



ANNUAL MONITORING REPORT
Task Order No. 067A
Soil and Groundwater Remediation
Building 45 – USTs S-941-1 and 941-2
Marine Corps Base
Camp Lejeune, North Carolina
Volume I

Prepared for
The Atlantic Division, Naval Facilities Engineering Command

December 2002

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CERTIFICATION

Annual Monitoring Report

Task Order 067a

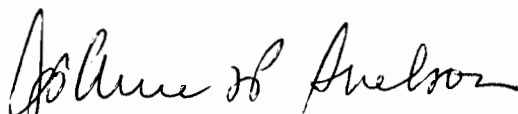
Soil and Groundwater Remediation
Building 45 – USTs S-941-1 and 941-2
Marine Corps Base
Camp Lejeune, North Carolina

The material and data in this Annual Monitoring Report was prepared under the direction of the undersigned.

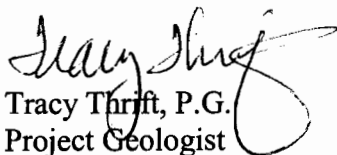
J.A. Jones Environmental Services Company is submitting this Annual Monitoring Report to the Navy as required under contract N62470-93-D-3033 for work performed at Building 45, Marine Corps Base, Camp Lejeune, North Carolina. The report was prepared in conformance with J.A. Jones Environmental Services Company's quality assurance/quality control procedures to ensure that the report meets industry standards in terms of the methods used and the information presented. If you have any questions or comments concerning the report, please contact one of the individuals listed below.

Respectfully submitted,

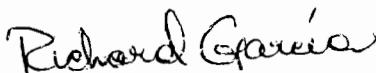
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ACRONYM LIST

µg/l	micrograms per liter
AFVR	aggressive fluid/vapor recovery
AS	Air Sparge Well
BQL	below quantitation limits
CAP	corrective action plan
cfm	cubic feet per minute
Dwyer	Dwyer Instruments, Inc.
ft bls	feet below land surface
HDPE	high density polyethylene
Hg	mercury
J.A. Jones	J.A. Jones Environmental Services Company
Law	Law Engineering and Environmental Services, Inc.
LNAPL	light non-aqueous phase liquid
mg/kg	milligrams per kilograms
mg/m ³	milligrams per cubic meter
MW	monitoring well
NAVFACENGCOM	Navy Atlantic Division, Naval Facilities Engineering Command
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
PAHs	polynuclear aromatic hydrocarbons
Paradigm	Paradigm Analytical Laboratories, Inc.
PCBs	polychlorinated biphenyls
ppm	parts per million
Prism	Prism Laboratories, Inc.
psi	pounds per square inch
PVC	polyvinyl chloride
Shaw	Shaw Environmental and Infrastructure, Inc.
SVE	soil vapor extraction
TCLP	toxicity characteristic leachate procedure
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

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EXECUTIVE SUMMARY

From April 1998 through July 2002, J.A. Jones Environmental Services Company (J.A. Jones) implemented the selected approach as outlined in the February 21, 1996 Corrective Action Plans (CAP) prepared by Law Engineering and Environmental Services, Inc. (Law). The selected remedial approach included the installation and operation of a remediation treatment system consisting of an air sparge and soil vapor extraction (SVE) to volatilize dissolved hydrocarbons present in the groundwater and to collect vapors generated during air sparging. It also included groundwater monitoring to maintain optimum treatment system performance and to track petroleum-impacted groundwater migration in order to verify remediation progress.

J.A. Jones completed installation and began operation of the Building 45 Underground Storage Tanks (USTs) S-941-1 and S-941-2 treatment system on April 16, 1998. Groundwater samples were collected monthly from selected on-site monitoring wells during the first quarter of system operation and quarterly thereafter.

There are two dissolved phase groundwater contamination plumes located at the Building 45 site. One plume is located at the vicinity of the former USTs S-941-1 and S-941-2 and the other is located in the vicinity of monitoring well MW-15. A dissolved phase contaminant plume encompasses the area around the location of the former USTs S-941-1 and S-941-2 and extends to encompass PW-01, MW-2, and MW-03. The separate plume, which was located around MW-15, appears to have been remediated.

From 1998 through 2002, the interpreted areal extent of dissolved volatile organic compound (VOCs) and polynuclear aromatic hydrocarbons (PAHs) in the vicinity of the former USTs S-941-1 and S-941-2 has remained generally consistent, with the plume reducing slightly over time. Dissolved phase contaminant concentrations have decreased overall.

Concentrations of VOCs and PAHs in monitoring wells PW-01, MW-02, and MW-03 have decreased significantly after a total of 30 aggressive fluid vapor recovery (AFVR) events were performed from April 9, 1999 to December 13, 2001. A total of 426 gallons of light non-aqueous phase liquid (LNAPL) was recovered during this period.

the Bldg 45 area is within a CERCLA site - Installation Restoration Site - Operable Unit 1
part of remedial actions for site
~~In June 2002, Shaw Environmental and Infrastructure, Inc. (Shaw) excavated soils~~
~~surrounding the areas of PW-01, MW-02, MW-03, and MW-10 as part of other~~
~~environmental remediation activities at the Building 45 site.~~ *in June 2002*
As a result of this excavation, J.A. Jones disconnected and removed the air sparge/soil vapor extraction wells AS-5 through AS-8 and SVE-5 through SVE-8. *This area represented the most impacted area from the petroleum contamination, and excavation activities were conducted in this area in an effort to remove the source plume, ~~as a result of other~~ ~~specific contaminants~~.*
Leave this sentence as one sentence.

** Shaw*
~~This area was excavated~~ *this area due to the presence of PCBs + pesticides; however,*
Contract Number N62740-93-D-3033 vii Task Order No. 067a/Bldg 45

it also...

J.A. Jones recommends that wells PW-1, MW-2, and MW-3 be replaced and sampled to determine the effectiveness of the site excavation activities and to evaluate the occurrence of LNAPL. J.A. Jones also recommends discontinuing treatment system operation and limiting the number of sampled monitoring wells to PW-1, NW-2, MW-3, MW-09, MW-10, and MW-15 as described in **Section 1.5 Sampling and Analyses Requirements** until dissolved petroleum related constituent concentrations consistently meet the site rehabilitation concentrations established by the North Carolina Administrative Code (NCAC) Title 15A Subchapter 2L (15A NCAC 2L) groundwater quality standards. A review of the excavation completion report for the work performed by Shaw should be conducted to assess if the air sparge and SVE treatment system previously located at the excavation area (AS-5 through AS-8 and SVE 5 through SVE 8) should be reconnected and be brought back to operation. As part of the evaluation to recommend if the air sparge and SVE treatment system should be reconnected, additional confirmatory soil samples may be required to confirm if the removal of contaminated petroleum soil was fully performed.

Note: preliminary data from Shaw activities suggest additional petroleum constituents were detected at locations not previously under the influence of the system. Further evaluation ^{of excavation data} ~~at~~ is recommended. A ^{final} completion report is expected mid- to late- March

}
(ask Rick Raines)

SECTION 1.0

INTRODUCTION

As part of the installation, operation, and maintenance of the soil and groundwater treatment system at Building 45 located on Camp Lejeune, North Carolina, J.A. Jones has been retained by the Department of the Navy Atlantic Division, Naval Facilities Engineering Command (NAVFACENGCOM), to prepare this Annual Monitoring Report. The purpose of this report is to present the findings and recommendations associated with the operation of the soil and groundwater treatment system and groundwater monitoring activities, which took place from November 1998 to July 2002.

This Annual Monitoring Report is organized into four sections of text including tables that present historical analytical data from sampling events and groundwater elevations at the site. Figures provided in this report present groundwater elevation contour maps detailing groundwater flow patterns and dissolved contaminant plume isopleth maps, which present the distribution of the volatile aromatic and polynuclear aromatic hydrocarbons detected above the North Carolina Department of Environment and Natural Resources (NCDENR) groundwater quality standards. Also included are three appendices that present the results of the AFVR events, the laboratory data from the groundwater monitoring well, and the soil vapor extraction system sampling events.

Section 1.0 Introduction includes the site history, an operational overview of the soil and groundwater treatment system, the operations and maintenance objectives, the product recovery efforts, and the sampling and analyses requirements.

Section 2.0 Operation and Maintenance provides a summary of the operation of the soil and groundwater treatment system including any problems encountered and troubleshooting required during system operation.

Section 3.0 Analytical Summary presents a summary of the analytical results from the air effluent samples collected from the soil vapor extraction system and the groundwater samples collected from the on-site monitoring wells.

Section 4.0 Conclusions and Recommendations addresses the conclusions and recommendations from the annual operation of the soil and groundwater treatment system and the quarterly groundwater monitoring well sampling events.

1.1 SITE HISTORY

Building 45 ^{was} is an equipment and maintenance shop located on the Marine Corps Base, Camp Lejeune, Onslow County, North Carolina (N361,330; E2,495,450). USTs 941-1 and 941-2 were part of this facility.

Figure 1-1 provides a plan of the Building 45 site and shows the air sparging and soil vapor extraction wells designed to remediate the petroleum hydrocarbon contamination at the site. The site consists of former buildings, Building 45 and 780, and the former fueling area.

According to information provided in the Leaking Underground Storage Tank Site Assessment Report, dated May 12, 1994, prepared by Law, the UST system at the site originally consisted of two USTs installed in 1941: Tank S-941-1 was a 6,000 gallon diesel steel tank and tank S-941-2 was a 550 gallon gasoline steel tank. According to this report, in June 1990, UST S-941-2 failed a leak detection test with a leak rate of 0.10250 gallons per hour. A subsequent test of the tank indicated that the leak was from a product pipe associated with the tank. In August 1991, ATEC conducted an investigation of the site, which indicated that soil and groundwater at the subject site was contaminated by petroleum hydrocarbon. In October 1992, both UST S-941-1 and S-941-2 were excavated and removed from the site by Jones and Frank, Inc. A total of 105 cubic yards of contaminated soils was transported from the site for disposal. Soil samples collected during the removal of UST S-941-2 indicated total petroleum hydrocarbon (TPH) concentrations ranging from 52.3 to 525 parts per million (ppm). During the excavation of UST S-941-1, free product was observed in the pit. Due to the presence of free product, soil samples were not collected from the UST S-941-1 tank pit.

As part of a 1994 site assessment, Law performed soil borings, hydropunches and monitoring well installation, soil and groundwater sampling and analysis, an 8-hour aquifer-pumping test, five rising head permeability tests, a preliminary exposure assessment, and a preliminary evaluation of remedial alternatives. The results of this investigation were presented by Law under the Leaking Underground Storage Tank Site Assessment Report dated May 12, 1994. In June 1994, R.E. Wright Associates, Inc. conducted further groundwater sampling and analysis to define the lateral extent of contamination at the site. Based on the information collected and presented from these investigations, Law completed a CAP, dated February 21, 1996.

A Work Plan for the implementation of the CAP was completed by J.A. Jones on May 30, 1997. J.A. Jones completed a Work Plan Addendum in October 1997. The Work Plan Addendum presented the site-specific project activities associated with the construction of a soil and groundwater treatment system, including eight vertical air sparge wells and eight vertical SVE wells. The objective of the system was to reduce concentrations of adsorbed petroleum hydrocarbons contained in vadose zone soil and reduce dissolved-phase petroleum hydrocarbons in groundwater beneath the site.

The final work plan was approved by the NCDENR on November 3, 1997. The construction of the soil and groundwater treatment system began in January 1998 and was completed in April 1998. The groundwater monitoring wells have been sampled quarterly since the startup of the remedial system on April 16, 1998. **Section 3.0** provides more information on the groundwater monitoring well and treatment system sampling results.

On November 18, 1999, soil was characterized for the purpose of excavating in the plume area around the location of the former USTs S-941-1 and S-941-2 and the area encompassing PW-01, MW-2, and MW-03. Three composite soil samples were collected from the proposed soil excavation area and analyzed for diesel-range and gasoline-range TPH, using United States Environmental Protection Agency (USEPA) Methods 3550 and 5030, respectively. Three grab samples were collected from the proposed soil excavation area and analyzed by Prism Laboratories, Inc. (Prism) for polychlorinated biphenyls (PCBs), using USEPA Method 8080 and one grab sample was collected from the proposed excavation area and analyzed for ignitability, reactivity, corrosivity and toxicity characteristic leachate procedure (TCLP) using USEPA Method 1311. Diesel-range and gasoline-range TPH were not detected in the three composite samples above laboratory quantitation limits. None of the TCLP constituents were detected above laboratory quantitation limits and the ignitability, reactivity and corrosivity tests results verified the fill material is not considered a hazardous waste. The results from the PCB sample indicated that the PCB Arochlor-1260 was detected in two of the three grab samples at concentrations of 1.8 milligrams per kilogram (mg/kg) and 0.16 mg/kg. In addition, the following pesticides were also detected in the three soil samples at the following concentrations:

4,4-DDD - 9 mg/kg, 79 mg/kg, and 15 mg/kg
4,4-DDE - 37 mg/kg, 200 mg/kg, and 29 mg/kg
4,4-DDT - 12 mg/kg, 19 mg/kg, and 13 mg/kg
Dieldrin - 18 mg/kg, 340 mg/kg, and 36 mg/kg

Based on the results outlined above, J.A. Jones did not proceed with the proposed soil removal at the Building 45 site. In June 2002, ^{however,} Shaw initiated and completed ~~the~~ ^{which} PCB and pesticide excavation activities at the area ^{ed} encompassing PW-1, MW-2, MW-3, and MW-10. Each well was abandoned prior to the start of the work. AS-5 through AS-8 and SVE-5 through SVE-8 were ^{also} disconnected from the Building 45 treatment system in order to accommodate the excavation activities. The area excavated by Shaw was located in the area with the highest groundwater petroleum concentrations at the site, and therefore the excavation should have contributed to the removal of the petroleum source plume at the site.

This Annual Monitoring Report documents the operation and performance of the soil and groundwater treatment system throughout its operation from April 1998 to July 2002.

1.2 SOIL AND GROUNDWATER TREATMENT SYSTEM

The soil and groundwater treatment system for Building 45 was designed to reduce the concentrations of adsorbed petroleum hydrocarbons in vadose zone soils at the site and to reduce dissolved-phase petroleum hydrocarbons in the groundwater at the site. In the February 1996 CAP, prepared by Law, remediation goals for soil and groundwater were identified. The target cleanup level for TPH gasoline range in soil was obtained from a Site Sensitivity Assessment and was identified as 40 mg/kg. The groundwater standards identified below are from 15A NCAC 2L *Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina*. Also identified below are the highest concentrations detected during the Law Site Assessment (May 1994) and the CAP (February 1996).

North Carolina Groundwater Quality Standards and Site Target Cleanup Concentrations

Groundwater <u>Constituent</u>	Maximum Detected <u>Concentration</u>	July 02 Maximum Detected <u>Concentration</u>	% Decrease In Site <u>Contamination</u>	Site Rehabilitation <u>Concentration</u>
Benzene	3,800 µg/l	55	98.55%	1.0 µg/l
Toluene	1,700 µg/l	2	99.88%	1,000 µg/l
Ethylbenzene	800 µg/l	5	99.38%	29 µg/l
Total Xylenes	3,600 µg/l	BQL	100%	530 µg/l
Naphthalene	24 µg/l	BQL	100%	21 µg/l
Benzo(a)anthracene	7.1 µg/l	BQL	100%	0.0478 µg/l

Groundwater and soils at the site are treated by an air sparge and SVE system. Eight vertical air sparge wells were installed to a depth of approximately 45 feet below land surface (ft bls) and are injected with compressed air. This compressed air enhances volatilization of the dissolved-phase VOCs in groundwater and adsorbed phase VOCs in saturated soils. Eight vertical SVE wells were installed to a depth of 6 ft bls. The SVE system works by extracting soil vapors, which also enhances the volatilization of adsorbed VOCs in the unsaturated zone. The extracted soil gas/vapors from the SVE system are discharged to the atmosphere.

The eight air sparge wells are 2 inch diameter and have a screen interval from 39.5 to 44.5 ft bls. The well screens consist of a 5 foot section of 2 inch diameter, 0.02 inch slot width, Circumslot™ polyvinyl chloride (PVC) well screen flush threaded to 38 feet of 2 inch diameter schedule 80 PVC well casing. The sand pack in each well consists of washed, grade 6/20 silica sand that is appropriate for the formation and slot size screen.

The eight SVE wells have a diameter of 4 inches and are installed to a depth of 6 ft bls, with a screen interval from 2.5 to 5.5 ft bls. The well screens consist of a 3 foot section of 4 inch diameter, 0.02 inch slot width, Circumslot™ PVC well screen flush threaded to 1 foot of 4 inch diameter schedule 80 PVC well casing. The sand pack in each well consists of washed, grade 6/20 silica sand that is appropriate for the formation and slot size screen.

Compressed air is supplied to the eight air sparge wells through a 1.25 inch diameter Air-Pro high density polyethylene (HDPE) compressed air header pipe installed in the trench approximately 2 ft bls. The air sparge system consists of a rotary vane air compressor, 80 gallon compressed air receiver, in-line filter, regulator, and flow meter. The soil vapor recovery system consists of two soil vapor extraction headers installed in a trench approximately 2 ft bls. The recovery system is configured to allow soil vapors to pass through a moisture separator, a particulate filter prior to the positive displacement vapor extraction blower, and discharged to the atmosphere. A 500 gallon vertical polyethylene storage tank is used to store condensate from the air receiver and to collect fluid from the moisture separator via pump.

1.3 OPERATIONS AND MAINTENANCE REQUIREMENTS

Scheduled operation and maintenance inspections were performed weekly to maintain the performance and operation of the treatment equipment, to inspect moisture accumulation level in the storage tank, and to collect and record instrumentation readings. Instrumentation readings include air sparge and soil vapor extraction pressure, vacuum, and flow-rate at the wells and within the treatment building. The frequency of the scheduled operations and maintenance inspections are presented as follows.

<u>Event Description</u>	<u>Frequency</u>
Record Instrumentation Readings	Monthly
Verify Proper Operation of Fail Safe Conditions	Monthly
Service Equipment	As Required by the Manufacturer's Instructions
Measure and Record Groundwater Elevations	Monthly
Collect Groundwater Monitoring Well Samples	Monthly for First Quarter and Quarterly Thereafter
Collect Soil Vapor Extraction Effluent Sample	Monthly for First Quarter and Quarterly Thereafter

Non-scheduled operations and maintenance events were required to troubleshoot equipment and adjust treatment system equipment.

1.4 SUMMARY OF PRODUCT RECOVERY EVENTS

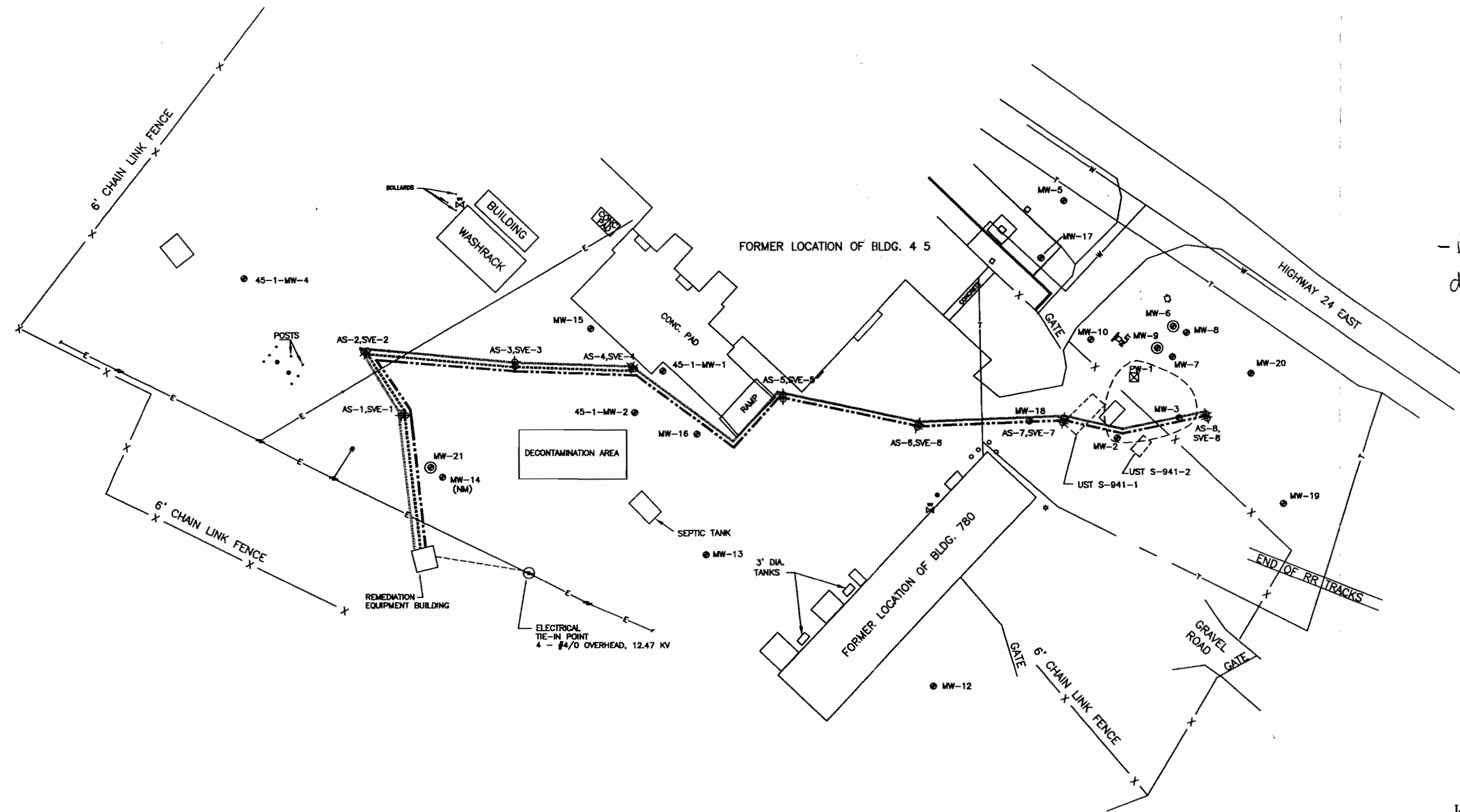
A total of 30 AFVR treatment events were performed at wells with LNAPL, including PW-1, MW-2, and MW-3, from April 9, 1999 through December 13, 2001. A total of 426 gallons of LNAPL has been removed during this period. Typical operation of an AFVR *event* involves operating a vacuum truck at the monitoring wells applying approximately a vacuum of 25 inches of Mercury (Hg) vacuum to the well-head. The more volatile petroleum constituents are vaporized while LNAPL is physically removed as a liquid. **Appendix A** provides a summary of the results from each AFVR event.

1.5 SAMPLING AND ANALYSES REQUIREMENTS

Groundwater monitoring well and soil vapor extraction effluent samples were collected monthly during the first quarter of operation of the treatment system and quarterly thereafter. Each groundwater sample collected from on-site monitoring wells was delivered by overnight carrier to Paradigm Analytical Laboratories, Inc. (Paradigm), and analyzed for volatile aromatic hydrocarbons using USEPA Method 602 and polynuclear aromatic hydrocarbons by USEPA Method 610. Initially, on April 14, 1998, groundwater samples were collected from monitoring wells MW-12, MW-16, and MW-17 in order to establish the contaminant concentrations prior to the April 16, 1998 treatment system start-up date. After treatment system startup, samples were collected from on-site monitoring wells, PW-1, MW-2, MW-3, MW-5, MW-8, MW-9, MW-10, MW-13 through MW-20, MW-01/4, and MW-04/4.

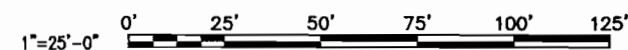
The air quality effluent samples were delivered by overnight carrier to Paradigm and analyzed for volatile aromatic hydrocarbons using USEPA Method 18. These samples were collected during April, May, June, and July 1998 and quarterly thereafter. Samples have been collected from the SVE system's effluent and influent locations to determine if any vapors are being recovered.

In addition, groundwater elevations were measured from each of the monitoring wells in the network on a monthly basis. During each groundwater elevation survey, the monitoring wells were gauged for LNAPL occurrence.



- indicate what
dashed isopleth
symbolizes.

SITE MAP



- LEGEND:**
- TYPE II MONITORING WELL
 - ⊙ TYPE III MONITORING WELL
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE WELL CLUSTER
 - ⊖ UTILITY POLE
 - ⊗ WATER VALVE
 - MANHOLE
 - ⊗ FIRE HYDRANT
 - ⊕ LIGHT POLE
 - E— ELECTRICAL UTILITY LINE
 - W— WATER UTILITY LINE
 - T— TELEPHONE UTILITY LINE
 - SOIL VAPOR EXTRACTION LINE NO. 1
 - SOIL VAPOR EXTRACTION LINE NO. 2
 - A— AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND		ATLANTIC DIVISION		NORFOLK, VIRGINIA	
NAVAL STATION		ANNUAL MONITORING REPORT		BUILDING 45, UST S-941-1 AND 2		MARINE CORPS BASE	
CAMP LEJUNE, NORTH CAROLINA		GROUNDWATER ELEVATION CONTOUR MAP - OCTOBER 14, 1986		CODE ID. NO. 80081		SIZE D	
SHEET 1 OF 18		1-1		REVISED		DATE	
SYMBOL		DESCRIPTION		REVISIONS		APPROVED BY	



D
C
B
A

SECTION 2.0

OPERATION AND MAINTENANCE

2.1 OPERATION HISTORY

Operation and maintenance of the soil and groundwater treatment system began on the system start-up date of April 16, 1998. Since April 16, 1998, the soil and groundwater treatment system has been inspected a minimum of once per week. Frequency of the operation and maintenance inspections increased during system repair and troubleshooting activities. In addition, scheduled inspections were conducted during the groundwater monitoring well and soil vapor extraction effluent sampling events.

Based on the results of a vapor extraction and air sparging pilot test performed at the site on March 30, 1995, Law estimated, in their CAP, a vacuum flow-rate of 567 cubic feet per minute (cfm) with a vacuum of up to 5.75 inches of Hg, and a sparge flow rate of approximately 24.5 cfm with a delivery pressure of up to 15 pounds per square inch (psi). At these designed vacuum and injection flow-rates, Law estimated a 42 feet radius of influence for each SVE well and a 33.6 feet radius of influence for each sparge well.

Discharge flowrates were measured on a monthly basis using Dwyer Instruments, Inc. (Dwyer) Capsuhelic differential pressure gauges located in each soil vapor extraction well.

During treatment system operation by J.A. Jones from April 1998 through July 2002, air sparge well injection and vacuum flowrates were adjusted during routine site inspections to be less than the design parameters recommended by Law (60% of the design parameters on average) in order to mitigate the effects of the sparging activity on groundwater mounding.

Groundwater elevations were measured monthly from the groundwater monitoring wells from April 1998 through July 2002. The groundwater elevation data is presented in **Table 2-1**. The groundwater contour map detailing the static on-site groundwater elevations on April 16, 1998 (the start-up date of the soil and groundwater treatment system) is provided in **Figure 2-1**. The groundwater elevation contour maps, presented as **Figures 2-2** through **2-5**, from the quarterly sampling events depict groundwater elevations following a one-week period of treatment system shut down in preparation for the quarterly groundwater sampling event.

2.2 SYSTEM REPAIR AND TROUBLESHOOTING

Since the start-up of the soil and groundwater treatment system on April 16, 1998, there have been no major repairs associated with the operation of the treatment system. The system was non-operational only during sampling events, AFVR events, power outages, hurricanes, demolition activities around Building 45, or high/high level water alarms from the condensate storage tank. As stated previously, AS-5 through AS-8 and SVE-5 through SVE-8 were disconnected from the treatment system in June 2002 in order to accommodate excavation operations performed by Shaw in this area.

2.3 SYSTEM-DERIVED WASTE

Since October 20, 1997, approximately 95,186 gallons of groundwater accumulated during monitoring well development, soil vapor extraction system operation, and AFVR events were transported to either the RR-72 Former Rifle Range groundwater recovery and treatment system or Shaw's North Plant Facility for treatment. In addition, on October 27, 1997, a total of 25 tons of soil generated from soil cuttings accumulated during vertical drilling were transported and disposed of at the Carlisle Farms disposal facility. This soil and approximately 871 gallons of groundwater from the development during the vertical drilling was generated prior to the start-up of the treatment system.

The transportation and disposal log, presented as **Table 2-2**, provides the complete history of the waste material accumulated during construction activities and derived during treatment system operation including the transporter, waste treatment destination, date of shipment, and the volume and/or weight.

Table 2-1
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	7/17/2002			5/15/2002			4/17/2002		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			Abandoned			7.14			7.93	
45-1-MW-1	11.43		11.32	0.11		11.16	0.27		11.91	-0.48
MW-2	10.74		Abandoned			7.51	3.23		7.27	3.47
MW-3	11.02		Abandoned			7.80	3.22		7.54	3.48
MW-4	14.83		11.16	3.67		10.56	4.27		9.58	5.25
MW-5	9.73		8.84	0.89		9.55	0.18		9.45	0.28
MW-7	10.00		5.32	4.68		6.58	3.42		6.40	3.60
MW-8	10.73		6.61	4.12		6.90	3.83		6.76	3.97
MW-10	11.49		Abandoned			9.15	2.34		9.03	2.46
MW-13	8.32		7.71	0.61		7.51	0.81		7.35	0.97
MW-15	8.26		8.34	-0.08		9.27	-1.01		9.87	-1.61
MW-16	8.77		8.89	-0.13		8.58	0.19		9.01	-0.24
MW-17	8.95		5.48	3.47		7.89	1.06		7.70	1.25
MW-18	10.80		7.61	3.19		8.70	2.10		8.70	2.10
MW-19	11.85		7.36	4.49		7.54	4.31		6.99	4.86
MW-20	10.64		5.95	4.69		6.86	3.78		6.47	4.17
MW-22			Not Measured			15.72	-15.72		Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	3/21/2002			2/19/2002			1/16/2002		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			6.00			7.61			9.23	
45-1-MW-1	11.43		11.29	0.14		12.51	-1.08		14.20	-2.77
MW-2	10.74		6.44	4.30		8.06	2.68		9.80	0.94
MW-3	11.02		6.71	4.31		8.31	2.71		10.31	0.71
MW-4	14.83		9.37	5.46		11.42	3.41		11.20	3.63
MW-5	9.73		8.78	0.95		9.85	-0.12		11.10	-1.37
MW-7	10.00		5.53	4.47		7.10	2.90		8.75	1.25
MW-8	10.73		6.07	4.66		7.32	3.41		8.65	2.08
MW-10	11.49		7.85	3.64		9.63	1.86		11.45	0.04
MW-13	8.32		6.92	1.40		5.63	2.69		9.96	-1.65
MW-15	8.26		8.60	-0.34		10.45	-2.19		12.38	-4.12
MW-16	8.77		8.45	0.32		6.74	2.03		11.42	-2.66
MW-17	8.95		6.78	2.17		8.41	0.54		9.84	-0.90
MW-18	10.80		7.62	3.18		9.49	1.31		11.21	-0.42
MW-19	11.85		6.54	5.31		8.22	3.63		9.49	2.36
MW-20	10.64		5.83	4.81		7.25	3.39		8.82	1.82
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	12/13/01 ²			12/13/01 ³			12/3/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.55			9.38			9.30	
45-1-MW-1	11.43		Not Measured			Not Measured			13.38	-1.95
MW-2	10.74		10.55	0.19		9.88	0.86		9.84	0.90
MW-3	11.02		15.54	-4.52		10.01	1.01		10.07	0.95
MW-4	14.83		Not Measured			Not Measured			12.42	2.41
MW-5	9.73		Not Measured			Not Measured			11.28	-1.55
MW-7	10.00		9.40	0.60		8.74	1.26		8.70	1.30
MW-8	10.73		Not Measured			Not Measured			8.71	2.02
MW-10	11.49		11.76	-0.27		11.37	0.12		11.29	0.20
MW-13	8.32		Not Measured			Not Measured			9.32	-1.01
MW-15	8.26		Not Measured			Not Measured			11.68	-3.42
MW-16	8.77		Not Measured			Not Measured			10.53	-1.77
MW-17	8.95		9.94	-0.99		9.90	-0.96		9.82	-0.88
MW-18	10.80		11.06	-0.27		10.67	0.13		10.65	0.15
MW-19	11.85		9.73	2.12		9.64	2.21		9.54	2.31
MW-20	10.64		9.50	1.14		8.98	1.66		8.94	1.70
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	11/27/01 ²			11/27/01 ¹			11/5/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.34			9.21			8.99	
45-1-MW-1	11.43		12.96	-1.53		13.04	-1.61		13.30	-1.87
MW-2	10.74		10.50	0.24	Trace	9.58	1.16	Trace	9.40	1.34
MW-3	11.02		14.31	-3.29		9.93	1.09		9.87	1.15
MW-4	14.83		12.37	2.46		12.37	2.46		12.12	2.71
MW-5	9.73		11.15	-1.42		11.15	-1.42		10.96	-1.23
MW-7	10.00		9.30	0.70		8.55	1.45		8.33	1.67
MW-8	10.73		8.60	2.13		8.60	2.13		8.42	2.31
MW-10	11.49		11.56	-0.07		11.15	0.34		11.01	0.48
MW-13	8.32		9.20	-0.89		9.23	-0.92		8.94	-0.63
MW-15	8.26		11.25	-2.99		11.32	-3.06		11.25	-2.99
MW-16	8.77		10.23	-1.47		10.45	-1.69		10.45	-1.69
MW-17	8.95		9.70	-0.75		9.72	-0.78		9.34	-0.40
MW-18	10.80		10.69	0.11		10.53	0.27		10.45	0.35
MW-19	11.85		9.54	2.31		9.50	2.35		9.15	2.70
MW-20	10.64		9.35	1.29		8.81	1.83		8.56	2.08
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	10/30/01 ¹			10/30/01 ¹			10/16/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.73			8.59			8.68	
45-1-MW-1	11.43		Not Measured			Not Measured			12.84	
MW-2	10.74	8.25	10.01	0.73	8.90	9.02	1.72	8.88	8.44	2.30
MW-3	11.02		16.65	-5.91		9.40	1.62		9.56	1.46
MW-4	14.83		12.01	2.82		11.98	2.85		11.71	3.12
MW-5	9.73		10.68	-0.95		10.67	-0.94		8.43	1.30
MW-7	10.00		9.16	0.84		7.98	2.02		8.01	1.99
MW-8	10.73		8.13	2.60		8.11	2.62		7.97	2.76
MW-10	11.49		11.24	0.25		10.47	1.02		10.38	1.11
MW-13	8.32		Not Measured			Not Measured			8.49	-0.18
MW-15	8.26		Not Measured			Not Measured			10.73	-2.47
MW-16	8.77		Not Measured			Not Measured			9.30	-0.54
MW-17	8.95		9.10	-0.15		9.07	-0.13		10.76	-1.82
MW-18	10.80		10.58	0.22		9.91	0.89		9.35	1.45
MW-19	11.85		9.05	2.80		8.96	2.89		8.69	3.16
MW-20	10.64		9.16	1.48		8.25	2.39		8.12	2.52
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	10/03/01 ¹			10/03/01 ¹			9/10/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.11			8.04			6.01	
45-1-MW-1	11.43		Not Measured			Not Measured			11.59	
MW-2	10.74	8.25	10.25	0.49	8.25	8.33	2.41	7.02	7.08	3.66
MW-3	11.02		15.82	-4.80		8.80	2.22		7.32	3.70
MW-4	14.83		11.44	3.39		11.44	3.39		10.96	3.87
MW-5	9.73		9.95	-0.22		9.90	-0.17		9.10	0.63
MW-7	10.00		8.78	1.22		7.28	2.72		5.46	4.54
MW-8	10.73		7.47	3.26		7.45	3.28		6.07	4.66
MW-10	11.49		10.50	0.99		9.65	1.84		5.48	6.01
MW-13	8.32		Not Measured			Not Measured			7.50	0.82
MW-15	8.26		Not Measured			Not Measured			9.08	-0.82
MW-16	8.77		Not Measured			Not Measured			8.15	0.62
MW-17	8.95		8.30	0.65		8.20	0.75		5.64	3.31
MW-18	10.80		9.85	0.95		9.22	1.58		8.25	2.55
MW-19	11.85		8.52	3.33		8.31	3.54		7.26	4.59
MW-20	10.64		8.70	1.94		7.56	3.08		6.05	4.59
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	8/29/01 ¹			8/29/01 ¹			8/16/01 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			9.48			8.07			10.46	
45-1-MW-1	11.43		11.55	-0.12		11.88	-0.45		Not Measured	
MW-2	10.74		9.50	1.24	8.25	8.29	2.45		10.48	0.26
MW-3	11.02		9.97	1.05		8.63	2.39		16.69	-5.67
MW-4	14.83		Not Measured			Not Measured			Not Measured	
MW-5	9.73		9.64	0.09		Not Measured			9.25	0.48
MW-7	10.00		8.07	1.93		7.20	2.80		8.65	1.35
MW-8	10.73		6.90	3.83		6.88	3.85		6.74	3.99
MW-10	11.49		10.18	1.31		9.60	1.89		10.09	1.40
MW-13	8.32		Not Measured			Not Measured			Not Measured	
MW-15	8.26		9.36	-1.10		9.01	-0.75		Not Measured	
MW-16	8.77		8.02	0.75		8.01	0.76		Not Measured	
MW-17	8.95		8.15	0.80		8.10	0.85		7.67	1.28
MW-18	10.80		9.23	1.57		8.25	2.55		8.85	1.95
MW-19	11.85		8.28	3.57		8.04	3.81		8.06	3.79
MW-20	10.64		8.05	2.59		7.43	3.21		8.49	2.15
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	8/16/01 ¹			8/9/2001			7/17/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			7.80			7.80			7.19	
45-1-MW-1	11.43		Not Measured			11.71	-0.28		10.95	0.48
MW-2	10.74	7.88	7.93	2.81	7.88	8.00	2.74	7.03	7.33	3.41
MW-3	11.02		8.40	2.62	8.40	8.42	2.60		7.74	3.28
MW-4	14.83		Not Measured			10.56	4.27		9.63	5.20
MW-5	9.73		9.24	0.49		9.08	0.65		8.67	1.06
MW-7	10.00		7.07	2.93		6.73	3.27		6.14	3.86
MW-8	10.73		6.70	4.03		6.75	3.98		6.47	4.26
MW-10	11.49		9.16	2.33		9.26	2.23		8.45	3.04
MW-13	8.32		Not Measured			7.32	0.99		6.58	1.74
MW-15	8.26		Not Measured			9.05	-0.79		8.44	-0.18
MW-16	8.77		Not Measured			7.96	0.81		7.42	1.35
MW-17	8.95		7.63	1.32		7.49	1.46		6.78	2.17
MW-18	10.80		8.43	2.37		8.93	1.87		7.75	3.05
MW-19	11.85		7.79	4.06		7.53	4.32		6.89	4.96
MW-20	10.64		7.17	3.47		6.90	3.74		6.35	4.29
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	6/26/01 ¹			6/26/01 ¹			6/20/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			8.20			5.10			6.21	
45-1-MW-1	11.43		10.73	0.70		11.10	0.33		11.15	0.28
MW-2	10.74		8.92	1.82	6.80	5.40	5.34	6.30	6.34	4.40
MW-3	11.02		14.13	-3.11		6.17	4.85		6.88	4.14
MW-4	14.83		8.40	6.43		8.40	6.43		8.42	6.41
MW-5	9.73		7.82	1.91		7.82	1.91		8.03	1.70
MW-7	10.00		6.65	3.35		4.14	5.86		5.07	4.93
MW-8	10.73		5.15	5.58		5.60	5.13		5.49	5.24
MW-10	11.49		5.23	6.26		4.54	6.95		7.13	4.36
MW-13	8.32		Not Measured			Not Measured			6.22	2.10
MW-15	8.26		8.39	-0.13		7.88	0.38		7.96	0.30
MW-16	8.77		6.82	1.95		7.00	1.77		7.34	1.43
MW-17	8.95		4.32	4.63		3.95	5.00		5.75	3.20
MW-18	10.80		7.10	3.70		6.56	4.24		7.12	3.68
MW-19	11.85		5.84	6.01		5.31	6.54		5.80	6.05
MW-20	10.64		6.65	3.99		4.53	6.11		5.26	5.38
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	6/14/01 ²			6/14/01 ¹			5/30/01 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			9.96			7.03			10.99	
45-1-MW-1	11.43		11.64	-0.21		11.59	-0.16		11.40	0.03
MW-2	10.74		9.82	0.92	6.80	6.85	3.89		9.79	0.95
MW-3	11.02		14.16	-3.14		7.41	3.61		14.70	-3.68
MW-4	14.83		9.35	5.48		9.37	5.46		9.15	5.68
MW-5	9.73		8.78	0.95		8.88	0.85		8.84	0.89
MW-7	10.00		7.98	2.02		5.85	4.15		8.43	1.57
MW-8	10.73		5.75	4.98		5.85	4.88		5.79	4.94
MW-10	11.49		9.05	2.44		7.73	3.76		9.98	1.51
MW-13	8.32		Not Measured			Not Measured			6.83	1.49
MW-15	8.26		8.80	-0.54		8.42	-0.16		9.27	-1.01
MW-16	8.77		7.33	1.44		7.61	1.16		7.42	1.35
MW-17	8.95		6.82	2.13		6.85	2.10		7.48	1.47
MW-18	10.80		8.40	2.40		7.60	3.20		8.55	2.25
MW-19	11.85		6.93	4.92		6.58	5.27		6.87	4.98
MW-20	10.64		7.55	3.09		6.00	4.64		7.80	2.84
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	5/30/01 ¹			5/9/01 ²			5/9/01 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			7.70			10.70			7.28	
45-1-MW-1	11.43		11.40	0.03		11.06	0.37		11.10	0.33
MW-2	10.74	7.24	7.28	3.46		8.03	2.71	6.60	6.92	3.82
MW-3	11.02	7.83	7.85	3.17		13.60	-2.58	7.25	7.30	3.72
MW-4	14.83		9.16	5.67		Not Measured			Not Measured	
MW-5	9.73		8.84	0.89		8.63	1.10		8.63	1.10
MW-7	10.00		6.34	3.66		8.36	1.64		5.82	4.18
MW-8	10.73		5.81	4.92		6.22	4.51		6.18	4.55
MW-10	11.49		8.92	2.57		9.46	2.03		7.27	4.22
MW-13	8.32		6.75	1.57		6.27	2.05		5.30	3.02
MW-15	8.26		8.67	-0.41		9.02	-0.76		8.62	-0.36
MW-16	8.77		7.34	1.43		7.06	1.71		6.95	1.82
MW-17	8.95		7.48	1.47		6.93	2.02		6.92	2.03
MW-18	10.80		7.98	2.82		7.96	2.84		7.36	3.44
MW-19	11.85		6.54	5.31		6.55	5.30		6.11	5.74
MW-20	10.64		6.31	4.33		7.82	2.82		5.86	4.78
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	4/26/01 ²			4/26/01 ¹			4/16/2001		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			9.80			5.55			5.72	
45-1-MW-1	11.43		10.50	0.93		10.12	1.31		10.70	0.73
MW-2	10.74		9.25	1.49	5.85	6.00	4.74	5.72	5.90	4.84
MW-3	11.02		13.30	-2.28		6.15	4.87	6.40	6.51	4.51
MW-4	14.83		Not Measured			Not Measured			7.54	7.29
MW-5	9.73		7.95	1.78		7.98	1.75		8.01	1.72
MW-7	10.00		6.98	3.02		4.73	5.27		4.66	5.34
MW-8	10.73		5.05	5.68		5.06	5.67		5.45	5.28
MW-10	11.49		Not Measured			7.30	4.19		7.12	4.37
MW-13	8.32		5.80	2.52		5.25	3.07		5.38	2.94
MW-15	8.26		8.56	-0.30		8.30	-0.04		8.64	-0.38
MW-16	8.77		7.25	1.52		6.92	1.85		7.34	1.43
MW-17	8.95		6.30	2.65		6.25	2.70		5.76	3.19
MW-18	10.80		7.27	3.53		6.70	4.10		6.57	4.23
MW-19	11.85		5.46	6.39		4.98	6.87		5.03	6.82
MW-20	10.64		6.50	4.14		4.83	5.81		4.85	5.79
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	3/20/2001			3/1/01 ²			3/1/01 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			5.01			7.57			4.90	
45-1-MW-1	11.43		10.64	0.79		11.10	0.33		11.15	0.28
MW-2	10.74	5.23	5.52	5.22		7.86	2.88		5.20	5.54
MW-3	11.02	5.68	5.76	5.26		9.03	1.99	5.92	5.49	5.53
MW-4	14.83		6.63	8.20		6.92	7.91		6.95	7.88
MW-5	9.73		7.71	2.02		7.81	1.92		7.81	1.92
MW-7	10.00		4.28	5.72		6.12	3.88		4.07	5.93
MW-8	10.73		4.96	5.77		4.77	5.96		4.75	5.98
MW-10	11.49		6.88	4.61		7.26	4.23		7.02	4.47
MW-13	8.32		5.60	2.72		6.12	2.20		6.12	2.20
MW-15	8.26		8.02	0.24		9.15	-0.89		8.75	-0.49
MW-16	8.77		6.43	2.34		6.78	1.99		6.67	2.10
MW-17	8.95		5.94	3.01		6.38	2.57		6.42	2.53
MW-18	10.80		6.42	4.38		7.33	3.47		6.79	4.01
MW-19	11.85		4.68	7.17		4.85	7.00		4.38	7.47
MW-20	10.64		4.41	6.23		5.72	4.92		4.04	6.60
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	2/20/2001			1/31/2001			1/18/01 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			5.33			5.93			9.00	
45-1-MW-1	11.43		11.13	0.30		11.49	-0.06		11.07	0.36
MW-2	10.74	5.57	5.74	5.00	6.22	6.33	4.41		8.36	2.38
MW-3	11.02	5.92	6.01	5.01		6.72	4.30		12.93	-1.91
MW-4	14.83		7.16	7.67		7.42	7.41		7.04	7.79
MW-5	9.73		8.03	1.70		8.63	1.10		8.02	1.71
MW-7	10.00		4.55	5.45		5.02	4.98		7.03	2.97
MW-8	10.73		5.00	5.73		5.45	5.28		5.03	5.70
MW-10	11.49		7.37	4.12		7.93	3.56		8.62	2.87
MW-13	8.32		6.22	2.10		13.08	-4.77		6.08	2.24
MW-15	8.26		8.82	-0.56		8.46	-0.20		8.96	-0.70
MW-16	8.77		6.69	2.08		7.00	1.77		6.84	1.93
MW-17	8.95		6.65	2.30		6.95	2.00		6.57	2.38
MW-18	10.80		7.00	3.80		7.44	3.36		7.52	3.28
MW-19	11.85		4.91	6.94		5.18	6.67		5.72	6.13
MW-20	10.64		4.65	5.99		15.02	-4.39		6.48	4.16
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	1/18/01 ¹			12/21/00 ²			12/21/00 ³		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			5.42			7.74			4.91	
45-1-MW-1	11.43		11.06	0.37		10.04	1.39		10.14	1.29
MW-2	10.74	5.67	6.03	4.71		7.82	2.92	4.92	5.03	5.71
MW-3	11.02	5.85	6.12	4.90		10.12	0.90	5.30	5.62	5.40
MW-4	14.83		7.03	7.80		5.97	8.86		6.04	8.79
MW-5	9.73		8.02	1.71		7.13	2.60		7.15	2.58
MW-7	10.00		4.51	5.49		6.02	3.98		3.98	6.02
MW-8	10.73		5.01	5.72		4.86	5.87		4.90	5.83
MW-10	11.49		7.43	4.06		7.39	4.10		6.45	5.04
MW-13	8.32		6.10	2.22		5.05	3.27		5.00	3.32
MW-15	8.26		8.70	-0.44		8.19	0.07		7.83	0.43
MW-16	8.77		6.75	2.02		6.16	2.61		6.20	2.57
MW-17	8.95		6.54	2.41		5.15	3.80		5.17	3.78
MW-18	10.80		6.93	3.87		5.93	4.87		5.90	4.90
MW-19	11.85		4.78	7.07		4.69	7.16		4.33	7.52
MW-20	10.64		4.54	6.10		5.71	4.93		4.14	6.50
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	12/5/2000			11/20/00 ¹			11/13/2000		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			3.96			6.20			6.43	
45-1-MW-1	11.43		9.68	1.75		11.01	0.42		10.78	0.65
MW-2	10.74	4.39	4.50	6.24	6.19	6.25	4.49	5.98	6.20	4.54
MW-3	11.02	4.40	4.58	6.44		6.30	4.72		6.76	4.26
MW-4	14.83		5.84	8.99		8.24	6.59		8.04	6.79
MW-5	9.73		7.14	2.59		8.49	1.24		8.63	1.10
MW-7	10.00		2.89	7.11		4.95	5.05		5.47	4.53
MW-8	10.73		4.06	6.67		5.05	5.68		5.89	4.84
MW-10	11.49		4.23	7.26		7.93	3.56		7.98	3.51
MW-13	8.32		Not Measured			6.46	1.86		6.21	2.11
MW-15	8.26		7.08	1.18		8.53	-0.27		8.55	-0.29
MW-16	8.77		Not Measured			6.79	1.98		6.76	2.01
MW-17	8.95		3.86	5.09		6.84	2.11		6.77	2.18
MW-18	10.80		5.54	5.26		7.33	3.47		7.05	3.75
MW-19	11.85		3.45	8.40		5.20	6.65		5.95	5.90
MW-20	10.64		3.10	7.54		4.95	5.69		5.62	5.02
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	10/11/2000			9/11/2000			8/31/00 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			6.55			5.42			10.30	
45-1-MW-1	11.43		9.95	1.48		9.45	1.98		10.15	1.28
MW-2	10.74	5.71	5.82	4.92		4.82	5.92		8.96	1.78
MW-3	11.02	6.35	6.45	4.57		5.27	5.75		10.26	0.76
MW-4	14.83		6.22	8.61		6.84	7.99		7.69	7.14
MW-5	9.73		7.06	2.67		6.75	2.98		7.15	2.58
MW-7	10.00		4.72	5.28		3.96	6.04		7.01	2.99
MW-8	10.73		5.09	5.64		4.60	6.13		4.25	6.48
MW-10	11.49		7.25	4.24		5.39	6.10		4.86	6.63
MW-13	8.32		5.04	3.28		4.73	3.59		Not Measured	
MW-15	8.26		5.04	3.22		7.31	0.95		8.94	-0.68
MW-16	8.77		6.18	2.59		Not Measured			Not Measured	
MW-17	8.95		4.93	4.02		4.11	4.84		3.97	4.98
MW-18	10.80		6.30	4.50		5.63	5.17		6.70	4.10
MW-19	11.85		4.92	6.93		4.63	7.22		4.80	7.05
MW-20	10.64		4.92	5.72		4.18	6.46		6.00	4.64
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	8/31/06 ¹			7/19/00 ²			7/18/00 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			3.90			10.95			8.70	
45-1-MW-1	11.43		10.15	1.28		12.55	-1.12		12.55	-1.12
MW-2	10.74	4.40	4.58	6.16		10.33	0.41		8.61	2.13
MW-3	11.02		4.60	6.42		12.78	-1.76		9.25	1.77
MW-4	14.83		7.73	7.10		11.18	3.65		11.15	3.68
MW-5	9.73		7.18	2.55		10.25	-0.52		10.24	-0.51
MW-7	10.00		3.11	6.89		9.05	0.95		7.51	2.49
MW-8	10.73		4.18	6.55		7.63	3.10		7.53	3.20
MW-10	11.49		4.16	7.33		10.00	1.49		10.04	1.45
MW-13	8.32		Not Measured			7.97	0.35		7.82	0.49
MW-15	8.26		7.16	1.10		10.27	-2.01		10.34	-2.08
MW-16	8.77		Not Measured			9.40	-0.64		8.74	0.03
MW-17	8.95		3.93	5.02		8.45	0.50		8.25	0.70
MW-18	10.80		6.25	4.55		10.03	0.77		9.50	1.30
MW-19	11.85		4.26	7.59		8.45	3.40		8.21	3.64
MW-20	10.64		3.50	7.14		8.71	1.93		7.25	3.39
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	6/19/00 ²			6/19/00 ¹			6/15/2000		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.59		Trace	6.86			6.63	
45-1-MW-1	11.43		11.33	0.10		11.34	0.09		11.13	0.30
MW-2	10.74		9.91	0.83	6.95	7.25	3.49		7.12	3.62
MW-3	11.02		11.13	-0.11		7.51	3.51		7.25	3.77
MW-4	14.83		9.82	5.01		9.80	5.03		9.62	5.21
MW-5	9.73		9.40	0.33		9.33	0.40		9.21	0.52
MW-7	10.00		8.62	1.38		6.23	3.77		5.98	4.02
MW-8	10.73		6.67	4.06		6.64	4.09		6.40	4.33
MW-10	11.49		9.97	1.52		8.66	2.83		8.43	3.06
MW-13	8.32		6.80	1.52		6.75	1.57		6.62	1.70
MW-15	8.26		9.23	-0.97		9.10	-0.84		8.79	-0.53
MW-16	8.77		7.66	1.11		7.69	1.08		7.50	1.27
MW-17	8.95		7.44	1.51		7.35	1.60		7.15	1.80
MW-18	10.80		8.66	2.14		8.20	2.60		7.79	3.01
MW-19	11.85		7.38	4.47		7.05	4.80		6.78	5.07
MW-20	10.64		8.03	2.61		6.45	4.19		6.21	4.43
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	5/16/2000			4/7/2000			3/16/2000		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			5.31			6.07			5.65	
45-1-MW-1	11.43		10.07	1.36		11.51	-0.08		10.81	0.62
MW-2	10.74	5.36	5.40	5.34	5.92	6.42	4.32	5.65	5.33	5.41
MW-3	11.02	5.88	5.99	5.03		6.91	4.11		6.15	4.87
MW-4	14.83		7.58	7.25		6.64	8.19		7.71	7.12
MW-5	9.73		8.04	1.69		7.83	1.90		8.78	0.95
MW-7	10.00		4.75	5.25		5.21	4.79		4.96	5.04
MW-8	10.73		5.51	5.22		5.93	4.80		5.61	5.12
MW-10	11.49		7.03	4.46		7.72	3.77		7.49	4.00
MW-13	8.32		5.47	2.85		6.62	1.70		6.42	1.90
MW-15	8.26		7.56	0.70		9.19	-0.93		8.26	0.00
MW-16	8.77		6.52	2.25		7.91	0.86		7.52	1.25
MW-17	8.95		5.75	3.20		6.69	2.26		6.74	2.21
MW-18	10.80		6.50	4.30		7.51	3.29		7.06	3.74
MW-19	11.85		5.56	6.29		5.63	6.22		5.42	6.43
MW-20	10.64		5.09	5.55		5.31	5.33		5.12	5.52
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	1/26/2000			11/22/1999			10/12/1999		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			Not Measured			5.96			5.92	
45-1-MW-1	11.43		11.90	-0.47		10.23	1.20		9.57	1.86
MW-2	10.74	5.16	5.33	5.41	5.33	9.15	1.59	5.46	5.81	4.93
MW-3	11.02		Not Measured		6.13	6.22	4.80	6.40	7.68	3.34
MW-4	14.83		7.00	7.83		6.20	8.63		8.83	6.00
MW-5	9.73		8.68	1.05		7.57	2.16		8.44	1.29
MW-7	10.00		Not Measured			4.60	5.40		4.53	5.47
MW-8	10.73		4.74	5.99		5.15	5.58		4.90	5.83
MW-10	11.49		4.30	7.19	5.92	6.98	4.51	5.92	6.02	5.47
MW-13	8.32		7.00	1.32		6.42	1.90		4.80	3.52
MW-15	8.26		Not Measured			Not Measured			7.81	0.45
MW-16	8.77		Not Measured			Not Measured			Not Measured	
MW-17	8.95		Not Measured			Not Measured			Not Measured	
MW-18	10.80		Not Measured			Not Measured			Not Measured	
MW-19	11.85		4.11	7.74		4.63	7.22		4.49	7.36
MW-20	10.64		Not Measured			4.60	6.04		4.51	6.13
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	9/2/99 ¹			9/2/99 ¹			8/26/99 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.66			7.38			11.26	
45-1-MW-1	11.43		9.62	1.81		9.61	1.82		11.57	-0.14
MW-2	10.74		9.30	1.44	6.65	6.99	3.75		10.00	0.74
MW-3	11.02		10.54	0.48	Trace	7.35	3.67		11.61	-0.59
MW-4	14.83		9.15	5.68		9.16	5.67		11.20	3.63
MW-5	9.73		8.90	0.83		8.90	0.83		10.02	-0.29
MW-7	10.00		7.70	2.30		5.88	4.12		8.70	1.30
MW-8	10.73		5.85	4.88		5.81	4.92		7.11	3.62
MW-10	11.49		8.55	2.94		7.40	4.09		10.66	0.83
MW-13	8.32		6.75	1.57		6.75	1.57		7.85	0.47
MW-15	8.26		Not Measured			Not Measured			Not Measured	
MW-16	8.77		7.29	1.48		7.28	1.49		8.40	0.37
MW-17	8.95		6.90	2.05		6.78	2.17		8.26	0.69
MW-18	10.80		Not Measured			Not Measured			Not Measured	
MW-19	11.85		6.87	4.98		6.64	5.21		8.31	3.54
MW-20	10.64		7.31	3.33		6.05	4.59		8.43	2.21
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	8/26/99 ¹			8/18/99 ²			8/18/99 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			9.09			11.05			8.65	
45-1-MW-1	11.43		11.57	-0.14		11.58	-0.15		11.58	-0.15
MW-2	10.74	8.30	8.45	2.29		9.94	0.80	8.15	8.45	2.29
MW-3	11.02	8.84	8.85	2.17		11.81	-0.79	8.73	8.76	2.26
MW-4	14.83		11.10	3.73		11.10	3.73		11.08	3.75
MW-5	9.73		10.00	-0.27		10.13	-0.40		10.13	-0.40
MW-7	10.00		7.40	2.60		8.59	1.41		7.31	2.69
MW-8	10.73		7.10	3.63		7.27	3.46		7.25	3.48
MW-10	11.49		9.85	1.64		10.46	1.03		9.73	1.76
MW-13	8.32		7.85	0.47		7.89	0.43		7.79	0.52
MW-15	8.26		Not Measured			9.23	-0.97		9.26	-1.00
MW-16	8.77		8.50	0.27		8.34	0.43		8.30	0.47
MW-17	8.95		8.20	0.75		8.30	0.65		8.29	0.66
MW-18	10.80		Not Measured			Not Measured			Not Measured	
MW-19	11.85		8.14	3.71		8.26	3.59		8.15	3.70
MW-20	10.64		7.49	3.15		8.36	2.28		7.50	3.14
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	7/27/99 ¹			7/27/99 ¹			7/19/99 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			10.76			7.55			9.00	
45-1-MW-1	11.43		11.29	0.14		11.29	0.14		11.13	0.30
MW-2	10.74		9.73	1.01	7.34	7.55	3.19		9.32	1.42
MW-3	11.02		10.92	0.10	7.95	8.04	2.98		9.54	1.48
MW-4	14.83		10.35	4.48		10.31	4.52		10.03	4.80
MW-5	9.73		9.41	0.32		9.41	0.32		9.33	0.40
MW-7	10.00		8.05	1.95		6.44	3.56		7.24	2.76
MW-8	10.73		6.42	4.31		6.38	4.35		6.39	4.34
MW-10	11.49		9.92	1.57		8.96	2.53		9.45	2.04
MW-13	8.32		7.32	0.99		7.31	1.01		7.21	1.11
MW-15	8.26		Not Measured			9.24	-0.98		Not Measured	
MW-16	8.77		8.07	0.70		8.05	0.72		7.88	0.89
MW-17	8.95		7.70	1.25		7.58	1.37		7.60	1.35
MW-18	10.80		8.96	1.84		7.60	3.20		Not Measured	
MW-19	11.85		7.50	4.35		7.31	4.54		7.27	4.58
MW-20	10.64		7.76	2.88		6.61	4.03		7.21	3.43
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	7/19/99 ¹			7/12/1999			6/29/99 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			7.57			7.76			10.31	
45-1-MW-1	11.43		11.19	0.24		11.21	0.22		10.13	1.30
MW-2	10.74	7.21	7.44	3.30	7.50	7.84	2.90		8.72	2.02
MW-3	11.02	7.72	7.82	3.20	7.79	7.91	3.11		11.02	0.00
MW-4	14.83		10.00	4.83		9.81	5.02		8.87	5.96
MW-5	9.73		9.81	-0.08		9.45	0.28		8.97	0.76
MW-7	10.00		6.31	3.69		6.40	3.60		7.58	2.42
MW-8	10.73		6.30	4.43		6.57	4.16		6.04	4.69
MW-10	11.49		8.83	2.66		8.73	2.76		9.28	2.21
MW-13	8.32		7.17	1.15		7.04	1.28		6.76	1.56
MW-15	8.26		Not Measured			Not Measured			Not Measured	
MW-16	8.77		7.88	0.89		7.51	1.26		7.11	1.66
MW-17	8.95		7.47	1.48		7.45	1.50		7.11	1.84
MW-18	10.80		Not Measured			8.49	2.31		8.15	2.65
MW-19	11.85		7.08	4.77		7.13	4.72		6.50	5.35
MW-20	10.64		6.47	4.17		6.62	4.02		7.14	3.50
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	6/29/99 ¹			6/22/99 ²			6/22/99 ¹		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			6.57			9.55			6.23	
45-1-MW-1	11.43		10.14	1.29		11.32	0.11		11.22	0.21
MW-2	10.74	6.44	6.94	3.80		8.53	2.21	5.66	6.59	4.15
MW-3	11.02	7.05	7.15	3.87		10.82	0.20	6.68	6.92	4.10
MW-4	14.83		8.86	5.97		8.35	6.48		8.38	6.45
MW-5	9.73		8.97	0.76		8.65	1.08		8.65	1.08
MW-7	10.00		5.66	4.34		7.04	2.96		5.08	4.92
MW-8	10.73		6.03	4.70		5.50	5.23		5.44	5.29
MW-10	11.49		8.13	3.36		9.04	2.45		7.61	3.88
MW-13	8.32		6.73	1.59		6.82	1.50		6.55	1.77
MW-15	8.26		Not Measured			Not Measured			Not Measured	
MW-16	8.77		7.14	1.63		7.66	1.11		7.57	1.20
MW-17	8.95		7.14	1.81		6.91	2.04		6.90	2.05
MW-18	10.80		7.92	2.88		8.53	2.27		8.07	2.73
MW-19	11.85		6.27	5.58		5.94	5.91		5.69	6.16
MW-20	10.64		5.78	4.86		6.59	4.05		5.17	5.47
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	5/11/99 ¹			5/11/99 ¹			4/22/99 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			8.05			5.19			9.03	
45-1-MW-1	11.43		10.51	0.92		10.51	0.92		10.44	0.99
MW-2	10.74		5.85	4.89	5.35	5.36	5.38	Trace	8.24	2.50
MW-3	11.02		9.04	1.98	5.86	6.05	4.97	9.91	9.94	1.08
MW-4	14.83		7.22	7.61		7.22	7.61		7.87	6.96
MW-5	9.73		8.16	1.57		8.15	1.58		8.81	0.92
MW-7	10.00		6.88	3.12		4.58	5.42		6.59	3.41
MW-8	10.73		5.23	5.50		5.20	5.53	Trace	5.70	5.03
MW-10	11.49		8.20	3.29		6.99	4.50		8.92	2.57
MW-13	8.32		5.85	2.47		5.87	2.45		5.98	2.34
MW-15	8.26		8.65	-0.39		8.32	-0.06		8.64	-0.38
MW-16	8.77		6.75	2.02		6.75	2.02		6.75	2.02
MW-17	8.95		6.25	2.70		6.23	2.72		6.70	2.25
MW-18	10.80		7.24	3.56		6.91	3.89	7.55	7.56	3.24
MW-19	11.85		5.35	6.50		5.14	6.71		5.79	6.06
MW-20	10.64		6.31	4.33		4.73	5.91		6.76	3.88
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	4/12/99 ¹			4/13/1999			4/9/99 ²		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1		5.30	5.35		25.30	25.25			5.89	
45-1-MW-1	11.43		10.39	1.04		10.86	0.57		5.89	5.54
MW-2	10.74	5.73	5.98	4.76	6.12	6.20	4.54		Not Measured	
MW-3	11.02		Not Measured			6.96	4.06		10.24	0.78
MW-4	14.83		7.86	6.97		7.58	7.25		7.32	7.51
MW-5	9.73		8.79	0.94		8.78	0.95		8.68	1.05
MW-7	10.00		4.72	5.28		17.92	-7.92		5.22	4.78
MW-8	10.73		6.63	4.10		5.96	4.77		5.59	5.14
MW-10	11.49	7.42	7.46	4.03	18.51	18.30	-6.81		7.46	4.03
MW-13	8.32		5.87	2.45		5.44	2.88		4.72	3.60
MW-15	8.26		8.32	-0.06		9.18	-0.92		8.67	-0.41
MW-16	8.77		6.74	2.03	Trace	6.75	2.02		6.42	2.35
MW-17	8.95		6.68	2.27		6.58	2.37		6.32	2.63
MW-18	10.80		7.20	3.60		7.08	3.72		7.10	3.70
MW-19	11.85		5.60	6.25		5.90	5.95		5.19	6.66
MW-20	10.64		5.32	5.32		15.60	-4.97		4.78	5.86
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	4/9/99 ¹			3/19/1999			2/8/1999		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			4.91		4.90	4.98			4.59	
45-1-MW-1	11.43		10.49	0.94		10.12	1.31		10.30	1.13
MW-2	10.74	5.35	5.40	5.34	5.25	5.30	5.44	5.10	5.15	5.59
MW-3	11.02	7.10	7.14	3.88	5.66	5.70	5.32	5.62	5.70	5.32
MW-4	14.83		7.31	7.52		7.56	7.27		6.75	8.08
MW-5	9.73		8.67	1.06		8.49	1.24		8.05	1.68
MW-7	10.00		4.53	5.47		4.37	5.63		4.20	5.80
MW-8	10.73		5.57	5.16		5.18	5.55		4.95	5.78
MW-10	11.49		7.05	4.44		6.99	4.50		6.80	4.69
MW-13	8.32		4.73	3.59		4.79	3.53		4.82	3.50
MW-15	8.26		8.71	-0.45		7.97	0.29		8.24	0.02
MW-16	8.77		6.50	2.27		5.88	2.89		6.83	1.94
MW-17	8.95		6.32	2.63		5.18	3.77		6.19	2.76
MW-18	10.80		6.81	3.99		6.90	3.90		6.92	3.88
MW-19	11.85		5.13	6.72		5.12	6.73		4.74	7.11
MW-20	10.64		4.75	5.89		4.58	6.06		4.44	6.20
MW-22			Not Measured			Not Measured			Not Measured	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	1/14/1999			12/8/1998			11/2/1998		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1		5.56	5.57			5.55			5.87	
45-1-MW-1	11.43		11.62	-0.19		11.70	-0.27		10.96	0.47
MW-2	10.74	6.05	6.34	4.40	7.16	7.37	3.37	6.35	6.64	4.10
MW-3	11.02	6.83	6.86	4.16	7.84	8.02	3.00	7.01	7.05	3.97
MW-4	14.83		8.18	6.65		10.04	4.79		8.92	5.91
MW-5	9.73		9.06	0.67		9.99	-0.26		9.23	0.50
MW-7	10.00		5.07	4.93		6.15	3.85		5.54	4.46
MW-8	10.73		5.58	5.15		6.41	4.32		6.22	4.51
MW-10	11.49		7.79	3.70		8.90	2.59		8.01	3.48
MW-13	8.32		5.49	2.83		8.83	-0.52		6.43	1.89
MW-15	8.26		9.14	-0.88		9.64	-1.38		8.36	-0.10
MW-16	8.77		8.38	0.39		8.35	0.42		7.64	1.13
MW-17	8.95		6.95	2.00		7.89	1.06		7.01	1.94
MW-18	10.80		8.16	2.64		Not Measured			7.88	2.92
MW-19	11.85		5.49	6.36		6.92	4.93		6.34	5.51
MW-20	10.64		5.10	5.54		6.40	4.24		5.86	4.78
MW-22			Not Measured			18.87			18.50	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	10/14/1998			9/21/1998			8/11/1998		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1		5.23	5.25			4.43			5.62	
45-1-MW-1	11.43		10.78	0.65		10.34	1.09		11.43	0.00
MW-2	10.74	5.93	6.07	4.67	4.70	5.08	5.66	Trace	5.81	4.93
MW-3	11.02	6.28	6.32	4.70	5.50	5.52	5.50	Trace	6.91	4.11
MW-4	14.83		4.89	9.94		6.41	8.42		9.33	5.50
MW-5	9.73		8.68	1.05		7.67	2.06		9.35	0.38
MW-7	10.00		5.20	4.80		4.15	5.85		5.35	4.65
MW-8	10.73		5.67	5.06		4.96	5.77		6.45	4.28
MW-10	11.49		7.56	3.93		6.60	4.89		7.87	3.62
MW-13	8.32		5.60	2.72		5.24	3.08		6.81	1.51
MW-15	8.26		8.29	-0.03		Not Measured			9.00	-0.74
MW-16	8.77		7.36	1.41		6.98	1.79		8.51	0.26
MW-17	8.95		6.55	2.40		5.73	3.22	Not Measured		
MW-18	10.80		7.43	3.37		6.51	4.29		8.30	2.50
MW-19	11.85		5.63	6.22		4.67	7.18		6.14	5.71
MW-20	10.64		5.33	5.31		4.18	6.46		5.59	5.05
MW-22			18.84			17.23			18.78	

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-1 (continued)
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
Groundwater Level Measurement Summary

Sample Point	Top of Casing Elevation (ft., msl)	7/22/1998			7/16/1998			7/6/1998		
		Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft. below toc)	Groundwater Elevation (ft., msl)
PW-1			6.06			5.99			Not Measured	
45-1-MW-1	11.43		11.24	0.19		11.41	0.02		10.81	0.62
MW-2	10.74	6.73	6.74	4.00	6.41	6.42	4.32	5.97	5.98	4.76
MW-3	11.02	7.33	7.34	3.68	6.72	6.75	4.27		6.27	4.75
MW-4	14.83		14.80	0.03		9.64	5.19		8.95	5.88
MW-5	9.73		9.80	-0.07		9.82	-0.09		9.35	0.38
MW-7	10.00		5.72	4.28		5.65	4.35		5.23	4.77
MW-8	10.73		6.63	4.10		6.66	4.07		6.23	4.50
MW-10	11.49		8.33	3.16		8.20	3.29		7.81	3.68
MW-13	8.32		6.48	1.84		6.49	1.83		Not Measured	
MW-15	8.26		8.76	-0.50		9.05	-0.79		8.30	-0.04
MW-16	8.77		8.19	0.58		8.44	0.33		Not Measured	
MW-17	8.95		7.01	1.94		7.33	1.62		Not Measured	
MW-18	10.80		7.91	2.89		8.38	2.42		7.86	2.94
MW-19	11.85		6.71	5.14		6.71	5.14		6.15	5.70
MW-20	10.64		6.01	4.63		5.94	4.70		5.53	5.11
MW-22			18.93			19.04			18.82	0.00

Notes:

¹ Groundwater elevation measurements same day prior to AFVR event.

² Groundwater elevation measurements same day after AFVR event.

³ Groundwater elevation measurements one day after AFVR event.

ft = feet

toc = top of casing elevation

msl = mean sea level

Table 2-2 TRANSPORTATION AND DISPOSAL LOG
J.A. JONES ENVIRONMENTAL SERVICES COMPANY
CAMP LEJEUNE, NORTH CAROLINA
PROJECT NUMBER: 005-067a

				GALLONS TO DATE	95,186			
				TONS TO DATE	25.00			
				DRUMS TO DATE	14.00			
DATE SHIPPED	DISPOSAL FACILITY	HAULER	TONS	GALLONS	DRUMS	MANIFEST NUMBER	LOAD NUMBER	COMMENTS
10/20/1997	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company			11	435	D-001	Development Water Accumulated During Vertical Drilling
10/27/1997	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company			3	436	D-002	Development Water Accumulated During Vertical Drilling
11/21/1997	Carlisle Farms, Inc.	SouthCo Enterprises, Inc.	25			444	S-001	20 Cubic Yards of Drill Cuttings Accumulated During Vertical Drilling
4/23/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		120		478	W-001	Soil Vapor Water Accumulated in Storage Tank
4/27/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		240		479	W-002	Soil Vapor Water Accumulated in Storage Tank
4/27/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		150		480	W-003	Soil Vapor Water Accumulated in Storage Tank
4/29/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		190		471	W-004	Soil Vapor Water Accumulated in Storage Tank
4/29/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		240		484	W-005	Soil Vapor Water Accumulated in Storage Tank
8/14/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		600		293	W-006	Soil Vapor Water Accumulated in Storage Tank
8/21/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		295	W-007	Soil Vapor Water Accumulated in Storage Tank
9/16/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		300		701	W-008	Soil Vapor Water Accumulated in Storage Tank
9/29/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		250		706	W-009	Soil Vapor Water Accumulated in Storage Tank
10/1/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		275		709	W-010	Soil Vapor Water Accumulated in Storage Tank
11/10/1998	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		325		716	W-011	Soil Vapor Water Accumulated in Storage Tank
1/19/1999	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		807	W-012	Soil Vapor Water Accumulated in Storage Tank
1/27/1999	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		724	W-013	Soil Vapor Water Accumulated in Storage Tank
3/5/1999	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		320		731	W-014	Soil Vapor Water Accumulated in Storage Tank
4/9/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		960		821	W-015	Groundwater and LNAPL Accumulated During AFVR Activities
4/22/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,371		821	W-016	Groundwater and LNAPL Accumulated During AFVR Activities
5/11/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,068		821	W-017	Groundwater and LNAPL Accumulated During AFVR Activities
6/12/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		500		734	W-018	Soil Vapor Water Accumulated in Storage Tank
6/23/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,483		821	W-019	Groundwater Accumulated During AFVR Activities
6/30/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,204		821	W-020	Groundwater Accumulated During AFVR Activities
7/20/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		708		821	W-021	Groundwater Accumulated During AFVR Activities
7/28/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,067		821	W-022	Groundwater Accumulated During AFVR Activities

Table 2-2 TRANSPORTATION AND DISPOSAL LOG (continued)
J.A. JONES ENVIRONMENTAL SERVICES COMPANY
CAMP LEJEUNE, NORTH CAROLINA
PROJECT NUMBER: 005-067a

			GALLONS TO DATE		95,186			
			TONS TO DATE		25.00			
			DRUMS TO DATE		14.00			
DATE SHIPPED	DISPOSAL FACILITY	HAULER	TONS	GALLONS	DRUMS	MANIFEST NUMBER	LOAD NUMBER	COMMENTS
8/19/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,149		821	W-023	Groundwater Accumulated During AFVR Activities
8/27/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,386		821	W-024	Groundwater Accumulated During AFVR Activities
9/2/1999	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,174		821	W-025	Groundwater Accumulated During AFVR Activities
1/5/2000	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		600		764	W-026	Soil Vapor Water Accumulated in Storage Tank
2/14/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		821	W-027	Soil Vapor Water Accumulated in Storage Tank
2/15/2000	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		771	W-028	Soil Vapor Water Accumulated in Storage Tank
4/19/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		320		1010	W-029	Soil Vapor Water Accumulated in Storage Tank
5/2/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		450		1010	W-030	Soil Vapor Water Accumulated in Storage Tank
6/19/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		2,684		957	W-031	Groundwater Accumulated During AFVR Activities
7/19/2000	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,026		969	W-032	Groundwater Accumulated During AFVR Activities
7/27/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		983	W-033	Soil Vapor Water Accumulated in Storage Tank
7/31/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		450		984	W-034	Soil Vapor Water Accumulated in Storage Tank
8/7/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		325		988	W-035	Soil Vapor Water Accumulated in Storage Tank
8/9/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		350		989	W-036	Soil Vapor Water Accumulated in Storage Tank
8/23/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		175		991	W-037	Soil Vapor Water Accumulated in Storage Tank
8/31/2000	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,973		995	W-038	Groundwater Accumulated During AFVR Activities
9/6/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		996	W-039	Soil Vapor Water Accumulated in Storage Tank
9/7/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		997	W-040	Soil Vapor Water Accumulated in Storage Tank
9/11/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		700		998	W-041	Soil Vapor Water Accumulated in Storage Tank
9/13/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		425		999	W-042	Soil Vapor Water Accumulated in Storage Tank
10/11/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		1000	W-043	Soil Vapor Water Accumulated in Storage Tank
11/20/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		2,806		1272	W-044	Groundwater Accumulated During AFVR Activities
11/20/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		125		1052	W-045	Soil Vapor Water Accumulated in Storage Tank
11/27/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		400		1274	W-046	Soil Vapor Water Accumulated in Storage Tank
11/29/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		375		1275	W-047	Soil Vapor Water Accumulated in Storage Tank
12/5/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		450		1276	W-048	Soil Vapor Water Accumulated in Storage Tank

Table 2-2 TRANSPORTATION AND DISPOSAL LOG (continued)
J.A. JONES ENVIRONMENTAL SERVICES COMPANY
CAMP LEJEUNE, NORTH CAROLINA
PROJECT NUMBER: 005-067a

				GALLONS TO DATE		95,186		
				TONS TO DATE		25.00		
				DRUMS TO DATE		14.00		
DATE SHIPPED	DISPOSAL FACILITY	HAULER	TONS	GALLONS	DRUMS	MANIFEST NUMBER	LOAD NUMBER	COMMENTS
12/11/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		425		1279	W-049	Soil Vapor Water Accumulated in Storage Tank
12/14/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		525		1282	W-050	Soil Vapor Water Accumulated in Storage Tank
12/21/2000	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		2,015		1289	W-051	Groundwater Accumulated During AFVR Activities
1/18/2001	Groundwater Treatment System, Former Rifle Range RR-72	J.A. Jones Environmental Services Company		2,721		1289	W-052	Groundwater Accumulated During AFVR Activities
2/6/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		325		1290	W-053	Soil Vapor Water Accumulated in Storage Tank
2/12/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		300		1292	W-054	Soil Vapor Water Accumulated in Storage Tank
2/20/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		1293	W-055	Soil Vapor Water Accumulated in Storage Tank
3/1/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		1297	W-056	Soil Vapor Water Accumulated in Storage Tank
3/1/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,499		1297	W-057	Groundwater Accumulated During AFVR Activities
3/28/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		820		1451	W-058	Soil Vapor Water Accumulated in Storage Tank
3/29/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,757		1452	W-059	Groundwater Accumulated During AFVR Activities
4/10/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		750		1901	W-060	Soil Vapor Water Accumulated in Storage Tank
4/26/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,204		2545	W-061	Groundwater Accumulated During AFVR Activities
5/2/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		425		2548	W-062	Soil Vapor Water Accumulated in Storage Tank
5/9/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,441		2555	W-063	Groundwater Accumulated During AFVR Activities
5/22/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		675		2565	W-064	Groundwater Accumulated During AFVR Activities
5/30/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,630		2571	W-065	Groundwater Accumulated During AFVR Activities and Soil Vapor Water Accumulated in Storage Tank
6/12/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		725		2577	W-066	Soil Vapor Water Accumulated in Storage Tank
6/14/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,330		2583	W-067	Groundwater Accumulated During AFVR Activities
6/18/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		425		2585	W-068	Soil Vapor Water Accumulated in Storage Tank
6/25/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		300		2589	W-069	Soil Vapor Water Accumulated in Storage Tank
6/26/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,441		2592	W-070	Groundwater Accumulated During AFVR Activities
7/9/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		450		2603	W-071	Soil Vapor Water Accumulated in Storage Tank
7/23/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,405		2610	W-072	Groundwater Accumulated During AFVR Activities
8/13/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		2633	W-073	Soil Vapor Water Accumulated in Storage Tank
8/16/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,450		2642	W-074	Groundwater Accumulated During AFVR Activities

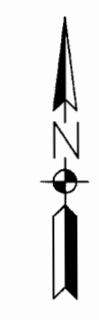
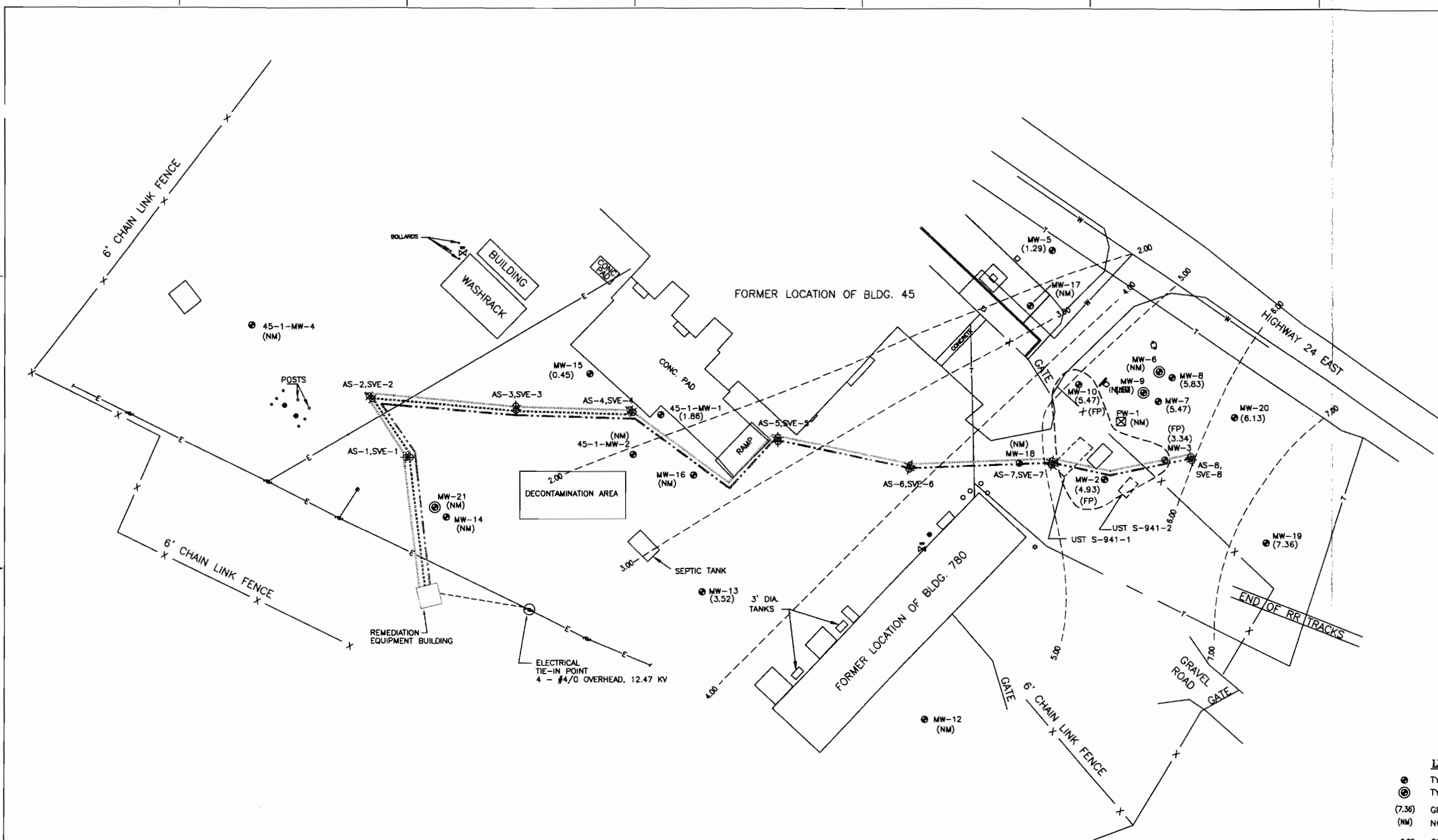
Table 2-2 TRANSPORTATION AND DISPOSAL LOG (continued)
 J.A. JONES ENVIRONMENTAL SERVICES COMPANY
 CAMP LEJEUNE, NORTH CAROLINA
 PROJECT NUMBER: 005-067a

GALLONS TO DATE 95,186
 TONS TO DATE 25.00
 DRUMS TO DATE 14.00

DATE SHIPPED	DISPOSAL FACILITY	HAULER	TONS	GALLONS	DRUMS	MANIFEST NUMBER	LOAD NUMBER	COMMENTS
8/29/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		1,650		2652	W-075	Groundwater Accumulated During AFVR Activities

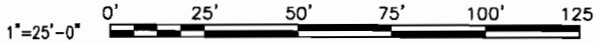
Table 2-2 TRANSPORTATION AND DISPOSAL LOG (continued)
J.A. JONES ENVIRONMENTAL SERVICES COMPANY
CAMP LEJEUNE, NORTH CAROLINA
PROJECT NUMBER: 005-067a

			GALLONS TO DATE		95,186			
			TONS TO DATE		25.00			
			DRUMS TO DATE		14.00			
DATE SHIPPED	DISPOSAL FACILITY	HAULER	TONS	GALLONS	DRUMS	MANIFEST NUMBER	LOAD NUMBER	COMMENTS
9/11/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		250		2658	W-076	Soil Vapor Water Accumulated in Storage Tank
9/18/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		2663	W-077	Soil Vapor Water Accumulated in Storage Tank
10/3/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,940		2674	W-078	Groundwater Accumulated During AFVR Activities
10/30/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,350		2693	W-079	Groundwater Accumulated During AFVR Activities
11/1/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		275		2696	W-080	Soil Vapor Water Accumulated in Storage Tank
11/27/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		3,080		2685	W-081	Groundwater Accumulated During AFVR Activities
12/13/2001	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		2,890		2727	W-082	Groundwater Accumulated During AFVR Activities
1/14/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		400		2744	W-083	Soil Vapor Water Accumulated in Storage Tank
1/8/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		425		2740	W-084	Soil Vapor Water Accumulated in Storage Tank
2/11/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		300		2761	W-085	Soil Vapor Water Accumulated in Storage Tank
3/4/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		300		2774	W-086	Soil Vapor Water Accumulated in Storage Tank
3/7/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		325		2776	W-087	Soil Vapor Water Accumulated in Storage Tank
3/21/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		300		2784	W-088	Soil Vapor Water Accumulated in Storage Tank
3/26/2002	Shaw's North Plant aquifer treatment facility, Camp Lejeune, NC	J.A. Jones Environmental Services Company		150		2788	W-089	Soil Vapor Water Accumulated in Storage Tank
5/14/2002	Camp Lejeune EMD Treatment Facility	J.A. Jones Environmental Services Company		300		2842	W-090	Soil Vapor Water Accumulated in Storage Tank
7/13/2002	Camp Lejeune EMD Treatment Facility	J.A. Jones Environmental Services Company		300		2946	W-091	Soil Vapor Water Accumulated in Storage Tank
			25.00	95,186.00	14.00	SOIL:	1	Loads
						WATER:	91	Loads
						DRUMS:	2	Loads



GROUNDWATER ELEVATION CONTOUR MAP OCTOBER 12, 1999

GRAPHICS SCALE
IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE

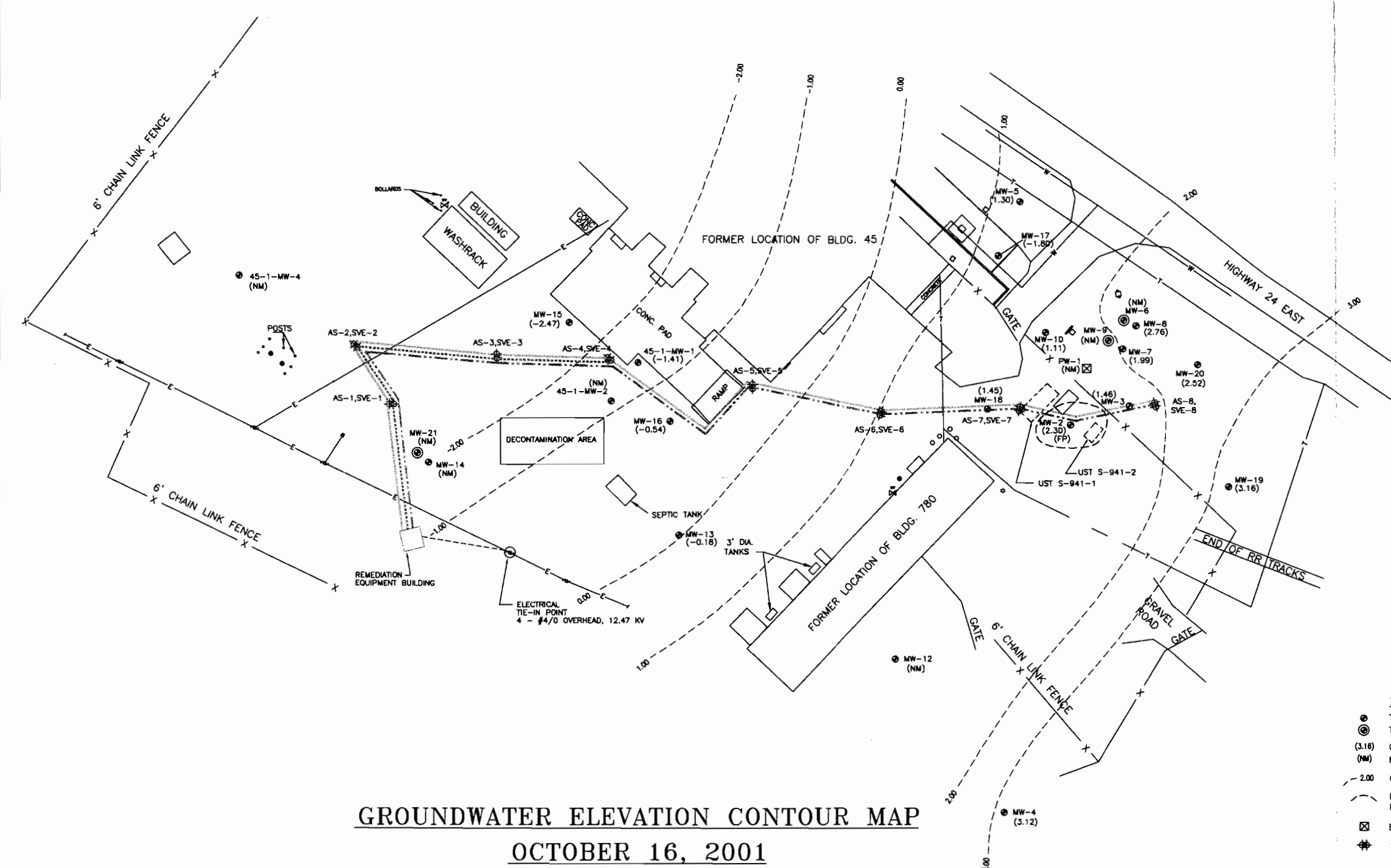


SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)
2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

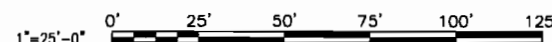
- LEGEND:**
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 - ⊙ TYPE III MONITORING WELL
 - (7.36) GROUNDWATER ELEVATION
 - (NM) NOT MEASURED
 - 2.00 GROUNDWATER CONTOUR
 - - - INTERPRETED AERIAL EXTENT OF FREE PRODUCT
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE WELL CLUSTER
 - ⊙ UTILITY POLE
 - ⊕ WATER VALVE
 - ⊙ MANHOLE
 - ⊕ FIRE HYDRANT
 - ⊙ LIGHT POLE
 - ELECTRICAL UTILITY LINE
 - WATER UTILITY LINE
 - TELEPHONE UTILITY LINE
 - SOIL VAPOR EXTRACTION LINE NO. 1
 - SOIL VAPOR EXTRACTION LINE NO. 2
 - AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NAVAL STATION BUILDING 45, UST S-941-1 AND 2 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA		J.A. JONES ENVIRONMENTAL SERVICES JACKSONVILLE, FLORIDA PROJECT NUMBER: NS62470-93-D-3033 DATE: 10/12/99 DRAWN BY: J.A. JONES CHECKED BY: J.A. JONES APPROVED BY: J.A. JONES	
CODE NO. 80091/SIZE D SCALE: 1"=50' EFD NO. STA. PROJ. NO. SPEC. NO. CONSTR. CONTR. NO.		NAVFAC DRAWING NO. SHEET 2 OF 18 2-2	



GROUNDWATER ELEVATION CONTOUR MAP
OCTOBER 16, 2001

GRAPHICS SCALE
IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



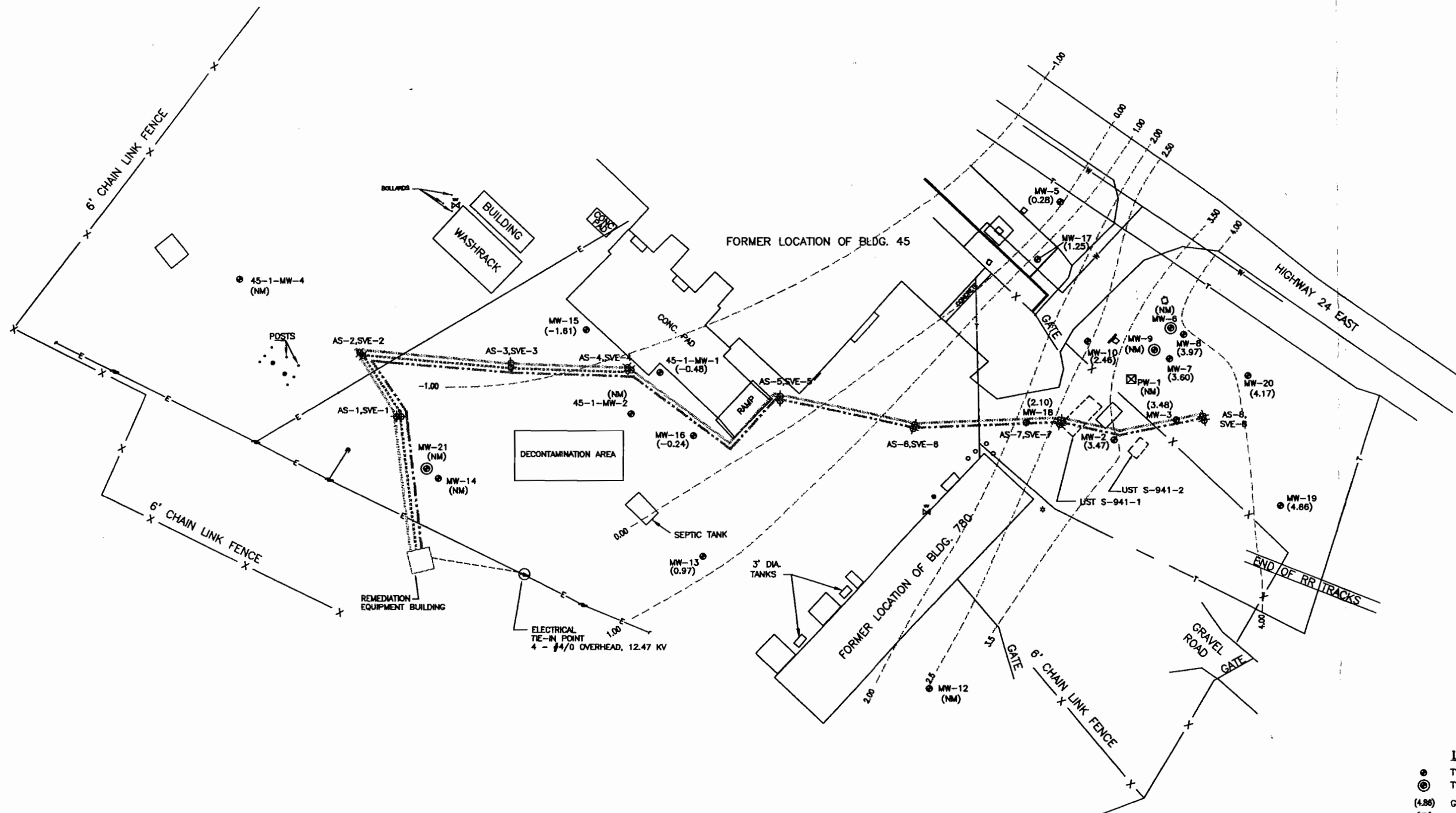
SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)
2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

- LEGEND:
- TYPE II MONITORING WELL
 - ⊙ TYPE III MONITORING WELL
 - (3.16) GROUNDWATER ELEVATION
 - (NM) NOT MEASURED
 - - - 2.00 GROUNDWATER CONTOUR
 - - - INTERPRETED AERIAL EXTENT OF FREE PRODUCT
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE
 - ⊙ WELL CLUSTER
 - ⊙ UTILITY POLE
 - ⊕ WATER VALVE
 - ⊙ MANHOLE
 - ⊕ FIRE HYDRANT
 - ⊕ LIGHT POLE
 - - - ELECTRICAL UTILITY LINE
 - - - WATER UTILITY LINE
 - - - TELEPHONE UTILITY LINE
 - SOIL VAPOR EXTRACTION LINE NO. 1
 - SOIL VAPOR EXTRACTION LINE NO. 2
 - AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND	
NAVAL STATION		ATLANTIC DIVISION NORFOLK, VIRGINIA	
ANNUAL MONITORING REPORT		BUILDING 45, UST S-941-1 AND 2	
CAMP LEJEUNE, NORTH CAROLINA		GROUNDWATER ELEVATION CONTOUR MAP - OCTOBER 16, 2001	
CODE NO. 00091	SIZE D	SCALE: 1"=50'	
EFD NO.	STA. PROJ. NO.		
SPEC. NO.	CONSTR. CONTR. NO.		
NAVFAC DRAWING NO.		SHEET 4 OF 18	
2-4		APPROVED BY	
DATE		REVISIONS	
SYMBOL		DESCRIPTION	

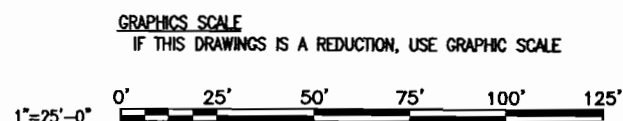




color?

GROUNDWATER ELEVATION CONTOUR MAP

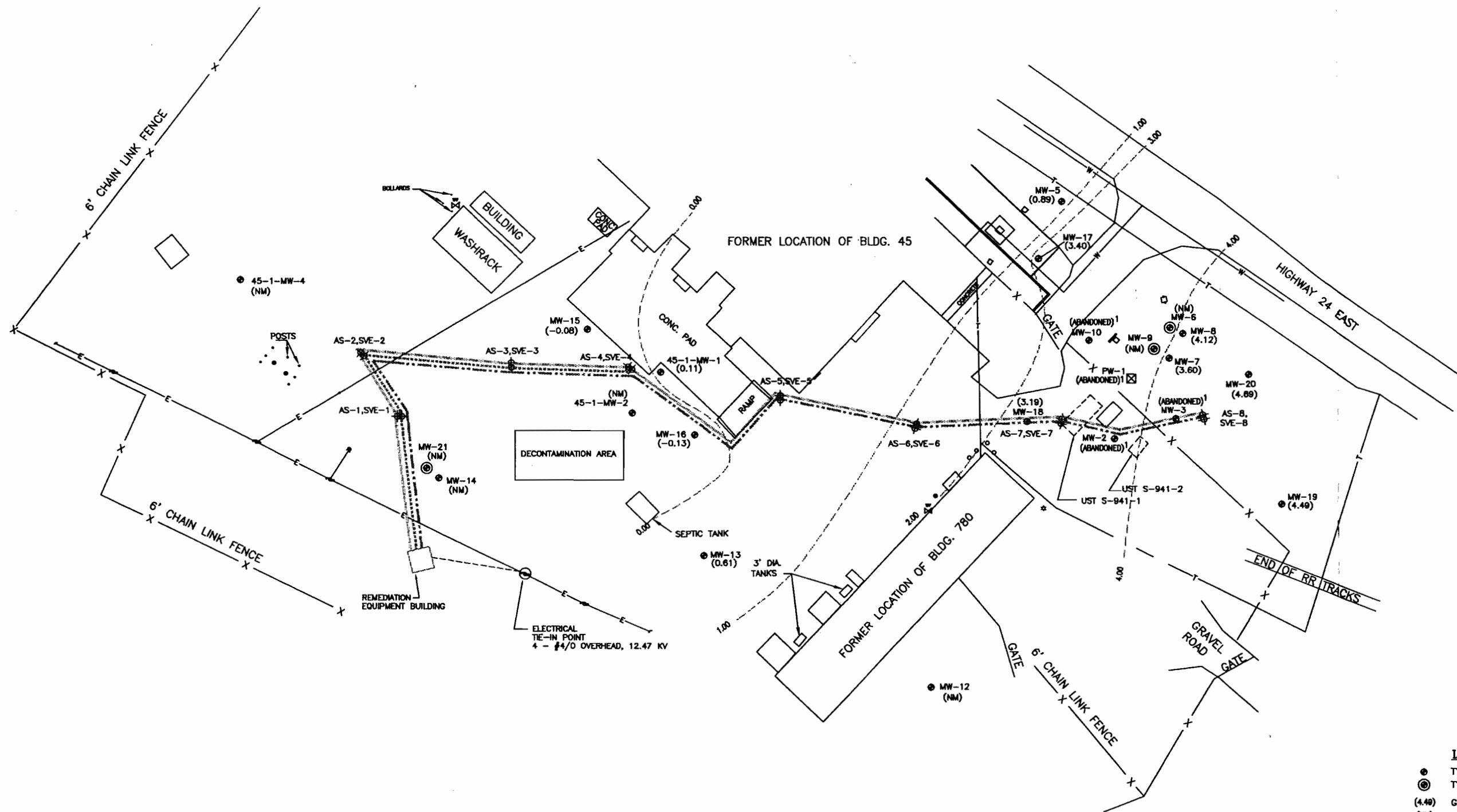
APRIL 17, 2002



- SURVEY NOTES:**
1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCSS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)
 2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

- LEGEND:**
- TYPE II MONITORING WELL
 - ⊙ TYPE III MONITORING WELL
 - (4.86) GROUNDWATER ELEVATION
 - (NM) NOT MEASURED
 - 2.00 GROUNDWATER CONTOUR
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE WELL CLUSTER
 - ⊙ UTILITY POLE
 - ⊕ WATER VALVE
 - MANHOLE
 - ⊕ FIRE HYDRANT
 - ⊕ LIGHT POLE
 - E- ELECTRICAL UTILITY LINE
 - W- WATER UTILITY LINE
 - T- TELEPHONE UTILITY LINE
 - SOIL VAPOR EXTRACTION LINE NO. 1
 - SOIL VAPOR EXTRACTION LINE NO. 2
 - AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND		ATLANTIC DIVISION		NORFOLK, VIRGINIA	
NAVAL STATION		ANNUAL MONITORING REPORT		BUILDING 45, UST S-941-1 AND 2		MARINE CORPS BASE	
CAMP LEJEUNE, NORTH CAROLINA		GROUNDWATER ELEVATION CONTOUR MAP - APRIL 17, 2002		CODE ID. NO. 80091		SIZE D	
SCALE: 1"=50'		STA. PROJ. NO.		SPEC. NO.		CONSTR. CONTR. NO.	
NAVFAC DRAWING NO.		SHEET 5 OF 18		2-5		REVISED	
DATE		DESCRIPTION		SYMBOL		APPROVED BY	
DATE		DESCRIPTION		SYMBOL		APPROVED BY	



color

GROUNDWATER ELEVATION CONTOUR MAP

JULY 17, 2002

SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCSS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)

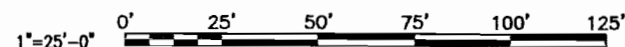
2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

NOTE:

1. MONITORING WELLS PW-1, MW-2, MW-3 AND MW-10 WERE ABANDONED DURING SOIL EXCAVATION ACTIVITIES BY SHAW ENVIRONMENTAL AND INFRASTRUCTURE IN JUNE 2002.

GRAPHICS SCALE

IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



- LEGEND:**
- TYPE II MONITORING WELL
 - ⊙ TYPE III MONITORING WELL
 - (4.40) GROUNDWATER ELEVATION
 - (NM) NOT MEASURED
 - 3.00 GROUNDWATER CONTOUR
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE WELL CLUSTER
 - ⊙ UTILITY POLE
 - ⊕ WATER VALVE
 - MANHOLE
 - ⊕ FIRE HYDRANT
 - ⊕ LIGHT POLE
 - ELECTRICAL UTILITY LINE
 - WATER UTILITY LINE
 - TELEPHONE UTILITY LINE
 - SOIL VAPOR EXTRACTION LINE NO. 1
 - SOIL VAPOR EXTRACTION LINE NO. 2
 - AIR SPARGE COMPRESSED AIR LINE

J.A. JONES
J.A. JONES & ASSOCIATES
INCORPORATED
1000 W. 10TH STREET
JACKSONVILLE, FLORIDA 32202



AGE CONTRACT NO. NE2470-03-D-3033

ACTIVITY - REMEDIATION

DATE - JULY 17, 2002

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL STATION
ATLANTIC DIVISION
NORFOLK, VIRGINIA

ANNUAL MONITORING REPORT
BUILDING 46, UST S-941-1 AND 2
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
GROUNDWATER ELEVATION CONTOUR MAP - JULY 17, 2002

CODE NO. 100001 SIZE D

SCALE: 1"=50'

STA. PROJ. NO.

SPEC. NO.

CONSTR. CONTR. NO.

NAVJAC DRAWING NO.

SHEET 6 OF 18

2-6

SECTION 3.0

ANALYTICAL SUMMARY

Groundwater monitoring well samples were collected once prior to treatment system start-up on April 16, 1998, monthly during the first quarter of treatment system operation from May 1998 through July 1998, and quarterly thereafter.

Groundwater samples were typically collected from groundwater monitoring wells, PW-01, MW-02, MW-03, MW-08, MW-09, MW-13 through MW-20, MW-01/4, and MW-04/4.

Where are these 2 wells on figs?

Groundwater samples were delivered by overnight carrier to Paradigm and analyzed for volatile aromatic hydrocarbons using USEPA Method 602 and polynuclear aromatic hydrocarbons using USEPA Method 610. A summary of the groundwater monitoring well sampling results is presented in **Table 3-1**. In addition, analytical results are presented graphically in **Figures 3-1** through **3-10**.

Volatile aromatic hydrocarbons were not detected in any of the groundwater samples collected from monitoring wells MW-04, MW-05, MW-08, MW-10, MW-12, MW-13, MW-14, MW-17, MW-19, and MW-20 during any of the sampling events conducted at the site from April 1998 through July 2002.

The following paragraphs provide a summary of volatile aromatic and PAHs detected above the 15A NCAC 2L groundwater quality standard from each monitoring well:

PW-1: Concentrations have been detected above the established 15A NCAC 2L groundwater quality standard of 1 micrograms per liter ($\mu\text{g/l}$) for benzene and 29 $\mu\text{g/l}$ for ethylbenzene at monitoring well PW-01. Benzene has been detected as high as 130 $\mu\text{g/l}$ while ethylbenzene was detected at a concentration of 31 $\mu\text{g/l}$ during the October 11, 2000 sampling event. Benzene and ethylbenzene were not detected above laboratory quantitation limits during the sampling event conducted on April 17, 2002.

The PAHs naphthalene, fluorene, 1-methylnaphthalene and 2-methylnaphthalene have exceeded the groundwater quality standards of 21 $\mu\text{g/l}$, the laboratory quantitation limit, laboratory quantitation limit, and 28 $\mu\text{g/l}$, respectively. The highest concentrations were observed during the July 18, 2000 sampling event where naphthalene, fluorene, 1-methylnaphthalene and 2-methylnaphthalene were detected at 48 $\mu\text{g/l}$, 40 $\mu\text{g/l}$, 240 $\mu\text{g/l}$, and 170 $\mu\text{g/l}$, respectively. All constituents were below laboratory quantitation limits during the sampling event conducted on April 17, 2002. Traces of LNAPL were recorded

in June 19, 2000 at this well. This well was abandoned in June 2002 as a result of excavation activities performed by Shaw at this location.

MW-02: The volatile aromatic hydrocarbons benzene and ethylbenzene were detected above the established 15A NCAC 2L standard of 1 µg/l and 29 µg/l, respectively. Concentrations of benzene in MW-02 fluctuated over the course of the sampling events ranging from 710 µg/l in the January 4, 1999 sampling event to 36 µg/l during the April 17, 2002 sampling event. Concentrations of ethylbenzene fluctuated over the course of the sampling events as well, ranging from below quantitation limits (BQL) in February 1, 2000 to 260 µg/l in July 18, 2000. Ethylbenzene was detected at 3 µg/l during the April 17, 2002 sampling event.

The PAHs naphthalene, acenaphthene, fluorene, phenanthrene, anthracene, pyrene, 1-methylnaphthalene, and 2-methylnaphthalene, were all detected above the established 15A NCAC 2L standards. Naphthalene, acenaphthene, fluorene, phenanthrene, anthracene, pyrene, and 1-methylnaphthalene were detected as high as 8,800 µg/l, 1,600 µg/l, 3,700 µg/l, 4,400 µg/l, 220 µg/l, 22,000 µg/l, and 27,000 µg/l, respectively, based on the January 31, 2001 sampling event. The sampling event conducted on April 17, 2002 had detected concentrations above established 15A NCAC 2L standards only for fluorene at 17 µg/l and 1-methylnaphthalene at 41 µg/l. All other analyzed PAHs were below established the 15A NCAC 2L standards.

LNAPL was recorded at this well through November 27, 2001. This well was abandoned in June of 2002 as a result of excavation activities performed by Shaw at this location.

MW-03: Benzene and ethylbenzene were detected above the established 15A NCAC 2L standard of 1 µg/l and 29 µg/l, respectively. Concentrations of benzene and have decreased from 390 µg/l on the April 12, 1999 sampling event to 55 µg/l on the April 17, 2002 sampling event. Concentrations of ethylbenzene decreased from 560 µg/l on the April 12, 1999 sampling event to 5µg/l during the April 17, 2002 sampling event.

The PAHs 1-methylnaphthalene and 2-methylnaphthalene were detected above the established 15A NCAC 2L groundwater quality standards. The concentrations of 1-methylnaphthalene and 2-methylnaphthalene have decreased from 2,500 µg/l and 3,400 µg/l detected on the April 12, 1999 sampling event, respectively, to below quantitation limits during the July 17, 2002 sampling event.

LNAPL was recorded at this well through August 9, 2001. This well was abandoned in June of 2002 as a result of excavation activities performed by Shaw at this location.

MW-09: Benzene was detected in monitoring well MW-09 ranging from BQL in late 1998 and early 1999 to 19 µg/l in April 17, 2002. Benzene was detected at a concentration of 15 µg/l during the July 17, 2002 sampling event, which is above the established 15A NCAC 2L standard of 1 µg/l.

MW-10: The VOC benzene was detected as high as 24 µg/l during the July 17, 1998 groundwater monitoring well sampling event. The detected concentration of benzene decreased to BQL for the last seven sampling events. This well was abandoned in June of 2002 as a result of excavation activities performed by Shaw at this location.

MW-15: The VOCs benzene, ethylbenzene, toluene, and total xylene were detected in the groundwater sample collected from monitoring well MW-15 during the May 14, 1998 sampling event at concentrations of 2,000 µg/l, 920 µg/l, 1,700 µg/l, and 3,550 µg/l, respectively. Similarly, the PAH naphthalene was detected at concentrations ranging from 31 µg/l to 120 µg/l during the sampling events. Persistently high detectable concentrations of VOCs were observed during 1998, 1999, and 2000. Concentrations of VOCs and PAHs were not detected above laboratory quantitation limits in groundwater samples collected from monitoring well MW-15 during the July 17, 2002 sampling event.

MW-16: The PAH naphthalene was detected in monitoring well MW-16 at 39 µg/l during the April 14, 1998 sampling event. PAHs have not been detected above laboratory quantitation limits in subsequent sampling events.

MW-18: Benzene was detected as high as 56 µg/l during the July 17, 1998 sampling event, but has decreased to below laboratory quantitation limits in subsequent sampling events.

MW-01/4: Benzene was detected in monitoring well MW-01/4 during the first, second, and third quarter 1999 sampling events. Concentrations of benzene in all three of these quarters were above or equal to the established 15A NCAC 2L standard of 1 µg/l but decreased to below laboratory quantitation limits in subsequent sampling events.

MW-04/4: Benzene was detected in monitoring well MW-04/4 during the October 14, 1998 sampling event. The concentration of benzene in this quarter was equal to the established 15A NCAC 2L standard of 1 µg/l. Subsequent sampling events did not detect any VOCs or PAHs above the laboratory quantitation limits.

Table 3-1 presents a summary of the detected contaminant concentrations in the groundwater samples collected from the on-site groundwater monitoring wells during the sampling events. **Appendix B** provides the laboratory analytical data from the groundwater monitoring well sampling events.

Dissolved contaminant plume isopleth maps, which present the distribution of the volatile aromatic hydrocarbons and the polynuclear aromatic hydrocarbons detected above the 15A NCAC 2L groundwater quality standards, are presented in **Figures 3-1 through 3-12**.

During each of the groundwater sample collection events conducted from April 16, 1998 through July 17, 2002, an air quality sample was collected from the SVE system effluent

or from an SVE system branch. Each air quality sample was delivered by overnight carrier to Paradigm and analyzed for volatile aromatic hydrocarbons using USEPA Method 18.

Volatile aromatic hydrocarbons were detected above laboratory quantitation limits in two of the air quality samples collected from the SVE system from April 16, 1998 through April 10, 2002. During the April 16, 1998 sampling event, which occurred on the first day of start-up, there was a total xylenes concentration of 17 milligrams per cubic meter (mg/m^3). On June 19, 1998, total xylenes were detected at a concentration of $0.3 \text{ mg}/\text{m}^3$. VOCs were not detected during subsequent sampling events. Dilution air is added as the airflow passes through the moisture separator tank in order to reduce total system vacuum and prevent the collection of groundwater in the treatment system. Due to the addition of dilution air to the SVE system effluent, recovered concentrations of VOCs may not be detected above the laboratory quantitation limits in the samples collected. Therefore, the concentrations of VOCs recovered appear to be zero. For this reason, J.A. Jones began in April 2001 collecting air quality samples from the SVE wells prior to the addition of dilution air in order to obtain a more accurate measurement of VOCs recovered during system operation. Each SVE well had a sample port installed, so no system modification was necessary. The sample results had concentrations below laboratory quantitation limit levels. The treatment system air quality sample has been collected from a sampling port located prior to the addition of dilution air since October 2001. Again, the sampling port was pre-existing so no system modification was necessary. **Table 3-2** presents a summary of the detected contaminant concentrations in the air quality samples collected from the soil vapor extraction system. **Appendix C** provides the laboratory analytical data from the air quality sampling events.

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		PW-01					
		Sample ID	Sample Date	UST45/S941-PW1-02A	UST45/S941-PW1-02A	UST45/S941-PW1-01D	UST45/S941-PW1-01C	UST45/S941-PW1-01B	UST45/S941-PW1-01A
Volatile Aromatic Hydrocarbons <i>by USEPA Method 602, ug/L</i>									
Benzene	1			BQL	13	25	100	60	1/31/2001
Ethylbenzene	29			BQL	BQL	2	22	7	5
Toluene	1,000			BQL	BQL	BQL	6	2	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	13	5	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21			BQL	BQL	BQL	12	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	23	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- * Duplicate sample taken from monitoring well MW-15.
- * Duplicate sample taken from monitoring well MW-18.
- * Duplicate sample taken from monitoring well MW-10
- * Duplicate sample taken from monitoring well MW-2.
- * Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
- Shaded areas indicate detected concentrations above laboratory quantization limits.
- BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		PW-01							
		Sample ID	Sample Date	UST45/S941-PW1-00D	UST45/S941-PW1-00C	UST45/S941-PW1-00B	UST45/S941-PW1-00A	UST45/S941-PW1-99D	UST45/S941-PW1-99C		
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999		
Benzene	1			130	23	61	35	110	82		
Ethylbenzene	29			31	3	9	10	30	14		
Toluene	1,000			BQL	BQL	2	3	13	17		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			BQL	2	BQL	2	BQL	11		
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>											
Naphthalene	21			11	48	BQL	BQL	19	BQL		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit			BQL	40	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100			BQL	98	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit			11	240	BQL	BQL	12	BQL		
2-Methylnaphthalene	28			BQL	170	BQL	BQL	BQL	BQL		

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		PW-01					
		Sample ID	Sample Date	UST45/S941-PW1-99B	UST45/S941-PW1-99A	UST45/S941-PW1-98D	UST45/S941-PW1-98C1	UST45/S941-PW1-98B3	
<i>Volatle Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>									
Benzene	1			4/12/1999	1/4/1999	10/14/1998	7/17/1998	6/22/1998	
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21								
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	
Pyrene	210			BQL	BQL	BQL	BQL	BQL	
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 1 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location		MW-02								
			Sample ID	Sample Date	UST45/S941-MW2-02A	UST45/S941-MW2-02A	UST45/S941-MW2-01D	UST45/S941-MW2-01C	UST45/S941-MW2-01B	UST45/S941-MW2-01A	UST45/S941-MW2-00D	UST45/S941-MW2-00C	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L		Regulatory Limit											
	Benzene	1	36	200	1/16/2002	10/16/2001	7/17/2001	4/16/2001	1/31/2001		10/11/2000		7/18/2000
	Ethylbenzene	29	3	4		13	100	79	79		61		260
	Toluene	1,000	2	BQL		3	31	13	12		9		69
	Methyl-tert-butyl ether	200	3	8		3	BQL	BQL	BQL		BQL		BQL
	Total Xylenes	530	BQL	BQL		11	240	41	171		24		633
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L													
	Naphthalene	21	BQL	BQL		150	540	60	8,800		93		3,300
	Acenaphthylene	210	BQL	BQL		BQL	BQL	BQL	BQL		BQL		BQL
	Acenaphthene	80	BQL	BQL		BQL	84	BQL	1,200		16		290
	Fluorene	Detection Limit	17	BQL		72	120	14	3,000		35		1,000
	Phenanthrene	Detection Limit	BQL	BQL		140	200	15	4,400		65		2,000
	Anthracene	2,100	29	BQL		BQL	BQL	BQL	BQL		BQL		BQL
	Pyrene	210	11	BQL		BQL	BQL	BQL	BQL		12		220
	1-Methylnaphthalene	Detection Limit	41	BQL		410	650	160	22,000		360		8,200
	2-Methylnaphthalene	28	28	BQL		600	960	60	27,000		190		9,000

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table 3.3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location	MW-02							
			Sample ID	UST45/S941-MW2-00B	UST45/S941-MW2-00A	UST45/S941-MW2-99D	UST45/S941-MW2-99C	UST45/S941-MW2-99B	UST45/S941-MW2-99A	UST45/S941-MW2-98D	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L		Regulatory Limit	Sample Date		4/12/2000	2/1/2000	10/12/1999	7/12/1999	4/12/1999	1/4/1999	10/14/1998
	Benzene	1		170		350	410	650	400	710	480
	Ethylbenzene	29		31		BQL	85	120	100	BQL	33
	Toluene	1,000		BQL		BQL	81	100	37	56	BQL
	Methyl-tert-butyl ether	200		BQL		BQL	BQL	BQL	BQL	BQL	BQL
	Total Xylenes	530		63		BQL	150	90	230	BQL	50
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
	Naphthalene	21		5,200		340	3,900	270	1,100	110	140
	Acenaphthylene	210		BQL		BQL	BQL	19	BQL	BQL	BQL
	Acenaphthene	80		1,600		110	720	36	BQL	BQL	BQL
	Fluorene	Detection Limit		3,700		210	BQL	66	300	14	71
	Phenanthrene	Detection Limit		4,900		360	3,100	140	520	17	91
	Anthracene	2,100		BQL		BQL	BQL	BQL	BQL	17	BQL
	Pyrene	210		BQL		55	BQL	20	BQL	BQL	BQL
	1-Methylnaphthalene	Detection Limit		17,000		1,200	12,000	470	2,600	160	450
	2-Methylnaphthalene	28		19,000		1,000	11,000	470	3,000	60	370

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantization limits.
 BQL = Below Laboratory Quantization Limit

Table (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-03					
		Sample ID	Sample Date	UST45/S941-MW3-02A	UST45/S941-MW3-02A	UST45/S941-MW3-01D	UST45/S941-MW3-01C	UST45/S941-MW3-01B	UST45/S941-MW3-01A
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L				4/17/2002	1/16/2002	10/16/2001	7/17/2001	4/16/2001	1/31/2001
Benzene	1			55	13	11	150	44	38
Ethylbenzene	29			5	1	BQL	33	17	12
Toluene	1,000			BQL	BQL	BQL	7	16	13
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	42	51	34
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-03					
		Sample ID	Sample Date	UST45/S941-MW3-00D	UST45/S941-MW3-00C	UST45/S941-MW3-00B	UST45/S941-MW3-00A	UST45/S941-MW3-99D	UST45/S941-MW3-99C
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999
Benzene	1			21	17	23	17	13	59
Ethylbenzene	29			4	34	4	7	3	22
Toluene	1,000			2	2	BQL	1	1	31
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			10	82	3	16	5	95
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21			BQL	17	BQL	BQL	BQL	13
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			14	47	BQL	15	BQL	28
2-Methylnaphthalene	28			15	62	BQL	23	BQL	42

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location		MW-03						
			Sample ID	Sample Date	UST45/S941-MW3-99B	UST45/S941-MW3-99A	UST45/S941-MW3-98D	UST45/S941-MW3-98C1	UST45/S941-MW3-98B3		
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L							4/12/1999	1/14/1999	10/14/1998	7/17/1998	6/22/1998
	Benzene	1			390	61	58	17	44		
	Ethylbenzene	29			560	26	BQL	8	7		
	Toluene	1,000			550	BQL	BQL	BQL	BQL		
	Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL		
	Total Xylenes	530			2,050	65	BQL	8	BQL		
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
	Naphthalene	21			950	BQL	BQL	BQL	BQL		
	Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL		
	Acenaphthene	80			BQL	BQL	BQL	BQL	BQL		
	Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL		
	Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL		
	Anthracene	2,100			BQL	BQL	BQL	BQL	BQL		
	Pyrene	210			BQL	BQL	BQL	BQL	BQL		
	1-Methylnaphthalene	Detection Limit			2,500	BQL	BQL	12	BQL		
	2-Methylnaphthalene	28			3,400	11	BQL	11	BQL		

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituents.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-05		
		Sample ID	Sample Date	UST45/S941-MW5-98C1	UST45/S941-MW5-98B3	UST45/S941-MW5-98B2
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L						
Benzene	1			BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L						
Naphthalene	21			BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-08						
		Sample ID	Sample Date	UST45/S941-MW8-02A	UST45/S941-MW8-02A	UST45/S941-MW8-02A	UST45/S941-MW8-01D	UST45/S941-MW8-01C	UST45/S941-MW8-01B	UST45/S941-MW8-01
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Regulatory Limit			7/17/2002	4/17/2002	1/16/2002	10/16/2001	7/17/2001	4/16/2001	1/31/2001
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L										
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-08					
		Sample ID	Sample Date	UST45/S941-MW8-00D	UST45/S941-MW8-00C	UST45/S941-MW8-00B	UST45/S941-MW8-00A	UST45/S941-MW8-99D	UST45/S941-MW8-99C
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>									
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 N/A indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-08					
		Sample ID	Sample Date	UST45/S941-MW8-99B	UST45/S941-MW8-99A	UST45/S941-MW8-98D	UST45/S941-MW8-98C1	UST45/S941-MW8-98B3	UST45/S941-MW8-98B2
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, µg/L</i>									
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, µg/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR Regulatory Limit	Sample Location		MW-09									
Sample ID			UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-01D	UST45/S941-MW9-01C	UST45/S941-MW9-01B	UST45/S941-MW9-01A	UST45/S941-MW9-00D				
Sample Date		UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A	UST45/S941-MW9-02A			
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Benzene	15	19	15	13	15	12	10	10/11/2000					
	Ethylbenzene	BQL	1	BQL	BQL	BQL	BQL	BQL						
	Toluene	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
	Methyl-tert-butyl ether	12	10	9	7	4	11	15						
	Total Xylenes	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L														
Naphthalene	21	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Acenaphthylene	210	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Acenaphthene	80	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Fluorene	Detection Limit	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Phenanthrene	Detection Limit	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Anthracene	2,100	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
Pyrene	210	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
1-Methylnaphthalene	Detection Limit	BQL	BQL	BQL	BQL	BQL	BQL	BQL						
2-Methylnaphthalene	28	BQL	BQL	BQL	BQL	BQL	BQL	BQL						

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-09							
		Sample ID	Sample Date	UST45/S941-MW9-00C	UST45/S941-MW9-00B	UST45/S941-MW9-00A	UST45/S941-MW9-99D	UST45/S941-MW9-99C	UST45/S941-MW9-99B	UST45/S941-MW9-99A	UST45/S941-MW9-98D
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Regulatory Limit										
	1			7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999	4/12/1999	1/14/1999	10/14/1998
				11	11	11	5	7	3		
	29			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
	1,000			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			17	7	6	5	10	45	45	16
				BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530										
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-10							
		Sample ID	Sample Date	UST45/S941-MW10-02A	UST45/S941-MW10-02A	UST45/S941-MW10-01D	UST45/S941-MW10-01C	UST45/S941-MW10-01B	UST45/S941-MW10-01A		
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>											
Benzene	1			4/17/2002	1/16/2002	10/16/2001	7/17/2001	4/16/2001	1/31/2001		
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL		
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL		
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>											
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL		

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantization limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-10					
		Sample ID	Sample Date	UST45/S941-MW10-00D	UST45/S941-MW10-00C	UST45/S941-MW10-00B	UST45/S941-MW10-00A	UST45/S941-MW10-99D	UST45/S941-MW10-99C
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999
Benzene	1			BQL	7	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	4	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NC DENR Regulatory Limit	Sample Location		MW-10							
		Sample ID	Sample Date	UST45/S941-MW10-99B	UST45/S941-MW10-99A1	UST45/S941-MW10-98D	UST45/S941-MW10-98C1	UST45/S941-MW10-98B3	UST45/S941-MW10-98B2		
Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L											
Benzene	1			BQL	BQL	BQL	24	1	BQL		
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL		
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL		
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL		
1-Methyl/naphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
2-Methyl/naphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL		

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID	MW-12			
			UST45/S941-MW12-98C1	UST45/S941-MW12-98B3	UST45/S941-MW12-98B2	UST45/S941-MW12-98B1
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>						
Benzene	1		7/17/1998	6/22/1998	5/14/1998	4/14/1998
Ethylbenzene	29		BQL	BQL	BQL	BQL
Toluene	1,000		BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>						
Naphthalene	21		BQL	BQL	BQL	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- N/A indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table S-1 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-13							
		Sample ID	Sample Date	UST45/S941-MW13-02A	UST45/S941-MW13-02A	UST45/S941-MW13-02A	UST45/S941-MW13-01C	UST45/S941-MW13-01B	UST45/S941-MW13-01A		
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				7/17/2002	4/17/2002	1/16/2002	7/17/2001	4/16/2001	1/31/2001		
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL		
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL		
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL		
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>											
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL		

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-13					
			UST45/S941-MW13-00D	UST45/S941-MW13-00C	UST45/S941-MW13-00B	UST45/S941-MW13-00A	UST45/S941-MW13-99D	UST45/S941-MW13-99C
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>								
Benzene	1		BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29		BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000		BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	8	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>								
Naphthalene	21		BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-13
		Sample ID	Sample Date	
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>	Regulatory Limit			
Benzene	1		6/22/1998	5/14/1998
Ethylbenzene	29		BQL	BQL
Toluene	1,000		BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL
Total Xylenes	530		BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>				
Naphthalene	21		BQL	BQL
Acenaphthylene	210		BQL	BQL
Acenaphthene	80		BQL	BQL
Fluorene	Detection Limit		BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL
Anthracene	2,100		BQL	BQL
Pyrene	210		BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL
2-Methylnaphthalene	28		BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
- ² Duplicate sample taken from monitoring well MW-18.
- ³ Duplicate sample taken from monitoring well MW-10.
- ⁴ Duplicate sample taken from monitoring well MW-2.
- ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
- Shaded areas indicate detected concentrations above laboratory quantitation limits.
- BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-14							
		Sample ID	Sample Date	UST45/S941-MW14-01C	UST45/S941-MW14-01C	UST45/S941-MW14-01C	UST45/S941-MW14-01B	UST45/S941-MW14-01A	UST45/S941-MW14-00D	UST45/S941-MW14-00C	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L											
Benzene	1			7/17/2002	4/17/2002	7/17/2001	4/16/2001	1/31/2001	10/11/2000	7/18/2000	
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL	
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL	BQL	

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location		MW-14						
		Regulatory Limit	Sample ID	Sample Date	UST45/S941-MW14-00B	UST45/S941-MW14-00A	UST45/S941-MW14-99D	UST45/S941-MW14-99C	UST45/S941-MW14-99B	UST45/S941-MW14-99A	UST45/S941-MW14-98C1
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L					4/12/2000	2/1/2000	10/12/1999	7/12/1999	4/12/1999	1/14/1999	10/14/1998
Benzene		1			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene		29			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Toluene		1,000			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether		200			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes		530			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
Naphthalene		21			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene		210			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene		80			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Fluorene		Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene		Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Anthracene		2,100			BQL	BQL	BQL	BQL	BQL	BQL	BQL
Pyrene		210			BQL	BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene		Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene		28			BQL	BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-14		
		Sample ID	Sample Date	UST45/S941-MW14-98B2	UST45/S941-MW14-98B3	UST45/S941-MW14-98B1
<i>Volatle Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>						
Benzene	1			7/17/1998	6/22/1998	5/14/1998
Ethylbenzene	29			BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>						
Naphthalene	21			BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table 2 (continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location Sample ID Sample Date		MW-15										
					UST45/S941-MW15-02A	UST45/S941-MW15-02A	UST45/S941-MW15-02A	UST45/S941-MW15-01D	UST45/S941-MW15-01D	UST45/S941-MW15-01C	UST45/S941-MW15-01B	UST45/S941-MW15-01A			
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L					Regulatory Limit										
	Benzene	1			7/17/2002	4/17/2002	5	BQL	1/16/2002	11/5/2001	10/16/2001	7/17/2001	4/16/2001		1/31/2001
	Ethylbenzene	29			BQL	BQL	BQL	5	BQL	NA	BQL	BQL	2		2
	Toluene	1,000			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		BQL
	Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		BQL
	Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L															
	Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL
	2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL		BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID		MW-15							
		Sample Date		UST45/S941-MW15-00D	UST45/S941-MW15-00C	UST45/S941-MW15-00B	UST45/S941-MW15-00A	UST45/S941-MW15-99D	UST45/S941-MW15-99C		
<i>Volatle Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				10/11/2000	7/18/2000	4/12/2000	3/7/2000	10/12/1999	7/28/1999		
Benzene	1			6	61	160	130	1,800	890		
Ethylbenzene	29			BQL	25	250	160	1,000	420		
Toluene	1,000			BQL	BQL	BQL	BQL	4,200	480		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			BQL	BQL	140	100	5,410	3,200		
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>											
Naphthalene	21			BQL	28	23	21	120	85		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL		
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	16	BQL		
				BQL	BQL	BQL	BQL	26	BQL		

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-15							
			UST45/S941-MW15-99B	UST45/S941-MW15-99A	UST45/S941-MW15-98C1	UST45/S941-MW15-98B3	UST45/S941-MW15-98B2	UST45/S941-MW15-98B1		
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L										
Benzene	1		4/12/1999	1/14/1999	10/14/1998	7/17/1998	6/22/1998	5/14/1998		
Ethylbenzene	29		180	720	660	990	870	1,500	2,000	
Toluene	1,000		220	BQL	BQL	870	1,100	1,700		
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Total Xylenes	530		900	4,400	3,730	4,330	4,010	3,550		
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L										
Naphthalene	21		71	85	67	45	31	27		
Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL		
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL		
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL		
2-Methylnaphthalene	28		14	15	BQL	BQL	BQL	BQL		

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table 3 (continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-16											
		Regulatory Limit	Sample Date	Sample ID	UST45/S941-MW16-02A	UST45/S941-MW16-02A	UST45/S941-MW16-01D	UST45/S941-MW16-01D	UST45/S941-MW16-01C	UST45/S941-MW16-01B					
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L															
Benzene	1			7/17/2002	BQL	BQL	4/17/2002	BQL	BQL	10/16/2001	7/17/2001	BQL	4/16/2001		UST45/S941-MW16-01A
Ethylbenzene	29				BQL	BQL	BQL	BQL	NA	NA	11/5/2001	BQL	BQL	BQL	BQL
Toluene	1,000				BQL	BQL	BQL	BQL	NA	NA		BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200				BQL	BQL	BQL	BQL	NA	NA		BQL	BQL	BQL	BQL
Total Xylenes	530				BQL	BQL	BQL	BQL	NA	NA		BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L															
Naphthalene	21				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Acenaphthylene	210				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Acenaphthene	80				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Fluorene	Detection Limit				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Phenanthrene	Detection Limit				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Anthracene	2,100				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
Pyrene	210				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
1-Methylnaphthalene	Detection Limit				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL
2-Methylnaphthalene	28				BQL	BQL	BQL	BQL	BQL	BQL		NA	NA	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantization limits.

BQL = Below Laboratory Quantization Limit

Table 1 (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-16					
			UST45/S941-MW16-00D	UST45/S941-MW16-00C	UST45/S941-MW16-00B	UST45/S941-MW16-00A	UST45/S941-MW16-99D	UST45/S941-MW16-99C
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>								
Benzene	1		BQL	BQL	BQL	BQL	NA	BQL
Ethylbenzene	29		BQL	BQL	BQL	BQL	NA	BQL
Toluene	1,000		BQL	BQL	BQL	BQL	NA	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	NA	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL	NA	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>								
Naphthalene	21		BQL	BQL	BQL	BQL	NA	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL	NA	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	NA	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	NA	BQL
Pyrene	210		BQL	BQL	BQL	BQL	NA	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	NA	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-16					
			UST45/S941-MW16-99B	UST45/S941-MW16-99A	UST45/S941-MW16-98C1	UST45/S941-MW16-98B3	UST45/S941-MW16-98B1	UST45/S941-MW16-98D
<i>Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>			4/12/1999	1/14/1999	10/14/1998	7/17/1998	5/14/1998	4/14/1998
Benzene	1		BQL	BQL	BQL	BQL	BQL	1,400
Ethylbenzene	29		BQL	BQL	BQL	BQL	BQL	610
Toluene	1,000		BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	3	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	2,500
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>								
Naphthalene	21		BQL	BQL	BQL	BQL	BQL	39
Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-17								
		Sample ID	Sample Date	UST45/S941-MW17-02A	UST45/S941-MW17-02A	UST45/S941-MW17-02A	UST45/S941-MW17-01D	UST45/S941-MW17-01D	UST45/S941-MW17-01C	UST45/S941-MW17-01B	UST45/S941-MW17-01A	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Regulatory Limit			7/17/2002	4/17/2002	1/16/2002		11/5/2001	10/16/2001	7/17/2001	4/16/2001	1/31/2001
Benzene	1			BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L												
Naphthalene	21			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantization limits.
BQL = Below Laboratory Quantitation Limit

Table 1 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-17						
		Sample ID	Sample Date	UST45/S941-MW17-00D	UST45/S941-MW17-00C	UST45/S941-MW17-00B	UST45/S941-MW17-00A	UST45/S941-MW17-99D	UST45/S941-MW17-99C	UST45/S941-MW17-99B
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>										
Benzene	1			BQL	BQL	BQL	BQL	NA	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	NA	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	NA	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	NA	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	NA	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>										
Naphthalene	21			BQL	BQL	BQL	BQL	NA	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	NA	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	NA	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	NA	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	NA	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	NA	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location	MW-17						
		Sample ID	UST45/S941-MW17-99A	UST45/S941-MW17-98C1	UST45/S941-MW17-98B3	UST45/S941-MW17-98B2	UST45/S941-MW17-98B1	UST45/S941-MW17-98D	
Regulatory Limit			Sample Date	1/14/1999	10/14/1998	7/17/1998	6/22/1998	5/14/1998	4/14/1998
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Benzene	1		BQL	BQL	BQL	BQL	BQL	BQL
	Ethylbenzene	29		BQL	BQL	BQL	BQL	BQL	BQL
	Toluene	1,000		BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	BQL	BQL	BQL
	530		BQL	BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes									
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L	Naphthalene	21		BQL	BQL	BQL	BQL	BQL	BQL
	Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL
	Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-18							
			UST45/S941-MW18-02A	UST45/S941-MW18-02A	UST45/S941-MW18-02A	UST45/S941-MW18-01D	UST45/S941-MW18-01D	UST45/S941-MW18-01C	UST45/S941-MW18-01B	UST45/S941-MW18-01A
Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L										
Benzene	1		7/17/2002	4/17/2002	1/16/2002	11/5/2001	10/16/2001	7/17/2001	4/16/2001	1/31/2001
Ethylbenzene	29		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Toluene	1,000		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		7	7	5	NA	5	5	5	5
Total Xylenes	530		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L										
Naphthalene	21		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	18	BQL	NA	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Pyrene	210		BQL	BQL	21	BQL	NA	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL

Notes:¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-18					
		Sample ID	Sample Date	UST45/S941-MW18-00D	UST45/S941-MW18-00C	UST45/S941-MW18-00B	UST45/S941-MW18-00A	UST45/S941-MW18-99D	UST45/S941-MW18-99C
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, µg/L</i>									
Benzene	1			BQL	BQL	BQL	BQL	10/12/1999	7/12/1999
Ethylbenzene	29			BQL	BQL	BQL	BQL	NA	4
Toluene	1,000			BQL	BQL	BQL	BQL	NA	BQL
Methyl-tert-butyl ether	200			4	6	8	5	NA	14
Total Xylenes	530			BQL	BQL	BQL	BQL	NA	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, µg/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	NA	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	NA	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	NA	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	NA	BQL
Pyrene	210			BQL	BQL	BQL	BQL	NA	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	NA	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	NA	BQL

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-18					
		Sample ID	Sample Date	UST45/S941-MW18-99B	UST45/S941-MW18-99A	UST45/S941-MW18-98C1	UST45/S941-MW18-98B3	UST45/S941-MW18-98B2	UST45/S941-MW18-98B1
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>									
Benzene	1			13	18	29	56	91	76
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			10	15	16	20	20	20
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table (continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location		MW-19									
Sample ID					UST45/S941-MW19-02A	UST45/S941-MW19-02A	UST45/S941-MW19-02A	UST45/S941-MW19-02A	UST45/S941-MW19-01D	UST45/S941-MW19-01D	UST45/S941-MW19-01C	UST45/S941-MW19-01B	UST45/S941-MW19-01A	
Sample Date		Regulatory Limit			7/17/2002	4/17/2002	1/16/2002	11/5/2001	10/16/2001	7/17/2001	4/16/2001	1/31/2001		
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Benzene	1			BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL		
	Ethylbenzene	29			BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL		
	Toluene	1,000			BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL		
	Methyl-tert-butyl ether	200			BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL		
	Total Xylenes	530			BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL		
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L														
Naphthalene	21				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Acenaphthylene	210				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Acenaphthene	80				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Fluorene	Detection Limit				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Phenanthrene	Detection Limit				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Anthracene	2,100				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
Pyrene	210				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		
2-Methylnaphthalene	28				BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL		

Notes

- ¹ Duplicate sample taken from monitoring well MW-15.
- ² Duplicate sample taken from monitoring well MW-18.
- ³ Duplicate sample taken from monitoring well MW-10.
- ⁴ Duplicate sample taken from monitoring well MW-2.
- ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
- Shaded areas indicate detected concentrations above laboratory quantitation limits.
- BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-19					
		Sample ID	Sample Date	UST45/S941-MW19-00D	UST45/S941-MW19-00C	UST45/S941-MW19-00B	UST45/S941-MW19-00A	UST45/S941-MW19-99D	UST45/S941-MW19-99C
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L									
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3-5 (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		MW-19					
		Sample ID	Sample Date	UST45/S941-MW19-99B	UST45/S941-MW19-99A	UST45/S941-MW19-98C1	UST45/S941-MW19-98B3	UST45/S941-MW19-98B2	UST45/S941-MW19-98B1
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>				4/12/1999	1/14/1999	10/14/1998	7/17/1998	6/22/1998	5/14/1998
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
- ² Duplicate sample taken from monitoring well MW-18.
- ³ Duplicate sample taken from monitoring well MW-10.
- ⁴ Duplicate sample taken from monitoring well MW-2.
- ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that this sample was not analyzed for the constituent.
- Shaded areas indicate detected concentrations above laboratory quantitation limits.
- BQL = Below Laboratory Quantitation Limit.

Table 3 (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-20							
			UST45/S941-MW20-02A	UST45/S941-MW20-02A	UST45/S941-MW20-02A	UST45/S941-MW20-01D	UST45/S941-MW20-01D	UST45/S941-MW20-01C	UST45/S941-MW20-01B	UST45/S941-MW20-01A
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L										
Benzene	1		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Ethylbenzene	29		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Toluene	1,000		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L										
Naphthalene	21		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	MW-20					
			UST45/S941-MW20-00D	UST45/S941-MW20-00C	UST45/S941-MW20-00B	UST45/S941-MW20-00A	UST45/S941-MW20-99D	UST45/S941-MW20-99C
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L			10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999
	Benzene	1	BQL	BQL	BQL	BQL	BQL	BQL
	Ethylbenzene	29	BQL	BQL	BQL	BQL	BQL	BQL
	Toluene	1,000	BQL	BQL	BQL	BQL	BQL	BQL
	Methyl-tert-butyl ether	200	BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L								
	Naphthalene	21	BQL	BQL	BQL	BQL	BQL	BQL
	Acenaphthylene	210	BQL	BQL	BQL	BQL	BQL	BQL
	Acenaphthene	80	BQL	BQL	BQL	BQL	BQL	BQL
	Fluorene	Detection Limit	BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDEMR Regulatory Limit	Sample Location		MW-20					
		Sample ID	Sample Date	UST45/S941-MW20-99B	UST45/S941-MW20-99A	UST45/S941-MW20-98C1	UST45/S941-MW20-98B3	UST45/S941-MW20-98B2	UST45/S941-MW20-98B1
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L									
Benzene	1			BQL	BQL	BQL	BQL	BQL	BQL
Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	BQL
Toluene	1,000			BQL	BQL	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 2 (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR Regulatory Limit	Sample Location		MW-01/4									
			Sample ID	Sample Date	UST45/S941-MW01/4-02A	UST45/S941-MW01/4-02A	UST45/S941-MW01/4-01D	UST45/S941-MW01/4-01D	UST45/S941-MW01/4-01C	UST45/S941-MW01/4-01B	UST45/S941-MW01/4-01A			
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L							7/17/2002	4/17/2002	1/16/2002	11/5/2001	10/16/2001	7/17/2001	4/16/2001	1/31/2001
	Benzene	1			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
	Ethylbenzene	29			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
	Toluene	1,000			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
	Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
	Total Xylenes	530			BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L														
	Naphthalene	21			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Acenaphthene	80			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Fluorene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Phenanthrene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	Pyrene	210			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	1-Methylnaphthalene	Detection Limit			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL
	2-Methylnaphthalene	28			BQL	BQL	BQL	BQL	BQL	BQL	NA	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NC DENR	Sample Location Sample ID Sample Date		MW-01/4						
Regulatory Limit			UST45/S941-MW01/4-00D	UST45/S941-MW01/4-00C	UST45/S941-MW01/4-00B	UST45/S941-MW01/4-00A	UST45/S941-MW01/4-99D	UST45/S941-MW01/4-99C	UST45/S941-MW01/4-99B	UST45/S941-MW01/4-99A	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L			10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999	4/12/1999	1/14/1999	
Benzene	1		BQL	2	2	BQL	BQL	1	4	2	
Ethylbenzene	29		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Toluene	1,000		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
Naphthalene	21		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	

Notes:

¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location		MW-04/4									
		Regulatory Limit	Sample Date	Sample ID	UST45/S941-MW04/4-02A	UST45/S941-MW04/4-02A	UST45/S941-MW04/4-02A	UST45/S941-MW04/4-01D	UST45/S941-MW04/4-01D	UST45/S941-MW04/4-01C	UST45/S941-MW04/4-01B	UST45/S941-MW04/4-01A	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L					7/17/2002	4/17/2002	1/16/2002		11/5/2001	10/16/2001	7/17/2001	4/16/2001	1/31/2001
Benzene	1				BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Ethylbenzene	29				BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Toluene	1,000				BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200				BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Total Xylenes	530				BQL	BQL	BQL		NA	BQL	BQL	BQL	BQL
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L													
Naphthalene	21				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Acenaphthylene	210				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Acenaphthene	80				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Fluorene	Detection Limit				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Phenanthrene	Detection Limit				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Anthracene	2,100				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
Pyrene	210				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL
2-Methylnaphthalene	28				BQL	BQL	BQL		BQL	NA	BQL	BQL	BQL

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		Sample Location		MW-04/4							
NCDENR		Sample ID	Sample Date	UST45/S941-MW04/4-00D	UST45/S941-MW04/4-00C	UST45/S941-MW04/4-00B	UST45/S941-MW04/4-00A	UST45/S941-MW04/4-99D	UST45/S941-MW04/4-99C	UST45/S941-MW04/4-99B	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L		Regulatory Limit		10/11/2000	7/18/2000	4/12/2000	2/1/2000	10/12/1999	7/12/1999	4/12/1999	
	Benzene	1		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Ethylbenzene	29		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Toluene	1,000		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Total Xylenes	530		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L											
	Naphthalene	21		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL	BQL	
	2-Methylnaphthalene	28		BQL	BQL	BQL	BQL	BQL	BQL	BQL	

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID	MW-04/4			
			UST45/S941-MW04/4-99A	UST45/S941-MW04/4-98C1	UST45/S941-MW04/4-98B1	UST45/S941-MW04/4-98B1
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, µg/L</i>						
Benzene	1		BQL	BQL	BQL	BQL
Ethylbenzene	29		BQL	BQL	BQL	BQL
Toluene	1,000		BQL	BQL	BQL	BQL
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL
Total Xylenes	530		BQL	BQL	BQL	BQL
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, µg/L</i>						
Naphthalene	21		BQL	BQL	BQL	BQL
Acenaphthylene	210		BQL	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		BQL	BQL	BQL	BQL

Notes

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter		NCDENR	Sample Location		DUP-1							
		Regulatory Limit	Sample ID	Sample Date	UST45/S941-DUP1-02A	UST45/S941-DUP1-02A	UST45/S941-DUP1-02A	UST45/S941-DUP1-01D	UST45/S941-DUP1-01D	UST45/S941-DUP1-01B	UST45/S941-DUP1-01A	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L					07/17/02 ⁵	04/17/02 ⁵	01/16/02 ⁵	11/15/01 ⁵	10/16/01 ⁵	4/16/01 ⁵	1/31/01 ⁵	
Benzene		1			16	36	BQL	NA	BQL	3	2	
Ethylbenzene		29			BQL	3	5	NA	2	2	BQL	
Toluene		1,000			BQL	2	BQL	NA	BQL	BQL	BQL	
Methyl-tert-butyl ether		200			12	3	BQL	NA	BQL	BQL	BQL	
Total Xylenes		530			BQL	BQL	BQL	NA	BQL	BQL	BQL	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L												
Naphthalene		21			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Acenaphthylene		210			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Acenaphthene		80			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Fluorene		Detection Limit			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Phenanthrene		Detection Limit			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Anthracene		2,100			BQL	N/A	BQL	BQL	NA	BQL	BQL	
Pyrene		210			BQL	N/A	BQL	BQL	NA	BQL	BQL	
1-Methylnaphthalene		Detection Limit			BQL	N/A	BQL	BQL	NA	BQL	BQL	
2-Methylnaphthalene		28			BQL	N/A	BQL	BQL	NA	BQL	BQL	

Notes:
¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
 NA indicates that the sample was not analyzed for the constituent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	DUP-1							
			UST45/S941-DUP1-00D	UST45/S941-DUP1-00C	UST45/S941-DUP1-00B	UST45/S941-DUP1-00A	UST45/S941-DUP1-99D	UST45/S941-DUP1-99C		
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L			10/11/00 ⁵	7/18/00 ⁵	4/12/00 ⁵	2/1/00 ⁵	10/12/99 ⁵	7/12/99 ⁵		
	1		6	67	190	18	1,600	230		
	29		BQL	21	290	7	980	60		
	1,000		BQL	BQL	BQL	2	3,900	80		
	200		BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530		BQL	BQL	170	16	5,080	230		
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L										
	21		BQL	26	32	BQL	120	64		
	210		BQL	BQL	BQL	BQL	BQL	BQL		
	80		BQL	BQL	BQL	BQL	BQL	BQL		
	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL		
Phenanthrene	Detection Limit		BQL	BQL	BQL	BQL	BQL	15		
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL		
1-Methylnaphthalene	Detection Limit		BQL	BQL	BQL	11	15	150		
2-Methylnaphthalene	28		BQL	BQL	BQL	16	22	210		

Notes:

¹ Duplicate sample taken from monitoring well MW-15.

² Duplicate sample taken from monitoring well MW-18.

³ Duplicate sample taken from monitoring well MW-10.

⁴ Duplicate sample taken from monitoring well MW-2.

⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location Sample ID Sample Date	DUP-1					
			UST45/S941-DUP1-99B 4/12/99 ¹	UST45/S941-DUP1-99A 1/14/99 ¹	UST45/S941-DUP1-98C1 10/14/98 ¹	UST45/S941-DUP1-98B3 7/17/98 ¹	UST45/S941-DUP1-98B2 6/22/98 ¹	UST45/S941-DUP1-98B1 5/14/98 ¹
Volatiles Aromatic Hydrocarbons by USEPA Method 602, ug/L								
Benzene	1		410	1,500	1,500	1,500	1,500	2,000
Ethylbenzene	29		110	710	630	960	820	970
Toluene	1,000		35	BQL	BQL	770	1,500	1,700
Methyl-tert-butyl ether	200		BQL	BQL	BQL	BQL	BQL	BQL
Total Xylenes	530		240	4,500	3,500	4,210	3,910	3,680
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L								
Naphthalene	21		1,600	100	59	20	25	14
Acenaphthylene	210		BQL	BQL	BQL	BQL	BQL	BQL
Acenaphthene	80		BQL	BQL	BQL	BQL	BQL	BQL
Fluorene	Detection Limit		BQL	BQL	BQL	BQL	BQL	BQL
Phenanthrene	Detection Limit		730	BQL	BQL	BQL	BQL	BQL
Anthracene	2,100		BQL	BQL	BQL	BQL	BQL	BQL
Pyrene	210		BQL	BQL	BQL	BQL	BQL	BQL
1-Methylnaphthalene	Detection Limit		3,900	BQL	BQL	BQL	BQL	BQL
2-Methylnaphthalene	28		4,800	16	BQL	BQL	BQL	BQL

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
 - ² Duplicate sample taken from monitoring well MW-18.
 - ³ Duplicate sample taken from monitoring well MW-10.
 - ⁴ Duplicate sample taken from monitoring well MW-2.
 - ⁵ Duplicate sample taken from monitoring well MW-3.
- NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3 (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR	Sample Location Sample ID	DUP-2						
			UST45/S941-DUP2-02A	UST45/S941-DUP2-02A	UST45/S941-DUP2-02A	UST45/S941-DUP2-01D	UST45/S941-DUP2-01D	UST45/S941-DUP2-01C	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L	Regulatory Limit	Sample Date							
Benzene	1		07/17/02 ⁴	04/17/02 ⁴	01/16/02 ⁴	11/05/01 ⁴	10/16/01 ⁴	7/17/01 ⁴	
Ethylbenzene	29		BQL	5	190	N/A	46	350	
Toluene	1,000		BQL	BQL	4	N/A	20	64	
Methyl-tert-butyl ether	200		BQL	BQL	BQL	N/A	7	32	
Total Xylenes	530		BQL	BQL	8	N/A	BQL	BQL	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21		BQL	N/A	BQL	BQL	NA	950	
Acenaphthylene	210		BQL	N/A	BQL	BQL	NA	BQL	
Acenaphthene	80		BQL	N/A	BQL	BQL	NA	190	
Fluorene	Detection Limit		BQL	N/A	BQL	BQL	NA	310	
Phenanthrene	Detection Limit		BQL	N/A	14	11	NA	480	
Anthracene	2,100		BQL	N/A	BQL	BQL	NA	BQL	
Pyrene	210		BQL	N/A	BQL	16	NA	BQL	
1-Methylnaphthalene	Detection Limit		BQL	N/A	BQL	BQL	NA	1,700	
2-Methylnaphthalene	28		BQL	N/A	BQL	BQL	NA	2,400	

Notes:

¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)

Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		DUP-2							
		Sample ID	Sample Date	UST45/S941-DUP2-01B	UST45/S941-DUP2-01A	UST45/S941-DUP2-00D	UST45/S941-DUP2-00C	UST45/S941-DUP2-00B	UST45/S941-DUP2-00A		
<i>Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L</i>											
Benzene	1			4/16/01 ⁴	1/31/01 ⁴	10/11/00 ⁴	7/18/00 ⁴	4/12/00 ⁴	2/1/00 ⁴		
Ethylbenzene	29			82	81	53	89	36	45		
Toluene	1,000			14	12	30	40	BQL	BQL		
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	BQL		
Total Xylenes	530			43	161	36	200	69	BQL		
<i>Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L</i>											
Naphthalene	21			56	4,200	110	5,600	2,300	190		
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	BQL		
Acenaphthene	80			BQL	BQL	20	710	BQL	59		
Fluorene	Detection Limit			12	1,600	44	BQL	1,700	120		
Phenanthrene	Detection Limit			13	2,300	84	3,000	2,100	200		
Anthracene	2,100			BQL	BQL	BQL	BQL	BQL	BQL		
Pyrene	210			BQL	BQL	13	BQL	BQL	27		
1-Methylnaphthalene	Detection Limit			150	11,000	430	15,000	6,900	720		
2-Methylnaphthalene	28			56	13,000	220	15,000	8,400	550		

Notes:

¹ Duplicate sample taken from monitoring well MW-15.² Duplicate sample taken from monitoring well MW-18.³ Duplicate sample taken from monitoring well MW-10.⁴ Duplicate sample taken from monitoring well MW-2.⁵ Duplicate sample taken from monitoring well MW-3.

NA indicates that the sample was not analyzed for the constituent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table (Continued)
Summary of Detected Concentrations
Groundwater Monitoring Well Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina
April 16, 1998 to August 31, 2001

Parameter	NCDENR Regulatory Limit	Sample Location		DUP-2					
		Sample ID	Sample Date	UST45/S941-DUP2-99D	UST45/S941-DUP2-99C	UST45/S941-DUP2-99B	UST45/S941-DUP2-99A	UST45/S941-DUP2-98C1	
Volatile Aromatic Hydrocarbons by USEPA Method 602, ug/L				10/12/99 ⁴	7/12/99 ⁴	4/12/99 ⁴	1/14/99 ⁴	10/14/98 ⁴	
Benzene	1			200	590	1,100	630	430	
Ethylbenzene	29			40	110	610	BQL	29	
Toluene	1,000			49	92	590	50	BQL	
Methyl-tert-butyl ether	200			BQL	BQL	BQL	BQL	BQL	
Total Xylenes	530			78	73	3,700	BQL	41	
Polynuclear Aromatic Hydrocarbons by USEPA Method 610, ug/L									
Naphthalene	21			6,200	230	48	120	150	
Acenaphthylene	210			BQL	BQL	BQL	BQL	BQL	
Acenaphthene	80			1,500	32	BQL	BQL	BQL	
Fluorene	Detection Limit			3,200	59	BQL	13	76	
Phenanthrene	Detection Limit			4,800	120	BQL	21	90	
Anthracene	2,100			BQL	BQL	BQL	22	BQL	
Pyrene	210			690	15	BQL	BQL	BQL	
1-Methylnaphthalene	Detection Limit			18,000	430	13	160	500	
2-Methylnaphthalene	28			18,000	380	12	97	370	

Notes:

- ¹ Duplicate sample taken from monitoring well MW-15.
² Duplicate sample taken from monitoring well MW-18.
³ Duplicate sample taken from monitoring well MW-10.
⁴ Duplicate sample taken from monitoring well MW-2.
⁵ Duplicate sample taken from monitoring well MW-3.
NA indicates that the sample was not analyzed for the constituent.
Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3-2
Summary of Detected Concentrations
Soil Vapor Extraction System Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina

Parameter	Sample Location Sample ID	SVE-1 ¹		SVE-1 ²	
		UST45/S941-SVEI-02B	UST45/S941-SVEI-02A	UST45/S941-SVEI-01C	UST45/S941-SVEI-01B
<i>Volatile Aromatic Hydrocarbons by USEPA Method 18, ppm</i>	Sample Date	4/10/2002	1/9/2002	7/10/2001	4/12/2001
Benzene		BQL	BQL	BQL	BQL
Ethylbenzene		BQL	BQL	BQL	BQL
Toluene		BQL	BQL	BQL	BQL
Total Xylenes		BQL	BQL	BQL	BQL

NOTE:

¹ Sample collected from Soil Vapor Extraction System Effluent

² Sample SVE-1 includes soil vapor extraction wells SVE-1 through SVE-4.

³ Sample SVE-2 includes soil vapor extraction wells SVE-5 through SVE-8.

⁴ Sample SVE-1 collected from Soil Vapor Extraction System Influent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit

Table 3-2 (continued)
Summary of Detected Concentrations
Soil Vapor Extraction System Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina

Parameter	Sample Location	SVE-2 ²		SVE-E ¹	
		UST45/S941-SVE2-01C	UST45/S941-SVE2-01B	UST45/S941-SVE-E-01A	UST45/S941-SVE-E-00D
<i>Volatile Aromatic Hydrocarbons by USEPA Method 16, ppm</i>	Sample Date	7/10/2001	4/12/2001	1/24/2001	10/3/2000
Benzene		BQL	BQL	BQL	BQL
Ethylbenzene		BQL	BQL	BQL	BQL
Toluene		BQL	BQL	BQL	BQL
Total Xylenes		BQL	BQL	BQL	BQL

NOTE:

- ¹ Sample collected from Soil Vapor Extraction System Effluent
² Sample SVE-1 includes soil vapor extraction wells SVE-1 through SVE-4.
³ Sample SVE-2 includes soil vapor extraction wells SVE-5 through SVE-8.
⁴ Sample SVE-1 collected from Soil Vapor Extraction System Influent.
 Shaded areas indicate detected concentrations above laboratory quantitation limits.
 BQL = Below Laboratory Quantitation Limit

Table 3-2 (continued)
Summary of Detected Concentrations
Soil Vapor Extraction System Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina

Parameter	Sample Location Sample ID	SVE-E ¹			
		UST45/S941-SVE-E-00C	UST45/S941-SVE-E-00B	UST45/S941-SVE-E-00A	UST45/S941-SVE-E-99D
<i>Volatile Aromatic Hydrocarbons by USEPA Method 18, ppm</i>	Sample Date	7/10/2000	4/4/2000	1/12/2000	7/7/1999
Benzene		BQL	BQL	BQL	BQL
Ethylbenzene		BQL	BQL	BQL	BQL
Toluene		BQL	BQL	BQL	BQL
Total Xylenes		BQL	BQL	BQL	BQL

NOTE:

- ¹ Sample collected from Soil Vapor Extraction System Effluent
 - ² Sample SVE-1 includes soil vapor extraction wells SVE-1 through SVE-4.
 - ³ Sample SVE-2 includes soil vapor extraction wells SVE-5 through SVE-8.
 - ⁴ Sample SVE-1 collected from Soil Vapor Extraction System Influent.
- Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3-2 (continued)
Summary of Detected Concentrations
Soil Vapor Extraction System Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina

Parameter	Sample Location	SVE-E			
		UST45/S941-SVE-E-99B	UST45/S941-SVE-E-99A	UST45/S941-SVE-E-98D	UST45/S941-SVE-E-98C1
<i>Volatile Aromatic Hydrocarbons by USEPA Method 18, ppm</i>	Sample ID				
	Sample Date	4/5/1999	1/6/1999	10/8/1998	7/8/1998
Benzene		BQL	BQL	BQL	BQL
Ethylbenzene		BQL	BQL	BQL	BQL
Toluene		BQL	BQL	BQL	BQL
Total Xylenes		BQL	BQL	BQL	BQL

NOTE:

- ¹ Sample collected from Soil Vapor Extraction System Effluent
 - ² Sample SVE-1 includes soil vapor extraction wells SVE-1 through SVE-4.
 - ³ Sample SVE-2 includes soil vapor extraction wells SVE-5 through SVE-8.
 - ⁴ Sample SVE-1 collected from Soil Vapor Extraction System Influent.
- Shaded areas indicate detected concentrations above laboratory quantitation limits.
BQL = Below Laboratory Quantitation Limit

Table 3-2 (continued)
Summary of Detected Concentrations
Soil Vapor Extraction System Samples
Building 45 USTs S-941-1 and 2
Camp Lejeune, North Carolina

Parameter	Sample Location	SVE-E		
		UST45/S941-SVE-E-98B3	UST45/S941-SVE-E-98B2	UST45/S941-SVE-E-98B1
<i>Volatile Aromatic Hydrocarbons by USEPA Method 18, ppm</i>	Sample ID			
	Sample Date	6/19/1998	5/8/1998	4/16/1998
Benzene		BQL	BQL	BQL
Ethylbenzene		BQL	BQL	BQL
Toluene		BQL	BQL	BQL
Total Xylenes		0.3	BQL	17.9

NOTE:

¹ Sample collected from Soil Vapor Extraction System Effluent

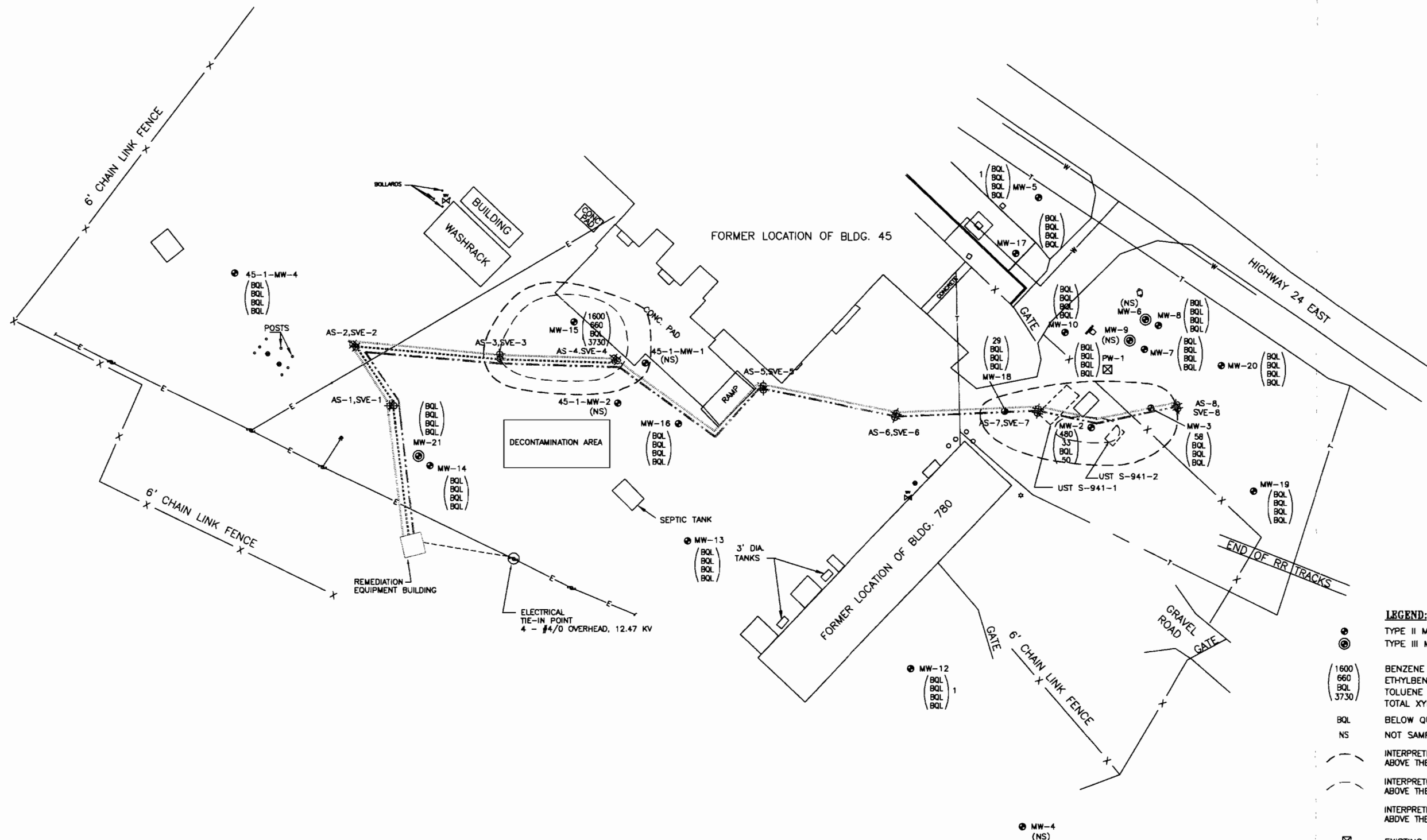
² Sample SVE-1 includes soil vapor extraction wells SVE-1 through SVE-4.

³ Sample SVE-2 includes soil vapor extraction wells SVE-5 through SVE-8.

⁴ Sample SVE-1 collected from Soil Vapor Extraction System Influent.

Shaded areas indicate detected concentrations above laboratory quantitation limits.

BQL = Below Laboratory Quantitation Limit



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 14, 1998 VOLATILE AROMATIC HYDROCARBONS

SURVEY NOTES:

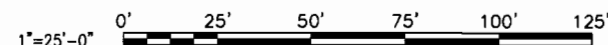
1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCOS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,498,141.90; ELEV=30.12)
2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

NOTE:

1. ANALYTICAL RESULTS FROM SAMPLES COLLECTED FROM MONITORING WELLS MW-5 AND MW-12 ON JULY 17, 1998.

GRAPHICS SCALE

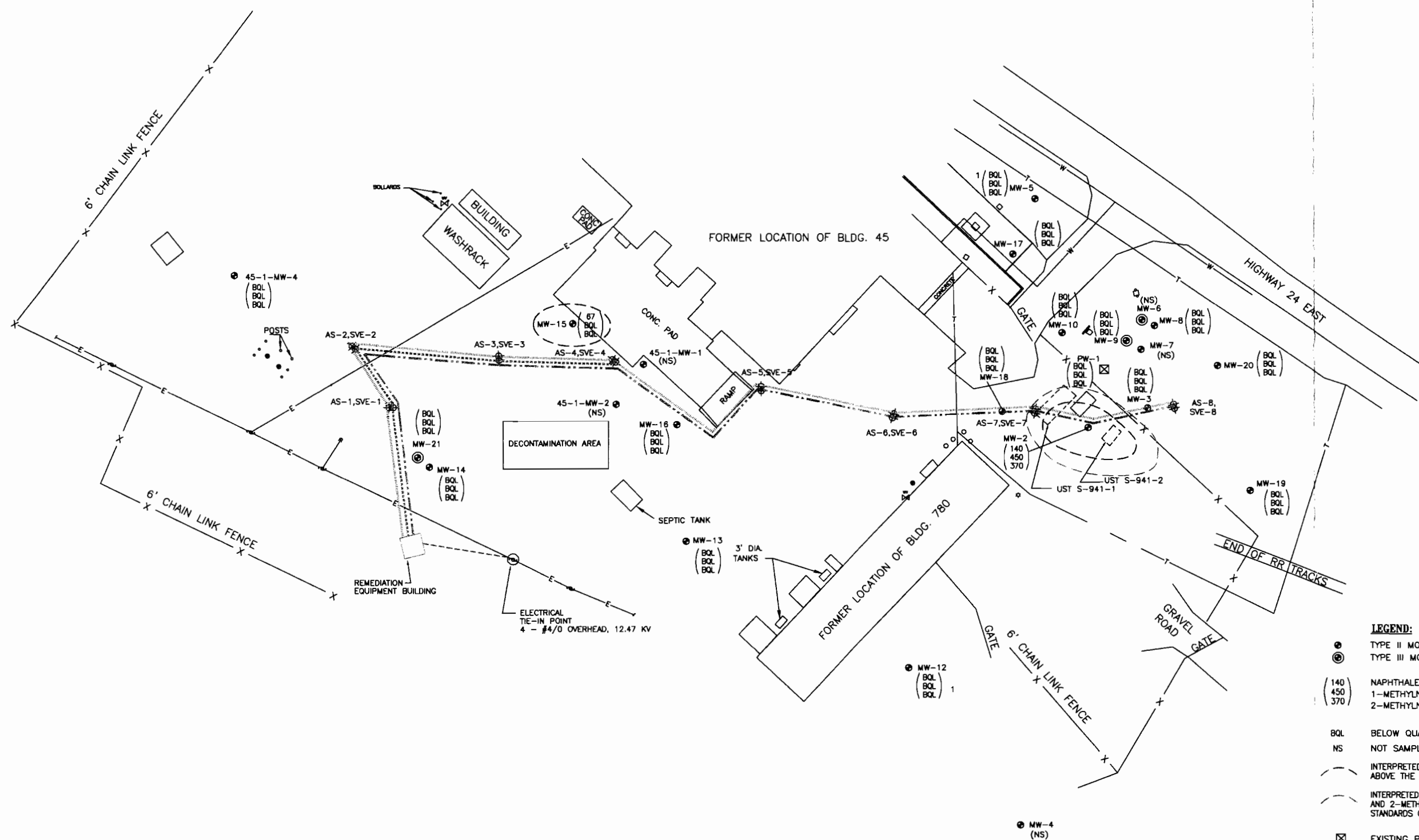
IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



LEGEND:

- TYPE II MONITORING WELL
- ⊙ TYPE III MONITORING WELL
- (1600
660
BQL
3730) BENZENE (ug/L)
- (1600
660
BQL
3730) ETHYL BENZENE (ug/L)
- (1600
660
BQL
3730) TOLUENE (ug/L)
- (1600
660
BQL
3730) TOTAL XYLENES (ug/L)
- BQL BELOW QUANTITATION LIMIT
- NS NOT SAMPLED
- INTERPRETED AERIAL EXTENT OF BENZENE ABOVE THE NCAC 15A:2L STANDARD OF 1 ug/L
- INTERPRETED AERIAL EXTENT OF ETHYL BENZENE ABOVE THE NCAC 15A:2L STANDARD OF 29 ug/L
- INTERPRETED AERIAL EXTENT OF TOTAL XYLENES ABOVE THE NCAC 15A:2L STANDARD OF 530 ug/L
- ⊠ EXISTING PUMPING WELL
- ⊕ SVE/AIR SPARGE WELL CLUSTER
- ⊙ UTILITY POLE
- ⊙ WATER VALVE
- ⊙ MANHOLE
- ⊙ FIRE HYDRANT
- ⊙ LIGHT POLE
- ELECTRICAL UTILITY LINE
- WATER UTILITY LINE
- TELEPHONE UTILITY LINE
- SOIL VAPOR EXTRACTION LINE NO. 1
- SOIL VAPOR EXTRACTION LINE NO. 2
- AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND		ATLANTIC DIVISION		NORFOLK, VIRGINIA	
NAVAL STATION		ANNUAL MONITORING REPORT		BUILDING 46, UST S-941-1 AND 2		MARINE CORPS BASE	
				CAMP LEJEUNE, NORTH CAROLINA		DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 14, 1998	
						VOLATILE AROMATIC HYDROCARBONS	
CODE NO.	80091	SIZE	D	SCALE:	1"=50'	DATE	
EFD NO.		STA. PROJ. NO.		SPEC. NO.		CONSTR. CONTR. NO.	
NAVJAC DRAWING NO.		SHEET 7 OF 18		3-1			
J.A. JONES		ENGINEER		PROJECT MANAGER		APPROVED BY	
JACKSONVILLE, FLORIDA		DATE		SYMBOL		REVISIONS	
LATE CONTRACT NO. N62470-93-D-3033							
ACTIVITY - ENVIRONMENTAL							
THE NAVY ENGINEERING MAP							



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 14, 1998
POLYNUCLEAR AROMATIC HYDROCARBONS

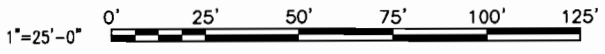
SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)
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NOTE:

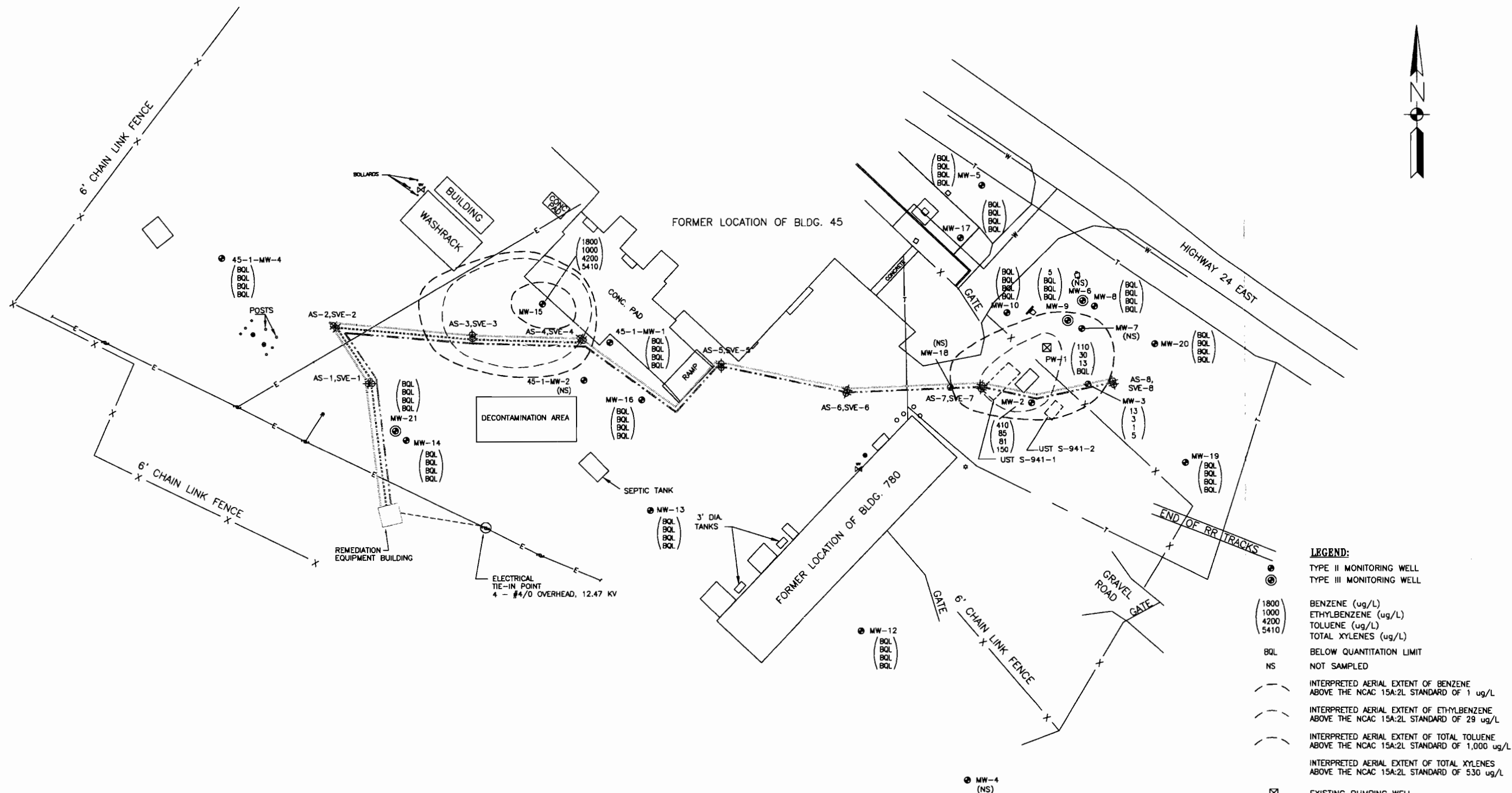
1. ANALYTICAL RESULTS FROM SAMPLES COLLECTED FROM MONITORING WELLS MW-5 AND MW-12 ON JULY 17, 1998.

GRAPHICS SCALE
IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



- LEGEND:**
- TYPE II MONITORING WELL
 - ⊙ TYPE III MONITORING WELL
 - (140 / 450 / 370) NAPHTHALENE (ug/L)
1-METHYLNAPHTHALENE (ug/L)
2-METHYLNAPHTHALENE (ug/L)
 - BQL BELOW QUANTITATION LIMIT
 - NS NOT SAMPLED
 - - - - - INTERPRETED AERIAL EXTENT OF NAPHTHALENE ABOVE THE NCAC 15A:2L STANDARD OF 21 ug/L
 - - - - - INTERPRETED AERIAL EXTENT OF 1-METHYLNAPHTHALENE AND 2-METHYLNAPHTHALENE ABOVE THE NCAC 15A:2L STANDARDS OF DETECTION LIMIT AND 28 ug/L RESPECTIVELY
 - ⊠ EXISTING PUMPING WELL
 - ⊕ SVE/AIR SPARGE WELL CLUSTER
 - ⊙ UTILITY POLE
 - ⊕ WATER VALVE
 - ⊕ MANHOLE
 - ⊕ FIRE HYDRANT
 - ⊕ LIGHT POLE
 - - - - - ELECTRICAL UTILITY LINE
 - - - - - WATER UTILITY LINE
 - - - - - TELEPHONE UTILITY LINE
 - - - - - SOIL VAPOR EXTRACTION LINE NO. 1
 - - - - - SOIL VAPOR EXTRACTION LINE NO. 2
 - - - - - AIR SPARGE COMPRESSED AIR LINE

J.A. JONES JONES & ASSOCIATES JACKSONVILLE, FLORIDA DATE: 10/14/98 PROJECT NO.: N62470-93-D-3033 ACTIVITY: GROUNDWATER MONITORING		REVISIONS	
NO.	DESCRIPTION	DATE	APPROVED BY
1	ISSUED FOR CONSTRUCTION		
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NAVAL STATION NORFOLK, VIRGINIA ANNUAL MONITORING REPORT BUILDING 45, UST S-941-1 AND 2 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 14, 1998 POLYNUCLEAR AROMATIC HYDROCARBONS			
CODE ID. NO. 80091 SIZE D		SHEET 8 OF 18	
SCALE: 1"=50'		3-2	
STA. PROJ. NO.			
SPEC. NO.			
CONSTR. CONTR. NO.			
NAVFAC DRAWING NO.			



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 12, 1999
VOLATILE AROMATIC HYDROCARBONS

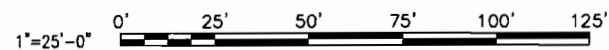
SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)

2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

GRAPHICS SCALE

IF THIS DRAWINGS IS A REDUCTION, USE GRAPHIC SCALE



LEGEND:

TYPE II MONITORING WELL
TYPE III MONITORING WELL

$$\begin{pmatrix} 1800 \\ 1000 \\ 4200 \\ 5410 \end{pmatrix}$$

BENZENE (ug/L)
ETHYLBENZENE (ug/L)
TOLUENE (ug/L)
TOTAL XYLENES (ug/L)
BELOW QUANTITATION LIMIT
NOT SAMPLED

INTERPRETED AERIAL EXTENT OF BENZENE
ABOVE THE NCAC 15A:2L STANDARD OF 1 ug/L

INTERPRETED AERIAL EXTENT OF ETHYLBENZENE
ABOVE THE NCAC 15A:2L STANDARD OF 29 ug/L

INTERPRETED AERIAL EXTENT OF TOTAL TOLUENE
ABOVE THE NCAC 15A:2L STANDARD OF 1,000 ug/L

INTERPRETED AERIAL EXTENT OF TOTAL XYLENES
ABOVE THE NCAC 15A:2L STANDARD OF 530 ug/L

☒ EXISTING PUMPING WELL

 SVE/AIR SPARGE
WELL CLUSTER

UTILITY POLE

 WATER VALVE

● MANHOLE

FIRE HYDRANT

✱ LIGHT POLE

—E— ELECTRICAL UTILITY LINE

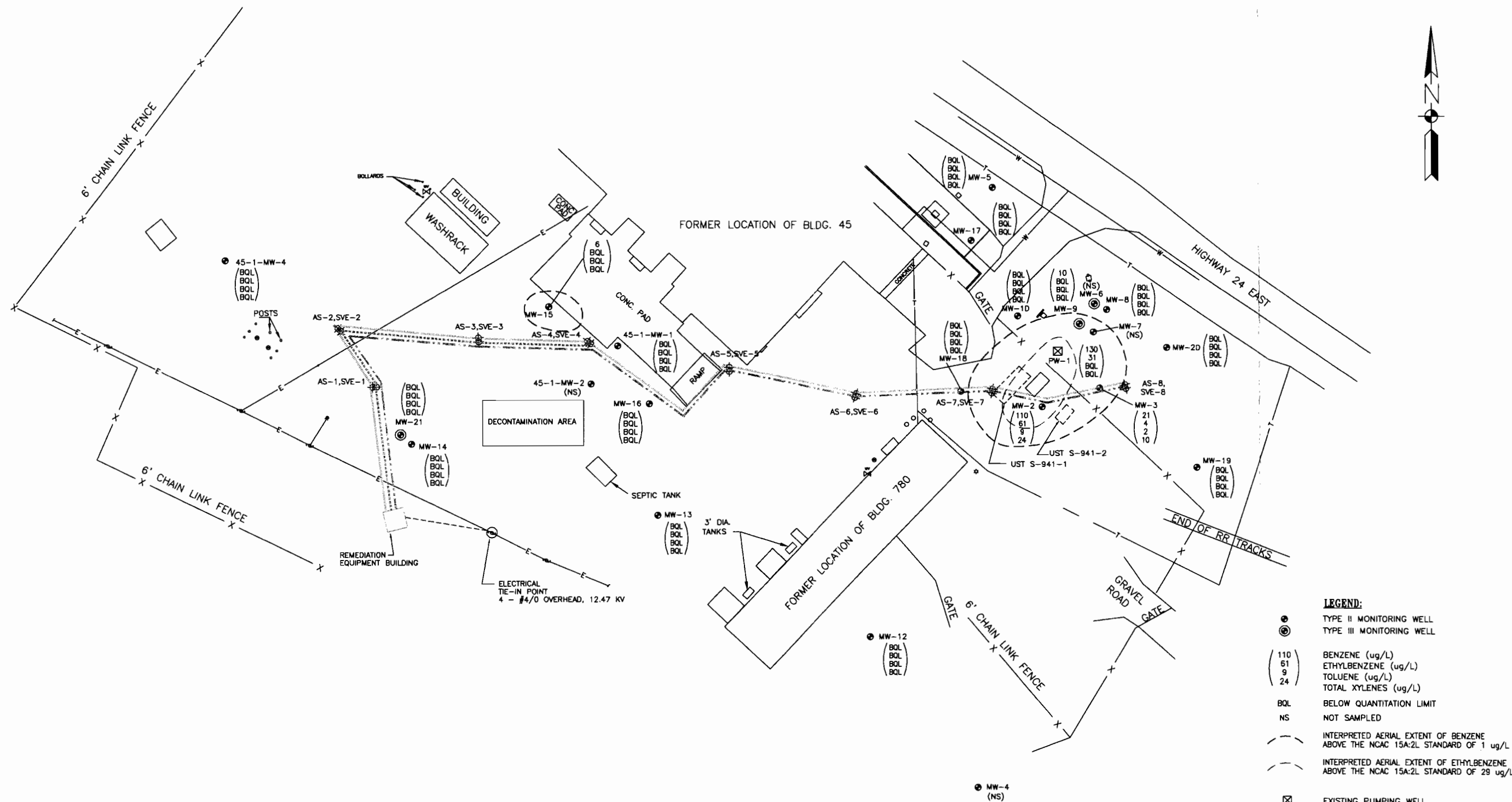
—W— WATER UTILITY LINE

—T— TELEPHONE UTILITY LINE

1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

SOIL VAPOR EXTRACTION LINE NO. 1

SOIL VAPOR EXTRACTION LINE NO. 2
NO. BEARDS COMPOSITE NO. 1007[illegible]



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 11, 2000
VOLATILE AROMATIC HYDROCARBONS

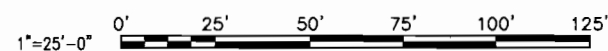
SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAO 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)

2. UTILITIES ARE BASED ON MCB, CAMP LEJEUNE BASE MAPS AND UTILITIES LOCATED DURING ASSESSMENT ACTIVITIES. PER SPECIFICATIONS, CONTRACTOR SHALL PERFORM UTILITY CLEARANCE AT TIME OF CONSTRUCTION.

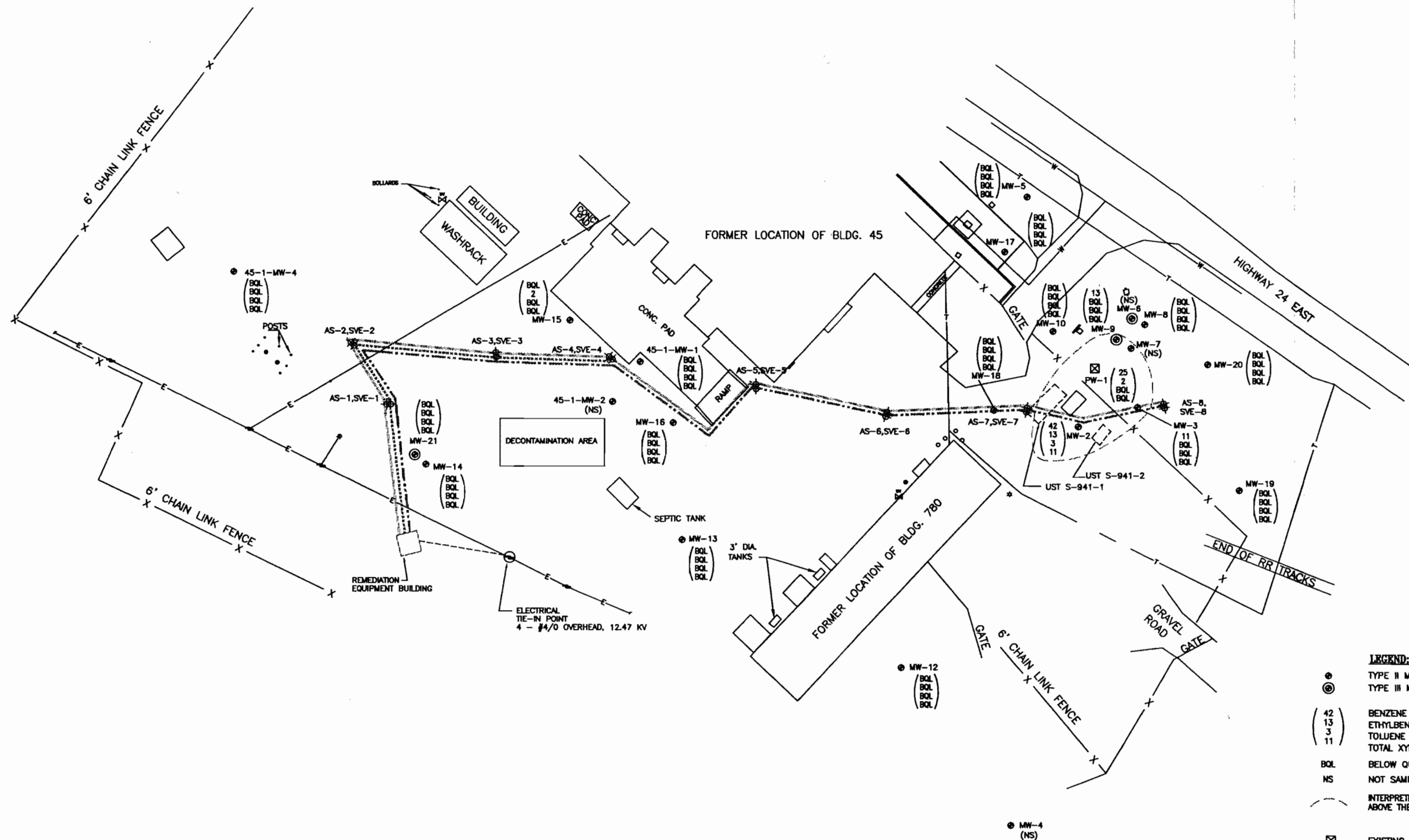
GRAPHICS SCALE

IF THIS DRAWINGS IS A REDUCTION, USE GRAPHIC SCALE



- LEGEND:**
- | | |
|--------------------------|--|
| ● | TYPE II MONITORING WELL |
| ⊙ | TYPE III MONITORING WELL |
| (110)
61
9
24 | BENZENE (ug/L)
ETHYLBENZENE (ug/L)
TOLUENE (ug/L)
TOTAL XYLENES (ug/L) |
| BQL | BELOW QUANTITATION LIMIT |
| NS | NOT SAMPLED |
| — — — | INTERPRETED AERIAL EXTENT OF BENZENE
ABOVE THE NCAC 15A:2L STANDARD OF 1 ug/L |
| — — — | INTERPRETED AERIAL EXTENT OF ETHYLBENZENE
ABOVE THE NCAC 15A:2L STANDARD OF 29 ug/L |
| ☒ | EXISTING PUMPING WELL |
| ⊗ | SVE/AIR SPARGE
WELL CLUSTER |
| ⌵ | UTILITY POLE |
| ⌵ | WATER VALVE |
| ● | MANHOLE |
| ⋈ | FIRE HYDRANT |
| ☆ | LIGHT POLE |
| —E— | ELECTRICAL UTILITY LINE |
| —W— | WATER UTILITY LINE |
| —T— | TELEPHONE UTILITY LINE |
| ——— | SOIL VAPOR EXTRACTION LINE NO. 1 |
| ——— | SOIL VAPOR EXTRACTION LINE NO. 2 |
| ——— | AIR SPARGE COMPRESSED AIR LINE |

[illegible]



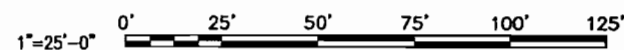
DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 16, 2001 **VOLATILE AROMATIC HYDROCARBONS**

SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,486,141.90; ELEV=30.12)
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GRAPHICS SCALE

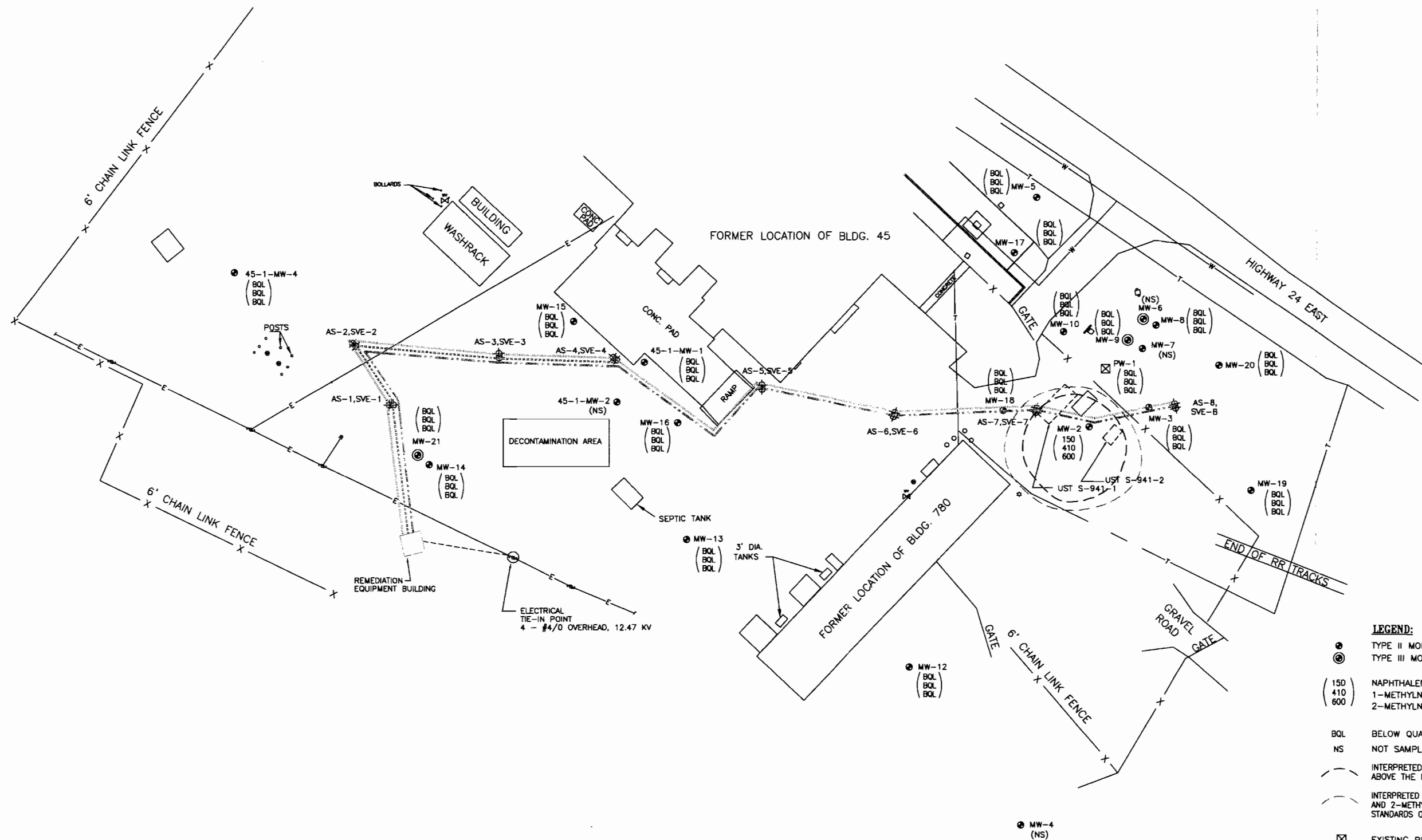
IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



LEGEND:

- TYPE II MONITORING WELL
- ⊙ TYPE III MONITORING WELL
- (42) BENZENE (ug/L)
- (13) ETHYL BENZENE (ug/L)
- (3) TOLUENE (ug/L)
- (11) TOTAL XYLENES (ug/L)
- BQL BELOW QUANTITATION LIMIT
- NS NOT SAMPLED
- (---) INTERPRETED AERIAL EXTENT OF BENZENE ABOVE THE NCAC 15A:2L STANDARD OF 1 ug/L
- ☒ EXISTING PUMPING WELL
- ⊕ SVE/AIR SPARGE WELL CLUSTER
- ⊙ UTILITY POLE
- ⊕ WATER VALVE
- ⊙ MANHOLE
- ⊕ FIRE HYDRANT
- ⊙ LIGHT POLE
- ELECTRICAL UTILITY LINE
- WATER UTILITY LINE
- TELEPHONE UTILITY LINE
- SOIL VAPOR EXTRACTION LINE NO. 1
- SOIL VAPOR EXTRACTION LINE NO. 2
- AIR SPARGE COMPRESSED AIR LINE

J.A. JONES ENVIRONMENTAL JACKSONVILLE, FLORIDA A/E CONTRACT NO. N62470-93-D-3033 ACTIVITY - MONITORING		REVISIONS NO. DESCRIPTION DATE APPROVED BY	
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL STATION ATLANTIC DIVISION NORFOLK, VIRGINIA ANNUAL MONITORING REPORT BUILDING 46, UST S-941-1 AND 2 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 16, 2001 VOLATILE AROMATIC HYDROCARBONS		CODE ID. NO. 80091 SIZE D SCALE: 1"=50' EFD NO. STA. PROJ. NO. SPEC. NO. CONSTR. CONTR. NO. NAVFAC DRAWING NO. SHEET 13 OF 18 3-7	



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 16, 2001
POLYNUCLEAR AROMATIC HYDROCARBONS

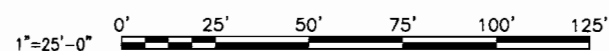
SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCGS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)

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GRAPHICS SCALE

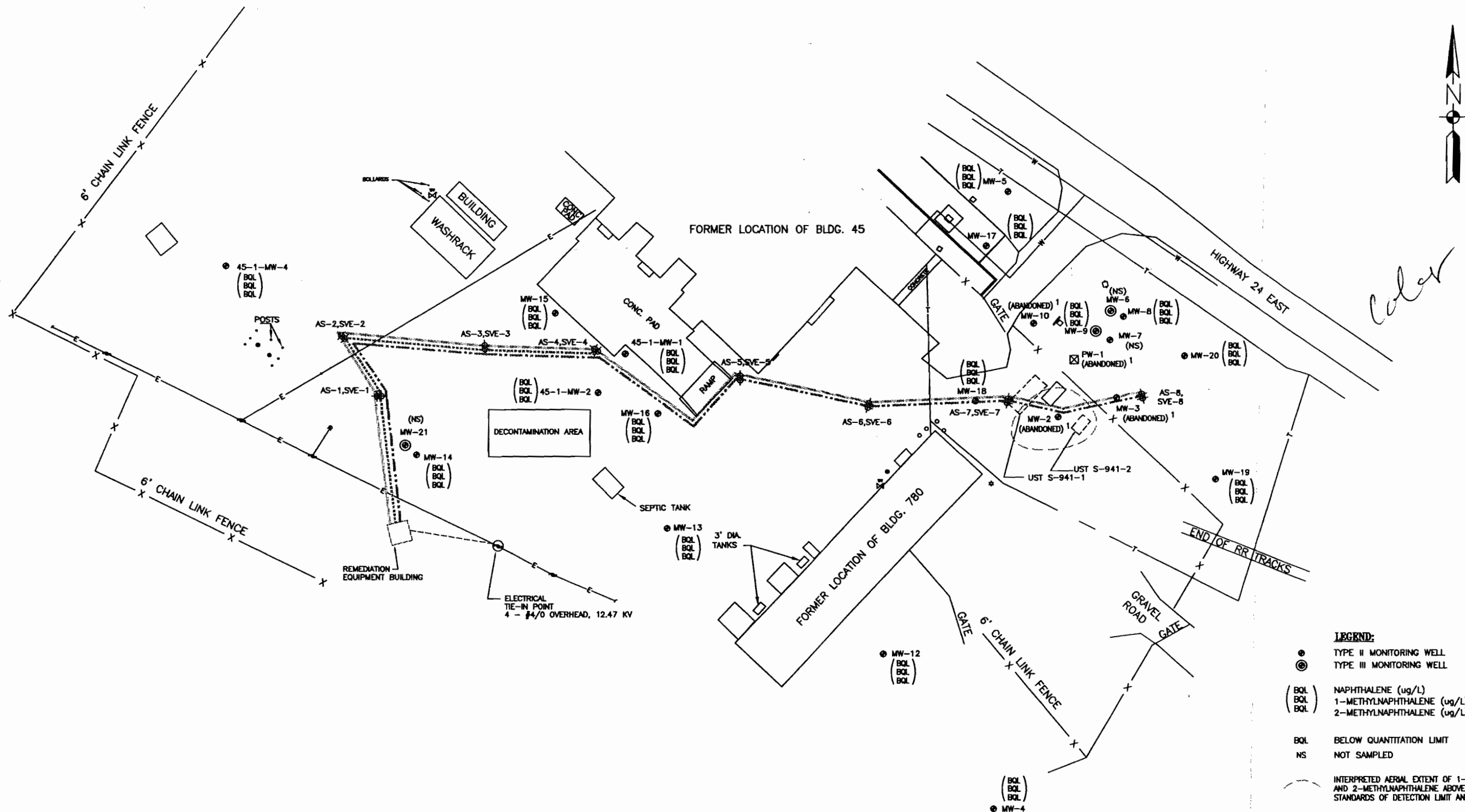
IF THIS DRAWINGS IS A REDUCTION, USE GRAPHIC SCALE



LEGEND:

- TYPE II MONITORING WELL
TYPE III MONITORING WELL
- (150)
410
600
- NAPHTHALENE (ug/L)
1-METHYLNAPHTHALENE (ug/L)
2-METHYLNAPHTHALENE (ug/L)
- BQL BELOW QUANTITATION LIMIT
NS NOT SAMPLED
- INTERPRETED AERIAL EXTENT OF NAPHTHALENE
ABOVE THE NCAC 15A:2L STANDARD OF 21 ug/L
- INTERPRETED AERIAL EXTENT OF 1-METHYLNAPHTHALENE
AND 2-METHYLNAPHTHALENE ABOVE THE NCAC 15A:2L
STANDARDS OF DETECTION LIMIT AND 28 ug/L RESPECTIVELY
- EXISTING PUMPING WELL
- SVE/AIR SPARGE
WELL CLUSTER
- UTILITY POLE
- WATER VALVE
- MANHOLE
- FIRE HYDRANT
- LIGHT POLE
- E— ELECTRICAL UTILITY LINE
- W— WATER UTILITY LINE
- T— TELEPHONE UTILITY LINE
- SOIL VAPOR EXTRACTION LINE NO. 1
- SOIL VAPOR EXTRACTION LINE NO. 2
- AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY		NAVAL FACILITIES ENGINEERING COMMAND	
NAVAL STATION		NORFOLK, VIRGINIA	
ATLANTIC DIVISION			
ANNUAL MONITORING REPORT			
BUILDING 46, UST S-041 - 1 AND 2			
MARINE CORPS BASE			
CAMP LEJUNE, NORTH CAROLINA			
DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - OCTOBER 18, 2001			
POLYNUCLEAR AROMATIC HYDROCARBONS			
CODE ID. NO. 80091	SIZE D		
SCALE:	1" = 50'		
EFD NO.			
STA. PROJ. NO.			
SPEC. NO.			
CONSTR. CONTR. NO.			
NAVFAC DRAWING NO.			
SHEET 14 OF 18			
3-8			



DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - JULY 17, 2002 **POLYNUCLEAR AROMATIC HYDROCARBONS**

SURVEY NOTES:

1. CURRENT SURVEY WORK WAS TIED INTO EXISTING WELLS WITH KNOWN COORDINATE INFORMATION. THESE WELL COORDINATES ARE BASED ON SURVEY WORK USING NCOS MONUMENT "PARK" (NAD 1983 COORDINATES N=361,294.78; E=2,496,141.90; ELEV=30.12)

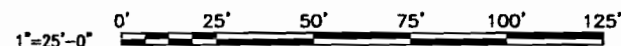
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NOTE:

MONITORING WELLS MW-1, MW-2, MW-3 AND MW-10 WERE ABANDONED DURING SOIL

GRAPHICS SCALE

IF THIS DRAWING IS A REDUCTION, USE GRAPHIC SCALE



LEGEND:

- TYPE II MONITORING WELL
- ⊙ TYPE III MONITORING WELL
- (BQL) NAPHTHALENE (ug/L)
- (BQL) 1-METHYLNAPHTHALENE (ug/L)
- (BQL) 2-METHYLNAPHTHALENE (ug/L)
- BQL BELOW QUANTITATION LIMIT
- NS NOT SAMPLED
- INTERPRETED AERIAL EXTENT OF 1-METHYLNAPHTHALENE AND 2-METHYLNAPHTHALENE ABOVE THE NCAC 15A:2L STANDARDS OF DETECTION LIMIT AND 28 ug/L RESPECTIVELY
- ⊠ EXISTING PUMPING WELL
- ⊛ SVE/AIR SPARGE WELL CLUSTER
- ⊙ UTILITY POLE
- ⊛ WATER VALVE
- ⊙ MANHOLE
- ⊛ FIRE HYDRANT
- ⊙ LIGHT POLE
- E— ELECTRICAL UTILITY LINE
- W— WATER UTILITY LINE
- T— TELEPHONE UTILITY LINE
- SOIL VAPOR EXTRACTION LINE NO. 1
- SOIL VAPOR EXTRACTION LINE NO. 2
- AIR SPARGE COMPRESSED AIR LINE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NAVAL STATION		NORFOLK, VIRGINIA ANNUAL MONITORING REPORT BUILDING 46, UST S-941-1 AND 2 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA		DISSOLVED GROUNDWATER CONTAMINANT ISOPLETH MAP - JULY 17, 2002	
CODE ID. NO. 80091		SIZE			
SCALE: 1"=50'					
EFD NO.					
STA. PROJ. NO.					
SPEC. NO.					
CONSTR. CONTR. NO.					
NAVJAC DRAWING NO.					
SHEET 18 OF 18		3-12			

SECTION 4.0

CONCLUSIONS AND RECOMMENDATIONS

From April 16, 1998 through July 31, 2002, J.A. Jones implemented the selected remedial approach as outlined in the February 21, 1996 CAP prepared by Law. The selected remedial approach is based on the installation and operation of a remediation treatment system consisting of air sparge and soil vapor extraction. The system volatilizes dissolved hydrocarbons present in the groundwater and collects vapors generated during air sparging. J.A. Jones also performed groundwater monitoring to monitor treatment system performance and to track petroleum-impacted groundwater migration in order to verify remediation progress.

J.A. Jones completed installation and began operation of the Building 45 treatment system on April 16, 1998. Groundwater samples were collected from on-site monitoring wells on a monthly basis for three months after system startup and quarterly thereafter. Groundwater samples were analyzed for volatile aromatic hydrocarbons by USEPA Method 602 and polynuclear aromatic hydrocarbons by USEPA Method 610.

There are two dissolved phase groundwater contamination plumes located at the Building 45 site. One plume is located at the vicinity of the former USTs S-941-1 and S-941-2 and the other is located in the vicinity of monitoring well MW-15. The dissolved plume around MW-15 appears to have been remediated while the plume in the vicinity of the former USTs appears to have reached an asymptotic concentration level. The soils in the former tank basin were excavated recently in order to attempt to eliminate the source of the petroleum plume.

From 1998 through 2002, the interpreted areal extent of dissolved VOCs and PAHs in the vicinity of the former USTs S-941-1 and S-941-2 has remained generally consistent, with the plume reducing slightly over time. Dissolved phase contaminant concentrations have decreased overall indicating the remedial system has been effective in volatilizing petroleum contamination at the site.

According to the groundwater elevation data collected by J.A. Jones, the direction of groundwater flow is estimated to be predominantly toward the northwest.

Vapor extraction flowrates were measured from each vapor extraction well and the air quality samples were collected from the treatment system effluent and from the SVE wells themselves. The sample results indicated concentrations below laboratory quantitation limits.

Shaw recently completed excavation activities at the Building 45 site, which encompassed monitoring wells PW-1, MW-2, MW-3, and MW-10. Each well was abandoned prior to the start of the work. Air sparge wells AS-5 through AS-8 and SVE wells SVE-5 through SVE-8 were also disconnected from the treatment system at the site in order to accommodate the excavation activities. This area represented the most impacted area from the petroleum plume and excavation activities were conducted in an effort to remove the source.

J.A. Jones recommends that wells PW-1, MW-2, and MW-3 be replaced and sampled for one year to determine the effectiveness of the site excavation activities and to evaluate the occurrence of LNAPL. J.A. Jones also recommends discontinuing treatment system (AS-1 through AS-4 and SVE-1 through SVE-4) operation and limiting the number of sampled monitoring wells to MW-09, MW-10 and MW-15 as described in **Section 1.5 Sampling and Analyses Requirements** until dissolved petroleum related constituent concentrations consistently meet the site rehabilitation concentrations established by the 15A NCAC 2L groundwater quality standards. A review of the excavation completion report for the work performed by Shaw should be conducted to assess if the air sparge and SVE treatment system previously located at the excavation area (SVE 5 through SVE 8) should be reconnected and be brought back to operation. As part of the evaluation to recommend if the air sparge and SVE treatment system should be reconnected, additional confirmatory soil samples may be required to confirm if the removal of contaminated petroleum soil was fully performed.

APPENDIX A

AGGRESSIVE FLUID/VAPOR RECOVERY RESULTS

**AFVR
Building 45
AFVR Event - April 9, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 and MW-3
Time Duration (hours)	1.50
Average Temperature ($^{\circ}\text{F}$)	78.9
Average Relative Humidity (%)	100.0
Average Velocity (ft/min)	172
Average FID Reading (ppm)	730
B_{WSW} (lb. water/lb. dry air)	0.0215
B_{WS} (water vapor % by volume)	0.0333
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	538.9
Q_{std} (flow at DSCRM)	14.2
PPM_{W} (wet concentration=measured concentration)	730
PPM_{d} (dry concentration)	755
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	755
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	377
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000024
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.02
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.02
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.03
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.00
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from April 9, 1999 AFVR Event	26
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from April 9, 1999 AFVR Event	26.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	26.00

**AFVR
Building 45
Data Measurement Summary**

Date: April 9, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 24

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	21	900	1030	1.50
MW-3	22	900	1030	1.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (⁰ F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
6 minutes - 9:06	78.9	100.0	172	730
Average	78.9	100.0	172	730

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.08		
MW-7	10.00		5.80	4.20	
MW-9	10.27		16.26		
MW-10	11.49		7.35	4.14	
MW-18			6.83		
MW-19			5.18		
MW-20			5.62		

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - April 22, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	2.25
Average Temperature ($^{\circ}$ F)	85.0
Average Relative Humidity (%)	33.1
Average Velocity (ft/min)	583
Average FID Reading (ppm)	No FID
B _{WSW} (lb. water/lb. dry air)	0.0091
B _{WS} (water vapor % by volume)	0.0144
Stack Pipe Cross Sectional Area (ft ²)	0.087
T _S Stack Temperature ($^{\circ}$ R)	545.0
Q _{std} (flow at DSCRM)	48.6
PPM _w (wet concentration=measured concentration)	No FID
PPM _d (dry concentration)	
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	
C _{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	
C _c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from April 22, 1999 AFVR Event	56
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from April 22, 1999 AFVR Event	56.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	82.00

**AFVR
Building 45
Data Measurement Summary**

Date: April 22, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 23.5 - reduced to 21 at 9:00 - reduced to 18.5 at 9:45

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	21	8:45	11:00	2.25
MW-3	22	8:45	11:00	2.25
PW-1	22	8:45	11:00	2.25

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (^o F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
15 minutes - 900	86.4	34.4	7	No FID
45 minutes - 930	84.6	32.5	701	No FID
75 minutes - 1000	84.1	32.4	1041	No FID
Average	85.0	33.1	583	No FID

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-7	10.00		7.79	2.21	
MW-9	10.27		17.46		
MW-10	11.49		8.86	2.63	
MW-18			7.55		
MW-19			5.75		
MW-20			6.81		

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - May 11, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	1.58
Average Temperature ($^{\circ}\text{F}$)	94.1
Average Relative Humidity (%)	53.4
Average Velocity (ft/min)	483
Average FID Reading (ppm)	20
B_{WSW} (lb. water/lb. dry air)	0.0198
B_{WS} (water vapor % by volume)	0.0307
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	554.1
Q_{std} (flow at DSCRM)	39.0
PPM_{W} (wet concentration=measured concentration)	20
PPM_{d} (dry concentration)	21
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	21
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	10
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000001
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.00
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.00
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.00
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from May 11, 1999 AFVR Event	0
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from May 11, 1999 AFVR Event	0.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	82.00

AFVR
Building 45
Data Measurement Summary

Date: May 11, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	21	10:15	11:50	1.58
MW-3	24	10:15	11:50	1.58
PW-1	20	10:15	11:50	1.58

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
30 minutes - 1045	86.6	35.0	1007	36
60minutes - 1115	98.3	67.0	233	16
90 minutes - 1145	97.4	58.1	210	8
Average	94.1	53.4	483	20

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.00		17.81		
MW-8	10.27		5.21	5.06	
MW-10	11.49		7.94	3.55	
MW-18			7.10		
MW-19			5.25		
MW-20			6.00		

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - June 22, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	2.00
Average Temperature ($^{\circ}\text{F}$)	79.7
Average Relative Humidity (%)	65.0
Average Velocity (ft/min)	591
Average FID Reading (ppm)	162
B_{WSW} (lb. water/lb. dry air)	0.0140
B_{WS} (water vapor % by volume)	0.0219
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	539.7
Q_{std} (flow at DSCRM)	49.4
PPM_{W} (wet concentration=measured concentration)	162
PPM_{d} (dry concentration)	165
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	165
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	83
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000005
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.02
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.02
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.03
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.01
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.01
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from June 22, 1999 AFVR Event	0
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from June 22, 1999 AFVR Event	0.01
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	82.01

**AFVR
Building 45
Data Measurement Summary**

Date: June 22, 1999

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	24	9:30	11:30	2.00
MW-3	19	9:30	11:30	2.00
PW-1	22	9:30	11:30	2.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (^o F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
15 minutes - 945	72.4	68.7	175	347
45 minutes - 1015	78.8	69.7	576	113
75 minutes - 1145	80.8	41.9	1290	118
120 minutes - 1130	86.8	79.8	323	69
Average	79.7	65.0	591	162

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.71		19.88		
MW-8	10.27		5.48	4.79	
MW-10	11.49		9.03	2.46	
MW-18			8.51		
MW-19			5.91		
MW-20			6.84		

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - June 29, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	2.00
Average Temperature ($^{\circ}\text{F}$)	92.8
Average Relative Humidity (%)	90.6
Average Velocity (ft/min)	1095
Average FID Reading (ppm)	325
B_{WSW} (lb. water/lb. dry air)	0.0306
B_{WS} (water vapor % by volume)	0.0467
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	552.8
Q_{std} (flow at DSCRM)	87.1
PPM_{W} (wet concentration=measured concentration)	325
PPM_{d} (dry concentration)	341
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	341
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	170
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000011
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.06
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.06
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.12
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.02
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.02
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from June 29, 1999 AFVR Event	27.50
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from June 29, 1999 AFVR Event	27.52
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	109.53

**AFVR
Building 45
Data Measurement Summary**

Date: June 29, 1999

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 21

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	15	10:00	12:00	2.00
MW-3	19	10:00	12:00	2.00
PW-1	20	10:00	12:00	2.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
15 minutes - 1015	97.8	100.0	1124	1361
30 minutes - 1030	85.0	93.7	2006	190
60 minutes - 1100	95.0	91.7	806	25
90 minutes - 1130	91.8	92.9	760	14
120 minutes - 1200	94.5	74.9	780	37
Average	92.8	90.6	1095	325

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.71		17.64		
MW-8	10.27		6.03	4.24	
MW-10	11.49		9.19	2.30	
MW-18			8.13		
MW-19			6.46		
MW-20			7.23		

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - July 19, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-3	MW-2
Time Duration (hours)	2.00	2.75
Average Temperature ($^{\circ}\text{F}$)	104.2	112.8
Average Relative Humidity (%)	61.5	67.7
Average Velocity (ft/min)	0	175
Average FID Reading (ppm)	832	78
B_{WSW} (lb. water/lb. dry air)	0.0442	0.0615
B_{WS} (water vapor % by volume)	0.0661	0.0897
Stack Pipe Cross Sectional Area (ft^2)	0.087	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	564.2	572.8
Q_{std} (flow at DSCRM)	0.0	12.8
PPM_{W} (wet concentration=measured concentration)	832	78
PPM_{d} (dry concentration)	891	86
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	891	86
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	445	43
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000028	0.000003
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.00	0.00
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.00	0.00
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00	0.01
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00	0.00
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.00	
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from July 19, 1999 AFVR Event	0.00	
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from July 19, 1999 AFVR Event	0.00	
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	109.53	

**AFVR
Building 45
Data Measurement Summary**

Date: July 19, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-3	22	9:30	11:30	2.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
start-up - 0930	91.6	81.9	0	1816
30 minutes - 1000	111.2	35.7	0	125
60 minutes - 1030	101.2	56.1	0	727
90 minutes - 1100	113.7	75.0	0	75
120 minutes - 1130	103.3	58.9	0	1415
Average	104.2	61.5	0	832

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			9.32		
MW-2	10.74	8.84	9.04	1.70	
MW-6	10.71		18.61		
MW-8	10.27		6.36	3.91	
MW-10	11.49		9.27	2.22	
MW-18	10.80		Not Measured		
MW-19	11.85		7.28	4.57	
MW-20	10.64		7.53	3.11	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

Date: July 19, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	21	11:45	14:30	2.75

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
start-up - 1145	103.1	57.2	173	53
30 minutes - 1215	114.4	74.9	160	34
60 minutes - 1245	116.2	76.8	0	30
90 minutes - 1315	104.3	60.3	359	69
120 minutes - 1345	117.2	58.1	147	53
165 minutes - 1430	121.3	78.8	208	228
Average	112.8	67.7	175	78

**AFVR
Building 45
AFVR Event - July 27, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	1.25
Average Temperature ($^{\circ}$ F)	104.8
Average Relative Humidity (%)	54.3
Average Velocity (ft/min)	702
Average FID Reading (ppm)	1412
B _{WSW} (lb. water/lb. dry air)	0.0260
B _{WS} (water vapor % by volume)	0.0400
Stack Pipe Cross Sectional Area (ft ²)	0.087
T _S Stack Temperature ($^{\circ}$ R)	564.8
Q _{std} (flow at DSCRM)	55.0
PPM _w (wet concentration=measured concentration)	1412
PPM _d (dry concentration)	1471
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	1471
C _{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	734
C _c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000046
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	0.15
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.16
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.21
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.03
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.03
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from July 27, 1999 AFVR Event	0
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from July 27, 1999 AFVR Event	0.03
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	109.56

AFVR
Building 45
Data Measurement Summary

Date: July 27, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 20

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	20	10:15	11:30	1.25
MW-3	17	10:15	11:30	1.25
PW-1	14	10:15	11:30	1.25

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
5 minutes - 1020	102.1	9.2	1977	1522
4 minutes - 1055	103.8	51.4	342	1446
60 minutes - 1115	103.6	68.2	326	1489
75 minutes - 1130	109.5	88.4	164	1192
Average	104.8	54.3	702	1412

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.71				
MW-8	10.27			10.27	
MW-10	11.49			11.49	
MW-18					
MW-19					
MW-20					

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - August 18, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	1.50
Average Temperature ($^{\circ}$ F)	106.8
Average Relative Humidity (%)	40.2
Average Velocity (ft/min)	1198
Average FID Reading (ppm)	1267
B_{WSW} (lb. water/lb. dry air)	0.0210
B_{WS} (water vapor % by volume)	0.0326
Stack Pipe Cross Sectional Area (ft ²)	0.087
T_S Stack Temperature ($^{\circ}$ R)	566.8
Q_{Std} (flow at DSCRM)	94.3
PPM _w (wet concentration=measured concentration)	1267
PPM _d (dry concentration)	1310
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	1310
C_{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	653
C_c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000041
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	0.23
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.25
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.38
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.06
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.06
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from August 18, 1999 AFVR Event	27.5
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from August 18, 1999 AFVR Event	27.56
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	137.12

**AFVR
Building 45
Data Measurement Summary**

Date: August 18, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 22.5

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	24	10:00	11:00	1.50
MW-3	20	10:00	11:00	1.50
PW-1	17	10:00	11:00	1.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
5 minutes - 1005	95.7	56.7	1291	1915
30 minutes - 1030	110.1	18.5	1575	1265
60 minutes - 1100	117.8	23.9	926	873
90 minutes - 1130	103.6	61.8	998	1014
Average	106.8	40.2	1198	1267

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.71		19.13		
MW-8	10.27		7.29	2.98	
MW-10	11.49		10.48	1.01	
MW-18	10.80				
MW-19	11.85		8.26	3.59	
MW-20	10.64		8.38	2.26	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - August 26, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	2.50
Average Temperature ($^{\circ}\text{F}$)	98.0
Average Relative Humidity (%)	44.6
Average Velocity (ft/min)	777
Average FID Reading (ppm)	1870
B_{WSW} (lb. water/lb. dry air)	0.0180
B_{WS} (water vapor % by volume)	0.0280
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	558.0
Q_{std} (flow at DSCRM)	62.4
PPM_{W} (wet concentration=measured concentration)	1870
PPM_{d} (dry concentration)	1924
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	1924
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	960
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000060
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.22
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.24
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.61
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.09
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.09
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from August 26, 1999 AFVR Event	8
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from August 26, 1999 AFVR Event	8.09
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	145.21

**AFVR
Building 45
Data Measurement Summary**

Date: August 26, 1999

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 22

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	18	9:30	12:00	2.50
MW-3	21	9:30	12:00	2.50
PW-1	18	9:30	12:00	2.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
30 minutes - 1000	105.1	12.6	926	3185
60 minutes - 1030	104.9	56.7	638	1408
90 minutes - 1100	94.3	53.1	713	3164
120 minutes - 1130	91.8	53.2	748	1281
150 minutes - 1200	93.7	47.3	862	313
Average	98.0	44.6	777	1870

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1					
MW-6	10.71		19.15		
MW-8	10.27		7.10	3.17	
MW-10	11.49		10.68	0.81	
MW-18	10.80				
MW-19	11.85		8.24	3.61	
MW-20	10.64		8.37	2.27	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - September 2, 1999**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	1.58
Average Temperature ($^{\circ}\text{F}$)	88.3
Average Relative Humidity (%)	40.5
Average Velocity (ft/min)	1085
Average FID Reading (ppm)	272
B_{WSW} (lb. water/lb. dry air)	0.0110
B_{WS} (water vapor % by volume)	0.0173
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	548.3
Q_{std} (flow at DSCRM)	89.6
PPM_{W} (wet concentration=measured concentration)	272
PPM_{d} (dry concentration)	277
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	277
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	138
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000009
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.05
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.05
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.08
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.01
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.01
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from September 2, 1999 AFVR Event	11.25
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from September 2, 1999 AFVR Event	11.26
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	156.47

**AFVR
Building 45
Data Measurement Summary**

Date: September 2, 1999
Diameter of Exhaust Pipe: 4 inches
Vacuum at the Blower (in. of Hg): 23

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	17	9:25	11:00	1.58
MW-3	22	9:25	11:00	1.58
PW-1	21	9:25	11:00	1.58

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
35 minutes - 1000	89.9	56.1	1109	535
65 minutes - 1030	88.7	28.6	1239	151
95 minutes - 1100	86.2	36.9	908	131
Average	88.3	40.5	1085	272

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.38		
MW-6	10.71		18.26		
MW-8	10.27		5.81	4.46	
MW-10	11.49		7.40	4.09	
MW-18	10.80				
MW-19	11.85		6.64	5.21	
MW-20	10.64		6.05	4.59	

Notes:
ft = feet
toc = top of casing elevation
msl = mean sea level

**AFVR
Building 45
AFVR Event - June 19, 2000**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	4.50
Average Temperature ($^{\circ}\text{F}$)	109.1
Average Relative Humidity (%)	28.5
Average Velocity (ft/min)	1324
Average FID Reading (ppm)	10549
B_{WSW} (lb. water/lb. dry air)	0.0158
B_{WS} (water vapor % by volume)	0.0247
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	569.1
Q_{std} (flow at DSCRM)	104.6
PPM_{W} (wet concentration=measured concentration)	10549
PPM_{d} (dry concentration)	10816
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	10816
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	5397
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000337
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	2.11
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	2.30
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	10.34
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.57
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.57
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from June 19, 2000 AFVR Event	4.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from June 19, 2000 AFVR Event	5.57
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	162.04

AFVR
Building 45
Data Measurement Summary

Date: June 19, 2000

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	20	8:30	13:00	4.50
MW-3	23	8:30	13:00	4.50
PW-1	16	8:30	13:00	4.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	97.9	11.0	3973	1528
15 minutes - 8:45	101.2	14.8	3524	1047
30 minutes - 9:00	98.6	12.4	3021	1041
45 minutes - 9:15	106.1	2.8	513	5971
1 hour - 9:30	114.9	12.3	761	15100
1 hour 15 minutes - 9:45	105.5	39.3	421	18000
1 hour 30 minutes - 10:00	122.2	40.6	633	16700
1 hour 45 minutes - 10:15	116.8	51.7	771	16400
2 hours - 10:30	99.9	56.1	683	13200
2 hour 30 minutes - 11:00	106.4	50.1	711	12700
3 hours - 11:30	121.9	28.6	744	12200
3 hours 30 minutes - 12:00	113.7	19.0	928	11700
4 hours - 12:30	113.2	18.2	928	11500
4 hours 30 minutes - 13:00	109.3	41.5	918	10600
Average	109.1	28.5	1324	10549

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1		Trace	3.90		
MW-6	10.71		17.02		
MW-8	10.27		4.18	6.09	
MW-10	11.49		4.16	7.33	
MW-18	10.80		6.25		
MW-19	11.85		4.26	7.59	
MW-20	10.64		3.50	7.14	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - July 19, 2000**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	99.5
Average Relative Humidity (%)	55.8
Average Velocity (ft/min)	1021
Average FID Reading (ppm)	26181
B_{WSW} (lb. water/lb. dry air)	0.0210
B_{WS} (water vapor % by volume)	0.0326
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	559.5
Q_{std} (flow at DSCRM)	81.4
PPM_{W} (wet concentration=measured concentration)	26181
PPM_{d} (dry concentration)	27062
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	27062
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	13503
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000843
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	4.11
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	4.47
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	26.84
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	4.07
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	4.07
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from July 19, 2000 AFVR Event	0.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from July 19, 2000 AFVR Event	4.07
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	166.11

**AFVR
Building 45
Data Measurement Summary**

Date: July 19, 2000

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 22

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	20	7:30	13:00	6.00
MW-3		7:30	13:00	6.00
PW-1	20	7:30	13:00	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 7:30	89.3		1125	15700
15 minutes - 7:45	88.2		1692	26400
30 minutes - 8:00	89.7		1291	25800
45 minutes - 8:15	90.6		1166	21800
1 hour - 8:30	91.5		978	25100
1 hour 15 minutes - 8:45	93.7		874	24700
1 hour 30 minutes - 9:00	99.5		877	30200
1 hour 45 minutes - 9:15	101.3		822	31100
2 hours - 9:30	101.4		915	39700
2 hour 30 minutes - 10:00	106.2		1068	35500
3 hours - 10:30	98.6		1008	28100
3 hours 30 minutes - 11:00	97.9		945	25100
4 hours - 11:30	106.2		802	25100
4 hours 30 minutes - 12:00	114.6		923	22200
5 hours - 12:30	108.6		927	22200
5 hours 30 minutes - 13:00	113.9		918	20200
Average	99.5	55.8*	1020.7	26181.3

* Based on the average of the relative humidity measurements from previous AFVR events.

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			8.70		
MW-6	10.71		21.70		
MW-8	10.27		7.53	2.74	
MW-10	11.49		10.04	1.45	
MW-18	10.80		9.50	1.30	
MW-19	11.85		8.21	3.64	
MW-20	10.64		7.25	3.39	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - August 31, 2000**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	4.00
Average Temperature ($^{\circ}\text{F}$)	169.5
Average Relative Humidity (%)	13.8
Average Velocity (ft/min)	2932
Average FID Reading (ppm)	96
B_{WSW} (lb. water/lb. dry air)	0.0328
B_{WS} (water vapor % by volume)	0.0499
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	629.5
Q_{std} (flow at DSCRM)	204.0
PPM_{w} (wet concentration=measured concentration)	96
PPM_{d} (dry concentration)	101
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	101
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	50
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000003
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.04
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.04
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.17
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.03
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.03
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from August 31, 2000 AFVR Event	0.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from August 31, 2000 AFVR Event	0.03
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	166.14

**AFVR
Building 45
Data Measurement Summary**

Date: August 31, 2000

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 22

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:00	15:00	7.00
MW-3		8:00	15:00	7.00
PW-1		8:00	15:00	7.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	177.5	9.7	3536	98.67
15 minutes - 8:15	174.2	11.6	5267	72.63
30 minutes - 8:30	169.4	14.7	3355	76.00
45 minutes - 8:45	176.5	6.0	4091	75.47
1 hour - 9:00	183.1	14.4	3495	84.65
1 hour 15 minutes - 9:15	162.4	10.4	2069	89.96
1 hour 30 minutes - 9:30	168.6	11.2	3218	79.45
1 hour 45 minutes - 9:45	162.7	25.2	1731	121.00
2 hours - 10:00	167.0	23.2	2263	113.00
2 hour 30 minutes - 10:30	166.9	18.8	1794	111.00
3 hours - 11:00	177.9	8.5	2703	107.00
3 hours 30 minutes - 11:30	168.1	12.4	2809	109.00
4 hours - 12:00	149.6	12.7	1784	109.00
Average	169.5	13.8	2931.9	95.9

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1		Sheen	3.90		
MW-6	10.71		17.02		
MW-8	10.27		4.18	6.09	
MW-10	11.49		4.16	7.33	
MW-18	10.80		6.25	4.55	
MW-19	11.85		4.26	7.59	
MW-20	10.64		3.50	7.14	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

AFVR
Building 45
AFVR Event - November 20, 2000

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	6.50
Average Temperature ($^{\circ}\text{F}$)	142.5
Average Relative Humidity (%)	13.5
Average Velocity (ft/min)	3970
Average FID Reading (ppm)	97
B_{WSW} (lb. water/lb. dry air)	0.0186
B_{WS} (water vapor % by volume)	0.0289
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	602.5
Q_{std} (flow at DSCRM)	294.9
PPM_{W} (wet concentration=measured concentration)	97
PPM_{d} (dry concentration)	100
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	100
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	50
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000003
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.06
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.06
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.39
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.06
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.06
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from November 20, 2000 AFVR Event	5.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from November 20, 2000 AFVR Event	5.06
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	171.20

**AFVR
Building 45
Data Measurement Summary**

Date: November 20, 2000

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:30	15:00	6.50
MW-3		8:30	15:00	6.50
PW-1		8:30	15:00	6.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	128.7	20.5	3574	68.42
15 minutes - 8:45	141.7	7.9	2852	66.78
30 minutes - 9:00	132.8	12.4	3281	85.34
45 minutes - 9:15	139.3	8.7	4150	74.86
1 hour - 9:30	142.7	4.7	4111	77.02
1 hour 15 minutes - 9:45	147.2	20.5	4058	85.21
1 hour 30 minutes - 10:00	128.2	35.6	3571	88.75
1 hour 45 minutes - 10:15	140.0	7.5	5021	107
2 hours - 10:15	145.8	9.9	4368	111
2 hour 30 minutes - 11:00	138.2	12.4	4291	156
3 hours - 11:30	147.1	4.1	3393	108
3 hours 30 minutes - 12:00	138.7	12.4	4381	103
4 hours - 12:30	148.2	14.8	4021	102
4 hours 30 minutes - 13:00	148.7	11.4	3037	103
5 hours - 13:30	150.1	13.7	4074	105
5 hours 30 minutes - 14:00	150.7	14.0	5332	102
6 hours - 14:30	146.4	16.8	4763	101
6 hours 30 minutes - 15:00	151.0	16.0	3184	105
Average	142.5	13.5	3970.1	97.2

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			6.20		
MW-6	10.71		17.87		
MW-8	10.27		5.05	5.22	
MW-10	11.49		7.93	3.56	
MW-18	10.80		7.33	3.47	
MW-19	11.85		5.20	6.65	
MW-20	10.64		4.95	5.69	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - December 21, 2000**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	5.00
Average Temperature ($^{\circ}\text{F}$)	135.4
Average Relative Humidity (%)	13.0
Average Velocity (ft/min)	2372
Average FID Reading (ppm)	122
B_{WSW} (lb. water/lb. dry air)	0.0148
B_{WS} (water vapor % by volume)	0.0232
Stack Pipe Cross Sectional Area (ft^2)	0.087
T_{S} Stack Temperature ($^{\circ}\text{R}$)	595.4
Q_{std} (flow at DSCRM)	179.4
PPM_{W} (wet concentration=measured concentration)	122
PPM_{d} (dry concentration)	125
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	125
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	63
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000004
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.04
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.05
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.23
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.03
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.03
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from December 21, 2000 AFVR Event	1.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from December 21, 2000 AFVR Event	1.03
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	172.23

AFVR
Building 45
Data Measurement Summary

Date: December 21, 2000
Diameter of Exhaust Pipe: 4 inches
Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:00	13:00	5.00
MW-3		8:00	13:00	5.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	98.6	30.6	815	384
15 minutes - 8:15	96.4	29.8	784	342
30 minutes - 8:30	97.8	31.9	843	334
45 minutes - 8:45	122.0	10.3	2109	223
1 hour - 9:00	122.7	8.1	3271	136
1 hour 15 minutes - 9:15	110.7	8.3	2821	73
1 hour 30 minutes - 9:30	147.8	8.1	3218	66
1 hour 45 minutes - 9:45	153.2	15.4	3972	63.84
2 hours - 10:00	152.1	4.8	2276	43.64
2 hour 30 minutes - 10:30	148.9	6.4	3218	41.29
3 hours - 11:00	155.2	8.1	1546	30.46
3 hours 30 minutes - 11:30	167.8	4.8	3398	35.69
4 hours - 12:00	158.7	6.2	2816	20.89
4 hours 30 minutes - 12:30	148.9	12.7	1874	23.74
5 hours - 13:00	150.5	9.2	2618	18.93
Average	135.4	13.0	2371.9	122.4

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			4.91		
MW-6	10.71		17.93		
MW-8	10.27		4.90	5.37	
MW-10	11.49		6.45	5.04	
MW-18	10.80		5.90	4.90	
MW-19	11.85		4.33	7.52	
MW-20	10.64		4.14	6.50	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - January 18, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	5.50
Average Temperature ($^{\circ}\text{F}$)	158.6
Average Relative Humidity (%)	8.7
Average Velocity (ft/min)	5054
Average FID Reading (ppm)	39
B_{WSW} (lb. water/lb. dry air)	0.0159
B_{WS} (water vapor % by volume)	0.0248
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	618.6
Q_{std} (flow at DSCRM)	824.5
PPM_{W} (wet concentration=measured concentration)	39
PPM_{d} (dry concentration)	40
PPM_{c} (PPM_{d} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	40
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	20
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000001
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.06
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.07
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.36
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.06
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.06
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from January 18, 2001 AFVR Event	40.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from January 18, 2001 AFVR Event	40.06
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	212.29

**AFVR
Building 45
Data Measurement Summary**

Date: January 18, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:30	14:00	5.50
MW-3		8:30	14:00	5.50

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	146.3	15.8	5082	43.80
15 minutes - 8:45	122.0	18.4	5318	32.83
30 minutes - 9:00	136.8	16.3	5072	31.61
45 minutes - 9:15	137.2	12.6	4817	30.90
1 hour - 9:30	173.0	4.5	5677	25.18
1 hour 15 minutes - 9:45	156.4	4.1	4829	47.93
1 hour 30 minutes - 10:00	163.7	5.3	4711	46.12
1 hour 45 minutes - 10:15	155.3	5.8	5573	32.36
2 hours - 10:30	156.3	5.2	4817	31.18
2 hour 30 minutes - 11:00	163.4	6.2	4634	29.41
3 hours - 11:30	163.6	8.7	4023	37.86
3 hours 30 minutes - 12:00	174.6	6.2	5704	39.74
4 hours - 12:30	180.2	4.9	6028	47.93
4 hours 30 minutes - 13:00	168.8	17.8	4982	41.64
5 hours - 13:30	177.6	3.7	4708	49.05
5 hours 30 minutes - 14:00	162.9	3.6	4893	48.78
Average	158.6	8.7	5054.3	38.52

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			5.42		
MW-6	10.71		17.94		
MW-8	10.27		5.01	5.26	
MW-10	11.49		7.43	4.06	
MW-18	10.80		6.93	3.87	
MW-19	11.85		4.78	7.07	
MW-20	10.64		4.54	6.10	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - March 1, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	
Average Temperature ($^{\circ}\text{F}$)	
Average Relative Humidity (%)	
Average Velocity (ft/min)	
Average FID Reading (ppm)	
B_{WSW} (lb. water/lb. dry air)	
B_{WS} (water vapor % by volume)	
Stack Pipe Cross Sectional Area (ft^2)	
T_{S} Stack Temperature ($^{\circ}\text{R}$)	
Q_{std} (flow at DSCRM)	
PPM_{W} (wet concentration=measured concentration)	
PPM_{d} (dry concentration)	
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from March 1, 2001 AFVR Event	10.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from March 1, 2001 AFVR Event	10.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	222.29

**AFVR
Building 45
Data Measurement Summary**

Date: March 1, 2001

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2				
MW-3				

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s)	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 7:30				
15 minutes - 7:45				
30 minutes - 8:00				
45 minutes - 8:15				
1 hour - 8:30				
1 hour 15 minutes - 8:45				
1 hour 30 minutes - 9:00				
1 hour 45 minutes - 9:15				
2 hours - 9:30				
2 hour 30 minutes - 10:00				
3 hours - 10:30				
3 hours 30 minutes - 11:00				
4 hours - 11:30				
4 hours 30 minutes - 12:00				
5 hours - 12:30				
Average				

* Based on the average of the relative humidity measurements from previous AFVR events.

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			4.90		
MW-6	10.71		18.05	-7.34	
MW-8	10.27		4.75	5.52	
MW-10	11.49		7.02	4.47	
MW-18	10.80		6.79	4.01	
MW-19	11.85		4.37	7.48	
MW-20	10.64		4.04	6.60	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - March 29, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	164.3
Average Relative Humidity (%)	8.1
Average Velocity (ft/min)	8387
Average FID Reading (ppm)	30
B_{WSW} (lb. water/lb. dry air)	0.0185
B_{WS} (water vapor % by volume)	0.0288
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	624.3
Q_{std} (flow at DSCRM)	1350.2
PPM_{W} (wet concentration=measured concentration)	30
PPM_{d} (dry concentration)	31
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	31
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	15
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000001
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.08
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.09
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.51
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.08
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.08
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from March 29, 2001 AFVR Event	0.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from March 29, 2001 AFVR Event	0.08
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	222.37

**AFVR
Building 45
Data Measurement Summary**

Date: March 29, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 24

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:30	14:30	6.00
MW-3		8:30	14:30	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (^o F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	137.0	13.5	7074	186.78
15 minutes - 8:45	167.1	8.6	6980	33.81
30 minutes - 9:00	168.4	8.4	7418	33.92
45 minutes - 9:15	173.2	8.6	8861	32.18
1 hour - 9:30	174.4	8.7	8917	31.74
1 hour 15 minutes - 9:45	169.2	8.2	7416	20.31
1 hour 30 minutes - 10:00	168.6	7.9	8013	18.21
1 hour 45 minutes - 10:15	167.4	7.4	9418	21.36
2 hours - 10:30	172.1	9.4	9862	16.49
2 hour 30 minutes - 11:00	178.2	6.8	10201	17.65
3 hours - 11:30	168.4	7.6	8928	17.69
3 hours 30 minutes - 12:00	115.7	9.7	7926	16.30
4 hours - 12:30	163.6	8.6	8188	11.82
4 hours 30 minutes - 13:00	164.8	6.3	7981	10.11
5 hours - 13:30	162.4	5.4	8001	9.69
5 hours 30 minutes - 14:00	173.2	5.6	8745	17.36
6 hours - 14:30	168.8	7.2	8641	16.91
Average	164.3	8.1	8386.5	30.14

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			4.62		
MW-6	10.71		17.38		
MW-8	10.27		4.45	5.82	
MW-10	11.49		6.05	5.44	
MW-18	10.80		4.75	6.05	
MW-19	11.85		4.05	7.80	
MW-20	10.64		3.95	6.69	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - April 26, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	4.00
Average Temperature (⁰ F)	143.7
Average Relative Humidity (%)	5.9
Average Velocity (ft/min)	5793
Average FID Reading (ppm)	109
B _{WSW} (lb. water/lb. dry air)	0.0083
B _{WS} (water vapor % by volume)	0.0131
Stack Pipe Cross Sectional Area (ft ²)	0.196
T _S Stack Temperature (⁰ R)	603.7
Q _{std} (flow at DSCRM)	980.0
PPM _w (wet concentration=measured concentration)	109
PPM _d (dry concentration)	111
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	111
C _{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	55
C _c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000003
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	0.20
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.22
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.88
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.13
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.13
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from April 26, 2001 AFVR Event	4.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from April 26, 2001 AFVR Event	4.13
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activites April 9, 1999	226.50

**AFVR
Building 45
Data Measurement Summary**

Date: April 26, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2		8:00	12:00	4.00
MW-3		8:00	11:00	3.00
PW-1		8:00	9:00	1.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	120.6	15.1	5720	215
15 minutes - 8:15	148.5	5.8	5840	174
30 minutes - 8:30	136.2	6.2	6201	101
45 minutes - 8:45	138.2	5.8	5724	98.02
1 hour - 9:00	146.2	4.2	5414	64.86
1 hour 15 minutes - 9:15	146.0	5.6	5864	70.04
1 hour 30 minutes - 9:30	150.1	4.4	5624	98.64
1 hour 45 minutes - 9:45	142.8	4.4	6817	101
2 hours - 10:00	148.4	4.8	5721	112
2 hour 30 minutes - 10:30	142.8	4.5	5732	115
3 hours - 11:00	158.3	3.4	5630	124
3 hours 30 minutes - 11:30	143.8	6.7	5418	83
4 hours - 12:00	146.7	5.4	5600	62.98
Average	143.7	5.9	5792.7	109.20

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			5.55		
MW-6	10.71		17.30		
MW-8	10.27		5.06	5.21	
MW-10	11.49		7.30	4.19	
MW-18	10.80		6.70	4.10	
MW-19	11.85		4.98	6.87	
MW-20	10.64		4.83	5.81	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - May 9, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	170.0
Average Relative Humidity (%)	4.6
Average Velocity (ft/min)	13645
Average FID Reading (ppm)	242
B_{WSW} (lb. water/lb. dry air)	0.0120
B_{WS} (water vapor % by volume)	0.0189
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	630.0
Q_{std} (flow at DSCRM)	2199.1
PPM_{W} (wet concentration=measured concentration)	242
PPM_{d} (dry concentration)	247
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	247
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	123
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000008
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.01
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.10
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	6.61
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.00
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.00
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from May 9, 2001 AFVR Event	27.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from May 9, 2001 AFVR Event	28.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	254.50

**AFVR
Building 45
Data Measurement Summary**

Date: May 9, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 26

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	26	8:00	14:00	6.00
MW-3	25	8:00	14:00	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (^o F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	122.0	15.2	8182	668
15 minutes - 8:15	144.4	6.8	7842	865
30 minutes - 8:30	148.1	7.1	8214	208
45 minutes - 8:45	171.3	4.8	15000	155
1 hour - 9:00	176.1	4.3	15000	131
1 hour 15 minutes - 9:15			15000	129
1 hour 30 minutes - 9:30	181.2	3.8	15000	119
1 hour 45 minutes - 9:45	179.8	3.6	15000	122
2 hours - 10:00	172.0	3.7	14448	154
2 hour 30 minutes - 10:30	187.2	3.2	14299	153
3 hours - 11:00	178.3	3.4	15000	164
3 hours 30 minutes - 11:30	178.4	3.3	15000	186
4 hours - 12:00	176.2	3.6	15000	184
4 hour 30 minutes - 12:30	173.8	3.1	15000	198
5 hours - 13:00	175.0	2.8	15000	210
5 hours 30 minutes - 13:30	181.2	2.3	13974	236
6 hours - 14:00	174.6	3.2	15000	231
Average	170.0	4.6	13644.6	241.9

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.28		
MW-6	10.71		18.50		
MW-8	10.27		6.18	4.09	
MW-10	11.49		7.27	4.22	
MW-18	10.80		7.36	3.44	
MW-19	11.85		6.11	5.74	
MW-20	10.64		5.86	4.78	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - May 30, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	3.00
Average Temperature ($^{\circ}\text{F}$)	162.0
Average Relative Humidity (%)	8.6
Average Velocity (ft/min)	9883
Average FID Reading (ppm)	490
B_{WSW} (lb. water/lb. dry air)	0.0193
B_{WS} (water vapor % by volume)	0.0300
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	622.0
Q_{std} (flow at DSCRM)	1595.0
PPM_{W} (wet concentration=measured concentration)	490
PPM_{d} (dry concentration)	505
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	505
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	252
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000016
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.51
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.64
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	4.91
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.75
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.75
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from May 9, 2001 AFVR Event	25.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from May 9, 2001 AFVR Event	25.75
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	280.25

**AFVR
Building 45
Data Measurement Summary**

Date: May 30, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 26

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	12	8:00	11:00	3.00
MW-3	12	8:00	11:00	3.00
PW-1	12	8:00	11:00	3.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	119.5	20.7	9419	653
15 minutes - 8:15	142.0	11.6	9450	762
30 minutes - 8:30	171.2	6.3	10387	780
45 minutes - 8:45	184.4	6.1	11041	608
1 hour - 9:00	173.3	6.2	12075	483
1 hour 15 minutes - 9:15	167.8	5.3	11969	394
1 hour 30 minutes - 9:30	158.4	8.2	9257	378
1 hour 45 minutes - 9:45	173.5	10.4	9340	343
2 hours - 10:00	160.4	6.7	9064	310
2 hour 30 minutes - 10:30	168.8	6.1	7818	326
3 hours - 11:00	162.7	6.8	8893	354
Average	162.0	8.6	9883.0	490.1

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.70		
MW-6	10.71		18.60		
MW-8	10.27		5.81	4.46	
MW-10	11.49		8.92	2.57	
MW-18	10.80		7.98	2.82	
MW-19	11.85		6.54	5.31	
MW-20	10.64		6.31	4.33	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - June 14, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2, MW-3, & PW-1
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	172.4
Average Relative Humidity (%)	7.7
Average Velocity (ft/min)	13189
Average FID Reading (ppm)	211
B_{WSW} (lb. water/lb. dry air)	0.0215
B_{WS} (water vapor % by volume)	0.0333
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	632.4
Q_{std} (flow at DSCRM)	2086.5
PPM_{W} (wet concentration=measured concentration)	211
PPM_{d} (dry concentration)	218
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	218
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	109
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000007
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.85
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.93
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	5.55
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.84
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.84
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from June 14, 2001 AFVR Event	2.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from June 14, 2001 AFVR Event	2.84
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	283.09

**AFVR
Building 45
Data Measurement Summary**

Date: June 14, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	22	8:00	14:00	6.00
MW-3	22	8:00	14:00	6.00
PW-1	20	8:00	9:00	1.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	126.8	19.1	8309	381
15 minutes - 8:15	160.2	9.6	9365	335
30 minutes - 8:30	163.6	8.6	13600	275
45 minutes - 8:45	175.3	7.0	13210	219
1 hour - 9:00	175.7	6.5	14404	191
1 hour 15 minutes - 9:15	178.6	5.9	14396	189
1 hour 30 minutes - 9:30	178.7	6.1	14817	186
1 hour 45 minutes - 9:45	175.1	6.7	13394	178
2 hours - 10:00	167.9	6.8	12289	173
2 hour 30 minutes - 10:30	171.0	6.8	13483	158
3 hours - 11:00	172.8	6.8	13892	162
3 hours 30 minutes - 11:30	184.7	6.3	13711	174
4 hours - 12:00	186.5	8.6	13804	173
4 hours 30 minutes - 12:30	178.8	7.4	14110	173
5 hours - 13:00	177.8	6.5	13097	180
5 hours 30 minutes - 13:30	178.5	6.3	14070	238
6 hours - 14:00	179.3	6.3	14268	202
Average	172.4	7.7	13189.4	211.0

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.03		
MW-6	10.71		18.65		
MW-8	10.27		5.85	4.42	
MW-10	11.49		7.73	3.76	
MW-18	10.80		7.60	3.20	
MW-19	11.85		6.58	5.27	
MW-20	10.64		6.00	4.64	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - June 26, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	5.00
Average Temperature ($^{\circ}\text{F}$)	182.6
Average Relative Humidity (%)	7.3
Average Velocity (ft/min)	13093
Average FID Reading (ppm)	70
B_{WSW} (lb. water/lb. dry air)	0.0258
B_{WS} (water vapor % by volume)	0.0397
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	642.6
Q_{std} (flow at DSCRM)	2024.8
PPM_{W} (wet concentration=measured concentration)	70
PPM_{d} (dry concentration)	73
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	73
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	36
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000002
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.28
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.30
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.50
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.23
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.23
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from June 26, 2001 AFVR Event	36.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from June 26, 2001 AFVR Event	36.23
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	319.32

**AFVR
Building 45
Data Measurement Summary**

Date: June 26, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg):

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	25	9:00	14:00	5.00
MW-3	25	9:00	14:00	5.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 9:00	128.0	28.8	4963	42.39
15 minutes - 9:15	166.1	11.6	7053	59.81
30 minutes - 9:30	174.3	6.9	9112	35.41
45 minutes - 9:45	171.4	6.8	13385	29.72
1 hour - 10:00	186.1	6.3	11998	29.13
1 hour 15 minutes - 10:15	189.4	5.6	15000	48.72
1 hour 30 minutes - 10:30	189.2	5.5	15000	81.97
1 hour 45 minutes - 10:45	182.4	5.7	15000	81.24
2 hours - 11:00	181.7	5.8	15000	82.01
2 hour 30 minutes - 11:30	189.6	5.3	14987	78.97
3 hours - 12:00	195.3	4.9	15000	83.44
3 hours 30 minutes - 12:30	191.7	4.9	15000	99.04
4 hours - 13:00	187.9	4.8	15000	95.78
4 hours 30 minutes - 13:30	202.1	4.1	14889	102
5 hours - 14:00	203.6	2.9	15000	101
Average	182.6	7.3	13092.5	70.0

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			5.10		
MW-6	10.71		18.37		
MW-8	10.27		8.10	2.17	
MW-10	11.49		4.54	6.95	
MW-18	10.80		6.56	4.24	
MW-19	11.85		5.31	6.54	
MW-20	10.64		4.53	6.11	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - July 23, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}$ F)	170.5
Average Relative Humidity (%)	9.0
Average Velocity (ft/min)	13864
Average FID Reading (ppm)	356
B _{WSW} (lb. water/lb. dry air)	0.0242
B _{WS} (water vapor % by volume)	0.0373
Stack Pipe Cross Sectional Area (ft ²)	0.196
T _S Stack Temperature ($^{\circ}$ R)	630.5
Q _{std} (flow at DSCRM)	2190.7
PPM _W (wet concentration=measured concentration)	356
PPM _d (dry concentration)	370
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	370
C _{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	185
C _c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000012
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	1.51
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.65
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	9.88
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.50
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.50
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from July 23, 2001 AFVR Event	2.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from July 23, 2001 AFVR Event	3.50
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activites April 9, 1999	322.82

**AFVR
Building 45
Data Measurement Summary**

Date: July 23, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 25

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	25	8:30	14:30	6.00
MW-3	25	8:30	14:30	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	107.8	39.8	15000	304
15 minutes - 8:45	141.5	14.2	8597	492
30 minutes - 9:00	174.6	7.5	11771	397
45 minutes - 9:15	173.5	7.1	15000	379
1 hour - 9:30	176.6	6.9	14897	344
1 hour 15 minutes - 9:45	183.4	5.6	15000	343
1 hour 30 minutes - 10:00	174.2	7.0	15000	323
1 hour 45 minutes - 10:15	192.8	6.1	15000	325
2 hours - 10:30	178.0	6.3	15000	312
2 hour 30 minutes - 11:00	183.2	6.1	15000	328
3 hours - 11:30	178.6	5.9	15000	338
3 hours 30 minutes - 12:00	178.6	6.0	15000	354
4 hours - 12:30	182.1	5.7	15000	357
4 hours 30 minutes - 13:00	158.8	6.3	13631	394
5 hours - 13:30	176.6	7.3	12382	361
5 hours 30 minutes - 14:00	169.9	7.4	11989	344
6 hours - 14:30	168.2	7.5	12428	358
Average	170.5	9.0	13864.4	356.1

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.05		
MW-6	10.71		17.30		
MW-8	10.27		6.29	3.98	
MW-10	11.49		8.38	3.11	
MW-18	10.80		7.65	3.15	
MW-19	11.85		7.17	4.68	
MW-20	10.64		6.50	4.14	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - August 16, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	5.00
Average Temperature ($^{\circ}$ F)	
Average Relative Humidity (%)	
Average Velocity (ft/min)	
Average FID Reading (ppm)	
B _{WSW} (lb. water/lb. dry air)	
B _{WS} (water vapor % by volume)	0.0000
Stack Pipe Cross Sectional Area (ft ²)	0.196
T _S Stack Temperature ($^{\circ}$ R)	460.0
Q _{std} (flow at DSCRM)	0.0
PPM _w (wet concentration=measured concentration)	0
PPM _d (dry concentration)	0
PPM _c (PPM _v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	0
C _{cm} (mg/dsm ³ , mass concentration of VOC emissions as carbon)	0
C _c (lb/dscf, mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000000
PMR _c (lb/hr, pollutant mass removal rate of VOCs as carbon)	0.00
PMR _{gas/diesel} (lb/hr, pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.00
PMR _{gas/diesel} (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00
PMR _{gas/diesel} (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.00
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.00
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from August 16, 2001 AFVR Event	16.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from August 16, 2001 AFVR Event	16.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activites April 9, 1999	338.82

**AFVR
Building 45
Data Measurement Summary**

Date: August 16, 2001

Diameter of Exhaust Pipe: 4 inches

Vacuum at the Blower (in. of Hg): 23

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	23	7:30	12:30	5.00
MW-3	23	7:30	13:00	5.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 7:30				
15 minutes - 7:45				
30 minutes - 8:00				
45 minutes - 8:15				
1 hour - 8:30				
1 hour 15 minutes - 8:45				
1 hour 30 minutes - 9:00				
1 hour 45 minutes - 9:15				
2 hours - 9:30				
2 hour 30 minutes - 10:00				
3 hours - 10:30				
3 hours 30 minutes - 11:00				
4 hours - 11:30				
4 hours 30 minutes - 12:00				
5 hours - 12:30				
Average				

* Based on the average of the relative humidity measurements from previous AFVR events.

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			7.80		
MW-6	10.71		18.23	-7.52	
MW-8	10.27		6.70	3.57	
MW-10	11.49		9.16	2.33	
MW-18	10.80		8.43	2.37	
MW-19	11.85		7.79	4.06	
MW-20	10.64		7.17	3.47	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - August 29, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	183.6
Average Relative Humidity (%)	
Average Velocity (ft/min)	8804
Average FID Reading (ppm)	32
B_{WSW} (lb. water/lb. dry air)	
B_{WS} (water vapor % by volume)	0.0000
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	643.6
Q_{std} (flow at DSCRM)	1415.6
PPM_{W} (wet concentration=measured concentration)	32
PPM_{d} (dry concentration)	32
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	32
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	16
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000001
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	0.08
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	0.09
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.54
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	0.08
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	0.08
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from August 29, 2001 AFVR Event	20.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from August 29, 2001 AFVR Event	20.08
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	358.82

**AFVR
Building 45
Data Measurement Summary**

Date: Aug. 29, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 24

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	19	8:00	14:00	6.00
MW-3	18	8:00	14:00	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (^o F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	126.5		6140	20.75
15 minutes - 8:15	149.3		6681	38.73
30 minutes - 8:30	175.4		8887	47.18
45 minutes - 8:45	175.6		9303	50.92
1 hour - 9:00	186.2		10003	64.66
1 hour 15 minutes - 9:15	174.9		10417	43.19
1 hour 30 minutes - 9:30	175.6		10426	40.39
1 hour 45 minutes - 9:45	180.1		10904	40.83
2 hours - 10:00	182.8		8962	32.41
2 hour 30 minutes - 10:30	183.7		9793	33.01
3 hours - 11:00	182.8		9203	29.76
3 hours 30 minutes - 11:30	183.9		9176	28.64
4 hours - 12:00	208.7		7905	14.56
4 hours 30 minutes - 12:30	209.1		8472	13.25
5 hours - 13:00	208.7		8209	12.61
5 hours 30 minutes - 13:30	208.7		7512	11.29
6 hours - 14:00	208.5		7667	14.01
Average	183.6		8803.5	31.54

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			8.07	7.57	
MW-6	10.71		18.17	17.56	
MW-8	10.27		6.88	4.77	
MW-10	11.49				
MW-18	10.80		8.25	2.55	
MW-19	11.85		8.04	3.81	
MW-20	10.64		7.43	3.21	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - October 3, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	188.5
Average Relative Humidity (%)	10.1
Average Velocity (ft/min)	8597
Average FID Reading (ppm)	397
B_{WSW} (lb. water/lb. dry air)	0.0400
B_{WS} (water vapor % by volume)	0.0602
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	648.5
Q_{std} (flow at DSCRM)	1289.3
PPM_{W} (wet concentration=measured concentration)	397
PPM_{d} (dry concentration)	423
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	423
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	211
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000013
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.02
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.11
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	6.65
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.01
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.01
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from October 3, 2001 AFVR Event	20.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from October 3, 2001 AFVR Event	21.01
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	379.83

AFVR
Building 45
Data Measurement Summary

Date: October 3, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 27

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	22	7:45	13:45	6.00
MW-3	22	7:45	13:45	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 7:45	98.7	38.0	2870	109
15 minutes - 8:00	172.7	15.0	6728	
30 minutes - 8:15	187.5	10.0	6912	
45 minutes - 8:30	190.3	9.0	6345	
1 hour - 8:45	198.3	9.0	7209	
1 hour 15 minutes - 9:00	198.1	9.0	7016	
1 hour 30 minutes - 9:15	200.2	11.0	6492	
1 hour 45 minutes - 9:30	185.3	11.0	6401	
2 hours - 9:45	186.4	10.0	6708	
2 hour 30 minutes - 10:15	196.0	6.0	11195	
3 hours - 10:45	198.0	7.0	9692	
3 hours 30 minutes - 11:15	213.7	10.0	10872	404
4 hours - 11:45	198.7	7.0	11237	421
4 hours 30 minutes - 12:15	194.8	4.0	11525	451
5 hours - 12:45	195.4	5.0	11771	460
5 hours 30 minutes - 13:15	196.1	5.0	11404	458
6 hours - 13:45	193.9	6.0	11774	479
Average	188.5	10.1	8597.1	397.4

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			8.04		
MW-6	10.71		19.11		
MW-8	10.27		7.45	2.82	
MW-10	11.49		9.65	1.84	
MW-18	10.80		9.22	1.58	
MW-19	11.85		8.31	3.54	
MW-20	10.64		7.56	3.08	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - October 30, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	200.4
Average Relative Humidity (%)	5.5
Average Velocity (ft/min)	8559
Average FID Reading (ppm)	620
B_{WSW} (lb. water/lb. dry air)	0.0275
B_{WS} (water vapor % by volume)	0.0422
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	660.4
Q_{std} (flow at DSCRM)	1284.7
PPM_{W} (wet concentration=measured concentration)	620
PPM_{d} (dry concentration)	647
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	647
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	323
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000020
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.55
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.69
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	10.14
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.54
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.54
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from October 30, 2001 AFVR Event	38.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from October 30, 2001 AFVR Event	39.54
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	419.37

AFVR
Building 45
Data Measurement Summary

Date: October 30, 2001
Diameter of Exhaust Pipe: 6 inches
Vacuum at the Blower (in. of Hg): 24

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	24	8:45	14:45	6.00
MW-3	22	8:45	14:45	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:45	131.5	14.0	5358	198
15 minutes - 9:00	171.3	8.0	7404	529
30 minutes - 9:15	184.8	7.0	8519	593
45 minutes - 9:30	191.8	6.0	8514	591
1 hour - 9:45	199.2	6.0	8225	617
1 hour 15 minutes - 10:00	201.1	5.0	8619	610
1 hour 30 minutes - 10:15	208.2	5.0	8802	615
1 hour 45 minutes - 10:30	210.3	5.0	8405	636
2 hours - 10:45	211.2	4.0	8301	658
2 hour 30 minutes - 11:15	213.8	4.0	9116	669
3 hours - 11:45	216.4	4.0	8708	670
3 hours 30 minutes - 12:15	216.8	5.0	9312	712
4 hours - 12:45	214.1	3.0	9917	701
4 hours 30 minutes - 13:15	211.2	4.0	9224	708
5 hours - 13:45	209.4	5.0	9455	686
5 hours 30 minutes - 14:15	209.1	5.0	9107	674
6 hours - 14:45	206.0	3.0	8524	675
Average	200.4	5.5	8559.4	620.1

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			8.59		
MW-6	10.71		19.17		
MW-8	10.27		8.11	2.16	
MW-10	11.49		10.47	1.02	
MW-18	10.80		9.91	0.89	
MW-19	11.85		8.96	2.89	
MW-20	10.64		8.25	2.39	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - November 27, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	192.3
Average Relative Humidity (%)	18.0
Average Velocity (ft/min)	9668
Average FID Reading (ppm)	602
B_{WSW} (lb. water/lb. dry air)	0.0900
B_{WS} (water vapor % by volume)	0.1260
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_s Stack Temperature ($^{\circ}\text{R}$)	652.3
Q_{std} (flow at DSCR)	1340.5
PPM_w (wet concentration=measured concentration)	602
PPM_d (dry concentration)	689
PPM_c (PPM_v , volumetric concentration of VOC emissions as carbon, dry basis at STP)	689
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	344
C_c (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000021
PMR_c (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.73
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.88
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	11.26
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.71
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.71
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from November 27, 2001 AFVR Event	4.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from November 27, 2001 AFVR Event	5.71
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	425.08

**AFVR
Building 45
Data Measurement Summary**

Date: November 27, 2001

Diameter of Exhaust Pipe: 6 inches

Vacuum at the Blower (in. of Hg): 20

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	12	8:00	14:00	6.00
MW-3	12	8:00	14:00	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:00	134.9	34	5332	1328
15 minutes - 8:15	158.1	36	7051	404
30 minutes - 8:30	166.8	30	8893	455
45 minutes - 8:45	190.7	27	10153	481
1 hour - 9:00	184.9	23	8897	526
1 hour 15 minutes - 9:15	192.5	10	10232	550
1 hour 30 minutes - 9:30	189.7	15	9411	543
1 hour 45 minutes - 9:45	187.8	18	11408	576
2 hours - 10:00	220.0	11	10464	562
2 hour 30 minutes - 10:30	187.8	13	11809	592
3 hours - 11:00	219.0	16	11191	625
3 hours 30 minutes - 11:30	221.0	14	11401	625
4 hours - 12:00	228.7	13	11726	633
4 hours 30 minutes - 12:30	227.1	11	11133	623
5 hours - 13:00	188.4	14	7933	583
5 hours 30 minutes - 13:30	184.0	12	8519	574
6 hours - 14:00	187.6	13	8803	560
Average	192.3	18	9668	602

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			9.21		
MW-6	10.71		19.30		
MW-8	10.27		8.60	1.67	
MW-10	11.49		11.15	0.34	
MW-18	10.80		10.53	0.27	
MW-19	11.85		9.50	2.35	
MW-20	10.64		8.81	1.83	

Notes:

ft = feet

toc = top of casing elevation

msl = mean sea level

**AFVR
Building 45
AFVR Event - December 13, 2001**

AFVR Event - Vacuum Applied to Recovery and Monitoring Wells/Calculated Parameters	MW-2 & MW-3
Time Duration (hours)	6.00
Average Temperature ($^{\circ}\text{F}$)	195.0
Average Relative Humidity (%)	9.0
Average Velocity (ft/min)	9023
Average FID Reading (ppm)	520
B_{WSW} (lb. water/lb. dry air)	0.0429
B_{WS} (water vapor % by volume)	0.0643
Stack Pipe Cross Sectional Area (ft^2)	0.196
T_{S} Stack Temperature ($^{\circ}\text{R}$)	655.0
Q_{std} (flow at DSCRM)	1333.9
PPM_{W} (wet concentration=measured concentration)	520
PPM_{d} (dry concentration)	556
PPM_{c} (PPM_{v} , volumetric concentration of VOC emissions as carbon, dry basis at STP)	556
C_{cm} (mg/dsm^3 , mass concentration of VOC emissions as carbon)	277
C_{c} (lb/dscf , mass concentration of VOC emissions as carbon, dry basis, at STP)	0.000017
PMR_{c} (lb/hr , pollutant mass removal rate of VOCs as carbon)	1.39
$\text{PMR}_{\text{gas/diesel}}$ (lb/hr , pollutant mass removal rate of VOCs as Gasoline and Diesel Fuel)	1.51
$\text{PMR}_{\text{gas/diesel}}$ (lbs, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	9.04
$\text{PMR}_{\text{gas/diesel}}$ (gals, total pollutant mass removal of VOCs as Gasoline and Diesel Fuel)	1.37
Total Gallons of Pollutant Volume Removal of VOCs as Gasoline and Diesel Fuel	1.37
Gallons of LNAPL Removed as Gasoline and Diesel Fuel from December 13, 2001 AFVR Event	0.00
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel from December 13, 2001 AFVR Event	1.37
Total Gallons of Pollutant Removed as Gasoline and Diesel Fuel Since Initiation of AFVR Activities April 9, 1999	426.45

**AFVR
Building 45
Data Measurement Summary**

Date: December 13, 2001
Diameter of Exhaust Pipe: 6 inches
Vacuum at the Blower (in. of Hg): 22

Vacuum Applied to Recovery/Monitoring Well(s)	Well Vacuum (in. of Hg)	Start Time	Stop Time	Duration (hours)
MW-2	20	8:30	14:30	6.00
MW-3	22	8:30	14:30	6.00

Time Duration And Actual Time Since Start of Vacuum Applied to Recovery/Monitoring Well(s):	Temperature (°F)	Relative Humidity (%)	Velocity (ft/min)	FID Reading (ppm)
Initial - 8:30	136.2	18	5832	235
15 minutes - 8:45	172.5	11	7905	385
30 minutes - 9:00	188.4	7	8771	462
45 minutes - 9:15	197.2	8	8938	463
1 hour - 9:30	207.8	8	9423	529
1 hour 15 minutes - 9:45	207.6	7	9985	557
1 hour 30 minutes - 10:00	205.8	7	9741	541
1 hour 45 minutes - 10:15	205.5	6	9532	538
2 hours - 10:30	209.6	7	9655	567
2 hour 30 minutes - 11:00	210.7	7	9409	579
3 hours - 11:30	217.9	7	10240	581
3 hours 30 minutes - 12:00	188.0	9	8917	579
4 hours - 12:30	187.1	10	8784	573
4 hours 30 minutes - 13:00	194.8	7	9156	571
5 hours - 13:30	193.6	8	8713	565
5 hours 30 minutes - 14:00	196.6	9	9269	549
6 hours - 14:30	196.4	9	9118	563
Average	195.0	9	9023	520

Recovery Well	Top of Casing Elevation (ft., msl)	Depth to Hydrocarbon Product (ft. below toc)	Depth to Groundwater (ft.)	Groundwater Elevation (ft., msl)	Well Vacuum (in. of H ₂ O)
PW-1			9.38		
MW-6	10.71		Not Measured		
MW-8	10.27		Not Measured		
MW-10	11.49		11.37	0.12	
MW-18	10.80		10.67	0.13	
MW-19	11.85		9.64	2.21	
MW-20	10.64		8.98	1.66	

Notes:
ft = feet
toc = top of casing elevation
msl = mean sea level