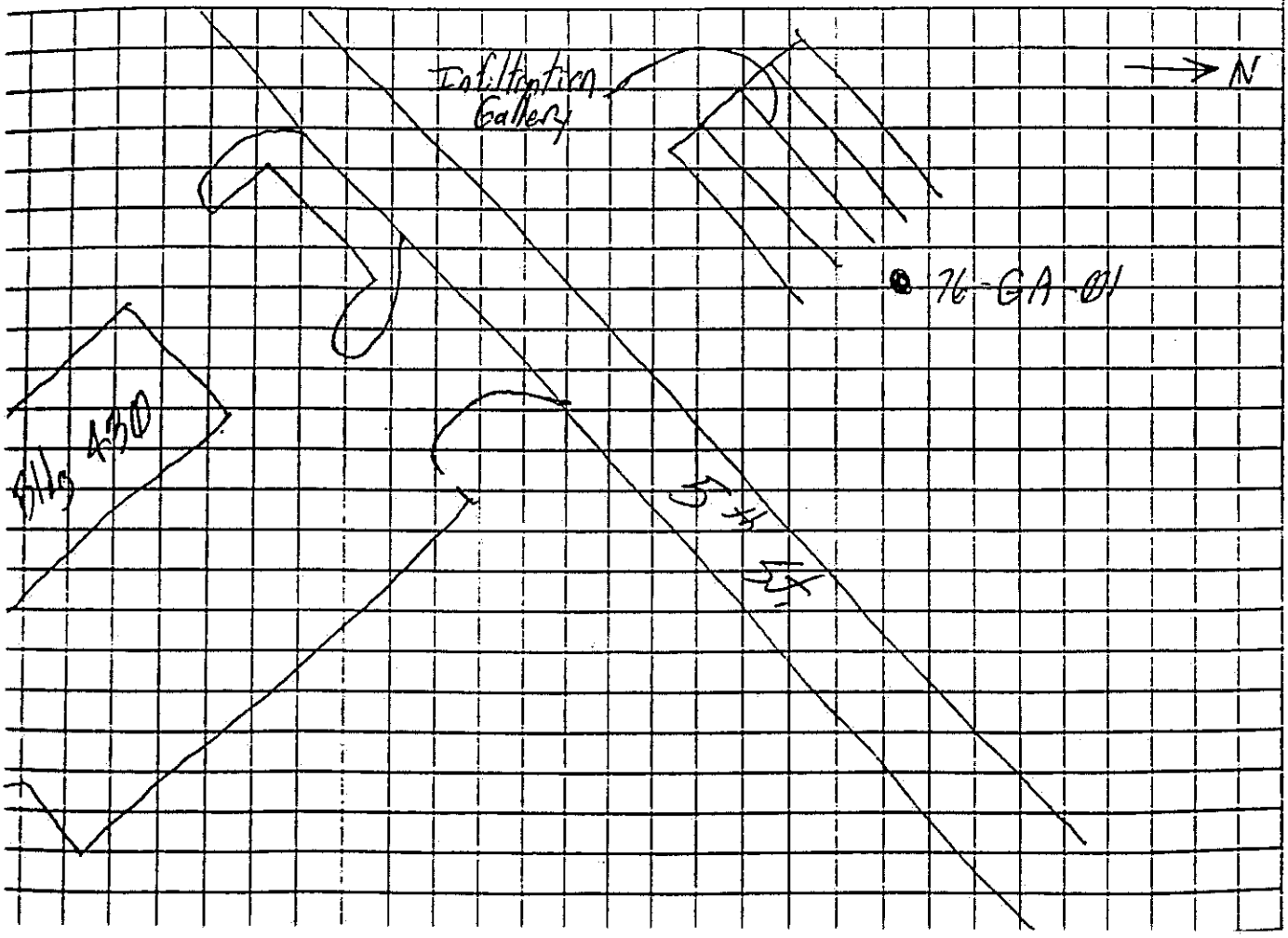
18. GEOTECHNICAL SAMPLES: NA | DISTURBED | UNDISTURBED | 19. TOTAL NUMBER OF CORE BOXES: NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
	BTEX	Lead				

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
		2" PVC		Ronnie Gilbertson

LOCATION SKETCH/COMMENTS

SCALE: NTS



HTRW DRILLING LOG

HOLE NUMBER 96-GA-01

SHEET 1 OF 2

PROJECT: VST's 252-261 INSPECTOR JKL

DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
1	No samples collected for Geologic Description				Auger to 4'
2					
3					
4					Auger to ~~5~~ 9'
5					
6					
7					
8					
9					Auger to 14'

96-GA-01

HTRW DRILLING LOG

HOLE NUMBER MW-LA-01

PROJECT: VSI 257-261 INSPECTOR SKL SHEET 2 OF 9

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	HEADSPACE SCREENING RESULTS	GEOTECH SAMPLE OR CORE BOX	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	11					
	12					
	13					
	14					
	15					Auger to 15.5'
	16	Bottom of hole 15.5'				
	17					
	18					
	19					

MONITORING WELL INSTALLATION LOG

PROJECT: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 008; 2

ONITORING WELL ID: 76-GA-01

ISTALLATION START: DATE: 6-24-02 TIME: 0850

ISTALLATION FINISH: DATE: 6-24-02 TIME: 0958

NNULAR SPACE MATERIALS INVENTORY:

GRANULAR FILTER PACK: TYPE: DSI #2 sand QUANTITY: 5 50lb bags

BENTONITE SEAL: TYPE: 3/8" bentonite pellets QUANTITY: 3/4 5 gal. bucket

GROUT: TYPE: Portland Cement QUANTITY: _____

ESCRIPTION OF WELL SCREEN:

SLOT SIZE (inches): .010" SLOT CONFIGURATION: Horizontal cut

OTAL OPEN AREA PER FOOT OF SCREEN: _____

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

PE OF MATERIAL BETWEEN BOTTOM OF BORING AND SCREEN: #2 sand

RIPTION OF WELL CASING:

OUTSIDE DIAMETER: .19' NOMINAL INSIDE DIAMETER: .17'

SCHEDULE/THICKNESS: 40 COMPOSITION: PVC

MANUFACTURER: _____

INT DESIGN AND COMPOSITION: Flush Threaded

ENTRALIZERS DESIGN AND COMPOSITION: N/A

ESCRIPTION OF PROTECTIVE CASING:

NOMINAL INSIDE DIAMETER: ~~15" x 15" square~~ 5ft COMPOSITION: ~~steel~~ flush mount 5ft

PECIAL PROBLEMS ENCOUNTERED DURING WELL CONSTRUCTION AND THEIR RESOLUTION:

Pieces of plug and/or sand heaved up in stem ~3' — flushed down with ~10 gal of water

s all well screen and casing material used for construction free of foreign matter (e.g., adhesive tape, labels, soil, grease,

)? YES [✓] NO [ ]

s all well screen and casing material used for construction free of unsecured couplings, ruptures, and other physical

akage and/or defects? YES [✓] NO [ ]

eformation or bending of the installed well screen and casing minimized to the point of allowing the insertion and

l of a 1.0-inch bailer throughout the entire length of the completed well? YES [✓] NO [ ]

ANTITY OF APPROVED WATER USED FOR FILTER PACK ENPLACEMENT: 10 gal

CORDED BY: [signature] 6-24-02 QA CHECK BY: [signature] 7/30/02

MONITORING WELL

PROJECT: AAFES Car Care Center, USTs 257-261

DELIVERY ORDER NO: 008; 2

WELL NUMBER: 76-GA-01

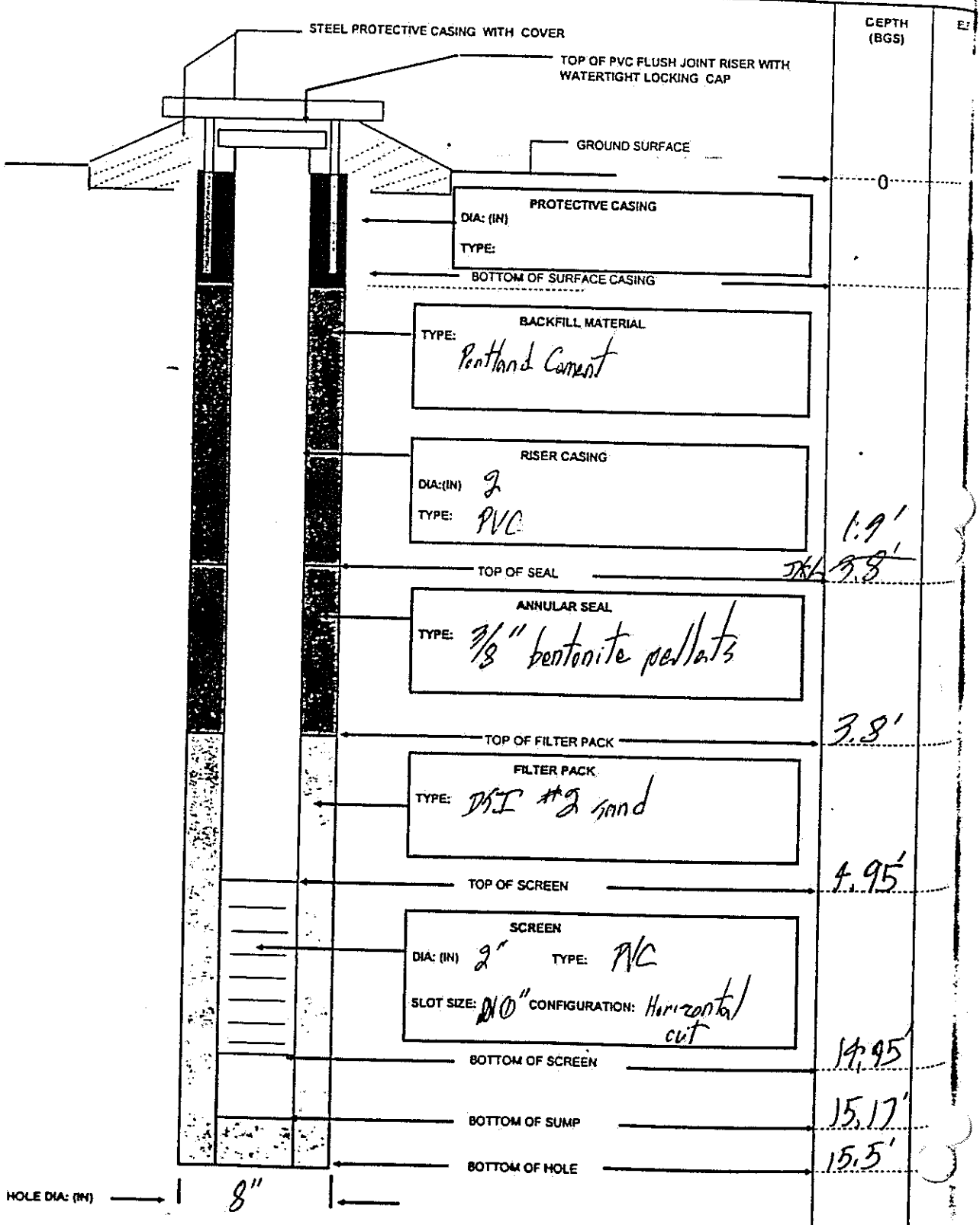
BEGIN: 6-24-08 0850

END: 6-24-08 0953

COORDINATES: N:
E:

DATUM/UNITS:

REFERENCE POINT: ELEVATION: DATUM/UNITS



Appendix B
Well Development Forms Information
(Field Data)

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 - DELIVERY ORDER NO.: 008

Date: 6/26/02 Time: 1445

Well Number and Location: 76AS1

Comments : soft at bottom

Water Levels / Time: Initial: 7.89 / 1447 Pumping: ____ / ____

Final: ____ / ____

Total Well Depth: Initial: 33.52 FT BTOC Final: ____ FT BTOC

Date and Time: Begin: ____ / ____ Completed: ____ / ____

Development Method(S): whale pump, surge block

Total Quantity of Water Removed: 55 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD0456	6/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP	↓	↓

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center USTs 257-261 DELIVERY ORDER NO.

Date: 6/26/02 Time: 1600

Well Number and Location: 76AS2

Comments :

Water Levels / Time: Initial: 14.26 / 1600 Pumping: /

Final: 12.35 / 1835

Total Well Depth: Initial: 32.75 FT BTOC Final: FT BTOC

Date and Time: Begin: / Completed: /

Development Method(S): Whale pump, surge block

Total Quantity of Water Removed: 55 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QDØØ566	6/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 0082

Date: 07/29/02 Time: 0920

Well Number and Location: AS-3

Comments : water started a dark brown with sediment in it cleared up to 290 NTU's Light brown color

Water Levels / Time: Initial: 0910 , 7.95 Pumping: 1115 , 23.03

Final: 1145 ,

Total Well Depth: Initial: 32.60 FT BTOC Final: 34.61 FT BTOC

Date and Time: Begin: 7/29/02 , 0915 Completed: 7/29/02 , 1145

Development Method(S): Whale pump, surge block

Total Quantity of Water Removed: ≈110 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	7/29/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 **DELIVERY ORDER NO.:** 00

Date: 06/24/02 Time: 0835

Well Number and Location: 76-A54

Comments: water is light Brown and has sand in it

Water Levels / Time: Initial: 0835 / 9.53 Pumping: 27.55 / 1330

Final: ____ / ____

Total Well Depth: Initial: 33.02 FT BTOC Final: ____ FT BTOC

Date and Time: Begin: ____ / ____ Completed: ____ / ____

Development Method(S): whale pump

Total Quantity of Water Removed: 1805 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	6/24/02
Specific Conductivity	↓	↓
pH	↓	↓
Turbidity	00110000003448	6/24/02
DO	QD00560	6/24/02
ORP	↓	↓

WELL DEVELOPMENT SUMMARY

PROJECT NAME: AAFES Car Care Center, USTs 257-261 Delivery Order NO: 008

WELL NUMBER: 76-AS-4

DATE	TIME	GALLONS REMOVED	TEMP (C)	SPECIFIC CONDUCTIVITY (µMHOS/CM)	pH (STANDARD UNITS)	TURBIDITY (NTU)	TOTAL GALLONS REMOVED	WELL VOLUMES REMOVED	DO mg/L	COMMENTS	ORP mV
	0840		23.67	101	5.31	FFF			1.56		191
	1205	125	24.20	56	4.75	136			1.08		173
	1350	55	24.75	63	4.75	281			0.91		164

RECORDED BY: _____ QA CHECKED BY: _____

8

24

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO. 008

Date: 06/23/02 Time: 1324

Well Number and Location: 76-A55

Comments : water started Light brown color with sand

Water Levels / Time: Initial: 10.17 / 1515 Pumping: _____ / _____

Final: _____ / _____

Total Well Depth: Initial: 35.0 FT BTOC Final: 35.0 FT BTOC

Date and Time: Begin: 1515 / 6/23/02 Completed: 2000 / 6/23/02

Development Method(S): whale pump

Total Quantity of Water Removed: 225 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	6/23/02
Specific Conductivity	↓	↓
pH	↓	↓
Turbidity	00110000003448	6/23/02
DO	QD00566	6/23/02
ORP	↓	↓

WELL DEVELOPMENT SUMMARY

PROJECT NAME: AAFES Car Care Center USTs 257-261 Delivery Order NO: 008

WELL NUMBER: 76-AS5

DATE	TIME	GALLONS REMOVED	TEMP (C)	SPECIFIC CONDUCTIVITY (µMHOS/CM)	pH (STANDARD UNITS)	TURBIDITY (NTU)	TOTAL GALLONS REMOVED	WELL VOLUMES REMOVED	DO mg/L	COMMENTS	ORP mV
	1520	initial	25.33	189	5.23	FFF	initial	initial	1.50		189
	2000	225	24.88	90	4.79	FFF			1.78		167
					AM						
					6/23/92						

RECORDED BY: _____ QA CHECKED BY: _____

6

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 – DELIVERY ORDER NO.: 008

Date: 6/23/02 Time: 0923

Well Number and Location: 76-MW56 AAFES

Comments : water started a milk chocolate color and consistency

Water Levels / Time: Initial: 4.77 / 0900 Pumping: ____ / ____

Final: ____ / ____

Total Well Depth: Initial: ____ FT BTOC Final: ____ FT BTOC

Date and Time: Begin: 6/23/02 / 0900 Completed: 6/23/02 / 1500

Development Method(S): whale pump

Total Quantity of Water Removed: 135 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	6/23/02
Specific Conductivity	↓	↓
pH	↓	↓
Turbidity		
DO	QD00566	6/23/02
ORP	↓	

WELL DEVELOPMENT SUMMARY

PROJECT NAME: AAFES Car Care Center, USTs 257-261 Delivery Order NO: 008

WELL NUMBER: 76-AS-6

DATE	TIME	GALLONS REMOVED	TEMP (C)	SPECIFIC CONDUCTIVITY (µMHOS/CM)	pH (STANDARD UNITS)	TURBIDITY (NTU) ~~AFTER FFF~~	TOTAL GALLONS REMOVED	WELL VOLUMES REMOVED	DO mg/L	COMMENTS	ORP mV
6/23/02	0900	initial	24.08	152	5.31	~~36.0~~	initial	initial	1.59		174
	1330	100	24.17	49	4.96	150	100		4.22		177
	1455	135	24.68	48	4.98	200	135		3.97		176

RECORDED BY: _____ QA CHECKED BY: _____

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center: USTs 257-261 DELIVERY ORDER NO.: 00

Date: ~~6/26/02~~ AOM 7/28/02 Time: ~~11:30~~ AOM 1045

Well Number and Location: ~~76-AS1~~ AOM 76-AS7

Comments : very soft bottom

flow rate is 0.7 gal per minute

Water Levels / Time: Initial: 1022 / 9.05 Pumping: 1050 / 28.14

Final: 1300 / 28.61

Total Well Depth: Initial: ~~33.38~~ AOM 33.19 FT BTOC Final: ______ FT BTOC

Date and Time: Begin: ~~11:30~~ AOM 7/28/02 / 1030 Completed: 7/28/02 / ______

Development Method(S): whale pump

Total Quantity of Water Removed: ≈ 100 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD 00566	7/28/02
Specific Conductivity	↓	↓
pH		
Turbidity	N/A	N/A
DO		
ORP	↓	↓

76-AS7

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, UST's 257, 261 DELIVERY ORDER NO. 1008

Date: 07/29/02 Time: 1535

Well Number and Location: AS-8

Comments: water started dark brown and cloudy cleared up to 114 NTU's

Water Levels / Time: Initial: 1315, 8.04 Pumping: 1600, 16.74

Final: 1610, 11.01

Total Well Depth: Initial: 33.40 FT BTOC Final: 34.42 FT BTOC

Date and Time: Begin: 1320, 7/29/02 Completed: 1615, 7/29/02

Development Method(S): whale pump, surge block

Total Quantity of Water Removed: ≈150 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD 00566	7/29/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO.

Date: 07281/02 Time: 15

Well Number and Location: AS-9

Comments : water started with sand and silt in it and a ~~Br~~ dark brown, at end lightened up to 190 NTU's

Water Levels / Time: Initial: 1410 / 7.75 Pumping: 1645 / 19.90

Final: 1715 / 20.31

Total Well Depth: Initial: 34.05 FT BTOC Final: 35.25 FT BTOC

Date and Time: Begin: 1415 / 7/28/02 Completed: 1715 / 7/28/02

Development Method(S): whale pump Surge block

Total Quantity of Water Removed: ~~5~~ 150 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	7/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO: 0

Date: 6/26/02 Time: 10:2

Well Number and Location: 76-AS10

Comments :

Water Levels / Time: Initial: 8.64 / 10:20 Pumping: /

Final: 3 /

Total Well Depth: Initial: 32.04 FT BTOC Final: ~~34.74~~ *C FT BTOC

Date and Time: Begin: 10:20 / 6/26/02 Completed: ~~10:45~~ / 6/26/02

Development Method(S): whale pump, surge block

Total Quantity of Water Removed: ~150 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	ΦΦΦ Φ566	6/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO.: 008

Date: 6/26/02 Time: 08:50

Well Number and Location: 76-AS11

Comments :

Water Levels / Time: Initial: 8.42 / 08:55 Pumping: /

Final: /

Total Well Depth: Initial: 34.40 FT BTOC Final: 34.74 FT BTOC

Date and Time: Begin: 8:50 / 6/26/02 Completed: 10:45 / 6/26/02

Development Method(S): whale pump

Total Quantity of Water Removed: ~100 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00564	6/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

34

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO.: 008

Date: 06/24/02 Time: 1605

Well Number and Location: 76-AS12

Comments : Light brown water with sand ~~in~~ at start

Water Levels / Time: Initial: 1550 / 8.60 Pumping: _____ / _____

Final: _____ / _____

Total Well Depth: Initial: 32.55 FT BTOC Final: _____ FT BTOC

Date and Time: Begin: 6/24/02 1555 Completed: _____ / _____

Development Method(S): whale pump

Total Quantity of Water Removed: ~~2.5~~ 2.125 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00566	6/24/02
Specific Conductivity	↓	↓
pH	↓	↓
Turbidity	0811000003448	6/24/02
DO	QD00566	6/24/02
ORP	↓	↓

WELL DEVELOPMENT SUMMARY

PROJECT NAME: AAFES Car Care Center, USTs 257-261 Delivery Order NO: 0083

WELL NUMBER: 76-AS12

DATE	TIME	GALLONS REMOVED	TEMP (C)	SPECIFIC CONDUCTIVITY (µMHOS/CM)	pH (STANDARD UNITS)	TURBIDITY (NTU)	TOTAL GALLONS REMOVED	WELL VOLUMES REMOVED	DO mg/L	COMMENTS	ORP mV
6/24/02	1555	initial	25.98	420	5.55	FFF	initial	initial	0.58		189
6/24/02	1820	125	24.38	89	5.21	FFF	125		4.32		169

RECORDED BY: _____ QA CHECKED BY: _____

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO. 3008

Date: 07/26/02 Time: 1330

Well Number and Location: EX-1

Comments: water at start contained a lot of sand and silt

Water Levels / Time: Initial: 1300, 8.19 Pumping: 1405, 11.01

Final: 1600, 10.22

Total Well Depth: Initial: 43.09 FT BTOC Final: 44.93 FT BTOC

Date and Time: Begin: 7/26/02, 1300 Completed: 7/26/02, 1608.

Development Method(S): grand Flow pump

Total Quantity of Water Removed: 500 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD 00566	7/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257, 261, DELIVERY ORDER NO. 1008

Date: 7/28/02 - 7/30/02 Time: _____

Well Number and Location: EX-2

Comments: water had a lot of ~~fine~~ sediment in it started dark brown and cloudy never cleared up

Water Levels / Time: Initial: 8.74, 0900 Pumping: well dried, quickly

Final: well recoved completly after ≈ 3 hours

Total Well Depth: Initial: _____ FT BTOC Final: 47.31 FT BTOC

Date and Time: Begin: 7/28/02, 0900 Completed: 7/30/02, 1800

Development Method(S): whale pump, Grundfloss, Surge block

Total Quantity of Water Removed: 235 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD 00566	7/28/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257-261 DELIVERY ORDER NO. 00

Date: 7/27/02 - 7/30/02 Time: _____

Well Number and Location: EX-3

Comments: a lot of sediment in well water started dark brown and cloudy, cleared to a light brown still cloudy

Water Levels / Time: Initial: 7.56, ~~FT~~ 0900 Pumping: water level drops to dry

Final: well takes ~3 hours to recover completly

Total Well Depth: Initial: _____ FT BTOC Final: 48.45 FT BTOC

Date and Time: Begin: 7/27/02, 0900 Completed: 7/30/02, 1800.

Development Method(S): grundfloss pump, whale pump, Surge block

Total Quantity of Water Removed: 310 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD00506	7/27/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: AAFES Car Care Center, USTs 257,261 DELIVERY ORDER NO. 1008

Date: 7/28/02 - 7/30/02 Time: _____

Well Number and Location: EX-4

Comments: Started dark brown, cloudy, a lot of sediment cleared slightly

Water Levels / Time: Initial: 967 / 0900 Pumping: well water dropped rapidly

Final: well recovered completely in ≈ 3hours

Total Well Depth: Initial: _____ FT BTOC Final: 49.02 FT BTOC

Date and Time: Begin: 7/27/02 1890 Completed: 7/30/02 1800.

Development Method(S): grundfloss pump, whale pump Surge block

Total Quantity of Water Removed: ≈ 310 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	000566	7/24/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
CO		
ORP		

WELL DEVELOPMENT FORM

PROJECT NAME: KAAFES Car Care Center, USTs 257-261; DELIVERY ORDER NO. 2008

Date: 7/26/02 - 7/30/02 Time: _____

Well Number and Location: EX-5

Comments: water started out cloudy and dark brown with a lot of sediment, cleared slightly

Water Levels / Time: Initial: 8.84 / 0900 Pumping: water level dropped very quickly

Final: well recovered in ≈ 3hrs

Total Well Depth: Initial: _____ FT BTOC Final: 47.07 FT BTOC

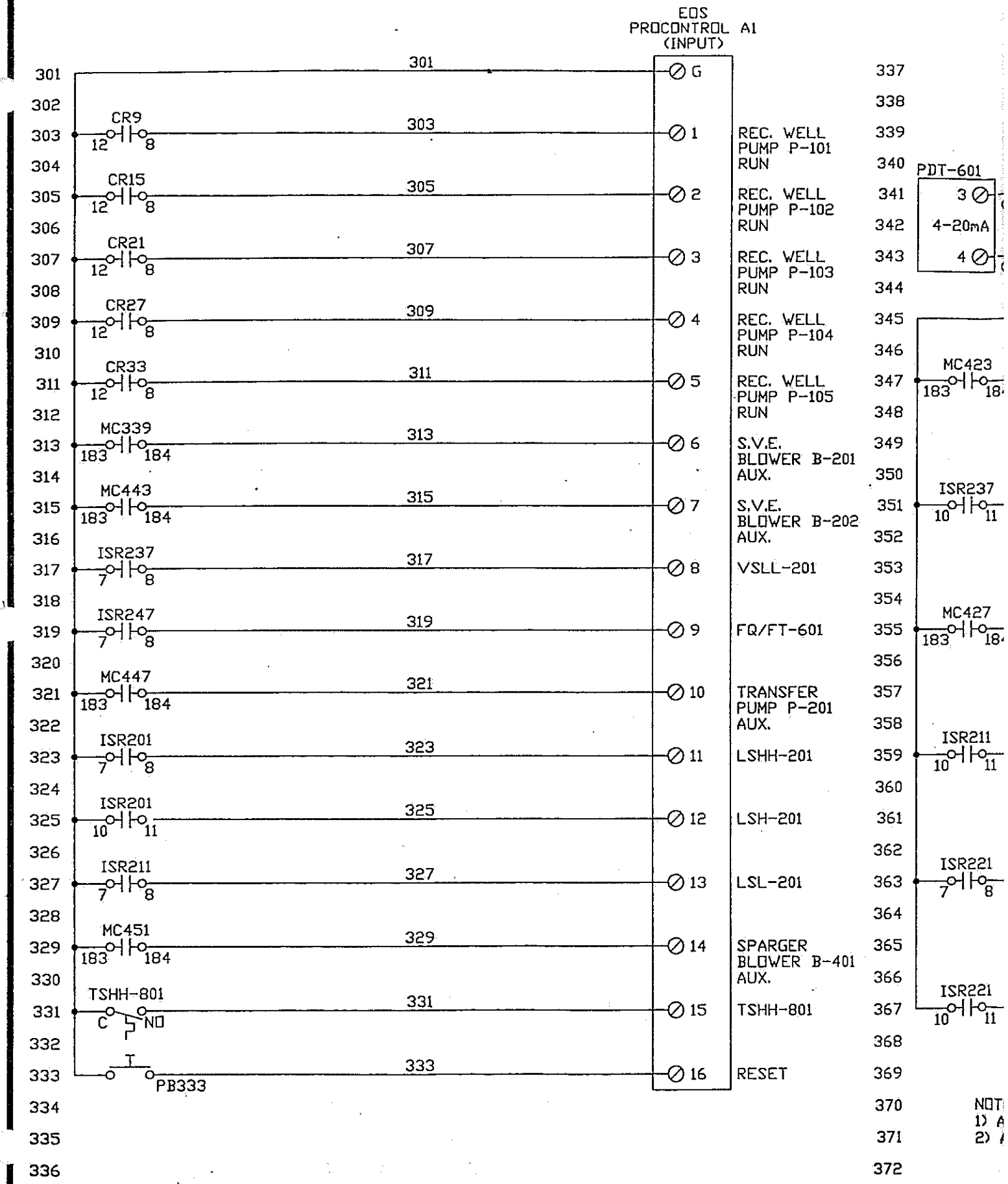
Date and Time: Begin: 7/27/02, 0900 Completed: 7/30/02, 1800.

Development Method(S): grundfos pump, whale pump, surge block

Total Quantity of Water Removed: ≈ 310 gals

FIELD MEASUREMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Temperature	QD 00 566	7/26/02
Specific Conductivity		
pH		
Turbidity	N/A	N/A
DO		
ORP		

Appendix C
Remedial System "As-Built" Drawings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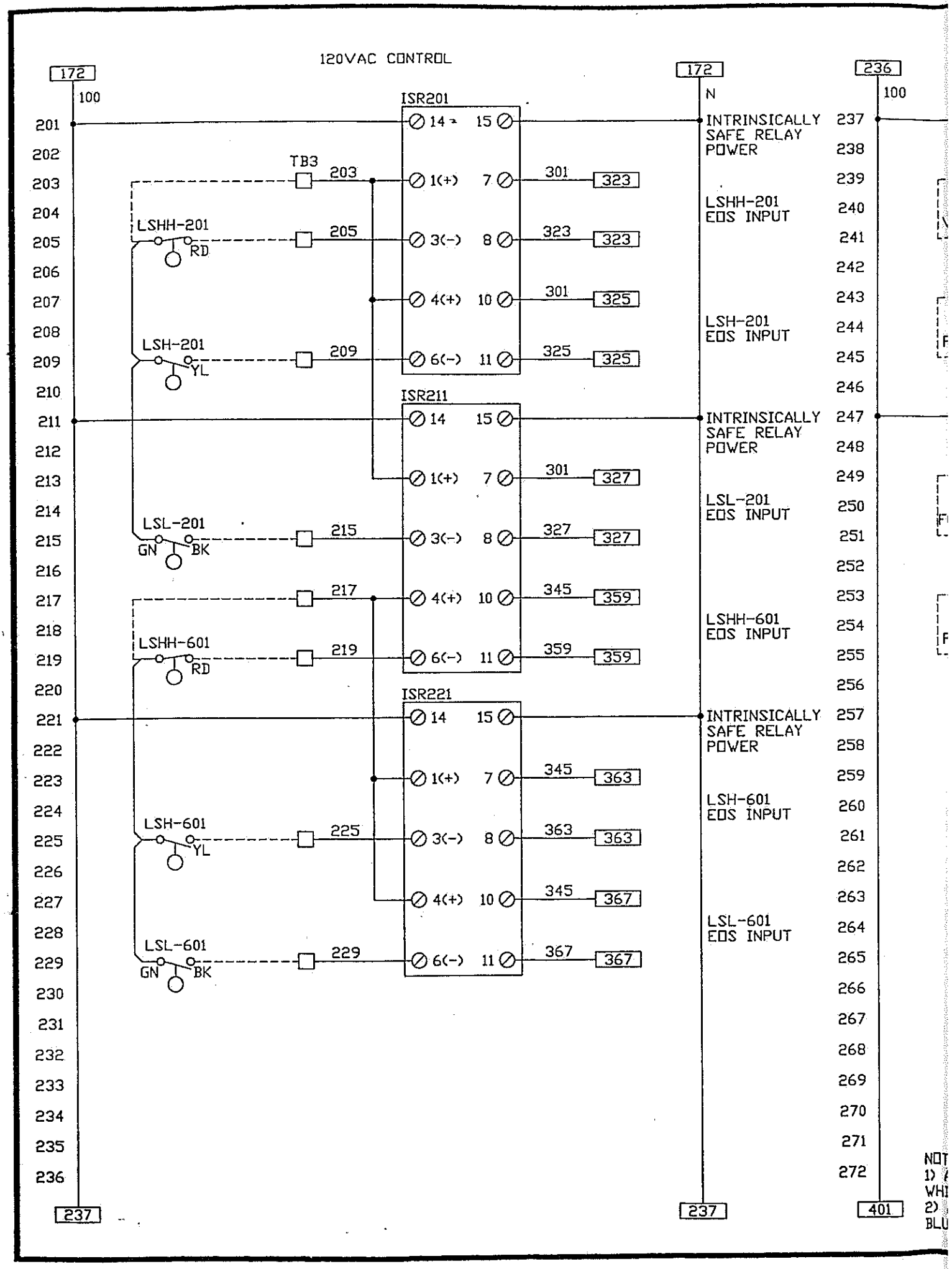
PROCONTROL A1
(INPUT)
301
303
305
307
309
311
313
315
317
319
321
323
325
327
329
331
333
CR9
CR15
CR21
CR27
CR33
MC339
MC443
ISR237
ISR247
MC447
ISR201
ISR201
ISR211
MC451
TSHH-801
PB333
G
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
REC. WELL PUMP P-101 RUN
REC. WELL PUMP P-102 RUN
REC. WELL PUMP P-103 RUN
REC. WELL PUMP P-104 RUN
REC. WELL PUMP P-105 RUN
S.V.E. BLOWER B-201 AUX.
S.V.E. BLOWER B-202 AUX.
VSLL-201
FQ/FT-601
TRANSFER PUMP P-201 AUX.
LSHH-201
LSH-201
LSL-201
SPARGER BLOWER B-401 AUX.
TSHH-801
RESET
PDT-601
3
4-20mA
4
MC423
ISR237
MC427
ISR211
ISR221
ISR221


120VAC CONTROL
172
100
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
TB3
203
LSHH-201
205
RD
LSH-201
209
YL
LSL-201
215
GN
BK
217
LSHH-601
219
RD
LSH-601
225
YL
LSL-601
229
GN
BK
ISR201
14
15
1(+)
7
301
323
3(-)
8
323
323
4(+)
10
301
325
6(-)
11
325
325
ISR211
14
15
1(+)
7
301
327
3(-)
8
327
327
4(+)
10
345
359
6(-)
11
359
359
ISR221
14
15
1(+)
7
345
363
3(-)
8
363
363
4(+)
10
345
367
6(-)
11
367
367
172
N
INTRINSICALLY SAFE RELAY POWER
237
LSHH-201 EOS INPUT
240
LSH-201 EOS INPUT
244
INTRINSICALLY SAFE RELAY POWER
247
LSL-201 EOS INPUT
250
LSHH-601 EOS INPUT
254
INTRINSICALLY SAFE RELAY POWER
257
LSH-601 EOS INPUT
260
LSL-601 EOS INPUT
264
237
236
100
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
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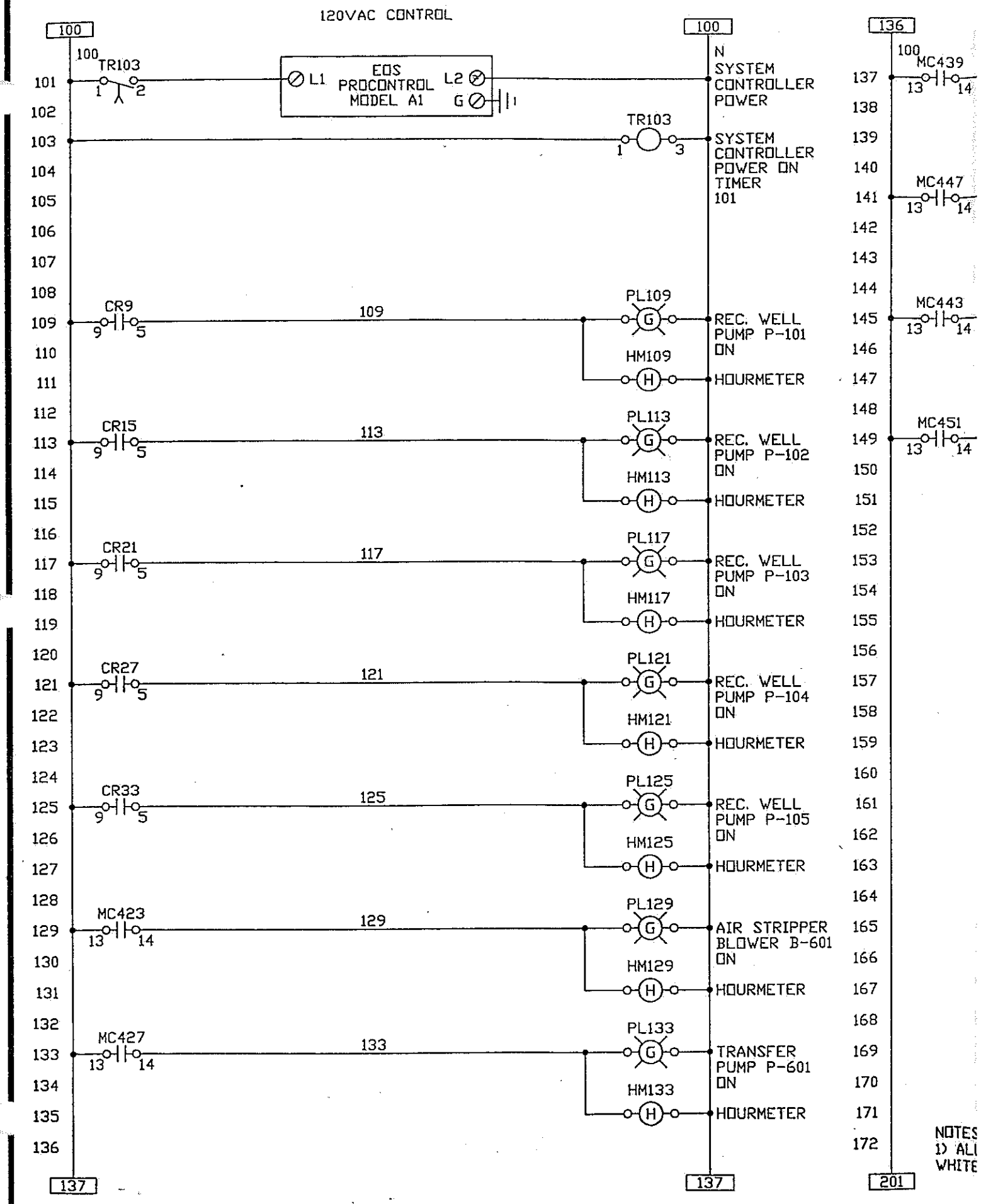
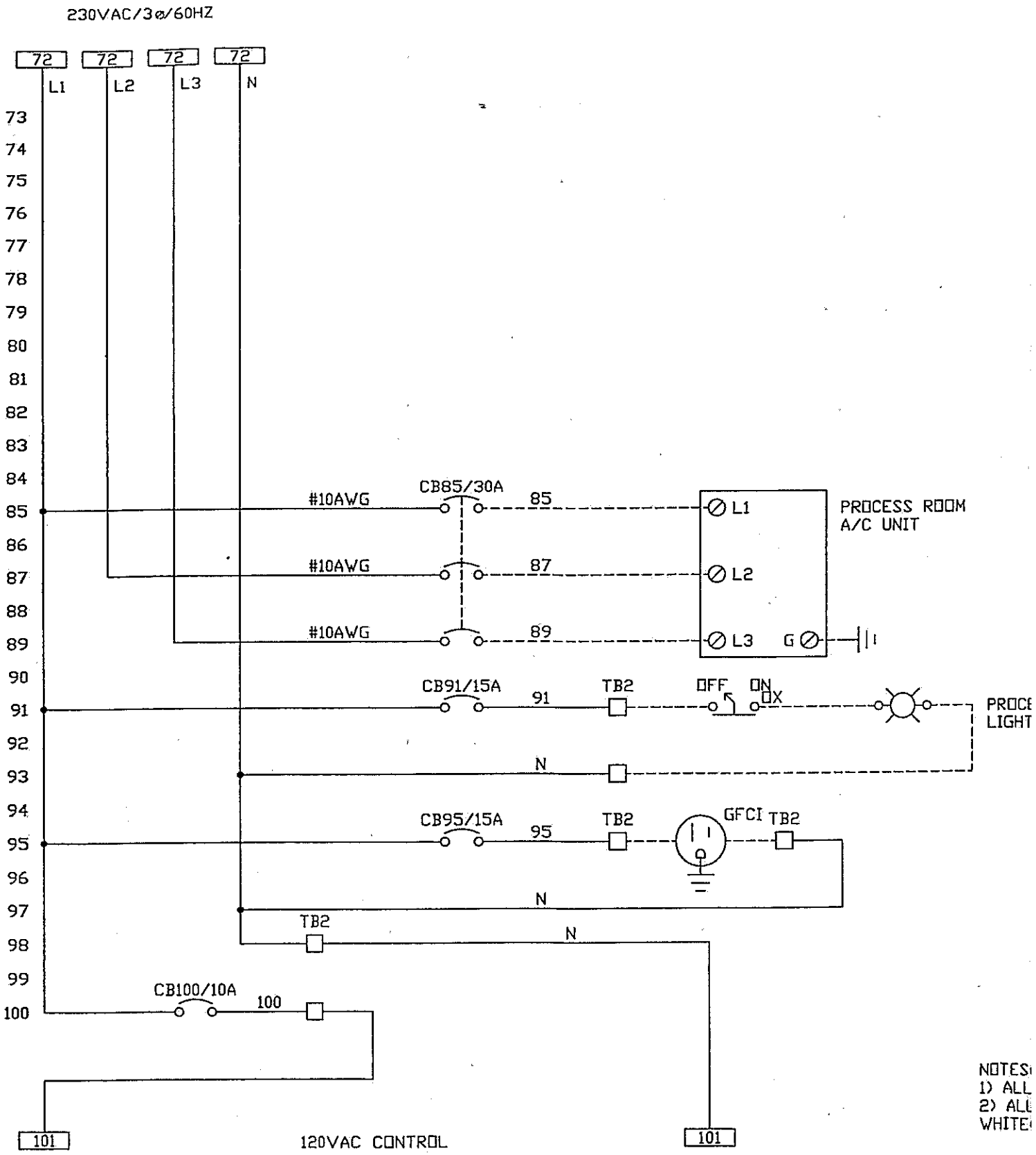
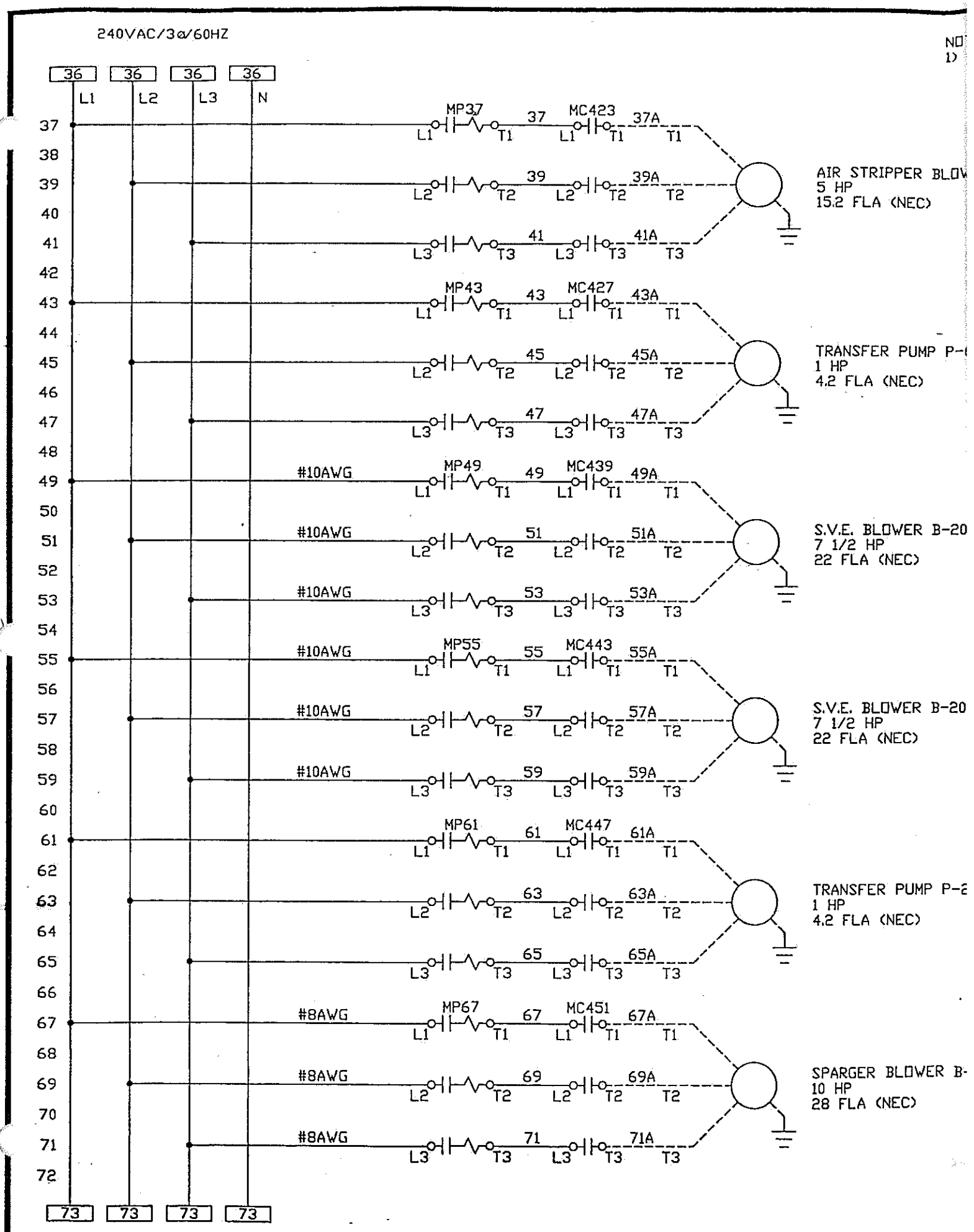
271
272
401


120VAC CONTROL
100
100
136
TR103
EOS
PROCONTROL
MODEL A1
L1
L2
G
N
SYSTEM
CONTROLLER
POWER
SYSTEM
CONTROLLER
POWER ON
TIMER
101
CR9
109
PL109
REC. WELL
PUMP P-101
ON
HM109
HOURMETER
CR15
113
PL113
REC. WELL
PUMP P-102
ON
HM113
HOURMETER
CR21
117
PL117
REC. WELL
PUMP P-103
ON
HM117
HOURMETER
CR27
121
PL121
REC. WELL
PUMP P-104
ON
HM121
HOURMETER
CR33
125
PL125
REC. WELL
PUMP P-105
ON
HM125
HOURMETER
MC423
129
PL129
AIR STRIPPER
BLOWER B-601
ON
HM129
HOURMETER
MC427
133
PL133
TRANSFER
PUMP P-601
ON
HM133
HOURMETER
MC439
MC447
MC443
MC451
137
137
201


230VAC/3ø/60HZ
72
72
72
72
L1
L2
L3
N
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
#10AWG
CB85/30A
85
#10AWG
87
#10AWG
89
L1
L2
L3
G
PROCESS ROOM
A/C UNIT
CB91/15A
91
TB2
OFF
ON
X
N
CB95/15A
95
TB2
GFCI TB2
N
TB2
N
CB100/10A
100
101
120VAC CONTROL
101
NOTES
1) ALL
2) ALL
WHITE


240VAC/3ø/60HZ
NO
1)
36
L1
L2
L3
N
MP37
37
MC423
37A
39
39A
41
41A
AIR STRIPPER BLOW
5 HP
15.2 FLA (NEC)
MP43
43
MC427
43A
45
45A
47
47A
TRANSFER PUMP P-
1 HP
4.2 FLA (NEC)
#10AWG
MP49
49
MC439
49A
51
51A
53
53A
S.V.E. BLOWER B-20
7 1/2 HP
22 FLA (NEC)
MP55
55
MC443
55A
57
57A
59
59A
S.V.E. BLOWER B-20
7 1/2 HP
22 FLA (NEC)
MP61
61
MC447
61A
63
63A
65
65A
TRANSFER PUMP P-2
1 HP
4.2 FLA (NEC)
#8AWG
MP67
67
MC451
67A
69
69A
71
71A
SPARGER BLOWER B-
10 HP
28 FLA (NEC)
L1
T1
L2
T2
L3
T3
37
38
39
40
41
42
43
44
45
46
47
48
49
50
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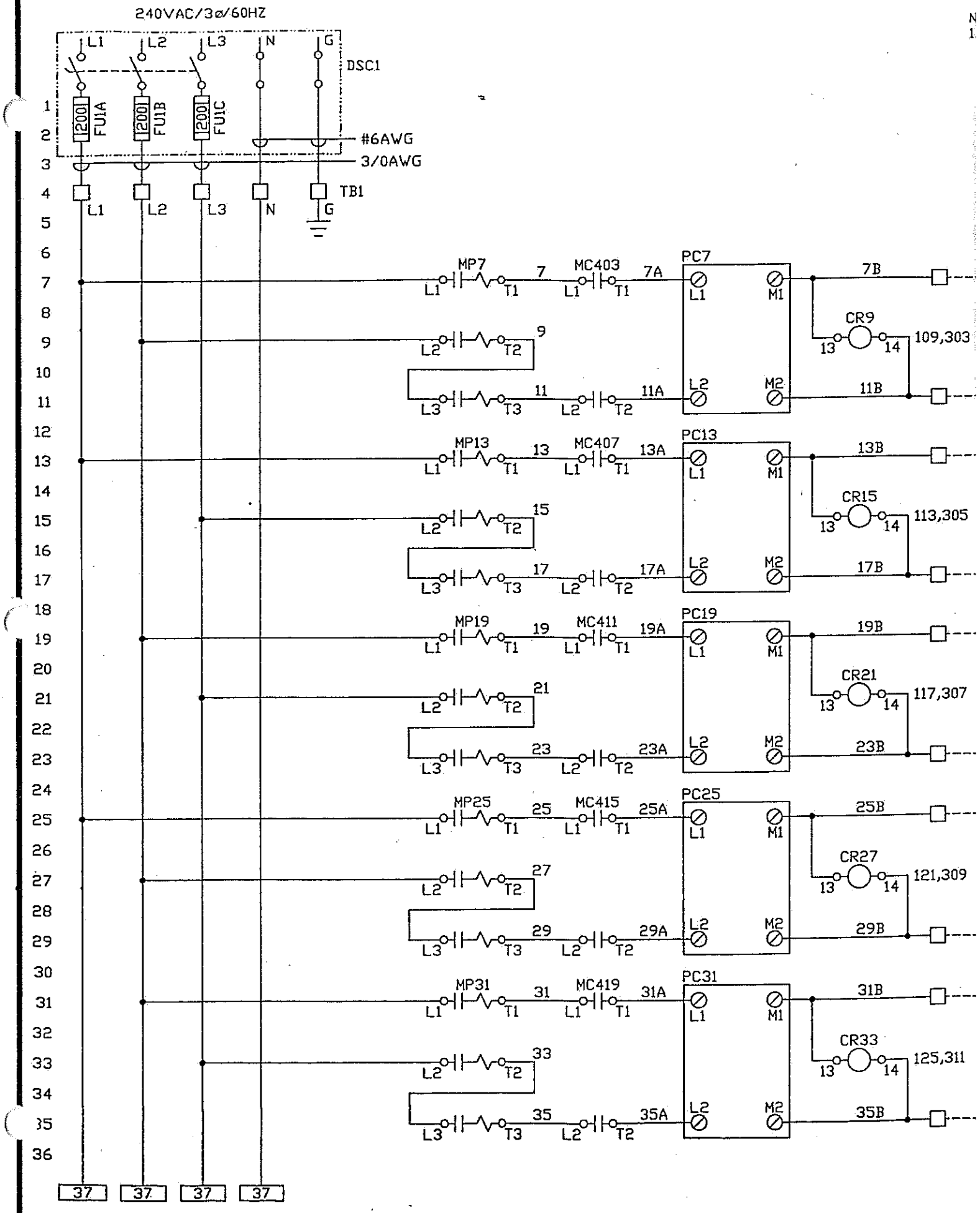
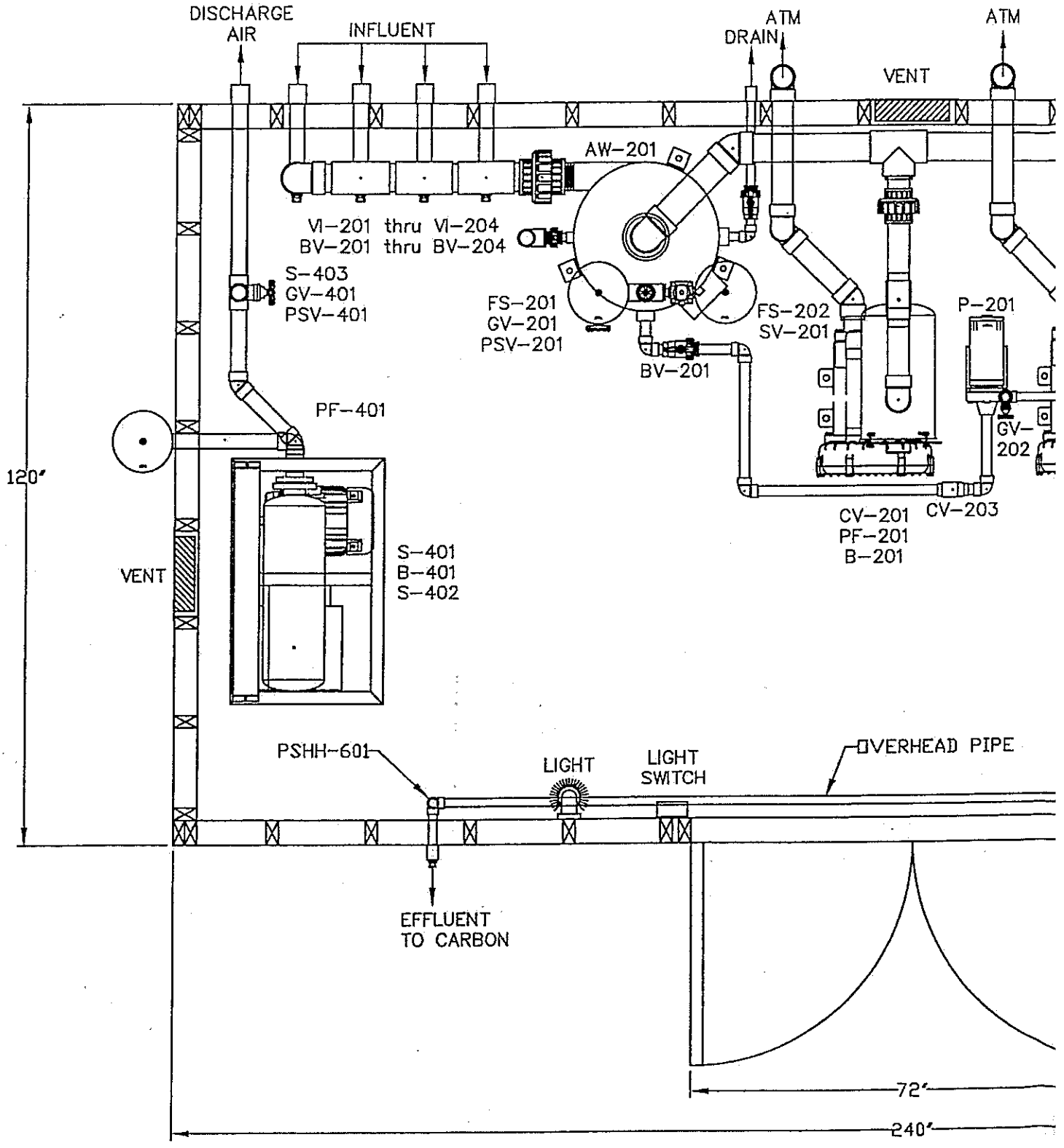

240VAC/3ø/60HZ
L1
L2
L3
N
G
DSC1
200I
FU1A
FU1B
FU1C
#6AWG
3/0AWG
TB1
MP7
MC403
PC7
7
7A
7B
CR9
109,303
9
11
11A
11B
MP13
MC407
PC13
13
13A
13B
CR15
113,305
15
17
17A
17B
MP19
MC411
PC19
19
19A
19B
CR21
117,307
21
23
23A
23B
MP25
MC415
PC25
25
25A
25B
CR27
121,309
27
29
29A
29B
MP31
MC419
PC31
31
31A
31B
CR33
125,311
33
35
35A
35B
37


DISCHARGE AIR
INFLUENT
ATM DRAIN
ATM
VENT
AW-201
VI-201 thru VI-204
BV-201 thru BV-204
S-403
GV-401
PSV-401
FS-201
GV-201
PSV-201
BV-201
FS-202
SV-201
P-201
GV-202
PF-401
120"
VENT
S-401
B-401
S-402
CV-201
PF-201
B-201
CV-203
PSHH-601
LIGHT
LIGHT SWITCH
OVERHEAD PIPE
EFFLUENT TO CARBON
72"
240"

Appendix D

Underground Injection Control Permit #156 Issued by the GA DNR Dated August 29, 2002.

Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive, S.E., East Tower, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-4713

August 29, 2002

Mr. Thomas C. Fry
Environmental Branch
Directorate of Public Works BLDG 1137
HQS 3D In DIV (Mech) and Fort Stewart
1550 Frank Cochran Drive
Fort Stewart, Georgia 31314-4927

RE: Underground Injection Control Permit #156 for injection of treated ground water and ambient air at the U. S. Army Corps of Engineers, Fort Stewarts, Building 430. Fort Stewart, Georgia (EPD-Facility ID # 9089118-1).

Dear Mr. Fry:

Enclosed is Underground Injection Control (UIC) Permit #156 for the U. S. Army Corps of Engineers, Building 430 located in Fort Stewart, Georgia. This UIC permit allows injection of treated ground water through one (1) injection well and ambient air through twelve (12) injection wells to assist with the remediation of soil and ground water contaminated with petroleum hydrocarbons at this site for up to five (5) years. The UIC permit states two (2) standard conditions and seven (7) additional conditions in the attachment.

If you have any questions about the permit, please contact Mr. Bijan Rahbar, UIC Coordinators, at (404) 656-3214.

Sincerely,

Harold F. Reheis
Director

Enclosure

cc: UIC Permit #156 File
Patty Stoll, Science Applications International Corporation
William E. Logan, EPD-USTMP

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

INJECTION WELL OPERATING PERMIT

PERMIT NUMBER: #156 **DATE ISSUED: August 29, 2002**

FACILITY DATA: **INJECTION WELL TYPE: CLASS V (type 5X26)**

FACILITY: U.S. Army
Underground Storage Tanks 257-261
Building 430
Fort Stewart, Georgia
Liberty County

OPERATOR: U.S. Army Corps of Engineers*
1550 Frank Cochran Drive
Fort Stewart, GA 31314-4927

LOCATION: Lat: 31° 52' 17" N
Long: 81° 36' 35" W

EPD-Facility ID # 9089118-1

In accordance with the provisions of the Georgia Rules for Underground Injection Control, Chapter 391-3-6-.13, as amended 2001, this permit is issued for the operation of the herein described injection system. Unless appealed, this permit is effective thirty (30) days after its issuance and is conditioned upon the following:

1) The Permittee's continued compliance with the Georgia Rules for Underground Injection Control, Chapter 391-3-6-.13, the Georgia Rules for Water Quality Control (Revised) and the Georgia Rules for Safe Drinking Water (Revised); and

2) The Permittee's continued compliance with the Permittee's approved injection operation plan, that is part of the approved Corrective Action Plan for this site, along with provisions of officially approved plan amendments, if any.

Additional conditions 1 through 7 are attached hereto.

This revised permit is issued in accordance with the application and supplemental information received on August 13, 2002 and August 26, 2002. The injection operation plan was approved on August 29, 2002, and is based on the statements and supporting data entered herein or attached thereto, all of which are filed with the Environmental Protection Division of the Georgia Department of Natural Resources and hereby made a part of this permit.

This revised permit is subject to revocation for noncompliance with aforementioned conditions.
This revised permit expires on August 29, 2007, unless previously terminated.

Harold F. Reheis, Director, Environmental Protection Division
Georgia Department of Natural Resources

*Science Applications International Corporation, as consultant to U.S. Army, may be contacted regarding technical questions at (865) 481-4600

INJECTION WELL OPERATING PERMIT
ADDITIONAL CONDITIONS

1. Permit Conditions.

   a. This revised permit is not transferable until any new operator shall agree in writing to all permit conditions. Any new operator also shall provide the Environmental Protection Division (Division) with appropriate documentation that they have adequate financial assurances to plug all existing Class V wells.

   b. If U.S. Army Corps of Engineers wishes to continue an activity regulated by this permit after the expiration of the permit, the Operator must apply for and obtain a new permit.

   c. The Operator shall report any instances of noncompliance with permit conditions to the Division in writing within five (5) working days of such noncompliance, and shall take all reasonable steps to minimize the impact on the environment resulting from noncompliance with this permit and the Georgia Rules for Underground Injection Control.

   d. The Operator shall notify the Division of any proposed changes to the performance of the treated ground water injection system in writing at least thirty (30) days prior to the change.

   e. All reports submitted to the Division shall be signed and stamped by a Georgia Registered Professional Engineer or Professional Geologist.

   f. All analyses shall be performed by a laboratory approved or accredited by EPD in accordance with the Georgia Rules for Commercial Laboratory Accreditation, Chapter 391-3-26.

2. System Parameters.

   a. This permit is issued to the Operator for the purpose of operating a treated ground water and ambient air injection system at the above referenced site to aid in remediation of soil and ground water contaminated with petroleum hydrocarbons.

   b. Number of Class V injection wells: one (1) for treated groundwater and twelve (12) for ambient air.

   c. Injected fluid: treated ground water meeting drinking water quality standards defined by Georgia Rules for Safe Drinking Water and ambient air.

   d. Maximum injection rate per well: 30 gallons of liquid/ minute (gpm)/well.
   Maximum total system injection rate: 30 gpm.
   Maximum injection rate per well: 3.5 cubic feet of air/min. (cfm)/well .
   Maximum total system injection rate: 42 cfm.

   e. Maximum injection volume per well: 43,200 gallons of liquid/day (g/day)/well.
   Maximum total system injection volume: 43,200 g/day.
   Maximum injection volume per well: 5,040 cubic feet of fluid/day/well.
   Maximum total system injection volume: 60,480 cf/day.

f. Maximum daily average injection pressure (at well head): 14.7 PSI.

3. Monitoring and Reporting Requirements.

a. The Operator shall report to the Underground Injection Control Program of the Division the number and exact location of all Class V injection wells it installs or plugs on a quarterly basis. The reports are to be submitted to the UIC Program in accordance with the reporting schedule stipulated by the Underground Storage Tank Management Program.

b. The Operator shall submit to the Division for its approval, a detailed schematic diagram and location map on any Class V injection well that is different in construction from the specifications contained in the UIC permit application, no later than 45 days prior to installation of the injection well. The Operator cannot install such a well until it receives approval from the Division.

c. The Operator shall submit to the UIC Program one (1) copy of any report regarding this site that the Operator is required to submit to the Underground Storage Tank Management Program.

d. The Operator shall submit to the UIC Program an annual report that will contain the following information.

1. Status of the injection system operation;

2. Results of any ground-water sampling and analyses;

3. Results of any soil sampling and analyses;

4. An evaluation of the plume movement through the ground water, if any;

5. Comparisons of analyses to determine any changes in pollutant concentrations.

The annual reports will be provided to the UIC Program in accordance with the schedule stipulated by the Underground Storage Tank Management Program.

4. Emergency Situations.

a. The Operator is to immediately notify the Division of any emergency situation that affects the injection system and describe the remedial activity that the Operator is utilizing to correct the situation.

b. The Operator is to immediately notify the Division when the emergency situation ceases to exist.

5. The Operator shall grant the Division permission to enter the facility property to conduct inspections of the injection system.

6. The Operator shall maintain a copy of this permit at the facility site.

7. The Operator shall, upon termination of the injection of treated ground water through one (1) and ambient air through twelve (12) Class V injection wells at this site, properly plug and abandon all Class V wells constructed on this site in accordance with EPD's *Manual for Groundwater Monitoring* (September 1991) and notify the division within thirty (30) days of such termination and abandonment.