REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

FEBRUARY 26, 2004

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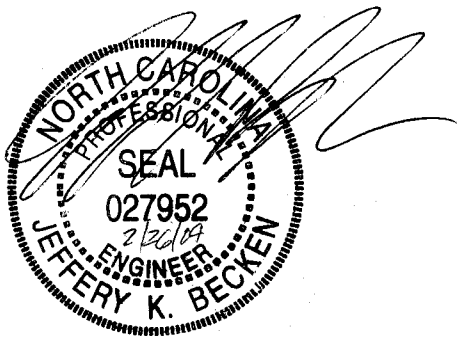

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LIST OF ACRONYMS

2000 Guidelines	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater
2001 Guidelines	Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section (Effective July 1, 2001)
2L GWQS	NCAC T15A:02L Groundwater Quality Standards
ARO	Asheville Regional Office
AS	Air Sparge
AST	Aboveground Storage Tank
BDL	Below Detection Limit
BN	Base/Neutral (extractables)
BNA	Base/Neutral/Acid (extractables)
BQL	Below Quantitation Limit
BLS	Below Land Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAP	Corrective Action Plan
CATLIN	CATLIN Engineers and Scientists (Formerly RC&A)
CFR	Code of Federal Regulations
Cr	Chromium
CSA	Comprehensive Site Assessment
CNP	Carbon Nitrogen Phosphorous
CPT	Cone Penetrometer Test
DEM	Division of Environmental Management
DIPE	Diisopropyl Ether
DO	Dissolved Oxygen
DOD	Department of Defense
DPT	Direct Push Technology
DWQ	Division of Water Quality
DWM	Division of Waste Management
DTW	Depth to Water
EAD	Environmental Affairs Department
EDB	Ethylene di-bromide
EMD	Environmental Management Division
EPA	Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
EQB	Environmental Quality Branch
Fe	Iron
FID	Flame Ionization Detector
FOD	Foreign Object Debris
FRO	Fayetteville Regional Office
FT	Feet
GCL	Gross Contaminant Level
GIS	Geographic Information System
GPS	Global Positioning System

Guidelines Vol. I	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other Than Petroleum Underground Storage Tanks (May 1998)
Guidelines Vol. II	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume II, Petroleum Underground Storage Tanks (January 2, 1998)
HDPE	High Density Polyethylene
I/C	Industrial/Commercial
ID	Identification
I&E	Installations and Environment Department
IGWQS	Interim Groundwater Quality Standards
IPE	Isopropyl Ether
LANTDIV	Atlantic Division
LSA	Limited Site Assessment
LUST	Leaking Underground Storage Tank
m-	meta
m	meter
MADEP	Massachusetts Department of Environmental Protection
MCALF	Marine Corps Auxiliary Landing Field
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCOLF	Marine Corps Outlying Landing Field
MDL	Method Detection Limit
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MRO	Mooresville Regional Office
MSCC	Maximum Soil Contaminant Concentration
MSL	Mean Sea Level
MTBE	Methyl tertiary butyl ether
µg/Kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
NA	Not Analyzed
N/A	Not Applicable
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOC	North Carolina Department of Corrections
NCDOT	North Carolina Department of Transportation
NCSP	North Carolina State Plane
NCSPA	North Carolina State Ports Authority
NE	None Established
NM	Not Measured
NMT	No Measurable Thickness
NS	Not Sampled
o-	ortho
OVA	Organic Vapor Analyzer

p-	para
PAH	Polynuclear Aromatic Hydrocarbons
Pb	Lead
PPB	Parts Per Billion
PPM	Parts Per Million
PID	Photo Ionization Detector
PQL	Practical Quantitation Limit
PVC	Polyvinyl chloride
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
Res	Residential
ROI	Radius of Influence
RRO	Raleigh Regional Office
SOW	Scope of Work
STGW	Soil-to-Groundwater
SVE	Soil Vapor Extraction
SVOC	Semi Volatile Organic Compound
TDHF	Toxicologically Defined Hydrocarbons Fractions
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compound
TKN	Total Kjeldahl Nitrogen
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
US	United States
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons
WaRO	Washington Regional Office
WiRO	Wilmington Regional Office
WSRO	Winston-Salem Regional Office

REMEDIAL ACTION OPTIMIZATION
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CATLIN PROJECT NO. 203-063

FEBRUARY 26, 2004

EXECUTIVE SUMMARY

This report is intended to provide information relevant to address and review the effectiveness of current remedial actions being conducted at Building 820 and to make revisions to the Corrective Action Plan in order to move towards site closeout. The project site is located in the Berkeley Manor residential area of MCB, Camp Lejeune in Onslow County, North Carolina.

Building 820 is currently utilized as a Marine Corps Exchange gas station. Various site assessments were conducted in the early 1990's to determine the integrity of the USTs and delineate the extent, if applicable, of free-phase product, soil contamination and groundwater contamination in the vicinity of Building 820. The USTs were reportedly upgraded in the late summer of 1995.

LAW Engineering and Environmental Services, Inc. (LAW) prepared and submitted a Corrective Action Plan (CAP) for the subject site dated October 29, 1996 that identified the presence of free-phase product, soil contamination, shallow groundwater (surficial aquifer) contamination and deeper (± 50 feet) groundwater contamination. The recommended remediation strategy within the CAP for site restoration was a treatment system consisting of air sparging coupled with soil vapor extraction (AS/SVE) for the remediation of the free-phase product, soil contamination and groundwater contamination. An optional discriminating pumping system was recommended if the SVE system was insufficient for free-phase product removal. It is our understanding that OHM (now known as Shaw Environmental, Inc.) installed an AS/SVE treatment system in mid 1997 and began operation of the system in October 1997.

The remedial goals set forth in the CAP for the site were based on the regulations that were applicable at the time. The cleanup goals for groundwater were the 2L GWQS and for soils were 10 mg/kg TPH - GRO and 40 mg/kg TPH – DRO. Since submittal of the CAP the State regulations have changed. The current applicable remedial requirements for this site are the Risk Based Corrective Action (RBCA) for Petroleum Underground Storage Tanks per 15A NCAC 2L .0106 effective date January 2, 1998 and document entitled *"Guidelines for Assessment and Corrective Action"* (2001 Guidelines) as released by the NCDENR Division of Waste Management, UST Section, effective July 1, 2001. The revised target "clean up" goals for this site are the 2L GWQS for groundwater and the Residential MSCCs for soil.

In order to effectively evaluate the current remediation system suitability, a discussion of the shallow groundwater conditions, the 50-feet deep groundwater conditions and the 100-feet deep groundwater conditions have been evaluated for this site. The AS/SVE system has been effective in the remediation of a portion of the shallow groundwater conditions to meet the 2L GWQS. The AS/SVE system has slightly reduced the groundwater contamination within the 50-feet deep groundwater conditions. The AS wells are installed to an approximate depth of 50 feet below land surface (BLS), therefore, the 100-feet deep groundwater conditions are not influenced by the current AS/SVE system. However, the 100-feet deep groundwater contamination appears to have naturally attenuated.

The recommendations within this report address the soil contamination, the shallow groundwater contamination, the 50-feet groundwater contamination, and the 100-feet groundwater contamination, separately. The following is a brief summary of the recommendations; please refer to Section 6.0 of this report for a detailed discussion of the recommendations:

- Shut down and abandon potable water supply well 623.
- Shut down a portion of the AS/SVE system.
- Conduct quarterly monitoring of monitoring wells in the vicinity of the portion of the AS/SVE system recommended to be shutdown. Upon completion of the quarterly monitoring, evaluate the potential to abandon selected monitoring wells.
- Install two additional 50-feet deep monitoring wells to further delineate the 50-feet groundwater contaminant plume.
- Collect additional soil samples for Risk Based Analysis.
- The results from the additional soil samples should be presented within a Soil Assessment Report in accordance with the 2001 Guidelines.
- Continue semi-annual sampling activities as indicated.
- Upon delineation of the 50-feet deep groundwater contamination, conduct a pilot test and prepare a Basis of Design for an air sparge system to address the 50-feet deep groundwater contamination.

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1.0 BACKGROUND

1.1 PURPOSE OF REPORT

The purpose of this report is to provide information relevant to address and review the effectiveness of current remedial actions being conducted at Building 820 located in the Berkeley Manor residential area of the MCB, Camp Lejeune. Additionally, this report provides revisions to the CAP for addressing deeper contamination and providing recommendation for continuing remediation activities in order to achieve site closure. This report has been formatted according to the NAVFACENGCOM "Guidance for Optimizing Remedial Action Operation" document prepared by Radian International and dated April 2001 with the ultimate purpose to "achieve environmentally protective site closeout at the least cost."

The work conducted herein was conducted in general accordance with the Workplan titled Remediation System Optimization Plans at the Various Sites, Marine Corps Base, Camp Lejeune, North Carolina dated July 16, 2003. CATLIN was authorized to perform this investigation by the LANTDIV NAVFACENGCOM in accordance with the Order of Supplies Contract Number N62470-01-D-3009, Delivery Order Number 0079.

1.2 SCOPE OF WORK

This Remedial Action Optimization & Revised Corrective Action Plan (RAO & RCAP) was developed in general accordance with the NAVFACENGCOM "Guidance for Optimizing Remedial Action Operation" document dated April 2001 and the 2001 Guidelines. Specific methods utilized to develop the RAO & RCAP included a thorough collection and review of available reports and field data. In addition, a field reconnaissance was conducted to perform on-site inspections of existing site and remedial system conditions and conduct personal interviews with the system operators. Data was then reviewed and the RAO & RCAP was developed.

2.0 SITE HISTORY

(Refer to Table 1, Figures 1, 2, and 4 and Appendix C)

Building 820 is located in the Berkeley Manor residential area of MCB, Camp Lejeune in Onslow County, North Carolina. The site vicinity is presented on Figure 1. The site is located on the west side of Stone Street. (See Figure 2)

Building 820 is currently utilized as a Marine Corps Exchange gas station. An UST system consisting of three 10,000-gallon capacity gasoline tanks and one 10,000-gallon capacity diesel tank is located south of the building. The USTs were reportedly upgraded in the late summer of 1995.

Various site assessments were conducted in the early 1990's to determine the integrity of the USTs and delineate the extent, if applicable, of free-phase product, soil contamination and groundwater contamination in the vicinity of Building 820. The findings of the previous assessments have been summarized in reports submitted to NCDENR, Division of Waste Management, UST Section in the WiRo. The reports from these various site assessments were utilized by LAW to develop a CAP dated October 29, 1996. These site assessment reports have been referenced within the CAP.

Numerous monitoring wells were installed across the area during these assessment activities. A detailed site plan, including monitoring well locations, is presented on Figure 2.

The CAP stated that a passive free-phase product recovery system was reportedly in operation since March 1994 at the project site. This recovery system was operated within pumping well PW-1. Shaw stated in their 2002 Annual Monitoring Report that the passive recovery system was in operation until February 1997 and approximately 43 gallons of free-phase product was removed. Pumping well PW-1 is believed to exist as of this RAO & RCAP.

The CAP identified the presence of free-phase product, soil contamination, shallow groundwater (surficial aquifer) contamination and deep (± 50 feet BLS) groundwater contamination. The recommended remediation strategy within the CAP for site restoration was a treatment system consisting of air sparging coupled with soil vapor extraction (AS/SVE) for the remediation of the free-phase product, soil contamination and groundwater contamination. An optional discriminating pumping system was recommended if the SVE system was insufficient for free-phase product removal. It is our understanding that OHM installed an AS/SVE treatment system in mid 1997 and began operation of the system in October 1997. Please note that OHM is now known as Shaw Environmental, Inc. (Shaw). The air sparge wells were installed with a screen interval at 47 to 50 feet BLS.

As per the request of NCDENR, OHM collected additional soil samples for laboratory analysis on June 8, 2001 in the vicinity of the dispenser island and along the route of the fuel transfer lines at the project site. The additional soil samples (10 total) were analyzed for TPH-GRO and TPH-DRO. One sample was analyzed for MADEP VPH. Laboratory results

from the additional soil samples were below the TPH-GRO and TPH-DRO target concentrations established in the CAP. The MADEP VPH results were below the laboratory quantitation limits. OHM submitted the results of this additional soil sampling in a letter dated August 24, 2001.

The current remediation system location is illustrated on Figure 2.

2.1 CONCEPTUAL SITE MODEL (BASED ON 1996 CAP)

2.1.1 Site Geology

The topography of the project site is relatively flat and gently slopes to the south towards Wallace Creek and to the west toward the New River. Sediment in the vicinity of the site has been documented to be generally sandy clays to clayey fine sands with occasional fine sand or clay lenses within the near surface soils (6 to 8 feet BLS). Below this surficial material, soils have been described as relatively clean, fine to medium sand to a depth of approximately 50 feet.

2.1.2 Groundwater Elevation and Flow Direction

As part of the CAP, groundwater flow direction was generally to the southeast. Shaw has obtained depth to groundwater measurement from selected Type II (shallow) and Type III (deep) monitoring wells during the numerous sampling and gauging events that have been conducted at the subject site. Groundwater elevation contours for the shallow monitoring wells, as interpreted by Shaw from the April and October 2002 and the April 2003 gauging events, continue to indicate a general groundwater flow direction to the south. Based on an interpretation of the data provided by Shaw for the April and October 2002 and the April 2003 gauging events, the general groundwater flow direction for the deep ($\pm$ 50 feet BLS) monitoring wells is toward the north-northwest.

2.1.3 Potential Receptors

LAW identified a tributary to Wallace Creek located approximately 1,500 feet south of the site and a drinking water supply well (HP-611) located approximately 700 feet east of the subject site as being the potential receptors of greatest risk.

2.1.4 Contaminants of Concern
(Refer to Appendix A)

The list of contaminants identified by LAW during the assessment activities along with the associated target cleanup levels established during the October

29, 1996 CAP are presented in Appendix A.

3.0 REMEDIAL ACTION REVIEW

3.1 REMEDIAL SYSTEM OBJECTIVES

As detailed in the CAP prepared by LAW, the remedial objectives included:

Primary Source(s):

Elimination of future releases through closure or integrity testing/upgrading the existing UST systems at the Berkely Manor Building 820 site.

Secondary Source(s):

(i) Free Product: Remove free product to less than or equal to 1/8 inch as measured in free product recovery wells and groundwater monitoring wells. Removal of free product will reduce the secondary source and assist in controlling the migration of free product.

(ii) Vadose Zone Contamination: Reduce TPH in soil to 10 ppm and 40 ppm as quantified by EPA Methods 5030 and 3550, respectively.

Dissolved-Phase Groundwater Contamination:

Restore groundwater adversely impacted by petroleum fuel releases to a quality consistent with North Carolina Quality Standards outlined in NCAC, Title 15A, Subchapter 2L or to variances established by NCDEHNR.

***Receptor Protection*:**

Conduct groundwater monitoring activities to document contaminant concentrations and minimize the potential for exposure to receptors.

LAW evaluated three remedial strategies for the site. Based on the results of pilot tests of SVE and AS conducted in the vicinity of the USTs, LAW recommended the AS/SVE remediation technology to meet the remedial goals established in the previously discussed objectives. LAW stated that should air sparging and soil vapor extraction not remediate free product then the remediation system may be upgraded with discriminating pumps to pump free product from 14 recovery wells to an aboveground storage tank. LAW recommended 58 AS wells to be screened from approximately 47.5 to 50 feet BLS and 58 SVE wells to be screened from approximately 2 to 10 feet BLS.

Active remediation was estimated to take approximately 8 years from system

installation and activation. LAW recommended that remedial activities continue until four consecutive quarters of groundwater data during and after operation of the system revealed no compounds above the 2L GWQS.

3.2 IMPLEMENTED REMEDIAL SYSTEM

(Refer to Figure 2)

Subsequent to CAP approval, the AS/SVE portion of the recommended remedial system was installed by OHM in 1997. OHM proposed forty-eight AS wells to be installed to an approximate depth of 50 feet BLS, and 48 SVE wells to be installed to an approximate depth of 10 feet BLS in a Workplan dated 7/97. As of the preparation of this RAC & RCAP, the depth of these wells has not been verified and therefore, CATLIN has assumed that the AS and SVE wells were installed to the proposed depths. The AS/SVE wells were divided into 4 well fields. System operation began in October 1997 and initially consisted of alternating the operation of the well fields. The well fields have been operated continuously since this initial operation period of 15 months. Shaw has stated that on occasion, the system has been operated intermittently by shutting down one or more of the well fields due to the effect of high groundwater conditions on SVE operations. The current remedial system layout is presented on Figure 2.

3.3 REMEDIAL SYSTEM STATUS

As detailed in the Annual Monitoring Report for Building 820 prepared by Shaw dated July 2003, data indicates that since system startup in October 1997, the system has operated continuously with the exception of minimal down time for equipment repairs and upgrades. Field reconnaissance conducted by CATLIN personnel in conjunction with Shaw personnel revealed the system to be well maintained and in good working condition.

3.4 MONITORING STATUS

Groundwater sampling and analysis is currently conducted on eleven (11) Type II monitoring wells (MW-2, MW-4, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16 and MW-26) and six (6) Type III monitoring wells (MW-7, MW-9, MW-9D, MW-17, MW-19, and MW-21) on a semi-annual basis. The groundwater samples are analyzed for Polynuclear Aromatic Hydrocarbons per EPA Method 610 and volatile organic analysis per EPA Method 602. These sampling events are summarized in annual monitoring reports prepared by Shaw and are on file in the WiRo.

4.0 REMEDIATION EFFECTIVENESS EVALUATION

According to Shaw's 2002 Annual Monitoring Report, a total of 18,033 pounds of hydrocarbon compounds have been recovered by the system since startup in October 1997. Shaw bases the quantity of recovered hydrocarbon on stack emission calculations performed on a monthly basis. As previously stated, Shaw has reported the system to be continuously operated since the start-up in October 1997, with the exception of minor equipment repairs and routine maintenance.

4.1 FREE PRODUCT

(Refer to Appendix C)

Free product spatial extent at the time of CAP preparation is shown on a figure included in Appendix C. As of the preparation of this RAO & RCAP, CATLIN could not confirm the method employed for free product removal, however, no measurable thickness of free product was identified in any of the monitoring wells at the subject site during the 2002 monitoring events in April and October.

4.2 CONTAMINANT CONCENTRATIONS

4.2.1 Soil

(Refer to Appendix B and Figure 3)

Soil TPH concentrations reported in the CAP as measured in November 1992 ranged from <1 mg/kg to 2,700 mg/kg. As previously referenced, OHM collected additional soil samples on June 8, 2001 in the vicinity of the dispenser island and along the route of the fuel transfer lines at the project site. All results from the additional soil samples were below the TPH-GRO and TPH-DRO target concentrations established in the CAP. The MADEP VPH results were below the laboratory quantitation limits. No additional soil assessments have been conducted in the areas in which exceedances of the TPH were reported within the CAP. A summary of the historical soil laboratory analytical results have been provided in Appendix B and Figure 3.

4.2.2 Groundwater

(Refer to Table 3, Figures 4 through 9, and Appendices A, C and D)

Groundwater contamination data at the time of the CAP preparation (May 1995 data) has been provided on the attached Figures 4 to 9. The CAP identified benzene, ethylbenzene, chloroform, chrysene, dibromochloromethane, chloromethane, 1,2 dichloroethane, toluene, total xylenes, and MTBE as the target contaminants of concern. The maximum concentration of these contaminants, as reported in the CAP, is provided in Appendix A.

The CAP did not distinguish between the shallow conditions and the deep conditions. In order to effectively evaluate the current remediation system, a discussion of the shallow conditions (Type II monitoring wells), the 50-feet deep conditions (Type III monitoring wells) and the 100-feet deep conditions (Type III monitoring wells) is provided in the following sections.

4.2.2.1 Shallow Conditions

The most recent estimated plume boundaries of the shallow groundwater conditions from the April 2003 sampling event along with the plume boundaries from the CAP are shown for BTEX, Naphthalene and MTBE on Figures 4, 6, and 8. As can be seen, the estimated extent of shallow groundwater contamination has been reduced significantly by the active remediation system and only the groundwater in the vicinity of the section between monitoring wells MW-11 and MW-27 remains with contaminant concentrations in excess of the 2L GWQS. The attached Table 2A summarizes the contaminants of concern for the site and Table 4 summarizes the last date an individual monitoring well exhibited concentrations above the 2L GWQS.

4.2.2.2 50-Feet Deep Conditions

The most recent estimated plume boundaries of the 50-feet deep conditions from the April 2003 sampling event along with the plume boundaries from the CAP are shown for BTEX, Naphthalene and MTBE on Figures 5, 7, and 9. As can be seen from the data, the estimated extent of the 50-feet deep groundwater contamination appears to have been reduced, however, within the source area, contamination has not been significantly reduced by the active remediation system. Additionally, the estimated extent of contamination has not been delineated to the north and the northeast. The maximum concentrations of dissolved petroleum constituents identified in previous sampling events are presented on Table 2B. Table 4 summarizes the last date that each monitoring well detected a contaminant of concern above the 2L GWQS.

4.2.2.3 100-Feet Deep Conditions

The most recent laboratory results from the only 100-feet deep well (MW-9D) from the April 2003 sampling event are shown for BTEX, Naphthalene and MTBE on Figures 5, 7, and 9. Historical groundwater analytical data from the Annual Monitoring Reports and data prepared by Shaw are included in Appendix C. As can be seen from the data, MW-9D has exhibited fluctuating benzene

concentrations near the 2L GWQS since October 2001, with the maximum concentration of 19.9 µg/l in October 2002.

4.3 SYSTEM SUITABILITY

4.3.1 Free Product

No measurable thickness of free product was identified in any of the monitoring wells at the subject site during the 2002 monitoring events in April and October. Therefore, free product is currently not an issue at the site.

4.3.2 Soil

As previously stated, no additional soil assessments have been conducted in the areas in which exceedances of the TPH were reported within the CAP. Therefore, the remediation system suitability in the reduction of the soil contamination cannot be determined as of preparation of this RAO & RCAP.

4.3.3 Groundwater

In order to effectively evaluate the current remediation system suitability, a discussion of the shallow conditions, the 50-feet deep conditions and the 100-feet deep conditions is provided in the following sections.

4.3.3.1 Shallow Conditions

As previously stated, the estimated extent of shallow groundwater contamination appears to have been reduced significantly by the active remediation system and only the shallow groundwater in the vicinity of the section between monitoring wells MW-11 and MW-27 remains with contaminant concentrations in excess of the 2L GWQS. Based on a review of the system performance and the reduced levels of groundwater contamination, the remediation system appears to have been applicable for the reduction of the Contaminants of Concern (COCs).

4.3.3.2 50-Feet Deep Conditions

As previously stated, the contaminant concentrations in the 50-feet deep groundwater contamination have only been slightly reduced by the active remediation system in the vicinity of monitoring well MW-9. The contamination in MW-17 has increased since submittal of the CAP. Based on a review of the system performance and the historical trend of the 50-feet deep groundwater contamination, the remediation

system appears to have minimal impact on the reduction of the COCs.

4.3.3.3 100-Feet Deep Conditions

As previously stated, MW-9D has exhibited fluctuating benzene concentrations near the 2L GWQS since October 2001, with the maximum concentration of 19.9 µg/l in October 2002 and an April 2003 concentration of less than the 2L GWQS. Based on the depth of the air sparge wells at approximately 50 feet, it is assumed that the 100-feet deep groundwater contamination has been reduced by natural attenuation.

5.0 REMEDIATION MODIFICATIONS AND ALTERNATIVES

5.1 REGULATORY FRAMEWORK EVALUATION

(Refer to Appendix E)

As previously discussed, the remedial goals for the site were based on the regulations current at the time and presented in the CAP. Current applicable remedial requirements for this site are the Risk Based Corrective Action for Petroleum Underground Storage Tanks (RBCA) per 15A NCAC 2L .0106 which became effective on January 2, 1998 and the requirements in the NCDENR 2001 Guidelines. As such, reclassification of the site based on current risk factors was necessary. A Risk Classification and Land Use Form, as presented in the 2001 Guidelines was completed as part of this work to present the data necessary to allow NCDENR to assess the site's applicable risk classification.

The completed form is included in Appendix E. Based on the findings of this Risk Classification and Land Use Form, CATLIN concludes that the subject site meets the criteria for classification as an Intermediate Risk and Residential Land Use site. The intermediate risk is based on the location of the potable water supply well 623 and the deep groundwater contamination that exists.

5.2 REVISED CONCEPTUAL SITE MODEL

5.2.1 Groundwater Depth and Flow Direction

The 2003 groundwater gauging data as compared to the historical data presented in the previous reports indicates that the groundwater flow trends at the site have remained relatively consistent with a general flow direction to the south for the shallow conditions and to the north-northwest for the deep conditions. Therefore, no change to the groundwater flow characteristics is necessary in the revised conceptual model.

5.2.2 Potential Receptors

(Refer to Figure 1 and Appendix E)

The potential receptors have been re-evaluated during the preparation of this RAO & RCAP using the Risk Classification and Land Use Form in Appendix E. Based on the risk characterization, this site appears to be an Intermediate Risk Site and classified as Residential Land Use. A receptor survey performed as part of this plan identified the following receptors within 1,500 feet of the site:

- A potable water supply well 623 located approximately 1,300 feet northeast of the site.
- A tributary of Wallace Creek located approximately 1,200 feet southeast of the site.
- The site is located in an area in which there is potential recharge to the deeper aquifer being used by potable water supply well 623. Well construction information of potable water supply well 623 was not available as of the preparation of this RAO & RCAP, however, the Well Head Protection Plan Update (2002) stated that the well is 197-feet deep with the pump depth set at 70 feet below ground surface.
- According to the Well Head Protection Plan Update (2002), the site is located within a potential wellhead protection area.
- The closest residence is approximately 400 feet east of the site.
- A Youth Sports and Activities Center and a playground are located approximately 300 feet east of the site.
- Athletic fields associated with a middle school are located approximately 500 feet northeast of the site.

Based on information provided by MCB Camp Lejeune, these potential receptors have not been reported to have been impacted by the potentially contaminated soils and/or groundwater. The potential receptors are presented on the Site Location Map on Figure 1.

5.2.3 Contaminants of Concern

(Refer to Table 3)

The groundwater COC as established in the CAP are still relevant; however, Shaw has reported additional contaminants since system start-up in their annual monitoring reports above the 2L GWQS. Therefore, the COCs have been expanded to include the additional contaminants reported by Shaw. Additionally, soils are required by the 2001 Guidelines to have chemical specific testing and cleanup levels. The revised COCs have been summarized on Table 3.

5.3 ALTERNATIVE REGULATORY MECHANISMS

5.3.1 Revised Target Cleanup Goals

(Refer to Table 3)

Based on the risk characterization study discussed above, it appears that the revised applicable cleanup concentration for soil is based on the Residential MSCCs. The Revised Target Cleanup Concentrations are shown on Table 3. Historical soil contamination data previously discussed from this site were based on the TPH-Gasoline and TPH-Diesel Action Levels. No soil samples have been obtained for Risk Based Analysis; however, it appears from an evaluation of previous TPH analyses that an area of soil contamination was identified in the vicinity of Building 820 with TPH concentrations in exceedance of the NCDENR 1997 Action Levels of 10 mg/kg Gasoline and 40 mg/kg Diesel. As such, additional soil sampling for Risk Based Analysis is recommended (see Section 7.1 Implementation Plan) within the areas with TPH concentrations exceeding the 1997 Action Levels.

Additionally, based on the intermediate risk classification in combination with the deep Coastal Plain aquifer contamination that could be used as a source of drinking water, the applicable cleanup concentrations (2L GWQS) for the groundwater contamination proposed in the CAP remain applicable.

5.3.2 Notice of Residual Petroleum

A Notice of Residual Petroleum is not required at this time for this site.

5.4 ALTERNATIVE REMEDIAL TECHNOLOGIES

As previously stated, the implemented remedial system has been effective in reducing the contaminant levels for the shallow groundwater contamination and potentially the free product and soil contamination. However, the 50-feet deep groundwater has had minimal historical reduction. Therefore, an alternative remedial technology is needed to reduce the contaminant levels to below the Revised Target Cleanup Concentrations within the 50-feet deep groundwater. This alternative remedial technology will be based on the approval and results of the optimization recommendations presented within the Section 6.0 of this report.

5.5 COST EFFICIENCY EVALUATION

A detailed cost efficiency evaluation was not performed for this site based on the recommendations within Section 6.0 of this report. A cost efficiency evaluation will be required in the future if the remediation system requires expansion based on the findings of shut down of the AS/SVE system, shut down of potable water supply well 623 and installation of the additional monitoring wells.

6.0 OPTIMIZATION RECOMMENDATIONS

6.1 SOIL

Based on the Revised Target Cleanup Concentrations discussed within Section 5.3.1 of this report, CATLIN recommends collecting additional soil samples for Risk Based Analysis in the vicinity of the six locations presented on Figure 10. These locations previously had TPH concentration in excess of the cleanup levels presented in the CAP and have not been re-sampled to confirm cleanup. Please note that the previous samples were collected at a depth of 11 to 12.5 feet below land surface or 13 to 15 feet below land surface, which is assumed to be immediately above the capillary fringe. The proposed soil samples should be collected from a depth of immediately above the capillary fringe, which may slightly differ from the previous samples. The recommended Risk Based analyses to be performed for each sample are as follows: EPA Method 8260 with IPE and MTBE, EPA Method 8270 plus 10 tics, MADEP VPH and EPH. The results of these soil samples should be presented within a Soil Assessment Report in accordance with the 2001 Guidelines.

6.2 GROUNDWATER

6.2.1 Shallow Conditions

Based on the Remedial Effectiveness Evaluation and the Revised Target Cleanup Concentrations discussed within Sections 4.2.2.1 and 5.3.1, respectively of this report, CATLIN recommends the shut down of the portion of the AS/SVE system where the groundwater quality has been restored to the 2L GWQS, and continued operation of the AS/SVE system within the area around wells MW-11 and MW-27 where concentration still exceed the 2L GWQS. Specific details to complete this recommendation are as follows:

- Recommend to NCDENR, shut down of AS/SVE wells 1, 5, 6, 7, 8, 12, 13, 14, 21, 22, 23, 24, 25, 30, 31, 32, 33, 34, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, and 48 immediately. Upon acceptance of the recommended system shut down by NCDENR, this portion of the active remediation system should be shut down and secured to assure that the integrity of the system and well network is not jeopardized.
- Sample the following shallow monitoring wells for rebound affects after system shut down on a quarterly basis for one year: MW-8, MW-10, MW-14, MW-18, MW-20, MW-22, MW-24, and MW-26. These shallow monitoring wells should be sampled for the contaminants of concern listed in Table 3 by use of the following methods: EPA Method 602 with xylenes, EPA Method 625 for PAH compounds only and Standard Prep Method 3030C for lead. The detection limits for all compounds should be below the 2L GWQS.
- Due to no free-phase product present since February 1997, CATLIN

recommends that pumping well PW-1 be properly abandoned upon approval by NCDENR.

- Upon completion of the quarterly sampling described above, properly abandon the shallow monitoring wells and AS/SVE wells in the areas in which groundwater contaminant levels have remained below the 2L GWQS. If these shallow monitoring wells exhibit a rebound of groundwater contamination above the 2L GWQS then CATLIN recommends considering an alternative remediation technology or restarting the AS/SVE wells.
- Pending the findings of the additional delineation 50-feet deep monitoring wells (See Section 6.2.2), evaluate the potential to shut down additional AS/SVE wells and associated shallow monitoring wells.
- The remaining shallow monitoring wells (MW-2 to MW-6, MW-11 to MW-13, MW-15, MW-16, and MW-27) should be sampled on a semi-annual basis until groundwater concentrations are below 2L GWQS for one year for the COCs listed in Table 3 by use of the following methods: EPA Method 602 with xylenes, EPA Method 625 for PAH compounds only and Standard Prep Method 3030C for lead. At the conclusion of this one-year time frame, the AS/SVE wells should be shut down in the area of these shallow monitoring wells. At that time the shallow monitoring wells should be placed on a quarterly close-out monitoring schedule for one year.
- The groundwater samples collected for lead should be collected using low-flow sampling techniques.
- The results of the sampling should be presented within an Annual Groundwater Monitoring Report. The implemented shut down activities should also be summarized in this report.

6.2.2 50-Feet Deep Conditions

Based on the Remedial Effectiveness Evaluation and the Revised Target Cleanup Concentrations discussed within Sections 4.2.2.2 and 5.3.1, respectively of this report, CATLIN recommends to shutdown and properly abandon the potable water supply well 623, to install two additional monitoring wells in order to further delineate the 50-feet deep groundwater conditions, and to evaluate active remediation of the contamination at the 50-feet deep. Specific details to complete this recommendation are as follows for the 50-feet deep groundwater conditions:

- Based on the location of the potable water supply well 623, identified during the receptor survey (See Section 5.2.2), the downward hydraulic gradient and the 50-feet deep contamination discussed in Section 4.2.2.2, CATLIN recommends that MCB Camp Lejeune shut down and abandon this potable water supply well as soon as possible.

It is assumed that the shut down of potable water supply well 623 will assist in preventing additional migration of contamination within the 50-feet deep groundwater aquifer.

- Sample the following 50-feet deep monitoring wells for rebound affects from the shut down of a portion of the AS/SVE wells (See Section 6.2.1) on a quarterly basis for one year: MW-7, MW-19, MW-21, MW-23, and MW-25. These 50-feet deep monitoring wells should be sampled for the contaminants of concern listed in Table 3 by use of the following methods: EPA Method 602 with xylenes, EPA Method 625 for PAH compounds only and Standard Prep Method 3030C for lead. The detection limits for all compounds should be below the 2L GWQS.
- In order to delineate the 50-feet deep contamination to the north of the existing plume, CATLIN recommends installing two additional 50-feet deep monitoring wells. The location of these additional 50-feet deep monitoring wells is provided on the attached Figure 11.
- Upon installation of the proposed 50-feet deep monitoring wells, these new wells and the existing 50-feet deep monitoring wells should be sampled on a semi-annual basis for one year for the contaminants of concern listed in Table 3 by use of the following methods: EPA Method 602 with xylenes, EPA Method 625 for PAH compounds only and Standard Prep Method 3030C for lead. The detection limits for all compounds should be below the 2L GWQS. The basis for the one-year time frame is to evaluate the affect of shutting down potable water supply well 623 on the 50-feet deep contaminate plume. At the conclusion of this one-year time frame the following scenarios should be evaluated:
    1. If the concentrations of the COCs are below the 2L GWQS, then the AS/SVE wells should be shut down in the area of these 50-feet deep monitoring wells. At that time the monitoring wells should be sampled on a quarterly basis for the same parameters.
    2. If the concentrations of the COCs are above the 2L GWQS, then the active remediation activities should be re-evaluated. This re-evaluation may include a pilot test conducted to design an air sparge system. The re-evaluation may also include a 100-feet continuously sampled boring in order to determine geological conditions that may impact the effectiveness of a sparge system.
- The groundwater samples collected for lead should be collected using low-flow sampling techniques.
- The results of the sampling should be presented within an Annual Groundwater Monitoring Report. The implemented shut down activities should also be summarized in this report.

6.2.3 100-Feet Deep Conditions

Based on the Remedial Effectiveness Evaluation and the Revised Target Cleanup Concentrations discussed within Sections 4.2.2.3 and 5.3.1, respectively of this report, CATLIN recommends no active remediation of the groundwater at 100 feet; however, CATLIN recommends continued monitoring of the 100-feet deep groundwater. Specific details to accomplish this recommendation are as follows for the 100-feet deep groundwater conditions:

- The 100-feet deep monitoring well, MW-9D should be sampled on a semi-annual basis for the COCs listed in Table 3 by use of the following methods: EPA Method 602 with xylenes, EPA Method 625 for PAH compounds only and Standard Prep Method 3030C for lead. The detection limits for all compounds should be below the 2L GWQS.
- The groundwater samples collected for lead should be collected using low-flow sampling techniques.
- Monitoring well MW-9D should be sampled until the site-wide groundwater contamination has met the 2L GWQS.
- The results of the sampling should be presented within an Annual Groundwater Monitoring Report.

7.0 IMPLEMENTATION

7.1 IMPLEMENTATION PLAN

The following is a suggested implementation plan for obtaining site closure:

- Initiate the shut down and abandonment of potable water supply well 623.
- Submittal of RAO & RCAP to NCDENR for approval of recommendations.
- Initiate the shut down of the recommended portion of the AS/SVE system followed by the suggested close-out quarterly groundwater sampling for one year.
- Installation of the two additional 50-feet deep monitoring wells.
- Collection of recommended soil samples.
- Preparation of a Soil Assessment Report. If additional soil contamination is detected, then a Soil Cleanup Plan will be required; otherwise, proceed with site closure activities.
- Implementation of the recommended sampling strategy to measure rebound of the shallow groundwater and the additional delineation of the 50-feet deep groundwater conditions.
- Preparation of the Annual Groundwater Monitoring Reports.
- Upon delineation of the 50-feet deep contamination, conduct the recommended pilot test and preparation of the Basis of Design report.
- Implement the remedial approach presented within the Basis of Design.

7.2 SCHEDULE FOR IMPLEMENTATION

The shutdown and abandonment of the potable water supply well 623 is recommended to be implemented immediately. System shutdown, installation of the additional 50-feet deep monitoring wells and collection of the additional soil samples are recommended to commence immediately upon plan approval by appropriate State authorities. The semi-annual sampling activities should continue on the current schedule of April and October. The quarterly sampling should be conducted simultaneously with the semi-annual sampling and during the months of January and July. The Annual Monitoring reports should be submitted following the December operation period.

8.0 LIMITATIONS

The field and groundwater data evaluated as part of this report provide isolated data points and may not represent conditions at every location in the project area. Analyses and conclusions of this report, being based on interpolation between data points at the project area, may not be completely representative of all site conditions. Conclusions and recommendations from this report are based on the best available data in an effort to comply with current regulatory requirements.

9.0 REFERENCES

LAW Engineering and Environmental Services, Inc., *Corrective Action Plan for the Recovery of Free Product and the Restoration of Petroleum Contaminated Soil and Groundwater, Berkeley Manor Tank 820, Marine Corps Base, Camp Lejeune, Onslow County, North Carolina.* October 29, 1996.

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North Carolina Department of Environment and Natural Resources, Division of Water Quality, 2002, *Title 15A Subchapter 2L-Classifications and Water Quality Standards Applicable To The Groundwaters of North Carolina.* April 7, 2002.

OHM Remediation Services Corp., *Soil Sampling Results for POL Site BM 820, Task Order 33, Contract N62470-94-D-5000, MCB Camp Lejeune, NC.* August 24, 2001.

OHM Remediation Services Corp., *Work Plan for Construction and Operation of Air Sparging and Soil Vapor Extraction Remediation System at Berkeley Manor UST 820, MCB Camp Lejeune, North Carolina.* July 1997.

Shaw Environmental, Inc., *Final 2002 Annual Monitoring Report Building 820, Marine Corps Base Camp Lejeune, Onslow County, North Carolina.* July 2003.

TABLES

TABLE 1

WELL CONSTRUCTION DATA

BUILDING 820
MARINE CORPS BASE
CAMP LEJEUNE, NC

WELL I.D.	DATE CONSTRUCTED	TOP OF CASING (Feet)	DIAMETER (Inches)	TOTAL DEPTH (Feet Below TOC)	CASING INTERVAL (Feet Below TOC)	SCREEN INTERVAL (Feet Below TOC)
TYPE II MONITORING WELLS						
MW-2	NA					
MW-3	NA					
MW-4	NA	33.35	NA	20	0-5	5-20
MW-5	NA	30.32	NA	25	0-10	10-25
MW-6	NA	32.04	NA	26.5	0-11.5	11.5-26.5
MW-8	NA	27.17	NA	21	0-6	6-21
MW-10	NA	32.62	NA	26	0-11	11-26
MW-11	NA	29.29	NA	25	0-10	10-25
MW-12	3/18/1994	31.73	2	23.5	0-8.5	8.5-23.5
MW-13	4/4/1994	29.15	2	23	0-8	8-23
MW-14	3/18/1994	31.48	2	23.5	0-8.5	8.5-23.5
MW-15	3/18/1994	30.18	2	23.5	0-8.5	8.5-23.5
MW-16	4/4/1994	32.24	2	23	0-8	8-23
MW-18	3/30/1994	31.70	2	23	0-8	8-23
MW-20	3/31/1994	31.63	2	23	0-8	8-23
MW-22	4/20/1994	NA	2	23	0-8	8-23
MW-24	3/30/1994	NA	2	22.5	0-7.5	7.5-22.5
MW-26	4/4/1994	28.72	2	23	0-8	8-23
MW-27	9/21/2001	30.07	2	14	-0.5-4	4-14
50-FEET TYPE III MONITORING WELLS						
MW-7	NA	27.18	NA	51.8	0-46.8	46.8-51.8
MW-9	NA	31.95	2	51.5	0-46.5	46.5-51.5
MW-17	4/1/1994	32.58	2	49.5	0-44.5	44.5-49.5
MW-19	4/1/1994	31.73	2	49.5	0-44.5	44.5-49.5
MW-21	3/31/1994	31.80	2	49.5	0-44.5	44.5-49.5
MW-23	3/30/1994	NA	2	49.5	0-44.5	44.5-49.5
MW-25	3/30/1994	NA	2	48.5	0-43.5	43.5-48.5
100-FEET TYPE III MONITORING WELLS						
MW-9D	9/20/2001	32.54	2	98	+2-93	93-98

1. Casing and screen intervals are assumed to be based on measurements from Top of Casing.
2. Total depth based on maximum depth of screen interval.
3. Top of casing provided by SHAW ENVIRONMENTAL, INC. 2002 Annual Monitoring Report.
4. Data for casing and screen intervals obtained from various OHM/SHAW Monitoring Reports.
5. NA = not available

TABLE 2 A

SUMMARY OF HISTORICAL GROUNDWATER CONTAMINANTS OF CONCERN
TYPE II MONITORING WELLS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

COMPOUND	2L GWQS (µg/L)	GCL (µg/L)	MAXIMUM CONCENTRATIONS (µg/L)							
			CAP DATA	1997	1998	1999	2000	2001	2002	2003
TYPE II MONITORING WELLS										
1,2 Dichlorobenzene	620	72,500	NA	<2,000	<500	<100	<20	<100	NA	NA
1,3 Dichlorobenzene	620	61,500	NA	<1,500	<380	<100	<20	<100	NA	NA
1,4 Dichlorobenzene	75	39,500	NA	<3,000	<750	<100	<20	<100	NA	NA
Dibromochloromethane	0.41	NE	ND	NA	NA	<100	<20	<100	NA	NA
Chloroform	0.19	190	39.0	NA	NA	<100	<20	<100	NA	NA
Chloromethane	2.6	2,600	1.9	NA	NA	<100	<20	<100	NA	NA
1,2 Dichloroethane	0.38	380	1.1	NA	NA	<100	<20	<100	NA	NA
Benzene	1	5,000	36,000	6,900	880	3,630	1,360	700	95.2	7.5J
Chlorobenzene	50	NE	NA	<1,000	<250	<100	<100	<100	<10	<10
Methyl Tert-Butyl Ether	200	200,000	44,000	<10,000	<2500	10,200	<500	1,400	22.5	139
Ethylbenzene	29	29,000	7,500	3,300	630B	613	1,110	9,000	481	36.6
Total Xylenes	530	87,500	39,000	18,600	4,400B	3,720	7,800	11,000	3,270	1,298
Toluene	1,000	257,500	80,000	29,000	4,400B	5,330	9,100	21,810	2,900	284
Chrysene	5	5	6.2	NA	NA	NA	NA	250	<56	<40
Naphthalene	21	15,500	NA	NA	NA	NA	NA	<5.0	271	140
Acenaphthene	80	2,120	NA	NA	NA	NA	NA	<5.0	<56	<40
Acenaphthylene	210	1,965	NA	NA	NA	NA	NA	<5.0	<56	<40
Benzo(a)anthracene	0.05	22	NA	NA	NA	NA	NA	<0.50	<56	<40
Pyrene	210	210	NA	NA	NA	NA	NA	<0.50	<56	<40
Flourene	280	950	NA	NA	NA	NA	NA	<10	<56	<40
Anthracene	2100	2,100	NA	NA	NA	NA	NA	<5.0	<56	<40
Fluoranthene	280	280	NA	NA	NA	NA	NA	<1.0	<56	<40
Phenanthrene	210	410	NA	NA	NA	NA	NA	<5.0	<56	<40
Lead	15	15,000	320	NA	NA	NA	NA	NA	0.0664	NA

NE = Not established
ND = Not detected; see laboratory reports for applicable detection limits.
J = Estimated Results
B = Detected in blank
Information obtained from Shaw Environmental, Inc.
CAP DATA is from the 1996 CAP by LAW.
NA= Not Analyzed
BQL = Below Quantitation Limits.
Shading represents concentrations above 2L GWQS.
2003 DATA is based on one sampling event (April), all others data is based on more than one sampling event in per year.

TABLE 2 B

SUMMARY OF HISTORICAL GROUNDWATER CONTAMINANTS OF CONCERN
50-FEET TYPE III MONITORING WELLS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

COMPOUND	2L GWQS (µg/L)	GCL (µg/L)	MAXIMUM CONCENTRATIONS (µg/L)							
			CAP DATA	1997	1998	1999	2000	2001	2002	2003
50-FEET TYPE III MONITORING WELLS										
1,2 Dichlorobenzene	620	72,500	NA	<2,000	<500	<200	<5	NA	NA	NA
1,3 Dichlorobenzene	620	61,500	NA	<1,500	<380	<200	<5	NA	NA	NA
1,4 Dichlorobenzene	75	39,500	NA	740J	<750	<200	<5	NA	NA	NA
Dibromochloromethane	0.41	NE	0.5	NA	NA	<200	<5	NA	NA	NA
Chloroform	0.19	190	4.0	NA	NA	<200	<5	NA	NA	NA
Chloromethane	2.6	2,600	NA	NA	NA	<200	<5	NA	NA	NA
1,2 Dichloroethane	0.38	380	NA	NA	NA	<200	<5	NA	NA	NA
Benzene	1	5,000	2,000	8,500	5,000	6,170	3,390	2,700	1,770	2,340
Chlorobenzene	50	NE	NA	<1,000	<250	<200	<50	<200	<50	<1.0
Methyl Tert-Butyl Ether	200	200,000	120	<10,000	14,000	16,700	9,260	7,000	4,200	4,530
Ethylbenzene	29	29,000	12.0	2,800	740	1,030	291	300	159	241
Total Xylenes	530	87,500	820	13,300	2,010B	5,990	740	820	447	556
Toluene	1,000	257,500	190	32,000	4,700B	5,480	1,060	1,200B	645	466
Chrysene	5	5	1.9	NA	NA	NA	NA	<0.10	<5.5	<5.1
Naphthalene	21	15,500	NA	NA	NA	NA	NA	25	<5.5	24.4
Acenaphthene	80	2,120	NA	NA	NA	NA	NA	<1.0	<5.5	<5.1
Acenaphthylene	210	1,965	NA	NA	NA	NA	NA	<1.0	<5.5	<5.1
Benzo(a)anthracene	0.05	22	NA	NA	NA	NA	NA	<0.10	<5.5	<5.1
Pyrene	210	210	NA	NA	NA	NA	NA	<0.25	<5.5	<5.1
Flourene	280	950	NA	NA	NA	NA	NA	<2.0	<5.5	<5.1
Anthracene	2100	2,100	NA	NA	NA	NA	NA	<1.0	<5.5	<5.1
Fluoranthene	280	280	NA	NA	NA	NA	NA	<0.25	<5.5	<5.1
Phenanthrene	210	410	NA	NA	NA	NA	NA	<1.0	<5.5	<5.1
Lead	15	15,000	12	NA	NA	NA	NA	<0.01	0.0048B	NA

NE = Not established
ND = Not detected; see laboratory reports for applicable detection limits.
J = Estimated Results
B = Detected in blank
Information obtained from Shaw Environmental, Inc.
CAP DATA is from the 1996 CAP by LAW.
NA= Not Analyzed
BQL = Below Quantitation Limits.
Shading represents concentrations above 2L GWQS.
2003 DATA is based on one sampling event (April), all others data is based on more than one sampling event in per year.
All other compounds analyzed were below laboratory method/quantitation detection limits or historically below 2LGWQS.
* Exceeds calibration curve > 20%

TABLE 2 C

SUMMARY OF HISTORICAL GROUNDWATER CONTAMINANTS OF CONCERN
100-FEET TYPE III MONITORING WELLS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

COMPOUND	2L GWQS (µg/L)	GCL (µg/L)	MAXIMUM CONCENTRATIONS (µg/L)							
			CAP DATA	1997	1998	1999	2000	2001	2002	2003
100-FEET TYPE III MONITORING WELLS										
1,2 Dichlorobenzene	620	72,500	NA	NA	NA	NA	NA	NA	NA	NA
1,3 Dichlorobenzene	620	61,500	NA	NA	NA	NA	NA	NA	NA	NA
1,4 Dichlorobenzene	75	39,500	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	0.41	NE	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	0.19	190	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	2.6	2,600	NA	NA	NA	NA	NA	NA	NA	NA
1,2 Dichloroethane	0.38	380	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1	5,000	NA	NA	NA	NA	NA	<1.0	19.9	<1.0
Chlorobenzene	50	NE	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0
Methyl Tert-Butyl Ether	200	200,000	NA	NA	NA	NA	NA	<1.0	2.5	<1.0
Ethylbenzene	29	29,000	NA	NA	NA	NA	NA	<1.0	7.8	<1.0
Total Xylenes	530	87,500	NA	NA	NA	NA	NA	<2.0	22	<3.0
Toluene	1,000	257,500	NA	NA	NA	NA	NA	<1.0	17.3	<1.0
Chrysene	5	5	NA	NA	NA	NA	NA	<0.10	<5.5	<5.2
Naphthalene	21	15,500	NA	NA	NA	NA	NA	<2.0	<5.5	<5.2
Acenaphthene	80	2,120	NA	NA	NA	NA	NA	<1.0	<5.5	<5.2
Acenaphthylene	210	1,965	NA	NA	NA	NA	NA	<1.0	<5.5	<5.2
Benzo(a)anthracene	0.05	22	NA	NA	NA	NA	NA	<0.10	<5.5	<5.2
Pyrene	210	210	NA	NA	NA	NA	NA	<0.25	<5.5	<5.2
Flourene	280	950	NA	NA	NA	NA	NA	<2.0	<5.5	<5.2
Anthracene	2100	2,100	NA	NA	NA	NA	NA	<1.0	<5.5	<5.2
Fluoranthene	280	280	NA	NA	NA	NA	NA	<0.25	<5.5	<5.2
Phenanthrene	210	410	NA	NA	NA	NA	NA	<1.0	<5.5	<5.2
Lead	15	15,000	NA	NA	NA	NA	NA	<0.005	<0.0012	NA

NE = Not established
ND = Not detected; see laboratory reports for applicable detection limits.
J = Estimated Results
B = Detected in blank
Information obtained from Shaw Environmental, Inc.
CAP DATA is from the 1996 CAP by LAW.
NA= Not Analyzed
BQL = Below Quantitation Limits.
Shading represents concentrations above 2L GWQS.
2003 DATA is based on one sampling event (April), all others data is based on more than one sampling event in per year.
All other compounds analyzed were below laboratory method/quantitation detection limits or historically below 2LGWQS.
* Exceeds calibration curve > 20%

TABLE 3

REVISED TARGET CLEANUP CONCENTRATIONS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

MEDIUM	COMPONENT	CURRENT CONDITIONS*	TARGET CLEANUP
Free Product	Gasoline/Diesel	No measureable thickness	<1/8"
Vadose Zone Soil	EPA Method 8260, EPA Method 8270, MADEP VPH/EPH	Unkown	Residential Maximum Soil Contaminant Concentrations
TYPE II MONITORING WELLS			
GROUNDWATER	1,2 Dichlorobenzene	NA	620
	1,3 Dichlorobenzene	NA	620
	1,4 Dichlorobenzene	NA	75
	Dibromochloromethane	NA	0.41
	Chloroform	NA	0.19
	Chloromethane	NA	2.6
	1,2 Dichloroethane	NA	0.38
	Benzene	7.5J	1
	Chlorobenzene	<10	50
	Methyl Tert-Butyl Ether	139	200
	Ethylbenzene	37	29
	Total Xylenes	1,298	530
	Toluene	284	1,000
	Chrysene	<40	5
	Naphthalene	140	21
	Acenaphthene	<40	80
	Acenaphthylene	<40	210
	Benzo(a)anthracene	<40	0.05
	Pyrene	<40	210
	Flourene	<40	280
	Anthracene	<40	2,100
	Fluoranthene	<40	280
	Phenanthrene	<40	210
	Lead	NA	15

TABLE 3

REVISED TARGET CLEANUP CONCENTRATIONS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

MEDIUM	COMPONENT	CURRENT CONDITIONS*	TARGET CLEANUP
50 FOOT-TYPE III MONITORING WELLS			
GROUNDWATER	1,2 Dichlorobenzene	NA	620
	1,3 Dichlorobenzene	NA	620
	1,4 Dichlorobenzene	NA	75
	Dibromochloromethane	NA	0.41
	Chloroform	NA	0.19
	Chloromethane	NA	2.6
	1,2 Dichloroethane	NA	0.38
	Benzene	2340	1
	Chlorobenzene	<1.0	50
	Methyl Tert-Butyl Ether	4530	200
	Ethylbenzene	241.0	29
	Total Xylenes	556	530
	Toluene	466	1,000
	Chrysene	<5.1	5
	Naphthalene	24.4	21
	Acenaphthene	<5.1	80
	Acenaphthylene	<5.1	210
	Benzo(a)anthracene	<5.1	0.05
	Pyrene	<5.1	210
	Flourene	<5.1	280
	Anthracene	<5.1	2,100
	Fluoranthene	<5.1	280
	Phenanthrene	<5.1	210
	Lead	NA	15

TABLE 3

REVISED TARGET CLEANUP CONCENTRATIONS

REMEDIAL ACTION OPTIMIZATION
&
REVISED CORRECTIVE ACTION PLAN
BUILDING 820

MARINE CORPS BASE, CAMP LEJEUNE, NC

MEDIUM	COMPONENT	CURRENT CONDITIONS*	TARGET CLEANUP
100 FOOT-TYPE III MONITORING WELLS			
GROUNDWATER	1,2 Dichlorobenzene	NA	620
	1,3 Dichlorobenzene	NA	620
	1,4 Dichlorobenzene	NA	75
	Dibromochloromethane	NA	0.41
	Chloroform	NA	0.19
	Chloromethane	NA	2.6
	1,2 Dichloroethane	NA	0.38
	Benzene	<1.0	1
	Chlorobenzene	<1.0	50
	Methyl Tert-Butyl Ether	<1.0	200
	Ethylbenzene	<1.0	29
	Total Xylenes	<3.0	530
	Toluene	<1.0	1,000
	Chrysene	<5.2	5
	Naphthalene	<5.2	21
	Acenaphthene	<5.1	80
	Acenaphthylene	<5.2	210
	Benzo(a)anthracene	<5.2	0.05
	Pyrene	<5.2	210
	Flourene	<5.2	280
	Anthracene	<5.2	2,100
	Fluoranthene	<5.2	280
	Phenanthrene	<5.2	210
	Lead	NA	15

* Current data obtained form Shaw Environmental, Inc.

J = Estimated Results.

Groundwater target cleanup levels based on 2L GWQS and are in ug/L.

NA = Not analyzed

TABLE 4

STATUS OF MONITORING WELLS COMPARED TO CONTAMINANTS OF CONCERN

BUILDING 820
MARINE CORPS BASE
CAMP LEJEUNE, NC

WELL I.D.	LAST DATE ABOVE 2L GWQS
TYPE II MONITORING WELLS	
MW-2	10/30/2002
MW-3	8/21/1991
MW-4	10/28/2002
MW-5	6/26/2001
MW-6	12/22/1992
MW-8	9/27/2001
MW-10	11/17/1999
MW-11	4/18/2003
MW-12	11/17/1999
MW-13	10/2/2001
MW-14	4/26/2002
MW-15	6/26/2001
MW-16	6/22/2001
MW-18	4/13/1994
MW-20	4/13/1994
MW-22	4/21/1994
MW-24	NEVER ABOVE
MW-26	10/2/2001
MW-27	4/9/2003*
50-FEET TYPE III MONITORING WELLS	
MW-7	3/19/2001
MW-9	4/16/2003
MW-17	4/18/2003
MW-19	4/24/2002
MW-21	11/17/1999
MW-23	4/13/1994
MW-25	4/13/1994
100-FEET TYPE III MONITORING WELLS	
MW-9D	10/28/2002

Last date above 2L GWQS = The last date in which a contaminant of concern was above the 2L GWQS for each monitoring well.

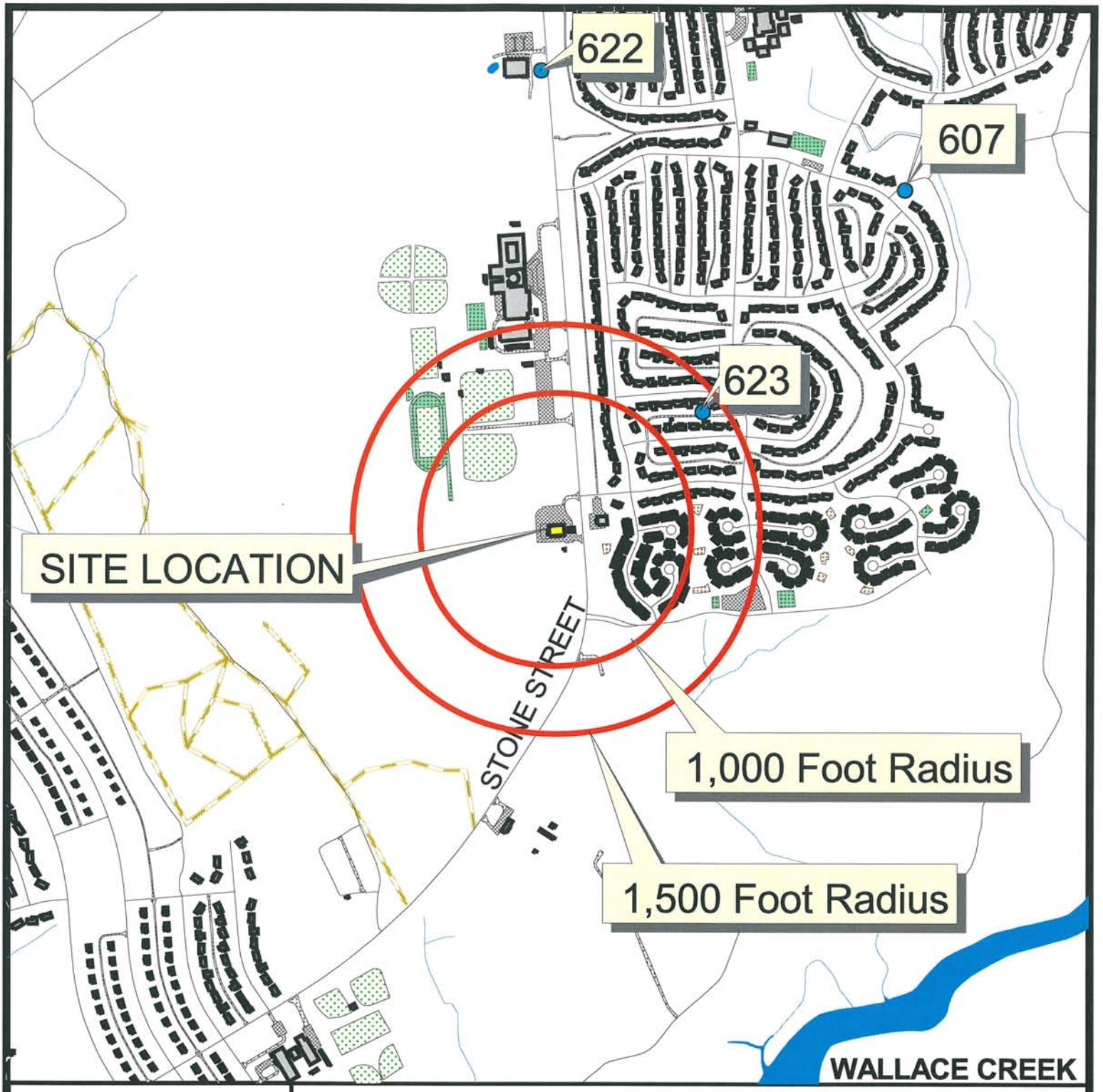
The laboratory detection limts for Chrysene and Benzo(a)anthracene were above the 2L GWQS for all wells.

Wells MW-3, MW-6, MW-18, MW-20, MW-22, MW-23, and MW-25 dates represent the only sampling event for those wells.

Data obtained from Shaw environmental Inc. and 1996 CAP by LAW.

* Laboratory detection limits for benzene was above the 2L GWQS.

FIGURES



LEGEND

Water Supply Wells
- ACTIVE
- CLOSED
- INACTIVE
- PENDING

Roads
Railroads
Recreational Horse Trail
Buildings and Structures
Parking Lots
Playgrounds
Driveways
Athletic Fields
Athletic Courts
Surface Water
Creeks
Surface Water

1000 0 1000 Feet

SCALE

N W E S

CATLIN ENGINEERS and SCIENTISTS

DRAWN BY:	CHECK BY:	APPROVED BY:
THW	SVH	

CATLIN PROJECT No.: 203-063

SITE LOCATION MAP

BUILDING 820

FIGURE 1

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊠	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
---SS---	SANITARY SEWER
---W---	WATERLINE W/VALVE
PP---P---	POWER LINE W/POLE
---UP---	UNDERGROUND POWER
FH	FIRE HYDRANT
△	POWER TRANSFORMER
⌑	AREA LIGHT

MW-19
MW-18
WOODS
MW-16
MW-17
TRAIL
PARKING AREA (PAVED)
CONCRETE
DUMPSTER
SHRUBBERY
UP
CONCRETE
COMPACTOR
BUILDING 820
CONCRETE SIDEWALK
ATM
PARKING AREA (PAVED)
MW-20
MW-21
WOODS
MW-10
MW-5
SS
W
EQUIPMENT COMPOUND
FENCE
MW-4
GRASS
MW-3
UST BASIN
FENCE
CONCRETE
PUMP ISLAND
MW-27
PUMP ISLAND
CANOPY
PAVEMENT
MW-15
MW-12
MW-22
MW-23
WOODS
MW-9D
MW-2
MW-9
PW-1
MW-6
PAVEMENT
MW-11
TELEPHONE CABINET
SIGN
WOODS
SIDEWALK
UT
18" RCP
FENCE
PT-1
#120 NAIL
(ELEVATION NOT AVAILABLE)
STONE STREET (PAVED)
MW-13
18" RCP
RCP
SS
W
FH
15" RCP
15" RCP
PP
P
W
CONCRETE SIDEWALK
SS
FENCE
MW-26
MW-8
MW-7
15" RCP
PARKING AREA (PAVED)
WOODS
MW-24
MW-25
MW-14
PLAYGROUND
BASKETBALL COURT
BUILDING 1985
SHED

NOTES:

- 1. FIELD 1 REPRESENTS AS/SVE WELLS 1–11
- 2. FIELD 2 REPRESENTS AS/SVE WELLS 12–20 AND 27–29
- 3. FIELD 3 REPRESENTS AS/SVE WELLS 21–26 AND 36–35
- 4. FIELD 4 REPRESENTS AS/SVE WELLS 36–48

NOTES:

1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

60 30 0 60
SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

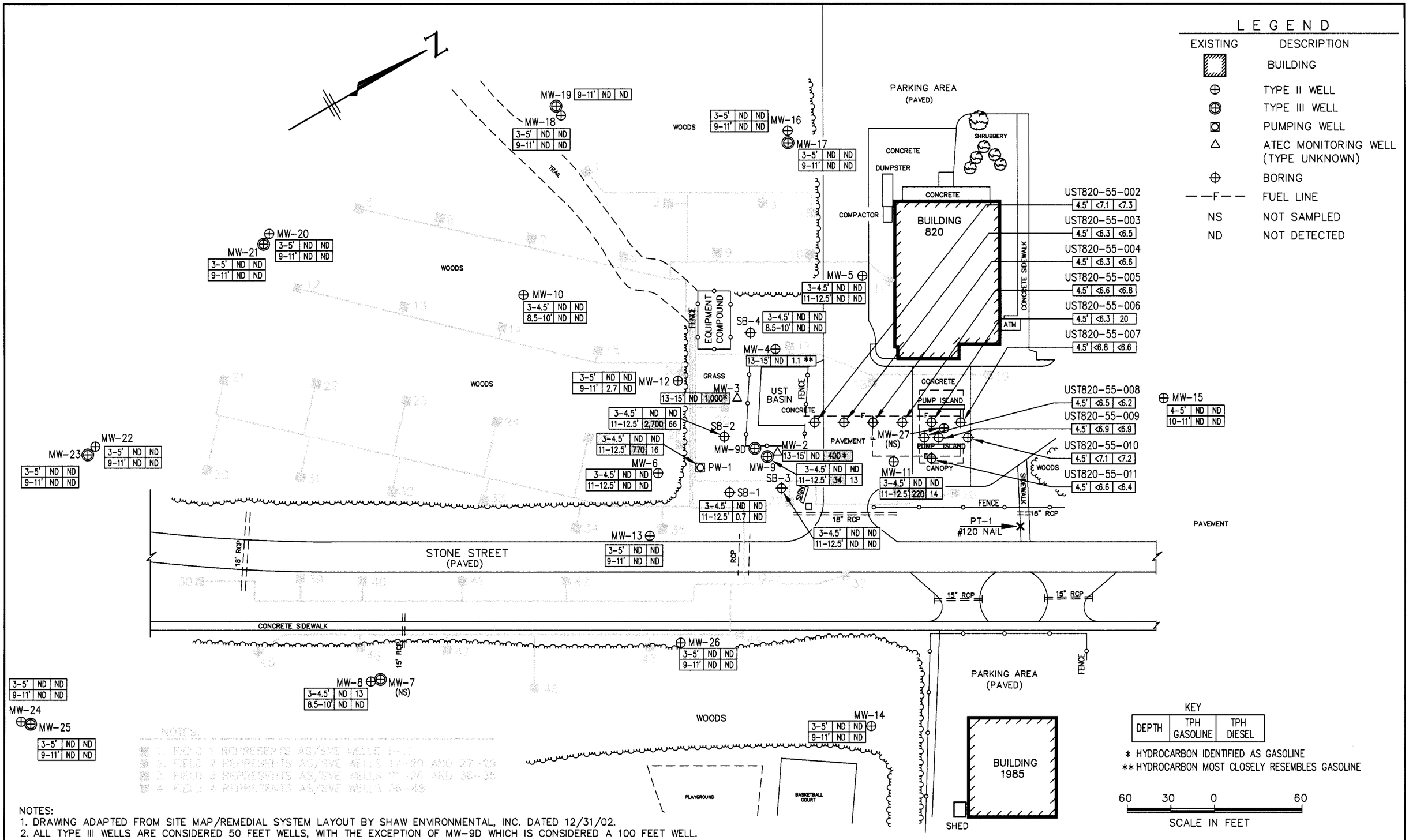
PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

TITLE: SITE MAP WITH CURRENT REMEDIATION LAYOUT

FIGURE 2

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1"=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-02



NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. SHADED CONCENTRATIONS EXCEED NCDENR 1997 ACTION LEVEL OF 10mg/Kg GASOLINE OR 40 mg/Kg DIESEL.
5. DATA OBTAINED FROM SHAW ENVIRONMENTAL, INC. OR THE CAP.
6. TPH CONCENTRATIONS FROM MONITORING WELL MW-22 TO MW-25, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS IN MARCH/APRIL 1994.
7. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

TITLE: HISTORICAL LABORATORY ANALYTICAL RESULTS – SOIL

FIGURE 3

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-03

N

ESTIMATED AREAL EXTENT OF ANY INDIVIDUAL BTEX CONSTITUENT IN EXCESS OF NCAC 15:02L STANDARDS FROM THE 1996 CAP

MW-19 / MW-18

#	4/03	4/13/94
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	ND

#	4/18/03	4/13/94
1	<1.0	ND
2	<1.0	ND
3	<1.0	ND
4	<3.0	ND

MW-16 / MW-17

MW-20 / MW-21

#	4/03	4/13/94
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	1.2

#	4/03	4/13/94
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	1.2

#	4/14/03	8/21/91
1	<1.0	6,800
2	<1.0	11,000
3	<1.0	1,100
4	<3.0	5,100

MW-5

#	4/08/03	12/22/92
1	<1.0	ND
2	<1.0	ND
3	<1.0	ND
4	<3.0	ND

MW-10

#	4/14/03	12/22/92
1	<1.0	1.3
2	<1.0	1.7
3	<1.0	ND
4	<3.0	1.4

#	4/03	12/21/91
1	NS	16,000
2	NS	31,000
3	NS	1,900
4	NS	9,600

MW-4

MW-12

#	4/09/03	4/13/94
1	<1.0	58.80
2	<1.0	80.10
3	<1.0	9.6
4	<3.0	97.20

MW-3

MW-9D / MW-9 / MW-2

MW-6

#	4/03	12/22/92
1	NS	9,100
2	NS	27,000
3	NS	4,000
4	NS	11,000

PW-1

#	4/03	12/22/92
1	NS	31,000
2	NS	80,000
3	NS	7,500
4	NS	39,000

MW-13

#	4/08/03	4/14/94
1	0.55*	9,000
2	62.5	28,100
3	3.9	3,000
4	103.1	14,900

MW-22 / MW-23

#	4/03	4/93
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	ND

#	4/03	4/93
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	1.2

MW-24 / MW-25

MW-8 / MW-7

#	4/18/03	12/22/92
1	<1.0	0.6
2	<1.0	ND
3	<1.0	ND
4	<3.0	ND

MW-26

#	4/18/03	4/21/94
1	<1.0	ND
2	0.87*	ND
3	<1.0	ND
4	2.1*	ND

MW-14

#	4/18/03	4/14/94
1	<1.0	ND
2	<1.0	ND
3	<1.0	ND
4	<3.0	ND

MW-15

#	4/08/03	4/13/94
1	<1.0	ND
2	<1.0	ND
3	<1.0	ND
4	<3.0	ND

MW-27

#	4/09/03	4/94
1	<2.0	NS
2	<2.0	NS
3	<2.0	NS
4	<6.0	NS

MW-11

#	4/18/03	12/22/92
1	7.5*	2,800
2	284	21,000
3	36.6	2,200
4	1,290	12,000

#	4/18/03	8/21/91
1	0.84*	31,000
2	82	42,000
3	21.1	2,900
4	100	15,000

PT-1 #120 NAIL

PARKING AREA (PAVED)

SHRUBBERY

CONCRETE

DUMPSTER

COMPACTOR

BUILDING 820

CONCRETE SIDEWALK

ATM

EQUIPMENT COMPOUND

FENCE

GRASS

UST BASIN

CONCRETE

PUMP ISLAND

CANOPY

PAVEMENT

WOODS

TRAIL

SIGN

TELEPHONE CABINET

18" RCP

STONE STREET (PAVED)

CONCRETE SIDEWALK

15" RCP

FENCE

PARKING AREA (PAVED)

ESTIMATED AREAL EXTENT OF ANY INDIVIDUAL BTEX CONSTITUENT IN EXCESS OF NCAC 15A:02L STANDARDS AS OF APRIL 2003

PLAYGROUND

BASKETBALL COURT

BUILDING 1985

SHED

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊠	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
NA	NOT ANALYZED
ND	NOT DETECTED
NS	NOT SAMPLED

KEY

#	DATE	2L GWQS
1	BENZENE	1
2	TOLUENE	1,000
3	ETHYLBENZENE	29
4	TOTAL XYLENES	530

* ESTIMATED

60 30 0 60

SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1991, 1992, AND 1994 DATA WAS OBTAINED FROM 1996 CAP BY LAW.
5. 2003 DATA WAS PROVIDED BY SHAW ENVIRONMENTAL, INC.
6. BTEX CONCENTRATIONS FROM MONITORING WELL MW-22 AND 24, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS IN APRIL 1994.
7. SHADED AREAS REPRESENT LABORATORY RESULTS IN EXCESS OF NCAC 15A:02L STANDARDS.
8. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

TITLE: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- BTEX AS OF APRIL 2003 SHALLOW CONDITIONS

FIGURE 4

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-04

ESTIMATED AREAL EXTENT OF ANY INDIVIDUAL BTEX CONSTITUENT IN EXCESS OF NCAC 15A:02L STANDARDS FROM THE 1996 CAP

ESTIMATED AREAL EXTENT OF ANY INDIVIDUAL BTEX CONSTITUENT IN EXCESS OF NCAC 15A:02L STANDARDS AS OF APRIL 2003

#	4/14/03	4/13/94
1	0.87*	ND
2	<1.0	0.5
3	<1.0	ND
4	<3.0	ND

MW-19
MW-18

MW-16
MW-17

#	4/18/03	4/13/94
1	45.8	0.7
2	<1.0	ND
3	<1.0	ND
4	1.9*	ND

MW-20
MW-21

#	4/14/03	4/13/94
1	<1.0	0.5
2	<1.0	ND
3	ND	ND
4	ND	ND

MW-10

#	4/14/03	4/92
1	<1.0	NS
2	<1.0	NS
3	<1.0	NS
4	<3.0	NS

MW-12
MW-4
MW-3
MW-9D
MW-2
MW-9
MW-6
PW-1
MW-5
MW-15
MW-27
MW-11
MW-22
MW-23

#	4/03	4/93
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	ND

MW-13

#	4/16/03	12/22/92
1	2,340	2,000
2	466	190
3	241	12
4	556	820

MW-26
MW-8
MW-7

#	4/18/03	12/22/92
1	<1.0	375
2	<1.0	6.2
3	<1.0	ND
4	<3.0	33

MW-24
MW-25

#	4/03	4/93
1	NS	ND
2	NS	ND
3	NS	ND
4	NS	ND

MW-14

PARKING AREA (PAVED)
CONCRETE
DUMPSTER
SHRUBBERY
COMPACTOR
CONCRETE
BUILDING 820
CONCRETE SIDEWALK
ATM
PARKING AREA (PAVED)
EQUIPMENT COMPOUND
FENCE
GRASS
UST BASIN
FENCE
CONCRETE
CONCRETE
PUMP ISLAND
PUMP ISLAND
CANOPY
PAVEMENT
PAVEMENT
WOODS
SIDEWALK
TELEPHONE CABINET
SIGN
FENCE
18" RCP
18" RCP
PT-1
#120 NAIL
STONE STREET (PAVED)
18" RCP
RCP
15" RCP
15" RCP
CONCRETE SIDEWALK
RCP
15" RCP
WOODS
PARKING AREA (PAVED)
FENCE
BUILDING 1985
SHED
PLAYGROUND
BASKETBALL COURT
TRAIL
WOODS
WOODS
WOODS

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊠	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
--F--	FUEL LINE
ND	NOT DETECTED
NS	NOT SAMPLED

KEY

#	DATE	2L GWQS
1	BENZENE	1
2	TOLUENE	1,000
3	ETHYLBENZENE	29
4	TOTAL XYLENES	530

* ESTIMATED

60 30 0 60
SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS OBTAINED FROM SHAW ENVIRONMENTAL, INC.
6. BTEX CONCENTRATIONS FROM MONITORING WELLS MW-23 AND MW-25, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS IN APRIL 1994.
7. SHADED CONCENTRATIONS REPRESENT LABORATORY RESULTS IN EXCESS OF NCAC 15A:02L STANDARD.
8. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

BUILDING 820 OPTIMIZATION PLAN
MARINE CORPS BASE
CAMP LEJEUNE, N.C.

PROJECT: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- BTEX AS OF APRIL 2003 DEEP CONDITIONS

FIGURE 5

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-05

N

MW-19
MW-18

#	4/03	4/13/94
1	NS	NA

WOODS

TRAIL

#	4/18/03	4/13/94
1	<5.1	NA

MW-16
MW-17

PARKING AREA (PAVED)

SHRUBBERY

CONCRETE

DUMPSTER

CONCRETE

COMPACTOR

BUILDING 820

CONCRETE SIDEWALK

ATM

PARKING AREA (PAVED)

MW-20
MW-21

#	4/03	4/13/94
1	NA	NA

WOODS

MW-5

#	4/08/03	12/22/92
1	<5.2	NA

MW-10

#	4/14/03	12/22/92
1	<5.0	NA

EQUIPMENT COMPOUND

FENCE

MW-4

#	4/14/03	8/21/91
1	<5.2	NA

#	4/03	8/21/91
1	NA	NA

MW-12

#	4/09/03	4/13/94
1	<5.1	NA

WOODS

MW-3

UST BASIN

FENCE

CONCRETE

PUMP ISLAND

PAVEMENT

MW-15

#	4/08/03	4/13/94
1	<5.1	NA

MW-27

#	4/09/03	4/94
1	<5.2	NS

PUMP ISLAND

CANOPY

GRASS

MW-9D

MW-2

MW-9

MW-22
MW-23

#	4/03	4/94
1	NA	NA

MW-6

#	4/03	12/22/92
1	NS	NA

PW-1

#	4/03	12/22/92
1	NS	NA

PAVEMENT

MW-11

#	4/18/03	12/22/92
1	140	NA

TELEPHONE CABINET

SIGN

WOODS

SIDEWALK

FENCE

18" RCP

18" RCP

PT-1
#120 NAIL

MW-13

#	4/08/03	4/14/94
1	7.2	NA

#	4/18/03	8/21/91
1	<5.4	NA

STONE STREET (PAVED)

18" RCP

RCP

15" RCP

15" RCP

CONCRETE SIDEWALK

15" RCP

PARKING AREA (PAVED)

MW-26

#	4/18/03	4/21/94
1	<5.1	NA

ESTIMATED AREAL EXTENT OF NAPHTHALENE CONCENTRATIONS IN EXCESS OF 21 ug/L. AS OF APRIL 2003

#	4/03	4/94
1	NA	NA

MW-24
MW-25

MW-8
MW-7

#	4/18/03	12/22/92
1	<5.1	NA

WOODS

MW-14

#	4/18/03	4/14/94
1	<5.1	NA

FENCE

BUILDING 1985

SHED

PLAYGROUND

BASKETBALL COURT

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
◘	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
NA	NOT ANALYZED
NS	NOT SAMPLED

KEY

#	DATE	2L GWQS
1	NAPHTHALENE	21

60 30 0 60

SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1991, 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS OBTAINED FROM SHAW ENVIRONMENTAL, INC.
6. NAPHTHALENE CONCENTRATIONS IN MONITORING WELLS MW-22 AND MW-24, NOT ILLUSTRATED, WERE NOT ANALYZED.
7. SHADED CONCENTRATIONS REPRESENT LABORATORY RESULTS IN EXCESS OF NCAC 15A:02L STANDARD.
8. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

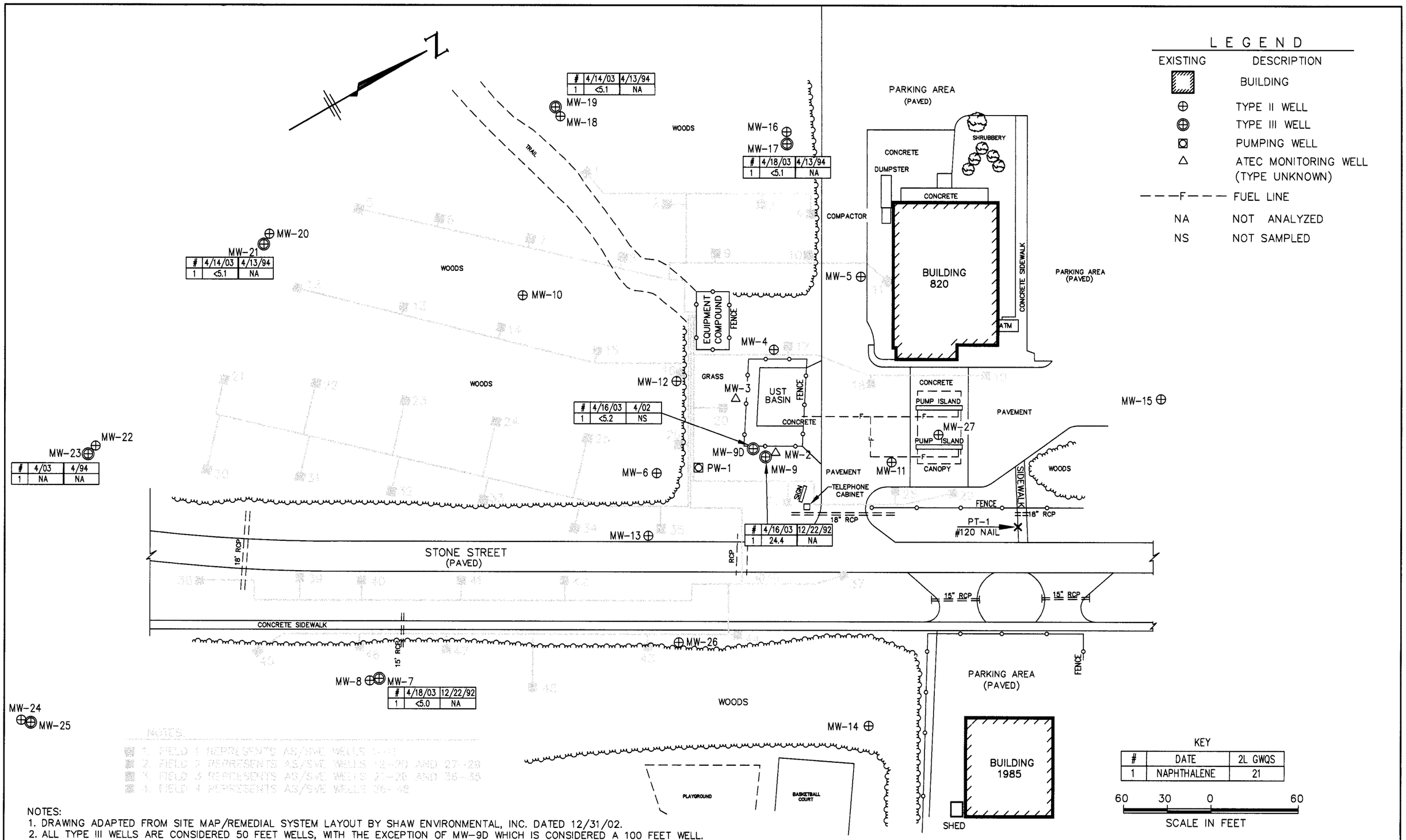
PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

TITLE: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- NAPHTHALENE AS OF APRIL 2003 SHALLOW CONDITIONS

FIGURE 6

203063-820-06



#	4/14/03	4/13/94
1	<5.1	NA

#	4/18/03	4/13/94
1	<5.1	NA

#	4/14/03	4/13/94
1	<5.1	NA

#	4/16/03	4/02
1	<5.2	NS

#	4/03	4/94
1	NA	NA

#	4/16/03	12/22/92
1	24.4	NA

#	4/18/03	12/22/92
1	<5.0	NA

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊠	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
NA	NOT ANALYZED
NS	NOT SAMPLED

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS OBTAINED FROM SHAW ENVIRONMENTAL, INC.
6. NAPHTHALENE CONCENTRATIONS IN MONITORING WELLS MW-23 AND MW-25, NOT ILLUSTRATED, WERE NOT ANALYZED.
7. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

KEY

#	DATE	2L GWQS
1	NAPHTHALENE	21

60 30 0 60

SCALE IN FEET

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.	TITLE: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- NAPHTHALENE AS OF APRIL 2003 DEEP CONDITIONS		FIGURE 7
JOB NO. 203063-820	DATE: JAN 2004	SCALE: 1'=60'	DRAWN BY: WHW / CHECKED BY: JKB

203063-820-07

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊡	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
NA	NOT ANALYZED
ND	NOT DETECTED
NS	NOT SAMPLED

ESTIMATED AREAL EXTENT OF METHYL-TERT-BUTYL ETHER CONCENTRATIONS IN EXCESS OF 200 ug/L FROM THE 1996 CAP

MW-19 / MW-18 / MW-18DUP

#	4/03	4/13/94	4/13/94
1	NS	ND	ND

MW-16 / MW-17

#	4/18/03	4/13/94
1	<1.0	ND

MW-20 / MW-21

#	4/03	4/13/94
1	NS	ND

MW-10

#	4/14/03	12/22/92
1	6.9	ND

MW-5

#	4/08/03	12/22/92
1	<1.0	ND

MW-4

#	4/14/03	8/21/91
1	<1.0	NA

#	4/03	8/21/91
1	NS	NA

MW-12

#	4/09/03	4/13/94
1	<1.0	NA

MW-3

MW-15

#	4/08/03	4/13/94
1	<1.0	ND

MW-27

#	4/09/03
1	139

MW-22 / MW-23

#	4/03	4/93
1	NS	ND

MW-6

#	4/03	12/22/92
1	NS	1,800

PW-1

#	4/03	12/22/92
1	NS	7,900

MW-9D / MW-2 / MW-9

MW-11

#	4/18/03	12/22/92
1	89.7	107

MW-13

#	4/08/03	4/14/94
1	4.4	NA

#	4/18/03	8/21/91
1	<5.0	NA

MW-26

#	4/18/03	4/21/94
1	0.54*	ND

MW-8 / MW-7

#	4/18/03	12/22/92
1	2.7	ND

#	4/03	4/93
1	NS	ND

MW-24 / MW-25

MW-14

#	4/18/03	4/14/94
1	<1.0	NA

PARKING AREA (PAVED)
WOODS
TRAIL
CONCRETE
DUMPSTER
SHRUBBERY
COMPACTOR
BUILDING 820
CONCRETE SIDEWALK
ATM
EQUIPMENT COMPOUND
FENCE
UST BASIN
GRASS
CONCRETE
PUMP ISLAND
PAVEMENT
PUMP ISLAND CANOPY
TELEPHONE CABINET
SIDEWALK
STONE STREET (PAVED)
18" RCP
15" RCP
RCP
PT-1 #120 NAIL
CONCRETE SIDEWALK
PLAYGROUND
BASKETBALL COURT
BUILDING 1985
SHED

NOTES:
1. FIELD 1 REPRESENTS AS/SVE WELLS 1-11.
2. FIELD 2 REPRESENTS AS/SVE WELLS 12-20 AND 27-29.
3. FIELD 3 REPRESENTS AS/SVE WELLS 21-26 AND 30-35.
4. FIELD 4 REPRESENTS AS/SVE WELLS 36-48.

KEY

#	DATE	2L GWQS
1	METHYL-TERT-BUTYL ETHER	200

* ESTIMATED

60 30 0 60

SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1991, 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS PROVIDED BY SHAW ENVIRONMENTAL, INC.
6. MTBE CONCENTRATIONS IN MONITORING WELLS MW-22 AND MW-24, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS.
7. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

JOB NO. 203063-820 | DATE: JAN 2004

TITLE: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- MTBE AS OF APRIL 2003 SHALLOW CONDITIONS

SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

FIGURE 8

203063-820-08

LEGEND

EXISTING	DESCRIPTION
	BUILDING
⊕	TYPE II WELL
⊕	TYPE III WELL
⊠	PUMPING WELL
△	ATEC MONITORING WELL (TYPE UNKNOWN)
---F---	FUEL LINE
ND	NOT DETECTED
NS	NOT SAMPLED

#	4/14/03	4/13/94
1	4.4	ND

MW-19
MW-18

#	4/18/03	4/13/94
1	148	37

MW-16
MW-17

#	4/14/03	4/13/94
1	<1.0	ND

MW-20
MW-21

MW-10

#	4/14/03	4/92
1	<1.0	NS

MW-12

#	4/03	4/94
1	NS	ND

MW-22
MW-23

#	4/03	4/94
1	NS	ND

MW-24
MW-25

#	4/16/03	12/22/92
1	4,530	120

MW-13

#	4/18/03	12/22/92
1	2.9	500

MW-8
MW-7

ESTIMATED AREAL EXTENT OF MTBE CONCENTRATIONS IN EXCESS OF 200 mg/L IN DEPTH OF 50 FEET AS OF APRIL 2003

ESTIMATED AREAL EXTENT OF METHYL-TERT-BUTYL ETHER CONCENTRATIONS IN EXCESS OF 200 ug/L FROM THE 1996 CAP

PARKING AREA (PAVED)
SHRUBBERY
CONCRETE
DUMPSTER
CONCRETE
COMPACTOR
BUILDING 820
CONCRETE SIDEWALK
ATM
PARKING AREA (PAVED)
MW-5
EQUIPMENT COMPOUND
FENCE
MW-4
GRASS
MW-3
UST BASIN
FENCE
CONCRETE
MW-9D
MW-2
MW-9
PW-1
PAVEMENT
MW-11
CONCRETE
PUMP ISLAND
MW-27
PUMP ISLAND
CANOPY
PAVEMENT
MW-15
WOODS
SIDEWALK
FENCE
TELEPHONE CABINET
SIGN
18" RCP
PT-1
#120 NAIL
18" RCP
WOODS
MW-6
STONE STREET (PAVED)
18" RCP
RCP
15" RCP
15" RCP
CONCRETE SIDEWALK
MW-26
15" RCP
FENCE
PARKING AREA (PAVED)
WOODS
MW-14
PLAYGROUND
BASKETBALL COURT
BUILDING 1985
SHED

KEY

#	DATE	2L GWQS
1	METHYL-TERT-BUTYL ETHER	200

* ESTIMATED

60 30 0 60
SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS PROVIDED BY SHAW ENVIRONMENTAL, INC.
6. MTBE CONCENTRATIONS IN MONITORING WELLS MW-23 AND MW-25, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS.
7. SHADED AREAS REPRESENT LABORATORY RESULTS IN EXCESS OF NCAC 15A:02L STANDARDS.
8. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

NOTES:
1. FIELD 1 REPRESENTS AS/SVE WELLS 1-11
2. FIELD 2 REPRESENTS AS/SVE WELLS 12-20 AND 27-29
3. FIELD 3 REPRESENTS AS/SVE WELLS 21-26 AND 30-35
4. FIELD 4 REPRESENTS AS/SVE WELLS 36-48

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

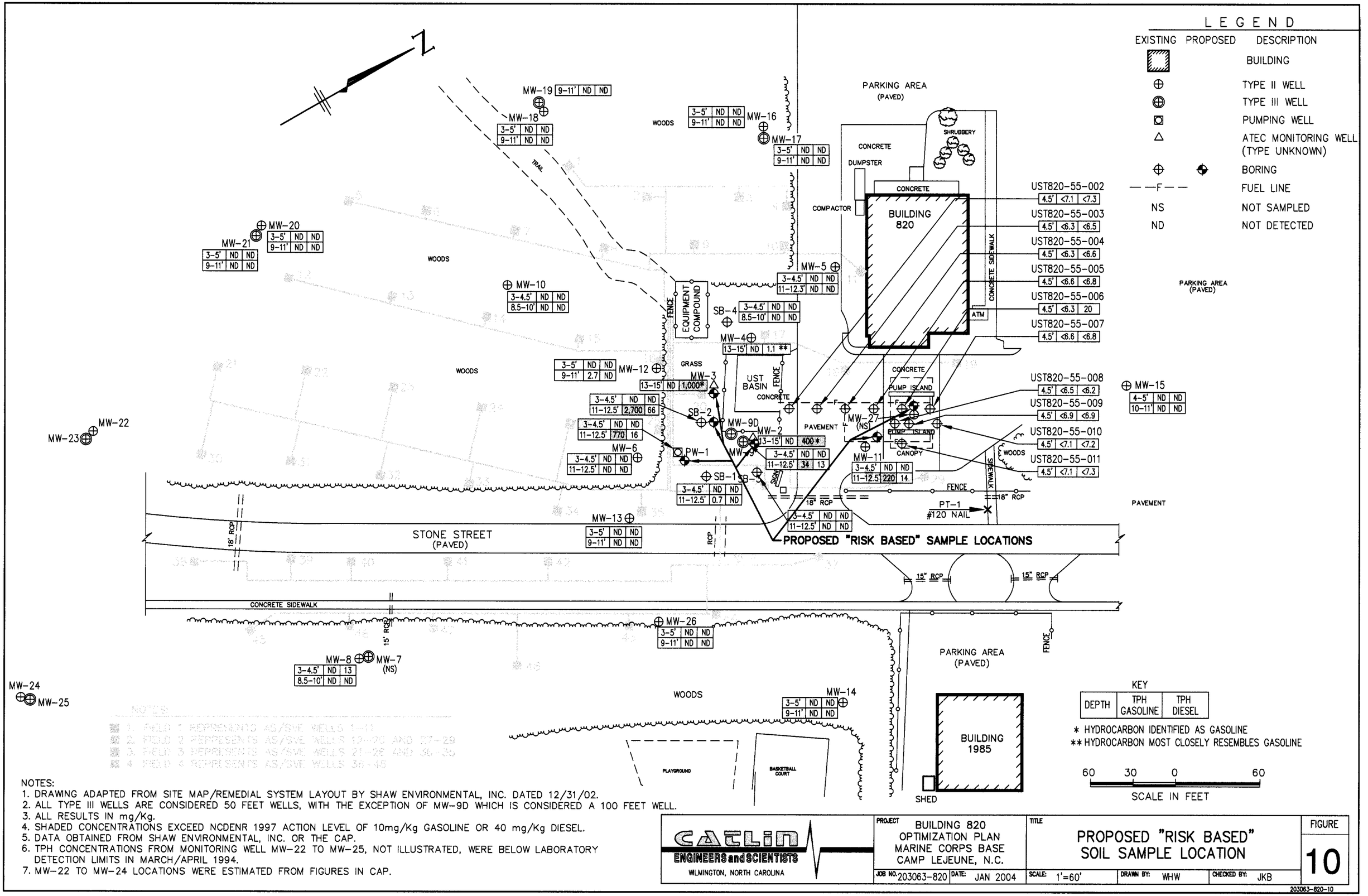
PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.
JOB NO. 203063-820 DATE: JAN 2004

TITLE: LABORATORY ANALYTICAL RESULTS -GROUNDWATER- MTBE AS OF APRIL 2003 DEEP CONDITIONS

SCALE: 1'=60' DRAWN BY: WHW CHECKED BY: JKB

FIGURE 9

203063-820-09



NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. SHADED CONCENTRATIONS EXCEED NCDENR 1997 ACTION LEVEL OF 10mg/Kg GASOLINE OR 40 mg/Kg DIESEL.
5. DATA OBTAINED FROM SHAW ENVIRONMENTAL, INC. OR THE CAP.
6. TPH CONCENTRATIONS FROM MONITORING WELL MW-22 TO MW-25, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS IN MARCH/APRIL 1994.
7. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: BUILDING 820 OPTIMIZATION PLAN MARINE CORPS BASE CAMP LEJEUNE, N.C.

TITLE: PROPOSED "RISK BASED" SOIL SAMPLE LOCATION

FIGURE 10

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1'=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-10

ESTIMATED AREAL EXTENT OF ANY INDIVIDUAL BTEX CONSTITUENT IN EXCESS OF NCAC 15A:02L STANDARDS

#	4/14/03	4/13/94
1	0.87*	ND
2	<1.0	0.5
3	<1.0	ND
4	<3.0	ND

MW-19
MW-18

#	4/18/03	4/13/94
1	45.8	0.7
2	<1.0	ND
3	<1.0	ND
4	1.9*	ND

MW-16
MW-17

#	4/14/03	4/13/94
1	<1.0	0.5
2	<1.0	ND
3	ND	ND
4	ND	ND

MW-21
MW-20

#	4/14/03	4/92
1	<1.0	NS
2	<1.0	NS
3	<1.0	NS
4	<3.0	NS

MW-12

#	4/16/03	12/22/92
1	2,340	2,000
2	466	190
3	241	12
4	556	820

MW-13

#	4/18/03	12/22/92
1	<1.0	375
2	<1.0	6.2
3	<1.0	ND
4	<3.0	33

MW-8
MW-7

50 FEET DEEP PLUME DELINEATION WELL

50 FEET DEEP PLUME DELINEATION WELL

PARKING AREA (PAVED)
CONCRETE
SHRUBBERY
DUMPSTER
CONCRETE
COMPACTOR
BUILDING 820
CONCRETE SIDEWALK
ATM
PARKING AREA (PAVED)
MW-5
EQUIPMENT COMPOUND
FENCE
MW-4
GRASS
MW-3
UST BASIN
FENCE
CONCRETE
MW-9D
MW-2
MW-9
PW-1
PAVEMENT
MW-11
CONCRETE
PUMP ISLAND
MW-27
PUMP ISLAND
CANOPY
PAVEMENT
MW-15
SIDEWALK
WOODS
TELEPHONE CABINET
SIGN
FENCE
18" RCP
18" RCP
PT-1
#120 NAIL
15" RCP
15" RCP
STONE STREET (PAVED)
18' RCP
RCP
CONCRETE SIDEWALK
15' RCP
MW-26
FENCE
PARKING AREA (PAVED)
BUILDING 1985
SHED
MW-14
WOODS
PLAYGROUND
BASKETBALL COURT
MW-23
MW-25
MW-6
MW-10
WOODS
WOODS
TRAIL

LEGEND

EXISTING	PROPOSED	DESCRIPTION
▨		BUILDING
⊕		TYPE II WELL
⊕	●	TYPE III WELL
⊠		PUMPING WELL
△		ATEC MONITORING WELL (TYPE UNKNOWN)
--F--		FUEL LINE
ND		NOT DETECTED
NS		NOT SAMPLED

KEY

#	DATE	2L GWQS
1	BENZENE	1
2	TOLUENE	1,000
3	ETHYLBENZENE	29
4	TOTAL XYLENES	530

* ESTIMATED

60 30 0 60
SCALE IN FEET

NOTES:
1. DRAWING ADAPTED FROM SITE MAP/REMEDIAL SYSTEM LAYOUT BY SHAW ENVIRONMENTAL, INC. DATED 12/31/02.
2. ALL TYPE III WELLS ARE CONSIDERED 50 FEET WELLS, WITH THE EXCEPTION OF MW-9D WHICH IS CONSIDERED A 100 FEET WELL.
3. ALL RESULTS IN mg/Kg.
4. 1992 AND 1994 DATA WAS OBTAINED FROM THE 1996 CAP BY LAW.
5. 2003 DATA WAS OBTAINED FROM SHAW ENVIRONMENTAL, INC.
6. BTEX CONCENTRATIONS FROM MONITORING WELLS MW-23 AND MW-25, NOT ILLUSTRATED, WERE BELOW LABORATORY DETECTION LIMITS IN APRIL 1994.
7. SHADED CONCENTRATIONS REPRESENT LABORATORY RESULTS IN EXCESS OF NCAC 15A:02L STANDARD.
8. MW-22 TO MW-24 LOCATIONS WERE ESTIMATED FROM FIGURES IN CAP.

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

BUILDING 820 OPTIMIZATION PLAN
MARINE CORPS BASE
CAMP LEJEUNE, N.C.

PROJECT
PROPOSED 50 FEET DEEP PLUME DELINEATION WELLS

FIGURE 11

JOB NO. 203063-820 | DATE: JAN 2004 | SCALE: 1"=60' | DRAWN BY: WHW | CHECKED BY: JKB

203063-820-11

APPENDIX A

TARGET CLEANUP CONCENTRATIONS FROM CAP

free product will reduce the secondary source and assist in controlling the migration of free product.

(ii) Vadose Zone Soil Contamination:

Reduce TPH in soil to 10 ppm and 40 ppm as quantified by EPA Methods 5030 and 3550, respectively.

c. Dissolved-Phase Groundwater Contamination:

Restore groundwater adversely impacted by petroleum fuel releases to a quality consistent with North Carolina Groundwater Quality Standards outlined in NCAC, Title 15A, Subchapter 2L or to variances established by NCDEHNR.

d. Receptor Protection:

Conduct groundwater monitoring activities to document contaminant concentrations and minimize the potential for exposure to receptors.

e. Target Cleanup Concentrations:

MEDIUM	COMPONENT	EXISTING CONDITIONS	TARGET CLEANUP
Free Product	Gasoline/Diesel	Free product thickness up to .15' in pumping well PW-1	≤1/8"
Vadose Zone Soil	TPH 3550/5030	TPH soil contamination was measured in November 1992 at levels that range from <1 mg/kg to 2700 mg/kg.	≤40 mg/kg ≤10 mg/kg
Groundwater	Benzene Ethylbenzene Chloroform Chrysene Dibromochloromethane Chloromethane 1,2 Dichloroethane Toluene Xylenes (Total) MTBE	36,000 ug/l 4000 ug/l 39 ug/l 2.0 ug/l .5 ug/l 1.9 ug/l 1.1 ug/l 28100 ug/l 17000 ug/l 44,000 ug/l	1 ug/l 29 ug/l .19 ug/l ** ** ** .38ug/L 1000ug/L 530ug/L 210ug/L

** Numerical standard has not been established

APPENDIX B

SUMMARY OF HISTORICAL SOIL LABORATORY RESULTS

Camp Lejeune, NC

Results For Soil Samples Of Piping BM 820

Project 780790

Sample Number		UST820-SS-002	UST820-SS-003	UST820-SS-004	UST820-SS-005	UST820-SS-006	UST820-SS-007	UST820-SS-008
Sample Date		8/1/01	8/1/01	8/1/01	8/1/01	8/1/01	8/1/01	8/1/01
Lab Lot #		G-468-6	G-468-6	G-468-6	G-468-6	G-468-6	G-468-6	G-468-6
Location		UST830-SB2	UST830-SB3	UST830-SB4	UST830-SB5	UST830-SB6	UST830-SB7	UST830-SB8
Depth		4.5'	4.5'	4.5'	4.5'	4.5'	4.5'	4.5'
Parameter								
DRO	mg/kg	<7.3	<6.5	<6.6	<6.8	20	<6.6	<6.2
GRO	mg/kg	<7.1	<6.3	<6.3	<6.6	<6.3	<6.8	<6.5
MEDEP VPH								
C5 - C8	mg/kg	NA	< 10 (mg/kg)	NA	NA	NA	NA	NA
C9 - C12	mg/kg	NA	< 10 (mg/kg)	NA	NA	NA	NA	NA
C9 - C10	mg/kg	NA	< 10 (mg/kg)	NA	NA	NA	NA	NA

Sample Number		UST820-SS-009	UST820-SS-010	UST820-SS-011	UST820-SS-012	UST820-SS-013	UST820-SS-014
Sample Date		8/1/01	8/1/01	8/1/01	8/1/01	8/1/01	8/1/01
Lab Lot #		G-468-6	G-468-6	G-468-6	G-468-6	G-468-6	G-468-6
Location		UST830-SB9	UST830-SB10	UST830-SB11	UST830-SB11Dup	Equip. Blank	Trip Blank
Depth		4.5'	4.5'	4.5'	4.5'		
Parameter							
DRO	mg/kg	<6.9	<7.2	<6.4	<6.7	<0.5 (mg/l)	NA
GRO	mg/kg	<6.9	<7.1	<6.6	<6.6	<0.5 (mg/l)	<0.5 (mg/l)
MEDEP VPH							
C5 - C8	mg/kg	NA	NA	NA	NA	NA	NA
C9 - C12	mg/kg	NA	NA	NA	NA	NA	NA
C9 - C10	mg/kg	NA	NA	NA	NA	NA	NA

TABLE 4.2
SUMMARY OF LABORATORY TEST RESULTS
OF SOIL SAMPLES

REPORT OF LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT
BERKLEY MANOR EXCHANGE SERVICE STATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-08137-01

SAMPLE LOCATION	SAMPLE ID	SAMPLE DEPTH (FT.)	LABORATORY RESULTS					
			TPH-GASOLINE (mg/Kg)	TPH-DIESEL (mg/Kg)	TOTAL LEAD (mg/Kg)	IGNITABILITY (DEGREES F)	TCLP LEAD (ug/L)	pH
MW-5	S-1	3.0 - 4.5	ND	ND	—	—	—	—
MW-5	S-2	11.0 - 12.5	ND	ND	—	>200	ND	7.5
MW-6	S-3	3.0 - 4.5	ND	ND	—	—	—	—
MW-6	S-4	11.0 - 12.5	ND	ND	6.6	>200	—	4.8
MW-8	S-5	3.0 - 4.5	ND	13.0	—	---	—	—
MW-8	S-6	8.5 - 10.0	ND	ND	—	---	—	—
MW-9	S-7	3.0 - 4.5	ND	ND	—	---	—	—
MW-9	S-8	11.0 - 12.5	34.0	13.0	—	>200	29.0	4.8
MW-10	S-11	3.0 - 4.5	ND	ND	—	—	—	—
MW-10	S-12	8.5 - 10.0	ND	ND	9.5	—	—	—
MW-11	S-13	3.0 - 4.5	ND	ND	—	—	—	—
MW-11	S-14	11.0 - 12.5	220.0	14.0	—	—	—	—
PW-1	S-9	3.0 - 4.5	ND	ND	—	---	—	—
PW-1	S-10	11.0 - 12.5	770.0	16.0	—	---	—	—
SB-1	S-15	3.0 - 4.5	ND	ND	—	—	—	—
SB-1	S-16	11.0 - 12.5	0.7	ND	ND	>200	—	4.8
SB-2	S-17	3.0 - 4.5	ND	ND	—	—	—	—
SB-2	S-18	11.0 - 12.5	2700	66.0	4.2	>200	41.0	5.0
SB-3	S-19	3.0 - 4.5	ND	ND	—	—	—	—
SB-3	S-20	11.0 - 12.5	ND	ND	ND	---	—	—
SB-4	S-21	3.0 - 4.5	ND	ND	—	---	—	—
SB-4	S-22	8.5 - 10.0	ND	ND	7.7	>200	—	5.1

ND = NOT DETECTED; SEE LABORATORY REPORTS FOR APPLICABLE DETECTION LIMIT
--- = NOT ANALYZED

TABLE 4.2A
SUMMARY OF LABORATORY TESTING OF SOIL SAMPLES
SOIL SAMPLES COLLECTED AND TESTED BY ATEC ASSOCIATES, INC.
ATEC PROJECT NO. 26-17479

REPORT OF LEAKING UNDERGROUND STORAGE TANK
SITE ASSESSMENT
BERKLEY MANOR EXCHANGE SERVICE STATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-08137-01

SAMPLE LOCATION (1)	SAMPLE DEPTH (FT.)	LABORATORY RESULTS TPH-DIESEL (mg/Kg)
MW2	13 - 15	400 (2)
MW3	13 - 15	1000 (2)
MW4	13- 15	1.1 (3)

Notes:
(1) Sample not collected for testing at MW1
(2) Hydrocarbon identified as gasoline
(3) Hydrocarbon most closely resembles gasoline

TABLE 2.4 (Page 1 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
SOIL SAMPLES
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

SAMPLE LOCATION		LABORATORY RESULTS			
		TPH-GASOLINE (mg/Kg)	TPH-DIESEL (mg/Kg)	FLASH POINT (DEGREES F)	pH
MW-12	3.0'-5.0'	ND	ND	--	--
MW-12	9.0'-11.0'	2.7	ND	--	--
MW-13	3.0'-5.0'	ND	ND	--	--
MW-13	9.0'-11.0'	ND	ND	NF	4.45
MW-13	13.0'-15.0'	--	--	NF	4.50
MW-14	3.0'-5.0'	ND	ND	--	--
MW-14	9.0'-11.0'	ND	ND	--	--
MW-15	4.0'-5.0'	ND	ND	--	--
MW-15	10.0'-11.0'	ND	ND	--	--
MW-16	3.0'-5.0'	ND	ND	--	--
MW-16	9.0'-11.0'	ND	ND	NF	4.56
MW-16	13.0'-15.0'	--	--	NF	4.10
MW-17	3.0'-5.0'	ND	ND	--	--
MW-17	9.0'-11.0'	ND	ND	--	--
MW-18	3.0'-5.0'	ND	ND	--	--
MW-18	9.0'-11.0'	ND	ND	--	--
MW-18	13.0'-15.0'	--	--	NF	3.88

ND Not detected; see laboratory reports for applicable detection limit
NF No Flash
-- Not analyzed
* Split Sample; sample analyzed at on-site and off-site laboratory
** Duplicate Sample
Shaded Area = Concentrations detected above NC soil remediation guidelines

NC Action Level for:
Low Boiling Point Hydrocarbons (Gasoline) = 10 mg/Kg
Medium Boiling Point Hydrocarbons (Diesel) = 40 mg/Kg
High Boiling Point Hydrocarbons (Oil & Grease) = 250 mg/Kg

TABLE 2.4 (Page 2 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
SOIL SAMPLES
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

SAMPLE LOCATION		LABORATORY RESULTS					
		TPH-GASOLINE (mg/Kg)		TPH-DIESEL (mg/Kg)		FLASH POINT (DEGREES F)	pH
MW-19*	9.0'-11.0'	ND	ND	ND	ND	--	--
MW-19**	9.0'-11.0'	ND		ND		--	--
MW-20	3.0'-5.0'	ND		ND		--	--
MW-20	9.0'-11.0'	ND		ND		--	--
MW-20	13.0'-15.0'	--		--		NF	5.03
MW-21	3.0'-5.0'	ND		ND		--	--
MW-21	9.0'-11.0'	ND		ND		--	--
MW-22	3.0'-5.0'	ND		ND		--	--
MW-22	9.0'-11.0'	ND		ND		--	--
MW-22	13.0'-15.0'	--		--		NF	4.92
MW-23	3.0'-5.0'	ND		ND		--	--
MW-23	9.0'-11.0'	ND		ND		--	--
MW-24	3.0'-5.0'	ND		ND		--	--
MW-24	9.0'-11.0'	ND		ND		--	--
MW-24	13.0'-15.0'	--		--		NF	4.74
MW-25	3.0'-5.0'	ND		ND		--	--
UMW-25	9.0'-11.0'	ND		ND		--	--

ND Not detected; see laboratory reports for applicable detection limit
NF No Flash
-- Not analyzed
* Split Sample; sample analyzed at on-site and off-site laboratory
** Duplicate Sample
Shaded Area = Concentrations detected above NC soil remediation guidelines

NC Action Level for:
Low Boiling Point Hydrocarbons (Gasoline) = 10 mg/Kg
Medium Boiling Point Hydrocarbons (Diesel) = 40 mg/Kg
High Boiling Point Hydrocarbons (Oil & Grease) = 250 mg/Kg

TABLE 2.4 (Page 3 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
SOIL SAMPLES
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

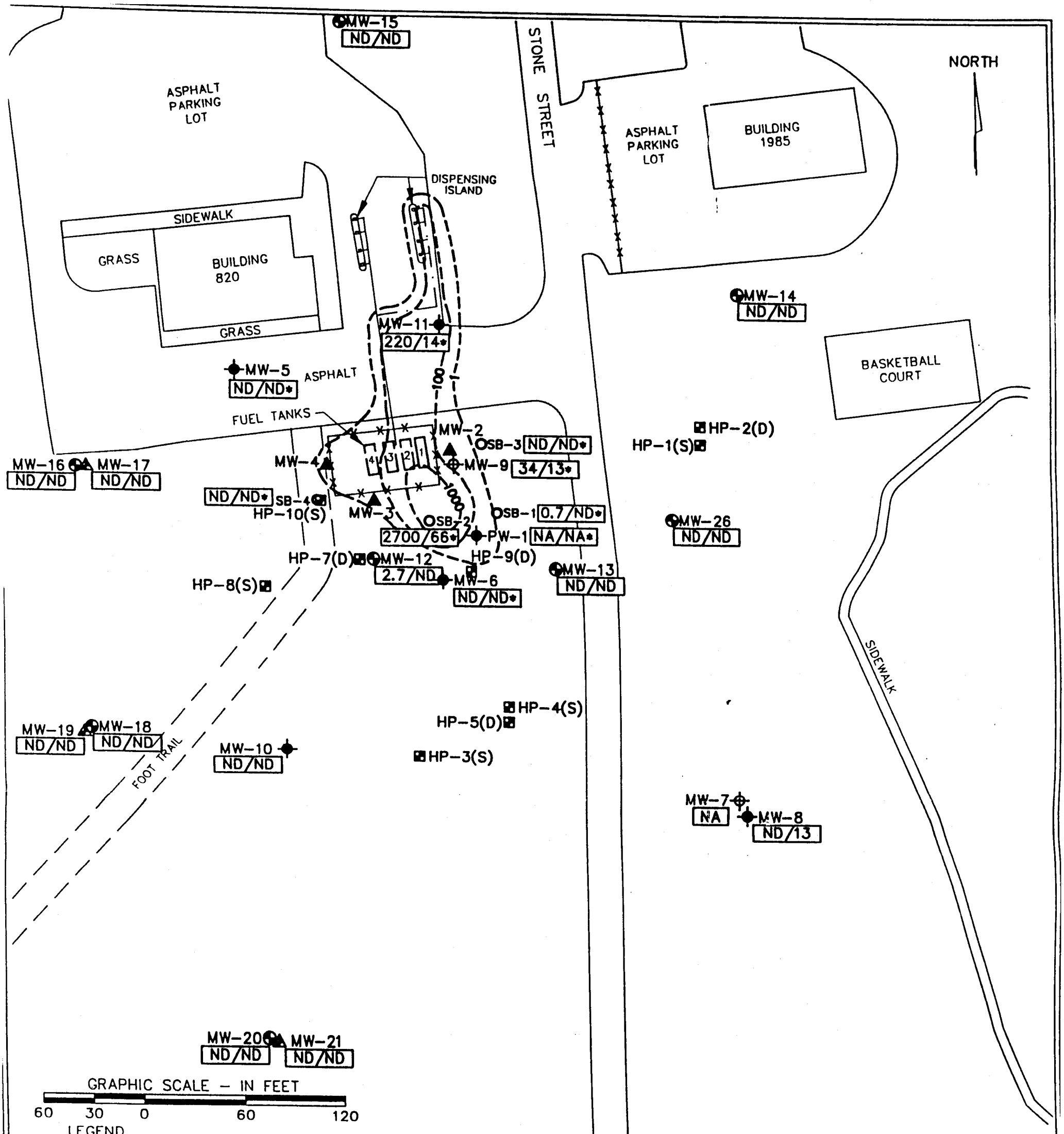
SAMPLE LOCATION		LABORATORY RESULTS			
		TPH-GASOLINE (mg/Kg)	TPH-DIESEL (mg/Kg)	FLASH POINT (DEGREES F)	pH
MW-26	3.0'-5.0'	ND	ND	--	--
MW-26**	3.0'-5.0'	ND	ND	--	--
MW-26	9.0'-11.0'	ND	ND	NF	4.65
MW-26	13.0'-15.0'	--	--	NF	5.00

ND Not detected; see laboratory reports for applicable detection limit
NF No Flash
-- Not analyzed
* Split Sample; sample analyzed at on-site and off-site laboratory
** Duplicate Sample
Shaded Area = Concentrations detected above NC soil remediation guidelines

NC Action Level for:
Low Boiling Point Hydrocarbons (Gasoline) = 10 mg/Kg
Medium Boiling Point Hydrocarbons (Diesel) = 40 mg/Kg
High Boiling Point Hydrocarbons (Oil & Grease) = 250 mg/Kg

APPENDIX C

SELECTED FIGURES FROM CAP



NOTES:

1. VERTICAL DATUM IS BASED ON EXISTING MILITARY GRID MONUMENT "D-4" WITH AN GIVEN ELEVATION OF 30.72 FEET.
2. ALL ELEVATIONS ON MONITORING WELLS WERE TAKEN AT THE TOP OF THE PVC CASING.
3. HORIZONTAL DATUM BASED ON NCGS MONUMENTS "D-4" AND "D-5".
4. ALL LOCATIONS OF BUILDING, STREETS, AND PARKING AREA WERE TAKEN FROM A CAMP LEJEUNE BASE MAP AUTOCAD.DWG FILE SUPPLIED BY LAW ENGINEERING UNLESS OTHERWISE NOTED.
5. THE MONITORING WELLS, HYDROPUNCHES AND THE CORNERS OF BUILDING 820 WERE THE ONLY POINTS LOCATED IN THE FIELD BY THIS SURVEY. ALL OTHER LOCATIONS WERE TAKEN FROM THE ABOVE REFERENCED FILE, AND MAY OR MAY NOT BE SHOWN CORRECTLY.
6. HYDROPUNCH SURVEY LOCATION MARKERS FOR HP-13 THROUGH HP-15, HP-19 THROUGH HP-27, HP-29, HP-31, HP-34, HP-35 AND HP-37 WERE REMOVED BY AREA RESIDENTS PRIOR TO THE SURVEY. THESE HYDROPUNCH LOCATIONS ARE APPROXIMATE.

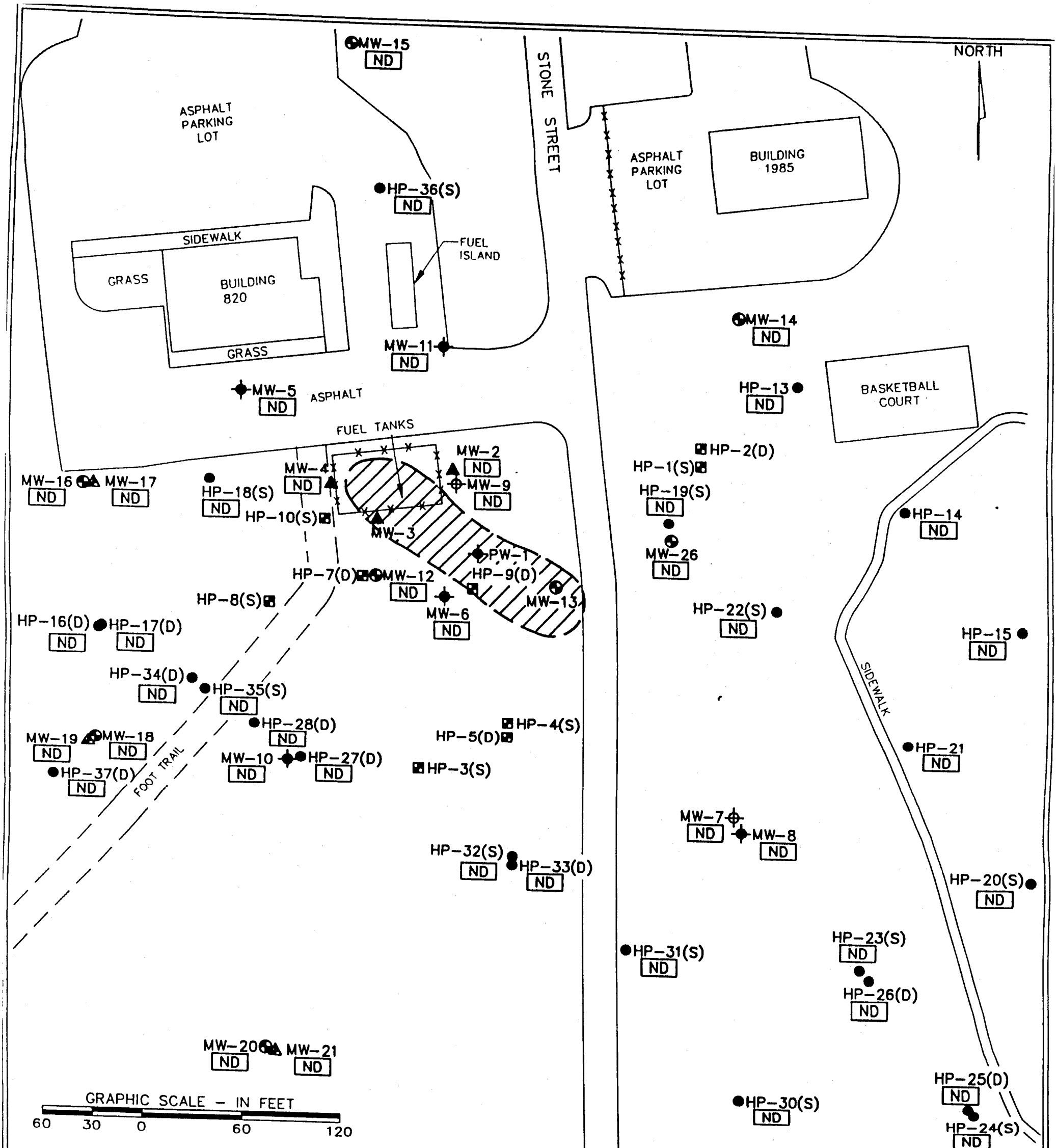
J9180R03

TPH CONCENTRATIONS IN SOIL
BERKELEY MANOR UST 820
CAMP LEJEUNE, NORTH CAROLINA

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

DRAWN:	ENG CHECK: J.T	DATE: JULY 1995	JOB: 475-09180-01
DFT CHECK:	APPROVAL: BJB	SCALE: 1"=60'	DWG: 2.2

REFERENCE: MCKIM AND CREED DRAWING # S.1.1.2.041; NAVY DRAWING # D7



LEGEND

- MW-22 TYPE II MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- MW-23 TYPE III MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- HP-22 HYDROPUNCH LOCATION (CURRENT INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- HP-10 HYDROPUNCH LOCATION (PREVIOUS LAW INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- MW-10 EXISTING TYPE II MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-9 EXISTING TYPE III MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-3 EXISTING ATEC MONITORING WELL
- CHAIN-LINK FENCE
- ND NO FREE PRODUCT DETECTED
- APPROXIMATE EXTENT OF FREE PRODUCT

NOTE:
WELLS PW-1 AND MW-3 CONTAIN PASSIVE FREE PRODUCT RECOVERY BAILERS.

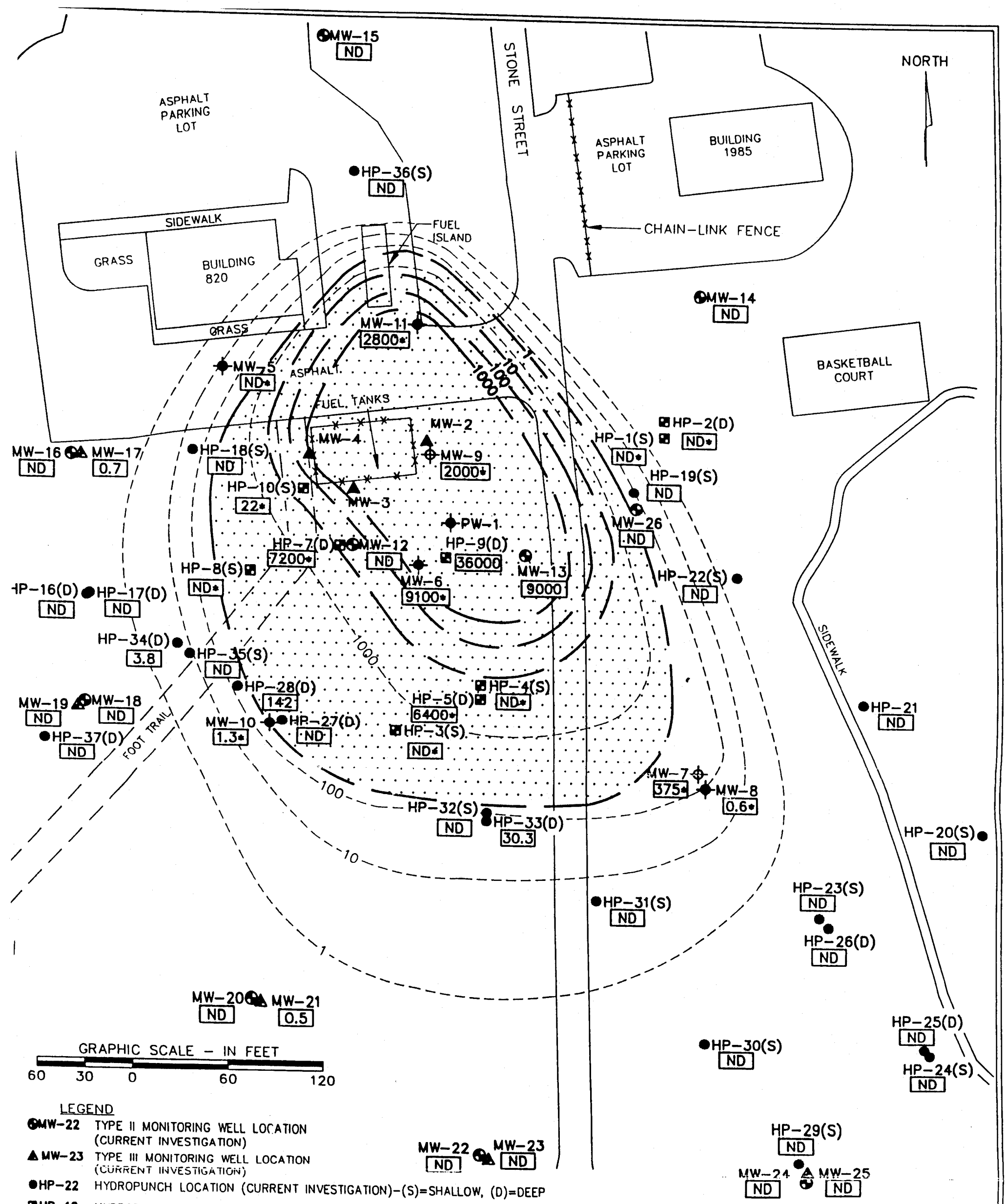
J9180R02

FREE PRODUCT SPATIAL EXTENT
BERKELEY MANOR UST 820
CAMP LEJEUNE, NORTH CAROLINA

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

DRAWN:	ENG CHECK: J.T	DATE: JULY 1995	JOB: 475-09180-01
DFT CHECK:	APPROVAL:	SCALE: 1"=60'	DWG: 2.4

REFERENCE: MCKIM AND CREED DRAWING



LEGEND

- MW-22 TYPE II MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- MW-23 TYPE III MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- HP-22 HYDROPUNCH LOCATION (CURRENT INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- HP-10 HYDROPUNCH LOCATION (PREVIOUS LAW INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- MW-10 EXISTING TYPE II MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-9 EXISTING TYPE III MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-3 EXISTING ATEC MONITORING WELL

APPROXIMATE EXTENT OF BENZENE (ug/L) IN SHALLOW GROUNDWATER

— — — BENZENE CONCENTRATION (ug/L) ISOPLETH IN DEEPER GROUNDWATER

LEGEND (CONT'D)

- 1.0 CONCENTRATION OF BENZENE ug/L
- ND NOT DETECTED
- * RESULTS OF PREVIOUS INVESTIGATION (4/93)

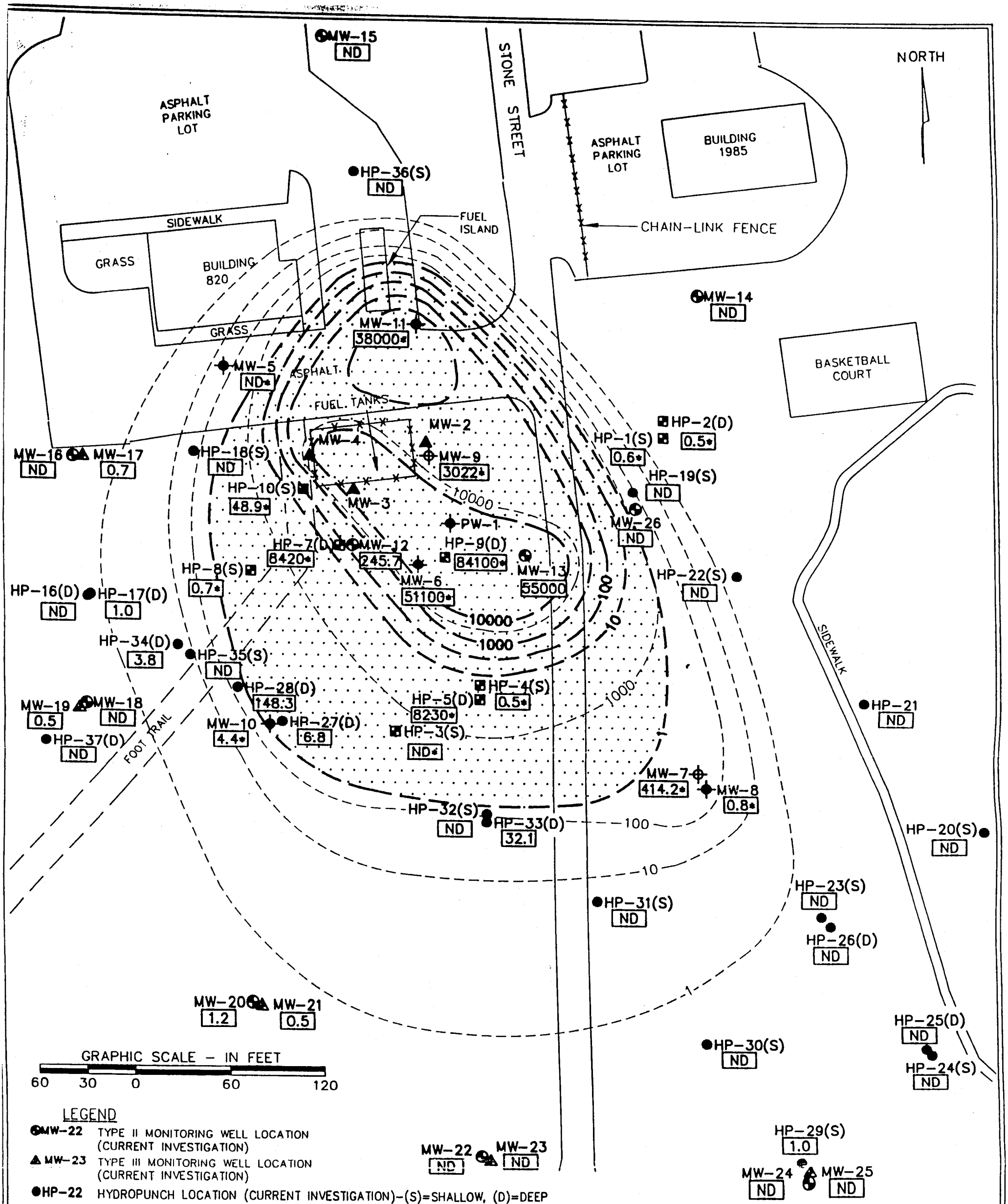
J9180R04

BENZENE CONCENTRATION ISOPLETH MAP - GROUNDWATER
BERKELEY MANOR UST 820
CAMP LEJEUNE, NORTH CAROLINA

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

DRAWN:	ENG CHECK: J.T	DATE:	JULY 1995	JOB:	475-09180-01
DFT CHECK:	APPROVAL: BJB	SCALE:	1"=60'	DWG:	2.5

REFERENCE: MCKIM AND CREED DRAWING # S.1.1.2.041; NAVY DRAWING # D7



LEGEND

- MW-22 TYPE II MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- MW-23 TYPE III MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- HP-22 HYDROPUNCH LOCATION (CURRENT INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- HP-10 HYDROPUNCH LOCATION (PREVIOUS LAW INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- MW-10 EXISTING TYPE II MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-9 EXISTING TYPE III MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-3 EXISTING ATEC MONITORING WELL
- APPROXIMATE EXTENT OF BTEX (ug/L) IN SHALLOW GROUNDWATER
- BTEX CONCENTRATION (ug/L) ISOPLETH IN DEEPER GROUNDWATER

LEGEND (CONT'D)

- 1.0 CONCENTRATION OF BTEX (ug/L)
- ND NOT DETECTED
- * RESULTS OF PREVIOUS INVESTIGATION (4/93)

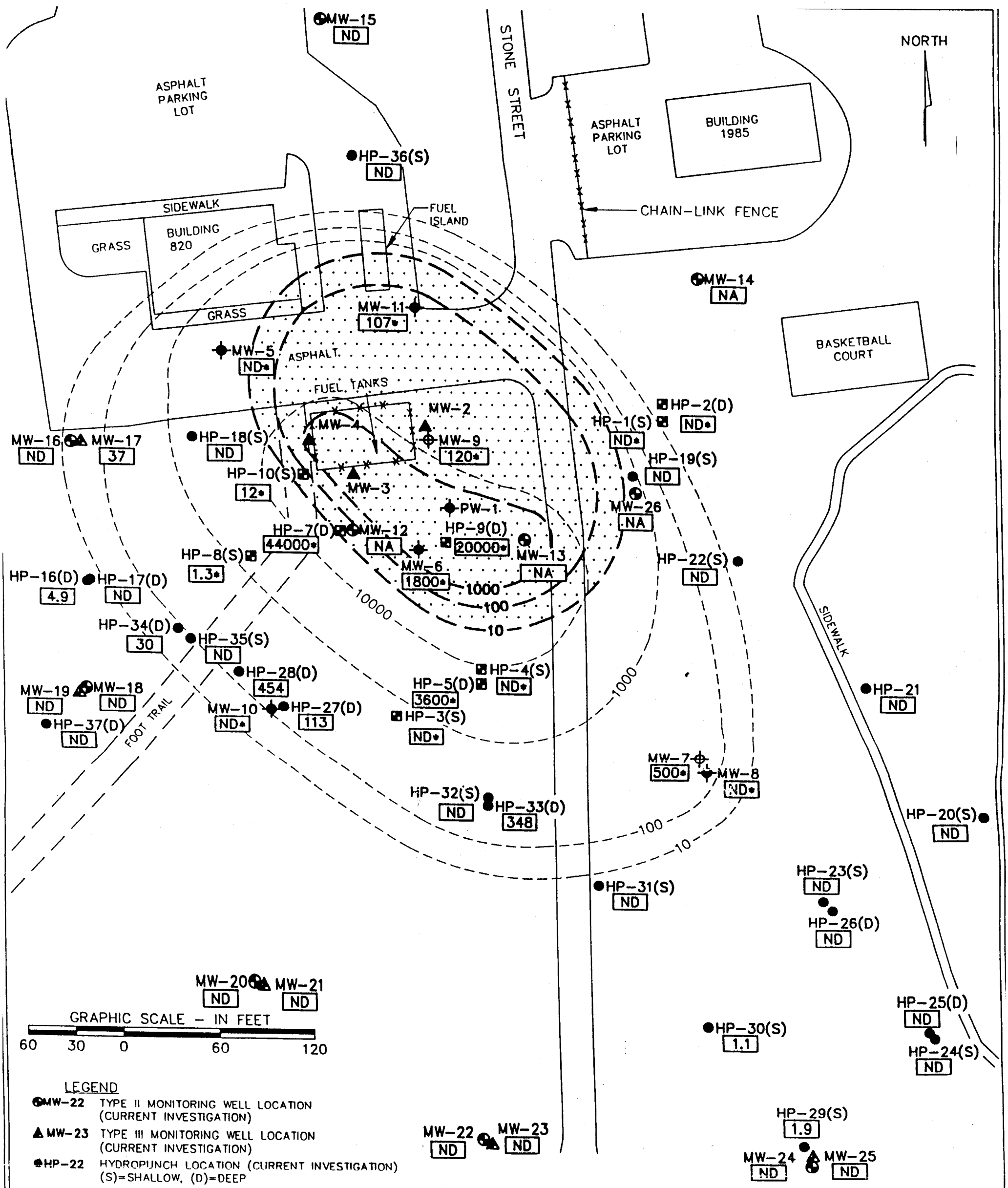
J9180R09

BTEX CONCENTRATION ISOPLETH MAP - GROUNDWATER
BERKELEY MANOR UST 820
CAMP LEJEUNE, NORTH CAROLINA

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

DRAWN:		ENG CHECK: J.T	DATE:	JULY 1995	JOB: 475-09180-01
DFT CHECK:		APPROVAL: B/B	SCALE:	1"=60'	DWG: 2.9

REFERENCE: MCKIM AND CREED DRAWING # S-1-1-2-041; NAVY DRAWING # D7



LEGEND

- MW-22 TYPE II MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- MW-23 TYPE III MONITORING WELL LOCATION (CURRENT INVESTIGATION)
- HP-22 HYDROPUNCH LOCATION (CURRENT INVESTIGATION) (S)=SHALLOW, (D)=DEEP
- HP-10 HYDROPUNCH LOCATION (PREVIOUS LAW INVESTIGATION)-(S)=SHALLOW, (D)=DEEP
- MW-10 EXISTING TYPE II MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-9 EXISTING TYPE III MONITORING WELL LOCATION (PREVIOUS LAW INVESTIGATION)
- MW-3 EXISTING ATEC MONITORING WELL
- APPROXIMATE EXTENT OF MTBE (ug/L) IN SHALLOW GROUNDWATER
- — — — MTBE CONCENTRATION (ug/L) ISOPLETH IN DEEPER GROUNDWATER

LEGEND (CONT'D)

- 1.0 CONCENTRATION OF MTBE ug/L
- ND NOT DETECTED
- NA NOT ANALYZED
- • RESULTS OF PREVIOUS INVESTIGATION (4/93)

J9180R05

MTBE CONCENTRATION ISOPLETH MAP - GROUNDWATER
BERKELEY MANOR UST 820
CAMP LEJEUNE, NORTH CAROLINA

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

DRAWN:	ENG CHECK: J.T	DATE: JULY 1995	JOB: 475-09180-01
DFT CHECK:	APPROVAL: BJB	SCALE: 1"=60'	DWG: 2.10

REFERENCE: MCKIM AND CREED DRAWING # S.1.1.2.041; NAVY DRAWING # D7

APPENDIX D

SUMMARY OF HISTORICAL GROUNDWATER LABORATORY RESULTS

CAP DATA

TABLE 4.3
SUMMARY OF LABORATORY TEST RESULTS
MONITORING WELL GROUND-WATER SAMPLES

REPORT OF LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT
BERKLEY MANOR EXCHANGE SERVICE STATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING J08 NO. 475-08137-01

PARAMETER (µg/L)	WELL NO.	NC GROUND-WATER STANDARD	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	PW-1	RINSE BLANK	TRIP BLANK
	DATE SAMPLED		12-22-92	12-22-92	12-22-92	12-22-92	12-22-92	12-22-92	12-22-92	12-22-92	12-22-92	12-22-92
	SCREENED INTERVAL (FT.)		10 - 25	11.5 - 26.5	45 - 50	6 - 21	45 - 50	11 - 26	10 - 25	12.5 - 32.5		
BENZENE		1	ND	9100.0	375.0	0.6	2000.0	1.3	2800.0	31,000.0	1.4	0.6
ETHYLBENZENE		29	ND	4000.0	ND	ND	12.0	ND	2200.0	7500.0	2.2	ND
TOLUENE		1000	ND	27,000.0	6.2	ND	190.0	1.7	21,000.0	80,000.0	15.0	2.8
TOTAL XYLENES		400	ND	11,000.0	33.0	ND	820.0	1.4	12,000.0	39,000.0	12.0	1.7
METHYL TERTIARY BUTYL ETHER		200	ND	1800	500.0	ND	120.0	ND	107.0	7900.0	ND	ND
LEAD		50	---	23.0	---	12.0	ND	26.0	---	---	---	---

NOTES:

ND = Not detected; see laboratory reports for applicable dectection limits.
--- = Sample not analyzed for this parameter.

TABLE 4.3A
SUMMARY OF LABORATORY TEST RESULTS
MONITORING WELL GROUND-WATER SAMPLES
COLLECTED AND TESTED BY ATEC ASSOCIATES, INC.
ATEC PROJECT NO. 26-17429

REPORT OF LEAKING UNDERGROUND STORAGE TANK
SITE ASSESSMENT
BERKLEY MANOR EXCHANGE SERVICE STATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-08137-01

PARAMETER (µg/L)	WELL NUMBER	N.C. GROUND-WATER STANDARD	MW-2	MW-3	MW-4
	DATE SAMPLED		8/21/91	8/21/91	8/21/91
	SCREENED INTERVAL (FT.)		5 - 20	5 - 20	5 - 20
BENZENE		1	31,000	16,000	6800
ETHYLBENZENE		29	2900	1900	1100
TOLUENE		1000	42,000	31,000	11,000
TOTAL XYLENES		400	15,000	9600	5100

TABLE 4.4
SUMMARY OF LABORATORY TEST RESULTS
HYDROPUNCH GROUND-WATER SAMPLES

REPORT OF LEAKING UNDERGROUND STORAGE TANK SITE ASSESSMENT
BERKLEY MANOR EXCHANGE SERVICE STATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-08137-01

PARAMETER (µg/L)	HYDROPUNCH NO.	NC GROUND-WATER STANDARD	HP-1	HP-2	HP-3	HP-4	HP-5	HP-6	HP-7	HP-8	HP-9	HP-10	HP RINSE BLANK
	DATE SAMPLED		12-03-92	12-3-92	12-3-92	12-3-92	12-3-92	12-7-92	12-7-92	12-7-92	12-8-92	12-8-92	12-8-92
	SAMPLE COLLECTION DEPTH (FT.)		11.0 - 15.0	34.5 - 36.0	15.0 - 18.0	15.0 - 18.0	32.0 - 35.0	13.0 - 18.0	39.0 - 40.0	15.0 - 18.0	33.0 - 35.0	15.0 - 19.0	
BENZENE		1	ND	ND	ND	ND	6400.0	390.0	7200.0	ND	36,000	22.0	3.2
ETHYLBENZENE		29	ND	ND	ND	ND	700.0	13.0	430.0	ND	3100	2.2	0.5
TOLUENE		1000	0.6	0.5	ND	0.5	240.0	81.0	430.0	0.7	28,000.0	8.7	1.3
TOTAL XYLENES		400	ND	ND	ND	ND	890.0	190.0	360.0	ND	17,000.0	16.0	ND
METHYL TERTIARY BUTYL ETHER		200	ND	ND	ND	ND	3600.0	4.8	44,000.0	1.3	20,000.0	12.0	1.7
LEAD		50	---	---	---	76.0	---	90.0	---	240.0	75.0	200.0	---
CHLOROMETHANE		*	---	---	---	---	---	ND	1.9	---	---	ND	ND
1,2-DICHLOROETHANE		0.38	---	---	---	---	---	ND	1.1	---	---	ND	ND

NOTES:

ND = Not detected; see laboratory reports for applicable detection limits.
--- = Sample not analyzed for this parameter.
* = NC Groundwater Standard = dectection limit

TABLE 2.1 (Page 1 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (HYDROPUNCH)
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

PARAMETER	HYDRO-PUNCH#	HP-16	HP-17	HP-18	HP-19	HP-20	HP-21	HP-22	HP-23	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL (FT.)	47.0'-50.0'	30.0'-33.0'	16.0'-19.0'	15.0'-18.0'	22.0'-25.0'	19.0'-22.0'	16.0'-19.0'	12.5'-15.5'	
	DATE SAMPLED	3/16/94	3/11/94	3/9/94	3/10/94	3/9/94	3/9/94	3/9/94	3/8/94	
EPA METHOD 602										
Benzene		ND	ND	ND	ND	ND	ND	ND	ND	1
Toluene		ND	1.0	ND	ND	ND	ND	ND	ND	1000
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	29
Xylenes (total)		ND	ND	ND	ND	ND	ND	ND	ND	530
Methyl-tert-butyl-ether		4.9	ND	ND	ND	ND	ND	ND	ND	200
EPA METHOD 610										
Chrysene		--	--	--	--	--	ND	--	--	*

All results are ug/l
Shaded Area = Concentrations detected above NC groundwater standards
* Maximun detection limit is equal to laboratory detection limit
ND Not Detected; see laboratory reports for applicable detection limits
-- Sample not analyzed for this parameter
** Exceeds calibration curve >20%

TABLE 2.1 (Page 2 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (HYDROPUNCH)
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

PARAMETER	HYDRO-PUNCH#	HP-24	HP-25D	HP-25 Duplicate	HP-26	HP-27	HP-28	HP-29	HP-30	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL (FT.)	15.0'-18.0'	30.0'-33.0'	30.0'-33.0'	47.0'-50.0'	40.0'-43.0'	47.0'-50.0'	15.0'-18.0'	15.0'-18.0'	
	DATE SAMPLED	3/08/94	3/08/94	3/08/94	3/15/94	3/14/94	3/17/94	3/09/94	3/09/94	
EPA METHOD 602										
Benzene		ND	ND	ND	ND	ND	142**	ND	ND	1
Toluene		ND	ND	ND	ND	2.8	1.4	1.0	ND	1000
Ethylbenzene		ND	ND	ND	ND	ND	0.5	ND	ND	29
Xylenes (total)		ND	ND	ND	ND	4.0	4.4	ND	ND	530
Methyl-tert-butyl-ether		ND	ND	ND	ND	113	454**	1.9	1.1	200
EPA METHOD 610										
Chrysene		6.2	1.5	2.0	--	ND	--	--	--	*

All results are ug/l
Shaded Area = Concentrations detected above NC groundwater standards
* Maximun detection limit is equal to laboratory detection limit
ND Not Detected; see laboratory reports for applicable detection limits
-- Sample not analyzed for this parameter
** Exceeds calibration curve >20%

TABLE 2.1 (Page 3 of 3)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (HYDROPUNCH)
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

PARAMETER	HYDRO-PUNCH#	HP-31	HP-32	HP-33	HP-34	HP-35	HP-35 Duplicate	HP-36	HP-37	RINSE BLANK	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL (FT.)	19.0'-22.0'	16.0'-19.0'	47.0'-50.0'	29.0'-32.0'	17.0'-20.0'	17.0'-20.0'	15.0'-18.0'	47.0'-50.0'		
	DATE SAMPLED	3/10/94	3/10/94	3/15/94	3/11/94	3/10/94	3/10/94	3/10/94	3/22/94	3/11/94	
EPA METHOD 602											
Benzene		ND	ND	30.3	3.8	ND	ND	ND	ND	ND	1
Toluene		ND	ND	1.3	ND	ND	ND	ND	ND	ND	1000
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	29
Xylenes (total)		ND	ND	0.5	ND	ND	ND	ND	ND	ND	530
Methyl-tert-butyl-ether		ND	ND	348**	30	ND	ND	ND	ND	ND	200
EPA METHOD 610											
Chrysene		0.7	--	1.9	ND	ND	--	ND	--	--	*

All results are ug/l
Shaded Area = Concentrations detected above NC groundwater standards
* Maximun detection limit is equal to laboratory detection limit
ND Not Detected; see laboratory reports for applicable detection limits
-- Sample not analyzed for this parameter
** Exceeds calibration curve >20%

TABLE 2.8 (Page 1 of 2)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (MONITORING WELLS)
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

PARAMETER	WELL #	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-18 Duplicate	MW-19	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL (FT.)	9.0'-24.0'	8.5'-23.5'	9.0'-24.0'	9.5'-24.5'	8.0'-23.0'	45.0'-50.0'	8.0'-23.0'		45.0'-50.0'	
	DATE SAMPLED	4/13/94	4/14/94	4/14/94	4/13/94	4/13/94	4/13/94	4/13/94	4/13/94	4/13/94	
EPA METHOD 601											
Chloroform		ND	ND	12	ND	ND	2.5	4.4	--	1.1	0.19
Dibromochloromethane		ND	ND	ND	ND	ND	ND	ND	--	ND	•
EPA METHOD 602											
Benzene		58.8	9000	ND	ND	ND	0.7	ND	ND	ND	1
Toluene		80.1	28,100	ND	ND	ND	ND	ND	ND	0.5	1000
Ethylbenzene		9.6	3000	ND	ND	ND	ND	ND	ND	ND	29
Xylenes (total)		97.2	14,900	ND	ND	ND	ND	ND	ND	ND	530
Methyl-tert-butyl-ether (MTBE)		--	--	--	ND	ND	37	ND	ND	ND	200
EPA METHOD 7000											
Lead		31	250	250	96	200	11	34	--	4.3	15

All results are ug/l
Shaded Area = Concentrations detected above NC groundwater standards
• Maximun detection limit is equal to laboratory detection limit
ND Not Detected; see laboratory reports for applicable detection limits
-- Sample not analyzed for this parameter
NA** Not analyzed; MTBE is not included in on-site laboratory 602 Analysis

TABLE 2.8 (Page 2 of 2)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
GROUNDWATER SAMPLES (MONITORING WELLS)
BERKELEY MANOR
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
LAW ENGINEERING JOB NO. 475-09180-01

PARAMETER	WELL #	MW-20	MW-21	MW-22	MW-23	MW-24	MW-25	MW-26	RINSE BLANK	TRIP BLANK	N.C. GROUNDWATER STANDARDS
	SCREENED INTERVAL (FT.)	8.5'-23.5'	45.0'-50.0'	8.0'-23.0'	45.0'-50.0'	8.0'-23.0'	43.0'-48.0'	8.0'-23.0'			
	DATE SAMPLED	4/13/94	4/13/94	4/21/94	4/13/94	4/13/94	4/13/94	4/14/94	4/13/94		
EPA METHOD 601											
Chloroform		7.2	4.0	39.0	2.6	ND	4.0	ND	--	--	0.19
Dibromochloromethane		ND	ND	ND	ND	ND	0.5	ND	--	--	•
EPA METHOD 602											
Benzene		ND	0.5	ND	ND	ND	ND	ND	ND	ND	1
Toluene		ND	ND	ND	ND	ND	ND	ND	ND	ND	1000
Ethylbenzene		ND	ND	ND	ND	ND	ND	ND	ND	ND	29
Xylenes (total)		1.2	ND	ND	ND	ND	ND	ND	ND	ND	530
Methyl tert-butyl ether (MTBE)		ND	ND	ND	ND	ND	ND	--	--	ND	200
EPA METHOD 7000											
Lead		71	5.1	42.0	9.6	320	12	120	--	--	15

All results are ug/l
Shaded Area = Concentrations detected above NC groundwater standards
• Maximun detection limit is equal to laboratory detection limit
ND Not Detected; see laboratory reports for applicable detection limits
-- Sample not analyzed for this parameter
NA** Not analyzed; MTBE is not included in on-site laboratory 602 Analysis

2002 ANNUAL MONITORING REPORT DATA

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-2**

Client Sample ID:		UST820-MW02-02B	UST820-MW02-02C	
Date Sampled:		04/26/02	10/30/02	
Analyte (ug/l)	Action Level	Result	Result	
EPA 602				
Benzene	1	**19.4**	**95.2**	
Chlorobenzene	50	<10	<10	
Methyl tert-butyl ether	210	<10	**22.5**	
Ethylbenzene	29	**34.9**	**212**	
Xylenes (total)	530	**285**	**778**	
Toluene	1000	**402**	**966**	
Total BTEX		**741.3**	**2051.2**	
EPA 610				
Chrysene	5	<50	<56	
Naphthalene	21	**52.9**	**167**	
Acenaphthene	80	<50	<56	
Acenaphthylene	210	<50	<56	
Benzo(a)anthracene	0.05	<50	<56	
Pyrene	210	<50	<56	
Fluorene	280	<50	<56	
Anthracene	2100	<50	<56	
Fluoranthene	280	<50	<56	
Phenanthrene	210	<50	<56	
Bold type indicates detectable concentrations.				
Shaded area indicates detectable concentrations above the groundwater quality standard				

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: MW-4

Client Sample ID:		143GW025	143GW047	143GW075	143GW106		143GW133	143GW144	143GW155	143GW176
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/26/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601										
1,2-Dichlorobenzene	620	**0.12 JP**	<0.8	<1	<1	<1	<1	<10	<1	<5
1,3-Dichlorobenzene	620	<0.8	**0.079 JP**	<0.8	<0.8	<1	<1	<10	<1	<5
1,4-Dichlorobenzene	75	**0.27 JP**	<1.5	<1.5	<1.5	**0.81 J**	<1	<10	<1	<5
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<10	<1	<5
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<10	<1	<5
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<10	<1	<5
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<10	<1	<5
EPA 602										
Benzene	1	**2.8 P**	**0.5 P**	<0.5	**1.1**	**1.6**	<1	<10	**3.8**	**161**
Chlorobenzene	50	<0.5	<0.5	**0.37 J**	<0.5	<1	<1	<10	<1	<5
Methyl tert-butyl ether	210	**11 P**	**30**	<5	**6.9**	**14**	**316**	**652**	**73.3**	**118**
Ethylbenzene	29	**0.68 J**	**0.27 JP**	**0.12 J**	**0.17 J**	**0.22 J**	<1	<10	**7.1**	**17.6**
Xylenes (total)	530	**1.55 JP**	**1.34 JBP**	**0.32 J**	**1.21 J**	**2.96 J**	<3	<30	<3	**87**
Toluene	1000	**2.1 P**	**0.88 JBP**	**0.85 J**	**1.8 J**	**0.69 J**	<1	<10	<1	**75.4**
Total BTEX		**7.13**	**2.99**	**1.29**	**4.28**	**5.47**			**10.9**	**341**
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-4**

Client Sample ID:		143GW191	143GW202	143GW213	CL-143-GW-224	GW-224	UST820-MW04-01C3	UST820-MW04-02B	UST820-MW04-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/21/01	10/02/01	04/26/02	10/28/02
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<4	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<4	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<4	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<4	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<4	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<4	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<4	NA	NA	NA	NA
EPA 602									
Benzene	1	<1	<1	<1	**13**	<6.0	**9.6**	<1.0	**5.2**
Chlorobenzene	50	<1	<2	<1	<4	<6.0	<2.0	<1.0	<1.0
Methyl tert-butyl ether	210	<1	0.79 J	<5	**380**	**600**	**36**	**0.75 J**	**0.68 J**
Ethylbenzene	29	<1	<2	<1	**3.7 J**	<6.0	**16**	<1.0	**3.1**
Xylenes (total)	530	<3	<6	<1	**9.6**	<6.0	**100**	**5.4**	**9.3**
Toluene	1000	<1	<2	<1	**10**	**1.7 J**	**72**	<1.0	**5.4**
Total BTEX					**36.3**	**1.7**	**197.6**	**5.4**	**23**
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.0	<5.2
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.0	<5.2
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-5**

Client Sample ID:		143GW024	143GW046	143GW077	143GW107		143GW134	143GW145	143GW164	143GW177
Date Sampled:		08/20/97	02/11/98	05/12/98	08/15/98	11/17/98	02/26/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601										
1,2-Dichlorobenzene	620	0.52 J	<5	<2	<1	<1	<1	<1	<1	<5
1,3-Dichlorobenzene	620	<0.8	<3.8	<1.5	<0.8	<1	<1	<1	<1	<5
1,4-Dichlorobenzene	75	<1.5	<7.5	<3	0.18 JB	<1	<1	<1	<1	<5
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<5
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<5
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<5
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<5
EPA 602										
Benzene	1	<0.5	21 P	2.2 P	1.9	<1	<1	<1	<1	47.2
Chlorobenzene	50	<0.5	<2.5	<1	<0.5	<1	<1	<1	<1	<5
Methyl tert-butyl ether	210	0.17 J	280	88 P	17	1.8 J	266	68.9	21	100
Ethylbenzene	29	0.066 J	1.8 J	<1.5	0.14 J	<1	<1	<1	<1	41.1
Xylenes (total)	530	0.064 J	8.7 JBP	0.64 J	0.82 J	<3	<3	<3	<3	269
Toluene	1000	0.054 J	8.1 JBP	0.29 JBP	0.21 J	0.3 J	<1	<1	<1	270
Total BTEX		0.184	39.6	3.13	3.07	0.3				627
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-5**

Client Sample ID:		143GW200	143GW210	143GW221	CL-143-GW-232	GW-232	Well Dry	Well Dry	Well Dry
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/26/01	10/02/01	04/26/02	10/28/02
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA			
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA			
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA			
Dibromochloromethane	0.41	<1	<2	<1	<1	NA			
Chloroform	0.19	<1	<2	<1	<1	NA			
Chloromethane	2.6	<1	<2	<1	<1	NA			
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA			
EPA 602									
Benzene	1	**6.1**	**216**	**30**	**18**	**3.4**			
Chlorobenzene	50	<1	<2	<1	<1	<1.0			
Methyl tert-butyl ether	210	**6.4**	**20**	<5	**3.2 J**	**0.72 J**			
Ethylbenzene	29	**4.9**	**11.1**	**5.6**	**2.8**	**1.3**			
Xylenes (total)	530	**23.9**	**6.8**	**14**	**4**	**7.5**			
Toluene	1000	**36.2**	**46.4**	**19**	**11**	**7.7**			
Total BTEX		**71.1**	**280.3**	**68.6**	**35.8**	**19.9**			
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10			
Naphthalene	21	NA	NA	NA	NA	<2.0			
Acenaphthene	80	NA	NA	NA	NA	<1.0			
Acenaphthylene	210	NA	NA	NA	NA	<1.0			
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10			
Pyrene	210	NA	NA	NA	NA	<0.10			
Fluorene	280	NA	NA	NA	NA	<2.0			
Anthracene	2100	NA	NA	NA	NA	<1.0			
Fluoranthene	280	NA	NA	NA	NA	<0.20			
Phenanthrene	210	NA	NA	NA	NA	<1.0			
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-7**

Client Sample ID:		143GW027	143GW053	143GW084	143GW108		143GW142	143GW153	143GW163	143GW181
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/26/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601										
1,2-Dichlorobenzene	620	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	620	<0.8	<0.8	<0.8	<0.8	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75	<1.5	0.12 J	0.34 J	1.2 JB	0.82 J	<1	<1	<1	<1
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<1
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<1
EPA 602										
Benzene	1	<0.5	0.1 J	<0.5	0.11 J	<1	7.5	36.6	47.9	7.1
Chlorobenzene	50	<0.5	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1
Methyl tert-butyl ether	210	0.82 J	0.67 J	0.21 J	1.8 J	1.2 J	8.3	19	4.2	8.6
Ethylbenzene	29	<0.8	0.15 JB	<0.8	<0.8	<1	3.3	12.6	11.3	12.8
Xylenes (total)	530	<3	0.95 JB	0.26 J	<3	<3	7.4	51.3	43.5	77.4
Toluene	1000	<2	1.2 JB	0.79 JB	<2	0.26 J	24.9	59.6	39.5	42.8
Total BTEX			2.4	1.05	0.11	0.26	43.1	160.1	142.2	140.1
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-7**

Client Sample ID:		143GW199	143GW209	143GW220	CL-143-GW-231	GW-231	UST820-MW07-01C3	UST820-MW07-02B	UST820-MW07-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/26/01	09/27/01	04/26/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<1	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<1	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<1	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA	NA	NA	NA
EPA 602									
Benzene	1	**4.7**	**46**	**21**	**18**	<1.0	<2.0	<1.0	<1.0
Chlorobenzene	50	<1	<2	<1	<1	<1.0	<2.0	<1.0	<1.0
Methyl tert-butyl ether	210	**91.4**	**86.9**	**28**	**39**	**1.7 J**	<2.0	**48.3**	**14.1**
Ethylbenzene	29	<1	**7.8**	**4.9**	**3.8**	<1.0	<2.0	<1.0	<1.0
Xylenes (total)	530	<3	**14.7**	**13**	**9.6**	<1.0	<4.0	**1.8 J**	<3.0
Toluene	1000	<1	**25.8**	**15**	**14**	**0.35 J**	<2.0	**1.8**	<1.0
Total BTEX		**4.7**	**94.3**	**53.9**	**45.4**	**0.35**		**3.6**	
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.3
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.3
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.3
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.3
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.3
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.5	<5.3
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.3
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.3
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.5	<5.3
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.3
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-8**

Client Sample ID:		GW-238	UST820-MW08-01C3	UST820-MW08-02B	UST820-MW08-02C
Date Sampled:		06/26/01	09/27/01	04/26/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	3.2 J	5.4	<1.0	<1.0
Chlorobenzene	50	<5.0	<5.0	<1.0	<1.0
Methyl tert-butyl ether	210	180	140	172	95.8
Ethylbenzene	29	<5.0	<5.0	<1.0	<1.0
Xylenes (total)	530	<5.0	<5.0	<3.0	<3.0
Toluene	1000	1.6 J	<5.0	1.3	<1.0
Total BTEX		4.8	5.4	1.3	
EPA 610					
Chrysene	5	<0.10	<0.10	<5.5	<5.2
Naphthalene	21	<2.0	<2.0	<5.5	<5.2
Acenaphthene	80	<1.0	<1.0	<5.5	<5.2
Acenaphthylene	210	<1.0	<1.0	<5.5	<5.2
Benzo(a)anthracene	0.05	<0.10	<0.10	<5.5	<5.2
Pyrene	210	<0.10	<0.25	<5.5	<5.2
Fluorene	280	<2.0	<2.0	<5.5	<5.2
Anthracene	2100	<1.0	<1.0	<5.5	<5.2
Fluoranthene	280	<0.20	<0.25	<5.5	<5.2
Phenanthrene	210	<1.0	<1.0	<5.5	<5.2
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-9**

Client Sample ID:		143GW021	143GW048	143GW078			143GW135	143GW146	143GW161	143GW175
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/26/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601										
1,2-Dichlorobenzene	620	<2000	<1	<500	<10	<380	<10	<200	<10	<50
1,3-Dichlorobenzene	620	<1500	<0.8	<380	<7.5	<290	<10	<200	<10	<50
1,4-Dichlorobenzene	75	740 J	<1.5	<750	2.6 JB	<580	<10	<200	<10	<50
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<10	<200	<10	<50
Chloroform	0.19	NA	NA	NA	NA	NA	<10	<200	<10	<50
Chloromethane	2.6	NA	NA	NA	NA	NA	<10	<200	<10	<50
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<10	<200	<10	<50
EPA 602										
Benzene	1	8500	0.45 J	4400 P	3300	5000	4140	5620	6170	1190
Chlorobenzene	50	<1000	<0.5	<250	<5	<190	<10	<200	<10	<50
Methyl tert-butyl ether	210	<10000	31	<2500	1300 J	14000	11600	14000	16700	55.2
Ethylbenzene	29	2800	0.19 JP	740	600 J	490	368	411	1030	736
Xylenes (total)	530	13300	1.21 JBP	2010 B	1780 J	1120 J	785	917	2760	5990
Toluene	1000	32000	0.82 JBP	4700 B	2500 B	1200	959	1340	1760	5480
Total BTEX		56600	2.67	11850	8180	7800	6252	8288	11720	13396
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-9**

Client Sample ID:		143GW197	143GW207	143GW218	CL-143-GW-229	GW-239	UST820-MW09-01C3	UST820-MW09-02B	UST820-MW09-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/21/01	10/01/01	04/24/02	10/28/02
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601									
1,2-Dichlorobenzene	620	<5	<2	<1	<50	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<5	<2	<1	<50	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<5	<2	<1	<50	NA	NA	NA	NA
Dibromochloromethane	0.41	<5	<2	<1	<50	NA	NA	NA	NA
Chloroform	0.19	<5	<2	<1	<50	NA	NA	NA	NA
Chloromethane	2.6	<5	<2	<1	<50	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<5	<2	<1	<50	NA	NA	NA	NA
EPA 602									
Benzene	1	2580	3390	2900	2000	2700	2600	1770	1450
Chlorobenzene	50	<5	<2	<50	<50	<80	<200	<50	<50
Methyl tert-butyl ether	210	7150	9260	7700	5100	6400	7000	4070	4200
Ethylbenzene	29	217	291	280	180	300	250	159	125
Xylenes (total)	530	507	735	740	490	820	690	447	348
Toluene	1000	747	1060	990	710	1200 B	1100	645	488
Total BTEX		4051	5476	4910	3380	5020	4640	3021	2411
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Naphthalene	21	NA	NA	NA	NA	25	24	9.6	15.6
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.0	<5.2
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.0	<5.2
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-9D**

Client Sample ID:		UST820-MW19D-01C3	UST820-MW09D-02B	UST820-MW09D-02C
Date Sampled:		10/03/01	04/24/02	10/28/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**
EPA 602				
Benzene	1	<1.0	2	19.9
Chlorobenzene	50	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	<10	**1.2**	**2.5**
Ethylbenzene	29	<1.0	**0.73 J**	**7.8**
Xylenes (total)	530	<2.0	**1.8 J**	**22**
Toluene	1000	<1.0	**1.7**	**17.3**
Total BTEX			**6.23**	**67**
EPA 610				
Chrysene	5	<0.10	<5.5	<5.2
Naphthalene	21	<2.0	<5.5	<5.2
Acenaphthene	80	<1.0	<5.5	<5.2
Acenaphthylene	210	<1.0	<5.5	<5.2
Benzo(a)anthracene	0.05	<0.10	<5.5	<5.2
Pyrene	210	<0.25	<5.5	<5.2
Fluorene	280	<2.0	<5.5	<5.2
Anthracene	2100	<1.0	<5.5	<5.2
Fluoranthene	280	<0.25	<5.5	<5.2
Phenanthrene	210	<1.0	<5.5	<5.2
Bold type indicates detectable concentrations.				
Shaded area indicates detectable concentrations above the groundwater quality standard				

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-10**

Client Sample ID:		143GW023	143GW051	143GW081	143GW111		143GW137	143GW147	143GW158	143GW172
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/27/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601										
1,2-Dichlorobenzene	620	0.33 J	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	620	0.098 J	<0.8	<0.8	<0.8	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75	<1.5	<1.5	<1.5	0.23 J	<1	<1	<1	<1	<1
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<1
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<1
EPA 602										
Benzene	1	0.067 J	6.2	<0.5	0.99	<1	8.3	60.4	7.7	2.6
Chlorobenzene	50	0.047 J	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1
Methyl tert-butyl ether	210	0.21 J	9.6	18 P	20	<5	12.6	11.6	3.8	8.4
Ethylbenzene	29	0.093 J	0.26 JBP	0.15 JP	0.16 J	<1	2.3	11.5	10.9	7.1
Xylenes (total)	530	0.333 J	1.24 JB	0.53 JP	0.44 J	<3	3.2	24.7	110	32.2
Toluene	1000	0.11 J	1.1 JB	1.1 JBP	0.25 JB	0.29 J	4.7	30.7	100	14.2
Total BTEX		0.503	8.8	1.78	1.84	0.29	18.5	127.3	228.6	56.1
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-10**

Client Sample ID:		143GW195	143GW205	143GW216	CL-143-GW-227	GW-227	UST820-MW10-01C3	UST820-MW10-02B	UST820-MW10-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/22/01	09/26/01	04/24/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<1	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<1	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<1	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA	NA	NA	NA
EPA 602									
Benzene	1	<1	<1	<1	**0.21 J**	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	50	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	**10.7**	**5.5**	**7.4**	**7.8**	**11**	<10	**7**	**9**
Ethylbenzene	29	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	530	<3	<6	<1	<1	<1.0	<2.0	<2.0	<2.0
Toluene	1000	<1	<2	<1	**0.23 J**	**0.41 J**	<1.0	<1.0	<1.0
Total BTEX					**0.44**	**0.41**			
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.1
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.1
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.1
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.1
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.1
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.5	<5.1
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.1
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.1
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.5	<5.1
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.1
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-11**

Client Sample ID:		143GW019	143GW045	143GW076			143GW140	143GW151	143GW156	143GW178
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/27/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601										
1,2-Dichlorobenzene	620	<2000	<100	<500	<10	<200	<1	<100	<50	<20
1,3-Dichlorobenzene	620	<1500	<75	<380	<7.5	<150	<1	<100	<50	<20
1,4-Dichlorobenzene	75	<3000	<150	<750	3.2 JB	<300	<1	<100	<50	<20
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<100	<50	<20
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<100	<50	<20
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<100	<50	<20
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<100	<50	<20
EPA 602										
Benzene	1	6900	340 P	590 P	760	880	<1	1040	445	3630
Chlorobenzene	50	<1000	<50	<250	<5	<100	<1	<100	<50	<20
Methyl tert-butyl ether	210	<10000	47 JP	<2500	20 J	<1000	116	<100	<50	10200
Ethylbenzene	29	3300	100 P	630 B	550 J	640	173	578	382	613
Xylenes (total)	530	18600	650 PB	4400 B	3700 J	3900	1250	3700	3720	1510
Toluene	1000	29000	420 PB	4400 B	3700 B	2800	1770	5330	3650	1040
Total BTEX		57800	1510	10020	8710	8220	3193	10648	8197	6793
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-11**

Client Sample ID:		143GW192	143GW211	143GW222	CL-143-GW-233	GW-233	UST820-MW11-01C3	UST820-MW11-02B	UST820-MW11-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/26/01	10/02/01	04/26/02	10/30/02
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601									
1,2-Dichlorobenzene	620	<20	<20	<1	<100	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<20	<20	<1	<100	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<20	<20	<1	<100	NA	NA	NA	NA
Dibromochloromethane	0.41	<20	<20	<1	<100	NA	NA	NA	NA
Chloroform	0.19	<20	<20	<1	<100	NA	NA	NA	NA
Chloromethane	2.6	<20	<20	<1	<100	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<20	<20	<1	<100	NA	NA	NA	NA
EPA 602									
Benzene	1	1360	647	1000	700	410	130	45.1	49.3
Chlorobenzene	50	<20	<20	<100	<100	170 J	<50	<10	1.1
Methyl tert-butyl ether	210	390	117	<500	190 J	<1000	<500	<10	20.2
Ethylbenzene	29	1110	881	1000	1000	1400	340	481	91.5
Xylenes (total)	530	7760	6140	7800	7000	9000	2600	3270	1580
Toluene	1000	8220	5690	9100	8200	11000	2900	2900	594
Total BTEX		**18450**	**14358**	**18900**	**16900**	**21810**	**5970**	**6696.1**	**2314.8**
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.50	<0.10	<20	<53
Naphthalene	21	NA	NA	NA	NA	250	7.5	163	271
Acenaphthene	80	NA	NA	NA	NA	<5.0	1.2 P	<20	<53
Acenaphthylene	210	NA	NA	NA	NA	<5.0	11	<20	<53
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.50	<0.10	<20	<53
Pyrene	210	NA	NA	NA	NA	<0.50	<0.25	<20	<53
Fluorene	280	NA	NA	NA	NA	<10	<2.0	<20	<53
Anthracene	2100	NA	NA	NA	NA	<5.0	<1.0	<20	<53
Fluoranthene	280	NA	NA	NA	NA	<1.0	<0.25	<20	<53
Phenanthrene	210	NA	NA	NA	NA	<5.0	<1.0	<20	<53
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
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B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-12**

Client Sample ID:		143GW020	143GW050	143GW079	143GW113		143GW136	143GW148	143GW157	143GW174
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/26/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601										
1,2-Dichlorobenzene	620	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	620	<0.8	<0.8	<0.8	<0.8	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75	<1.5	<1.5	<1.5	<1.5	0.36 J	<1	<1	<1	<1
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<1
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<1
EPA 602										
Benzene	1	**0.13 J**	<0.5	**0.17 J**	**1.2**	**0.21 J**	**35.1**	**12.6**	**9.2**	**14.7**
Chlorobenzene	50	<0.5	**1.1**	<0.5	<0.5	<1	<1	<1	<1	<1
Methyl tert-butyl ether	210	**0.27 J**	**11**	**0.75 J**	**1.4 J**	**1 J**	**5.1**	**5**	**10.3**	**2**
Ethylbenzene	29	**0.075 J**	**0.17 JB**	<0.8	**0.49 J**	**0.29 J**	**7.5**	**4.4**	**10.3**	**28**
Xylenes (total)	530	**0.216 J**	**0.74 JBP**	**0.43 J**	**2.08 J**	<3	**12.6**	**9.6**	**102**	**106**
Toluene	1000	**0.2 J**	**0.34 JBP**	**0.91 JB**	**2.9 B**	**0.65 J**	**16.3**	**8.4**	**114**	**57.6**
Total BTEX		**0.621**	**1.25**	**1.51**	**6.67**	**1.15**	**71.5**	**35**	**235.5**	**206.3**
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-12**

Client Sample ID:		143GW193	143GW206	143GW217	CL-143-GW-228	GW-228	UST820-MW12-01C3	UST820-MW12-02B	UST820-MW12-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/21/01	09/26/01	04/25/02	10/28/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<1	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<1	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<1	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA	NA	NA	NA
EPA 602									
Benzene	1	<1	<1	<1	**0.15 J**	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	50	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	<1	**2.5**	<5	**4.4 J**	**3.9J**	<10	**2.2**	<1.0
Ethylbenzene	29	<1	<2	<1	<1	<1.0	<1.0	<1.0	**1.7**
Xylenes (total)	530	<3	<6	<1	<1	<1.0	<2.0	<3.0	**47.8**
Toluene	1000	<1	<2	<1	<1	**0.38 J**	<1.0	<1.0	<1.0
Total BTEX					**0.15**	**0.38**			**49.5**
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.0	<5.2
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.0	<5.2
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Analytical Data Summary

Type II Well: **MW-13**

Client Sample ID:		GW-236	UST820-MW13-01C3	UST820-MW13-02B	UST820-MW13-02C
Date Sampled:		06/21/01	10/02/01	04/26/02	10/29/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	**40**	**24**	**0.63 J**	<1.0
Chlorobenzene	50	<10	<10	<1.0	<1.0
Methyl tert-butyl ether	210	**260**	**350**	**18.3**	**6.7**
Ethylbenzene	29	**52**	**110**	**5**	**0.73 J**
Xylenes (total)	530	**550**	**590**	**24.8**	**7.2**
Toluene	1000	**920 B**	**68**	**17.5**	**2.1**
Total BTEX		**1562**	**792**	**47.93**	**10.03**
EPA 610					
Chrysene	5	<0.10	<0.10	<5.0	<5.4
Naphthalene	21	**11**	**6**	<5.0	<5.4
Acenaphthene	80	<1.0	**1 P**	<5.0	<5.4
Acenaphthylene	210	<1.0	**3.6**	<5.0	<5.4
Benzo(a)anthracene	0.05	<0.10	**0.15 P**	<5.0	<5.4
Pyrene	210	<0.10	<0.25	<5.0	<5.4
Fluorene	280	<2.0	<2.0	<5.0	<5.4
Anthracene	2100	<1.0	<1.0	<5.0	<5.4
Fluoranthene	280	<0.20	<0.25	<5.0	<5.4
Phenanthrene	210	<1.0	<1.0	<5.0	<5.4
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Analytical Data Summary

Type II Well: **MW-14**

Client Sample ID:		GW-237	UST820-MW14-01C3	UST820-MW14-02B	UST820-MW14-02C
Date Sampled:		06/22/01	09/27/01	04/26/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	<1.0	<1.0	1.2	<1.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	**2.1 J**	<10	**0.53 J**	<1.0
Ethylbenzene	29	<1.0	<1.0	**7.3**	<1.0
Xylenes (total)	530	<1.0	<2.0	**37.2**	<3.0
Toluene	1000	**0.36 J**	<1.0	**89.2**	<1.0
Total BTEX		**0.36**		**134.9**	
EPA 610					
Chrysene	5	<0.10	<0.10	<5.0	<5.1
Naphthalene	21	<2.0	<2.0	**2.9**	<5.1
Acenaphthene	80	<1.0	<1.0	<5.0	<5.1
Acenaphthylene	210	<1.0	<1.0	<5.0	<5.1
Benzo(a)anthracene	0.05	<0.10	<0.10	<5.0	<5.1
Pyrene	210	<0.10	<0.25	<5.0	<5.1
Fluorene	280	<2.0	<2.0	<5.0	<5.1
Anthracene	2100	<1.0	<1.0	<5.0	<5.1
Fluoranthene	280	<0.20	<0.25	<5.0	<5.1
Phenanthrene	210	<1.0	<1.0	<5.0	<5.1
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-15**

Client Sample ID:		GW-235	UST820-MW15-01C3	UST820-MW15-02B	UST820-MW15-02C
Date Sampled:		06/26/01	10/01/01	04/26/02	10/28/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	**1.9**	<1.0	<1.0	<1.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	<5.0	<10	<1.0	<1.0
Ethylbenzene	29	**0.67 J**	<1.0	<1.0	<1.0
Xylenes (total)	530	**3.1**	<2.0	<3.0	<3.0
Toluene	1000	**3.3**	<1.0	<1.0	<1.0
Total BTEX		**8.97**			
EPA 610					
Chrysene	5	<0.10	<0.10	<5.0	<5.2
Naphthalene	21	<2.0	<2.0	<5.0	<5.2
Acenaphthene	80	<1.0	<1.0	<5.0	<5.2
Acenaphthylene	210	<1.0	<1.0	<5.0	<5.2
Benzo(a)anthracene	0.05	<0.10	<0.10	<5.0	<5.2
Pyrene	210	<0.10	<0.25	<5.0	<5.2
Fluorene	280	<2.0	<2.0	<5.0	<5.2
Anthracene	2100	<1.0	<1.0	<5.0	<5.2
Fluoranthene	280	<0.20	<0.25	<5.0	<5.2
Phenanthrene	210	<1.0	<1.0	<5.0	<5.2
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
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Analytical Data Summary

Type II Well: **MW-16**

Client Sample ID:		GW-234	UST820-MW16-01C3	UST820-MW16-02B	UST820-MW16-02C
Date Sampled:		06/22/01	09/27/01	04/25/02	10/29/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	**8.2**	<1.0	<1.0	<1.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	**1.8 J**	<10	<1.0	<1.0
Ethylbenzene	29	**2.3**	<1.0	<1.0	<1.0
Xylenes (total)	530	**9.6**	<2.0	<3.0	<3.0
Toluene	1000	**12 B**	<1.0	<1.0	<1.0
Total BTEX		**32.1**			
EPA 610					
Chrysene	5	<2.5	<0.10	<5.5	<5.1
Naphthalene	21	<50	<2.0	<5.5	<5.1
Acenaphthene	80	<25	**2.4**	<5.5	<5.1
Acenaphthylene	210	<25	**4**	<5.5	<5.1
Benzo(a)anthracene	0.05	<2.5	<0.10	<5.5	<5.1
Pyrene	210	<2.5	<0.25	<5.5	<5.1
Fluorene	280	<50	<2.0	<5.5	<5.1
Anthracene	2100	<25	<1.0	<5.5	<5.1
Fluoranthene	280	<5	<0.25	<5.5	<5.1
Phenanthrene	210	<25	**1.3**	<5.5	<5.1
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-17**

Client Sample ID:		GW-240	UST820-MW17-01C3	UST820-MW17-02B	UST820-MW17-02C
Date Sampled:		06/22/01	09/27/01	04/25/02	10/29/02
Analyte (ug/l)	Action Level	Result	Result	Result	Result
EPA 602					
Benzene	1	19	18	17.4	<1.0
Chlorobenzene	50	<1.0	<2.0	<1.0	<1.0
Methyl tert-butyl ether	210	**56**	<2.0	**61**	**12.4**
Ethylbenzene	29	**2.2**	<2.0	<1.0	<1.0
Xylenes (total)	530	**10**	<4.0	<3.0	<3.0
Toluene	1000	**12 B**	<2.0	<1.0	<1.0
Total BTEX		**43.2**	**18**	**17.4**	
EPA 610					
Chrysene	5	<0.10	<0.10	<5.5	<5.1
Naphthalene	21	<2.0	<2.0	<5.5	<5.1
Acenaphthene	80	<1.0	<1.0	<5.5	<5.1
Acenaphthylene	210	<1.0	<1.0	<5.5	<5.1
Benzo(a)anthracene	0.05	<0.10	<0.10	<5.5	<5.1
Pyrene	210	<0.10	<0.25	<5.5	<5.1
Fluorene	280	<2.0	<2.0	<5.5	<5.1
Anthracene	2100	<1.0	<1.0	<5.5	<5.1
Fluoranthene	280	<0.20	<0.25	<5.5	<5.1
Phenanthrene	210	<1.0	<1.0	<5.5	<5.1
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-19**

Client Sample ID:		GW-229	UST820-MW19-01C3	UST820-MW19-02B	UST820-MW19-02C
Date Sampled:		06/22/01	09/26/01	04/24/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**
EPA 602					
Benzene	1	**1.5**	<1.0	**1.4**	<1.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	**12**	<10	**8.2**	**5.1**
Ethylbenzene	29	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	530	**0.56 J**	<2.0	<3.0	<3.0
Toluene	1000	**0.66 J**	<1.0	**0.75 J**	<1.0
Total BTEX		**2.72**		**2.15**	
EPA 610					
Chrysene	5	<0.10	<0.10	<5.5	<5.3
Naphthalene	21	<2.0	<2.0	<5.5	<5.3
Acenaphthene	80	<1.0	<1.0	<5.5	<5.3
Acenaphthylene	210	<1.0	<1.0	<5.5	<5.3
Benzo(a)anthracene	0.05	<0.10	<0.10	<5.5	<5.3
Pyrene	210	<0.10	<0.25	<5.5	<5.3
Fluorene	280	<2.0	<2.0	<5.5	<5.3
Anthracene	2100	<1.0	<1.0	<5.5	<5.3
Fluoranthene	280	<0.20	<0.25	<5.5	<5.3
Phenanthrene	210	<1.0	<1.0	<5.5	<5.3
Bold type indicates detectable concentrations.					
Shaded area indicates detectable concentrations above the groundwater quality standards.					

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type III Well: **MW-21**

Client Sample ID:		143GW026	143GW052	143GW082	143GW114		143GW138	143GW149	143GW159	143GW171
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/27/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601										
1,2-Dichlorobenzene	620	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	620	<0.8	<0.8	<0.8	<0.8	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75	<1.5	<1.5	<1.5	0.56 JB	0.44 J	<1	<1	<1	<1
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<1
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<1
EPA 602										
Benzene	1	<0.5	<0.5	<0.5	0.49 J	<1	3.8	50.4	2.2	1.9
Chlorobenzene	50	<0.5	0.085 J	<0.5	<0.5	<1	<1	<1	<1	<1
Methyl tert-butyl ether	210	<5	1.3 J	<5	<5	8.3	0.86 J	3.6	<1	<1
Ethylbenzene	29	<0.8	<0.8	0.42 J	0.29 J	<1	<1	8.8	4.5	5.5
Xylenes (total)	530	<3	0.51 JB	1.48 J	0.95 J	<3	<3	20	44	24.9
Toluene	1000	<2	0.23 JB	1.9 J	<2	<1	1.4	26	36.7	10.8
Total BTEX			0.74	3.8	1.73		5.2	105.2	87.4	43.1
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

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Analytical Data Summary

Type III Well: **MW-21**

Client Sample ID:		143GW195	143GW203	143GW214	CL-143-GW-225	GW-225	UST820-MW21-01C3	UST820-MW21-02B	UST820-MW21-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/22/01	09/26/01	04/24/02	10/30/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<1	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<1	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<1	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA	NA	NA	NA
EPA 602									
Benzene	1	<1	<1	<1	0.17 J	0.19 J	<1.0	<1.0	<1.0
Chlorobenzene	50	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	<1	<2	<5	2 J	<5.0	<10	<1.0	<1.0
Ethylbenzene	29	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	530	<3	<6	<1	<1	0.55 J	<2.0	<3.0	<3.0
Toluene	1000	<1	<2	<1	0.24 J	0.56 J	<1.0	<1.0	<1.0
Total BTEX					0.41	1.3			
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.0
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.0
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.0
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.0
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.5	<5.0
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.5	<5.0
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.5	<5.0
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.0
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.5	<5.0
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.5	<5.0
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-26**

Client Sample ID:		143GW022	143GW049	143GW083	143GW115		143GW141	143GW152	143GW162	143GW180
Date Sampled:		08/19/97	02/11/98	05/12/98	08/15/98	11/17/98	02/27/99	05/18/99	09/10/99	11/17/99
Analyte (ug/l)	Action Level	Result	Result	Result	Result	Result	Result	Result	Result	Result
EPA 601										
1,2-Dichlorobenzene	620	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	620	<0.8	0.05 JP	<0.8	<0.8	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75	0.29 J	<1.5	<1.5	0.54 JB	0.3 J	<1	<1	<1	<1
Dibromochloromethane	0.41	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloroform	0.19	NA	NA	NA	NA	NA	<1	<1	<1	<1
Chloromethane	2.6	NA	NA	NA	NA	NA	<1	<1	<1	<1
1,2-Dichloroethane	0.38	NA	NA	NA	NA	NA	<1	<1	<1	<1
EPA 602										
Benzene	1	<0.5	0.092 JP	<0.5	0.1 J	<1	14.7	21	166	15.4
Chlorobenzene	50	<0.5	0.039 JP	<0.5	<0.5	<1	<1	<1	<1	<1
Methyl tert-butyl ether	210	0.72 JP	6.4	<5	6.3	7.4	67.4	65.4	99	76.6
Ethylbenzene	29	0.32 JP	0.08 JB	<0.8	<0.8	<1	7.8	16.9	23	19.5
Xylenes (total)	530	1.62 JP	0.6 JB	0.196 JB	<3	<3	39	91	80.7	127
Toluene	1000	1.2 JP	0.22 JBP	0.3 JB	<2	<1	66.4	159	91.7	83.2
Total BTEX		3.14	0.992	0.496	0.1		127.9	287.9	361.4	245.1
EPA 610										
Chrysene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	280	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Bold type indicates detectable concentrations.								
		Shaded area indicates detectable concentrations above the groundwater quality standards.								

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-26**

Client Sample ID:		143GW198	143GW208	143GW219	CL-143-GW-230	GW-230	UST820-MW26-01C3	UST820-MW26-02B	UST820-MW26-02C
Date Sampled:		05/18/00	08/29/00	12/13/00	03/19/01	06/22/01	10/02/01	04/26/02	10/29/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 601									
1,2-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	620	<1	<2	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	<1	<2	<1	<1	NA	NA	NA	NA
Dibromochloromethane	0.41	<1	<2	<1	<1	NA	NA	NA	NA
Chloroform	0.19	<1	<2	<1	<1	NA	NA	NA	NA
Chloromethane	2.6	<1	<2	<1	<1	NA	NA	NA	NA
1,2-Dichloroethane	0.38	<1	<2	<1	<1	NA	NA	NA	NA
EPA 602									
Benzene	1	<1	49.6	30	42	<1.0	2.6	<1.0	<1.0
Chlorobenzene	50	<1	<2	<1	<1	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	210	132	92	31	20	7.1	10	28.5	14.8
Ethylbenzene	29	<1	8.5	5	7.4	<1.0	3.2	3.1	<1.0
Xylenes (total)	530	<3	18	11	19	<1.0	18	16.7	<3.0
Toluene	1000	<1	27.7	17	28	0.3 J	14	30.2	<1.0
Total BTEX			103.8	63	96.4	0.3	37.8	50	
EPA 610									
Chrysene	5	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Naphthalene	21	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Acenaphthene	80	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Acenaphthylene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Benzo(a)anthracene	0.05	NA	NA	NA	NA	<0.10	<0.10	<5.0	<5.2
Pyrene	210	NA	NA	NA	NA	<0.10	<0.25	<5.0	<5.2
Fluorene	280	NA	NA	NA	NA	<2.0	<2.0	<5.0	<5.2
Anthracene	2100	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
Fluoranthene	280	NA	NA	NA	NA	<0.20	<0.25	<5.0	<5.2
Phenanthrene	210	NA	NA	NA	NA	<1.0	<1.0	<5.0	<5.2
		Bold type indicates detectable concentrations.							
		Shaded area indicates detectable concentrations above the groundwater quality standards.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
Samples analyzed by Compuchem, STL, or Accutest

CLJ - POL Berkeley Manor
Project #824603

Analytical Data Summary

Type II Well: **MW-27**

Client Sample ID:		UST820-MW27-01C3	Well Dry	Well Dry
Date Sampled:		10/03/01	04/25/02	10/28/02
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**
EPA 602				
Benzene	1	<1.0		
Chlorobenzene	50	<1.0		
Methyl tert-butyl ether	210	<10		
Ethylbenzene	29	<1.0		
Xylenes (total)	530	<2.0		
Toluene	1000	<1.0		
Total BTEX				
EPA 610				
Chrysene	5	<0.10		
Naphthalene	21	<2.0		
Acenaphthene	80	<1.0		
Acenaphthylene	210	<1.0		
Benzo(a)anthracene	0.05	<0.10		
Pyrene	210	<0.25		
Fluorene	280	<2.0		
Anthracene	2100	<1.0		
Fluoranthene	280	<0.25		
Phenanthrene	210	<1.0		
Bold type indicates detectable concentrations.				
Shaded area indicates detectable concentrations above the groundwater quality standard				

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 12/11/2002
Samples analyzed by Compuchem, STL, or Accutest

2003 DATA PROVIDED BY SHAW

CLJ - POL Berkeley Manor
Project #824603

Table 4.4
Analytical Data Summary
B-820 Year 6 Semi-Annual 1
April 2003 Shallow

Client Sample ID:		UST820-MW02	UST820-MW04	UST820-MW05	UST820-MW08	UST820-MW10	UST820-MW11	UST820-MW12	UST820-MW13	UST820-MW14	UST820-MW15	UST820-MW16	UST820-MW26	UST820-MW27
Well ID:		MW-2	MW-4	MW-5	MW-8	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-16	MW-26	MW-27
Date Sampled:		04/18/03	04/14/03	04/08/03	04/18/03	04/14/03	04/18/03	04/09/03	04/08/03	04/18/03	04/08/03	04/18/03	04/18/03	4/9/2003
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 602														
Benzene	1	**0.84 J**	<1.0	<1.0	<1.0	<1.0	**7.5 J**	<1.0	**0.55 J**	<1.0	<1.0	<1.0	<1.0	<2.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
Methyl tert-butyl ether	200	<5.0	<1.0	<1.0	**2.7**	**6.9**	**89.7**	<1.0	**4.4**	<1.0	<1.0	<1.0	**0.54 J**	**139**
Ethylbenzene	29	**21.1**	<1.0	<1.0	<1.0	<1.0	**36.6**	<1.0	**3.9**	<1.0	<1.0	<1.0	<1.0	<2.0
Xylenes (total)	530	**100**	<3.0	<3.0	<3.0	<3.0	**1290**	<3.0	**103**	<3.0	<3.0	<3.0	**2.1 J**	<6.0
Toluene	1000	**82**	<1.0	<1.0	<1.0	<1.0	**284**	<1.0	**62.5**	<1.0	<1.0	<1.0	**0.87 J**	<2.0
Total BTEX		**203.94**					**1617.1**		**169.95**				**2.97**	
EPA 610														
Chrysene	5	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Naphthalene	21	<5.4	<5.2	<5.2	<5.1	<5.0	**140**	<5.1	**7.2**	<5.1	<5.1	<5.1	<5.1	<5.2
Acenaphthene	80	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Acenaphthylene	210	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Benzo(a)anthracene	0.05	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Pyrene	210	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Fluorene	280	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Anthracene	2100	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Fluoranthene	280	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Phenanthrene	210	<5.4	<5.2	<5.2	<5.1	<5.0	<40	<5.1	<5.1	<5.1	<5.1	<5.1	<5.1	<5.2
Bold type indicates detectable concentrations.														
Shaded area indicates detectable concentrations above the groundwater quality standard														

J= estimated
B= detected in blank
P >25% difference between columns
NA= not analyzed

Printed: 11/3/2003
Samples analyzed by Accutest

CLJ - POL Berkeley Manor
Project #824603

Table 4.4
Analytical Data Summary
B-820 Year 6 Semi-Annual 1
April 2003 Deep

Client Sample ID:		UST820-MW07	UST820-MW09	UST820-MW09D	UST820-MW17	UST820-MW19	UST820-MW21
Well ID:		MW-7	MW-9	MW-9D	MW-17	MW-19	MW-21
Date Sampled:		04/18/03	04/16/03	4/14/2003	04/18/03	04/14/03	04/14/03
Analyte (ug/l)	**Action Level**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 602							
Benzene	1	<1.0	**2340**	<1.0	**45.8**	**0.87 J**	<1.0
Chlorobenzene	50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	200	**2.9**	**4530**	<1.0	**148**	**4.4**	<1.0
Ethylbenzene	29	<1.0	**241**	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	530	<3.0	**556**	<3.0	**1.9 J**	<3.0	<3.0
Toluene	1000	<1.0	**466**	<1.0	<1.0	<1.0	<1.0
Total BTEX			**3603**		**47.7**	**0.87**	
EPA 610							
Chrysene	5	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Naphthalene	21	<5.0	**24.4**	<5.2	<5.1	<5.1	<5.1
Acenaphthene	80	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Acenaphthylene	210	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Benzo(a)anthracene	0.05	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Pyrene	210	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Fluorene	280	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Anthracene	2100	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Fluoranthene	280	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Phenanthrene	210	<5.0	<5.1	<5.2	<5.1	<5.1	<5.1
Bold type indicates detectable concentrations.							
Shaded area indicates detectable concentrations above the groundwater quality standard.							

J= estimated
P= >25% difference between column quantitation
B= detected in blank
NA= not analyzed

Printed: 11/3/2003
Samples analyzed by Accutest

APPENDIX E

RISK CLASSIFICATION
AND
LAND USE FORM

A. RISK CHARACTERIZATION

Submit the following questionnaire in its entirety. Answer all questions completely. Attach additional pages as needed to fully explain answers. Base answers/explanations on information known or required to be obtained during the Limited Site Assessment.

NOTE: *Source area means point of release from a UST system.*

Limited Site Assessment Risk Classification and Land Use Form

Part I - Groundwater/Surface Water/Vapor Impacts
High Risk

1. *Has the release contaminated any water supply well including any used for non-drinking purposes?* YES **NO**

   No, according to water supply well data provided by MCB Camp Lejeune, the closest well is water supply well 623 (approximately 1,300 feet northeast of site) which analytical results were below the quantitation limit during the January 2003 sampling event.

2. *Is a water supply well used for drinking water located within 1,000 feet of the source area of the discharge or release?* YES **NO**

   According to water supply well data provided by MCB Camp Lejeune, there are no water supply wells located within 1,000 feet of the subject site.

3. *Is a water supply well not used for drinking water (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release?* YES **NO**

   No wells were located within 250 feet of the site.

4. *Does groundwater within 500 feet of the source area of the release have the potential for future use (there is no other source of water supply other than the groundwater)?* YES **NO**

   No, there are an adequate number of locations for additional water supply wells to be installed on other portions of the base, which are used for water supply.

5. *Do vapors from the release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment?* YES **NO**
If YES describe.

There is no evidence to suggest an accumulation of vapors and no evidence of accumulation has been reported.

6. *Are there any other factors that would cause the discharge or release to pose an imminent danger to public health, public safety, or the environment?* YES **NO**
If YES describe.

No. Data collected during this investigation does not provide evidence to suggest other factors that would cause an imminent danger to public health, public safety or the environment.

Intermediate Risk

7. *Is a surface water body located within 500 feet of the source area of the discharge or release?* YES **NO**
*If **YES**, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B.0200 by a factor of 10?* YES NO

No. No surface water bodies have been located within 500 feet of the subject site.

8. *Is the source area of the discharge or release located within an approved or planned wellhead protection area as defined in 42 USC 300h-7(e)?* **YES** NO
If YES describe.

Wellhead protection areas defined by 42 USC 300h-7(e) have not, as of this report, been designed by NCDENR for MCB, Camp Lejeune. However, MCB Camp Lejeune has identified well protection areas on the base. Based on the most recent Wellhead Protection Plan Update (2002) performed for MCB Camp Lejeune, the site is located within a potential wellhead protection area.

9. *Is the release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985?* **YES** NO
If YES, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? **YES** NO
If YES describe.

Evidence of recharge to the lower portion of the aquifer appears to have occurred at this site based on the following:

- Shaw has stated in their annual monitoring reports that there is a significant downward vertical hydraulic gradient at the site.
- Groundwater flow within the 50 feet deep Type III wells appears to be in a direction toward the closest water supply well 623.

10. *Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels established by the Department?* YES **NO**

All contaminant levels from the April 2003 sampling event are below the Gross Contaminant Levels established by the Department.

Part II - Land Use

Property Containing Source Area of Release

The questions below pertain to the property containing the source area of the release.

1. *Does the property contain one or more primary or secondary residences (permanent or temporary)?* YES **NO**
Describe.

No. The subject site is a gas station and convenience store, and does not contain any residences.

2. *Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly?* YES **NO**
Describe.

The property does not contain any place of public assembly.

3. *Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped?* **YES** NO
Describe.

Yes, as mentioned above, the property contains a gas station/convenience store with four USTs of which three contain gasoline and one diesel.

4. *Do children visit the property?* **YES** NO
Explain.

Yes, the site is accessible to the public. However, the remediation system and UST area are restricted by a fence.

Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? YES **NO**
Explain.

No, as mentioned above, the site is accessible to the public, and only the UST and the remediation system area are fenced.

5. *Do pavement, buildings, or other structures cap the contaminated soil?* YES **NO**
Describe.

The areas of the release are covered with asphalt and/or concrete. However, contaminated soil has not been identified within the optimization plan.

If YES, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?

As necessary, appropriate land use restrictions will insure that any potentially impacted soils will remain in place. However, no evidence suggests the continued presence of petroleum impacted soils.

6. *What is the zoning status of the property?*

The MCB Camp Lejeune is not subject to local or county zoning requirements. The surrounding properties have been developed for military support purposes.

7. *Is the use of the property likely to change in the next 20 years?* YES **NO**
Explain.

No, the designated use of military property is not likely to change within the foreseeable future.

Property Surrounding Source Area of Release
The questions below pertain to the area within 1500 feet of the source area of the release (excludes property containing source area of the release):

1. *What is the distance from the source area of the release to the **nearest** primary or secondary residence (permanent or temporary)?*

The closest residence is approximately 400 feet from the subject site.

2. *What is the distance from the source area of the release to the **nearest** school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly?*

The Youth Sports and Activities Center and a playground are located approximately 300 feet from the subject site. Also, athletic fields associated with a middle school are located approximately 500 feet from the subject site.

3. *What is the zoning status of properties in the surrounding area?*

As previously mentioned, the MCB Camp Lejeune is not subject to local or county zoning requirements.

4. *Briefly characterize the use and activities of the land in the surrounding area.*

The subject site is located in a mostly wooded area, with the exception of residential land use to the east and the school to the north.

B. RECEPTOR INFORMATION

1. Water Supply Wells

(See Table 5 and Figure 1)

Physical reconnaissance and review of the Wellhead Protection Plan – 2002 Update prepared by AH Environmental indicated that there is one water supply well (623) located within 1,500 feet of the subject site.

2. Public Water Supplies

Are public water supplies available within 1,500 feet of the source area of the release? **YES** NO

If YES, where is the location of the nearest public water lines and the source(s) of the public water supply (indicate on map). Describe.

Public water is provided to buildings within 1,500 feet of the subject site by water mains which carry treated potable water. Potable water is supplied to the site and surrounding areas by the MCB water supply system. Potable water for Camp Lejeune is obtained from various water treatment facilities throughout the base. Groundwater obtained from the Castle Hayne Aquifer is the raw water source for the treatment facilities.

3. Surface Water

Identify all surface water bodies (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map.

An unnamed tributary of Wallace Creek has been located approximately 1,200 feet from the subject site.

4. Wellhead Protection Areas

Identify all planned or approved wellhead protection areas (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map. Wellhead protection areas are defined in 42 USC 300h-7(e).

According to the Wellhead Protection Plan – 2002 Update prepared by AH Environmental Consultants, the site is located within a wellhead protection area.

5. Deep Aquifers in the Coastal Plain Physiographic Region

(refer to page 19 of the guidelines) NOTE: This requirement only pertains to releases in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985.

As identified in the Geologic Map of North Carolina (North Carolina Department of Natural Resources and Community Development 1985), the subject site lies within the Coastal Plain physiographic province. Results of the groundwater analysis conducted on samples collected from the Type III monitoring wells indicates that the deeper portions of the aquifer have been impacted by petroleum constituents.

To some degree seven of the ten aquifers identified to date in the North Carolina Coastal Plain are typically present beneath portions of the MCB. In order of increasing depth, these aquifers include the Surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and upper and lower Cape Fear aquifers.

Aquifers below the surficial aquifer in the area typically include the Castle Hayne Aquifer, the Beaufort Aquifer, and the Peedee Aquifer, in order of increasing depth. Both the Beaufort and Peedee Aquifers contain saltwater in portions of the MCB and are not generally used for water supply. The Castle Hayne Aquifer contains freshwater and is the principal aquifer used in the area for water supply.

6. Subsurface Structures

Numerous underground utilities are present throughout the site. These utilities are located above the shallow groundwater table and are not considered potential receptors. Additionally, an active groundwater remediation system is currently in operation at the subject site.

7. Property Owners and Occupants

(see Table 6)

The subject site is owned and operated by the Commanding General – Marine Corps Base, Camp Lejeune.