

**WORK PLAN – RAPID REFUELER AND JP-5 SITES
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

Prepared for:

Department of the Navy, Atlantic Division



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Task Order 0046/Shaw Project No. 115122

August 2005

**WORK PLAN
FOR
RAPID REFUELER A-B TANKS and JP-5 LINE SITE
CAP IMPLEMENTATION
MARINE CORPS AIR STATION NEW RIVER
NORTH CAROLINA**

Prepared for:

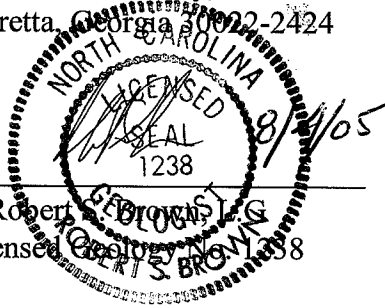
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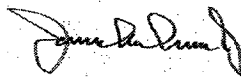
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TABLE OF CONTENTS

List of Acronyms.....	iii
1.0 INTRODUCTION.....	1-1
1.1 Background	1-1
1.2 Site Descriptions	1-1
1.2.1 Rapid Refueler	1-1
1.2.2 JP-5 Line Area	1-1
1.3 Objectives	1-2
1.4 Work Plan Organization	1-3
2.0 PRE-CONSTRUCTION ACTIVITIES	2-1
2.1 Permits	2-1
2.2 Procurement	2-1
2.3 Pre-Construction Meeting.....	2-1
3.0 PROPOSED ACTIVITIES	3-1
3.1 Rapid Refueler	3-1
3.2 JP-5 Line Area	3-2
3.3 Mobilization.....	3-2
3.4 Site Preparation.....	3-2
3.4.1 Erosion and Safety Controls	3-3
3.5 Recovery Trench Installation	3-4
3.6 Free Product Recovery and Groundwater Monitoring.....	3-4
3.6.1 Mobile Multi-Phase Extraction (MMPE)	3-5
3.6.2 Aggressive Fluid Vapor Recovery (AFVR) Events	3-5
3.6.3 Groundwater Monitoring Activities.....	3-5
4.0 TRANSPORTATION AND DISPOSAL	4-1
4.1 On-site Waste Management.....	4-1
4.1.1 Contaminated Groundwater and Free Phased Product	4-1
4.1.2 Soils	4-1
4.1.3 Concrete and debris.....	4-1
4.2 Transportation.....	4-2

4.3	Disposal.....	4-2
4.4	Disposal of PPE	4-2
4.5	Documentation.....	4-3
5.0	DOCUMENTATION, REPORTS, AND SUBMITTALS.....	5-1

FIGURES

- 1.1: Base Location Map
- 1.2: Rapid Refueler and JP-5 Location Map
- 3.1: Proposed Recovery Trench Layout
- 3.2: Typical Recovery Trench Cross Section
- 3.3: JP-5 Line Site Map

APPENDICES

- Appendix A - Site Specific Health and Safety Plan Addendum
- Appendix B - Sampling and Analysis Plan Addendum
- Appendix C - Program Quality Control Plan Addendum

LIST OF ACRONYMS

AFVR	Aggressive Fluid Vapor Recovery
CAP	Corrective Action Plan
CRZ	Contamination Reduction Zone
CY	Cubic Yard
DOT	Department of Transportation
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
EPH	Method for the Determination of Extractable Petroleum Hydrocarbons
EZ	Exclusion Zone
FID	Flame Ionization Detector
GRO	Gasoline Range Organics
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
NAVFAC	Naval Facilities Engineering Command, Atlantic Division
MADEP	Massachusetts Department of Environmental Protection
MCB	Marine Corps Base
MMPE	Mobile Multi-Phase Extraction
PPE	Personal Protection Equipment
POL	Petroleum Oil Lubricant
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
Shaw	Shaw Environmental, Inc.
T&D	Transportation and Disposal
TCLP	Toxic Characteristic Leachability Procedure
TPH	Total Petroleum Hydrocarbons
TPHC	Total Petroleum Hydrocarbon Contaminated
UST	Underground Storage Tank
VPH	Method for the Determination of Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 Background

Shaw Environmental Inc. (Shaw) is tasked by the Department of the Navy, Naval Facilities Engineering Command, Atlantic Division (NAVFAC) under Contract Number N62470-02-D-3260, Task Order 0046 to prepare this Work Plan for the Rapid Refueler CAP Implementation located at the Marine Corps Air Station, New River, in Onslow County North Carolina. The Air Station is associated with MCB Camp Lejeune, which is a training base for the United States Marine Corps. The Base covers approximately 236 square miles and includes 14 miles of coastline. MCB Camp Lejeune is bounded to the southeast by the Atlantic Ocean and the northeast by State Route 24. *Figure 1.1* presents the location of the Base.

1.2 Site Descriptions

1.2.1 Rapid Refueler

The Rapid Refueler site is located at the Marine Corps Air Station, New River and is responsible for providing aviation fuels to the flight line. It is located northeast of Instrument Runway 5-23. Fuel is transferred to the Rapid Refueler from the Campbell Street Fuel Farm, located at the Marine Corps Air Station, New River. The location of the Rapid Refueler is presented in *Figure 1.2*.

The Rapid Refueler has typically been identified by two sections, A-B associated with Building AS-498, and section C-D associated with structure AS-511. Several releases have been recorded from the system requiring repair and contamination removals. Recently Camp Lejeune employed a pipe leak detection contractor who identified suspect areas using a tracer based method, with one area within the A-B section identified as requiring immediate attention. The pipeline was repaired in January 2005, immediately following discovery of the leak.

1.2.2 JP-5 Line Area

The mission of the fuel transfer pipeline at MCAS New River is to transfer JP-5 fuel from the Campbell Street Bulk Fuel Farm to four Underground Storage Tanks at the rapid jet systems A & B and C & D. JP-5 fuel is transferred to the C & D rapid jet system via approximately 4,000 feet of singlewall fiberglass, underground piping. Its general routing is along White Street and then under the aircraft parking ramp MAT-7. Six valve pits with new block and

bleed valves are located along the fiberglass portion of this piping system. The transfer pipeline transitions to 8-inch stainless steel just prior to entering valve box # 6 and approximately 1,000 feet of 8 inch stainless steel transfer line continues to the A & B rapid jet UST systems. Leaks associated with the underground piping that transfers fuel from the bulk fuel farm to the Rapid Refueler system have been documented in the past. Monitoring wells in the vicinity of Building AS-4141 will be sampled during implementation of this Revised Corrective Action Plan. The location of the JP-5 Line Area is presented in *Figure 1.2*.

1.3 Objectives

The objective of this remedial action is to install a free product recovery system that will contain and recover product from the Rapid Refueler A-B Tanks area to meet the site cleanup goal of less than 0.25-inches of free phase product. In addition, AFVR events and groundwater monitoring will be completed at the JP-5 Line area.

Following removal of free product from the site, an evaluation of dissolved hydrocarbon contaminated groundwater will be completed to determine if additional remedial actions are required. This document presents Shaw's proposed technical approach to executing the projects primary objectives:

- Install two Type II monitoring wells, one Type III monitoring well, and five piezometers at the JP-5 Line Site.
- Install a recovery trench system at the Rapid Refueler Site that will ensure that any areas of increased permeability through which the free phase product may migrate will be intersected.
- Complete Mobile Multi-Phase Extraction (MMPE) events from the recovery trench on a monthly schedule for up to one year until free product has been removed from the site.
- Continue Aggressive Fluid Vapor Recovery (AFVR) events on monitoring wells in the vicinity that display the presence of free product.
- Complete semi-annual groundwater sample collection and analysis from select monitoring wells at each site to track free phase product and dissolved hydrocarbon contamination occurrence.
- Annual Report Preparation for both Sites

1.4 Work Plan Organization

The introduction provided in this section is followed by a summary of the Pre-construction Activities (Section 2.0), the proposed field activities (Section 3.0), the transportation and disposal of waste (Section 4.0), and the required reporting and submission of other documents (5.0). *Appendix A* presents the Health and Safety Plan Addendum and *Appendix B* provides the Sampling and Analysis Plan Addendum. A copy of the Construction Quality Control Plan is provided in *Appendix C*.

2.0 PRE-CONSTRUCTION ACTIVITIES

2.1 Permits

Shaw will prepare all appropriate permit applications for submission by the Base as required for the remedial system installation, and will coordinate with the state/federal agencies, Camp Lejeune EMD personnel, and NAVFAC as needed. This will consist primarily of utility clearance and Base construction permits.

Shaw will work with Base personnel to identify and mark all known utilities potentially within the work zone. Shaw will exercise caution while performing ground-intrusive work and will implement its Standard Operating Procedures for excavation near utilities. Techniques for minimizing damage to existing utilities will include the use of location devices and hand digging. A Base issued dig permit or excavation permit will be obtained from the Public Works Officer, Utilities Division prior to beginning intrusive work.

2.2 Procurement

Upon approval of this work plan, Shaw will complete procurement of equipment, materials, and subcontractors necessary for the execution of this removal action. Materials procurement will consist mainly of product recovery equipment, manifold material, and backfill stone

Specialty subcontractors will be procured to execute certain portions of the work. This will primarily include utility locating, analytical lab testing, drilling company to install monitoring wells, and material transportation and disposal services.

2.3 Pre-Construction Meeting

Shaw will participate in a pre-construction meeting at MCB Camp Lejeune with Base, NAVFAC, and other parties prior to mobilization to the site. Shaw representatives will include the Site Supervisor at a minimum. The purpose of this meeting will be to:

- Confirm roles and responsibilities of key personnel and flow of communications for project execution
- Review project schedule, work hours, sequence of tasks and key milestones
- Identify and discuss Base-specific issues relative to the upcoming mobilization and construction activities
- Obtain the necessary flight line security clearances for operations personnel

3.0 PROPOSED ACTIVITIES

3.1 Rapid Refueler

The following focused tasks have been identified to successfully complete the CAP implementation:

- Install an 8-inch diameter sump well in the vicinity of the center of the free phase product plume.
- Excavate four trenches extending radially from the central sump well into the delineated free phase product plume boundary.
- Each trench will be excavated to a depth of nine feet bls, approximately two feet below the groundwater surface.
- Install 4-inch diameter slotted pipe in the bottom of each excavation and backfill with coarse river washed gravel to roughly five feet bls.
- Install two 2-inch diameter wells in the trench (one at the leg midpoint and one at the end of the trench) prior to backfilling to facilitate free product recovery from the trench.
- Place a geotextile fabric on the coarse gravel prior to final backfill using the clean excavated soil and re-seeding the area.
- Excavate, stockpile and manage soils and debris on-site until T&D load-out.
- Complete semi-annual groundwater sample collection and analysis from select monitoring wells at the site to track free phase product and dissolved hydrocarbon contamination occurrence.
- Preparation of an annual report.

Following completion of trench installation activities Mobile Multi-Phase Extraction (MMPE) will be used to recover free phased product from the trench. A suction line installed in the recovery sump will be attached to a vacuum truck that will recover groundwater, free product and vapors from the trench system. This will lower the groundwater level within the influence of the recovery trench inducing free product and contaminated groundwater flow into the trench and recovery sump. Recovered groundwater and product will be transported to the Base groundwater treatment system for treatment and disposal. Additionally, both 2-inch diameter wells in each trench leg will be gauged and free product removed as necessary.

AFVR events will continue to be completed at monitoring wells exhibiting the presence of free product.

3.2 JP-5 Line Area

Field activities to be completed at the JP-5 Line during Revised CAP implementation are as follows:

- Installation of two Type II and one Type III 2-inch diameter PVC monitoring wells
- Installation of five piezometers to be gauged for the presence of free product. The piezometers will be installed in accordance with 15A NCAC 2C .0108.
- Weekly monitoring well gauging for the presence of free product at the site.
- Weekly completion of AFVR events from monitoring wells displaying the presence of free product.
- Semi-Annual groundwater sample collection from six monitoring wells (three new monitoring wells, OBG-6, W-2 and W-10). The samples will be analyzed for VOCs using EPA Method 8260B, PAHs using EPA Method 8270C, and lead using EPA Method 6010B
- Preparation of an Annual Report

3.3 Mobilization

Mobilization will consist of transporting personnel and equipment to and from the site. Prior to beginning work on site, training will be conducted to brief all site personnel on the Site Specific Health and Safety Plan (HASP) provided in *Appendix A*, construction drawings, operation procedures, and other relevant site-specific plans. Site hazards and conditions will be discussed and all personnel will acknowledge their understanding and compliance with the plan by signing an approved acceptance form.

3.4 Site Preparation

The first work activities at the site as part of this installation will be site setup. Site setup activities include:

- Survey of the work areas for underground utilities
- Last minute work coordination with personnel
- Establishing storage areas adjacent to the work site for construction materials
- Establishing stockpile areas for the temporary storage of excavated soils

- Establishing site controls

Site control zones will be field designated near the trenching activities. The zones will include an exclusion zone (EZ), a contamination reduction zone (CRZ), and a support zone. The zones will be delineated as needed by the site supervisor. These zones will be marked using construction fencing, barrier tape, and stakes. A brief description of each zone and its function follows:

- The EZ, or exclusion zone, includes the designated excavation, stockpile, and loadout areas. These areas are known to contain contaminated materials and have the highest potential for exposure to the contaminants by contact or inhalation; therefore, appropriate personal protective equipment (PPE) shall be used by anyone working in this zone. The boundary of the EZ is dynamic and should be expanded or reduced as needed during the project.
- The CRZ is composed of the personnel decontamination zone and the equipment decontamination area. This is the exit/entrance control zone or corridor through which all personnel and equipment must pass to enter or exit the EZ.
- The support zone consists of the temporary equipment laydown and material staging area, if needed. This is an uncontaminated area used to store materials.

3.4.1 Erosion and Safety Controls

The primary erosion control technique, if used, will be silt fencing and staked straw bales. Silt fence will be installed around the down-gradient perimeter of the excavation and stockpile areas. Safety fencing will be installed to keep unauthorized personnel from accidentally entering a working area. The fencing will be constructed using 3-foot-high, bright orange polyethylene-mesh.

An inspection of the erosion control devices will be performed after each rainfall, and daily during prolonged rainfall. Sediment deposits will be removed from the silt fence after each rainfall or when sediment reaches one-quarter of the barrier height. Damaged erosion control devices, as well as damaged areas around and beneath the devices, will be repaired immediately upon discovery. Upon completion of the project, erosion and sedimentation control devices will be removed and disposed of.

3.5 Recovery Trench Installation

As part of site preparation activities a depth to groundwater and free product survey in existing wells will be completed to verify depth to groundwater and extent of free product at the site. Following site preparation, trenching activities will begin using a tracked or rubber tired excavator. Overburden soils in particular will be screened with a Flame Ionization Detector (FID) and stockpiled separate (presumed clean) from soils contaminated with petroleum constituents. Shaw will also make the vacuum truck available should any large quantities of free product or groundwater require removal.

The initial dimension of each of the trenches is estimated to range from 40 to 70 feet long extending from the recovery sump. The trenches will be 9 feet deep by 3 feet wide. An estimated 150 tons of TPH contaminated soil that will require off-site disposal is expected to be generated (i.e., the bottom four feet of the excavation). All contaminated excavated soil will be transferred to the stockpile/staging area for management until final disposal. The stockpiled soil will be staged on plastic and covered with plastic at the end of each work day. The clean excavated soil (i.e., upper five feet of soil) will be staged on plastic and covered for use as backfill material for the trench.

The 8-inch diameter vertical sump will be installed in the center of the trench system and completed with a concrete pad and protective bollards. The 4-inch diameter slotted HDPE pipe will be placed in the bottom of each trench leg. In addition, two 2-inch diameter piezometers will be installed at the midpoint and end of each trench leg prior to backfilling activities. The piezometers will be used to facilitate free product recovery from the trench. The trench will then be backfilled with a #57 washed granite stone (or approved equivalent) to a depth of five feet bls. To prevent sediment infiltration into the backfilled stone, a layer of non-woven geotextile will be placed on top of the washed stone. The remainder of the trench will be backfilled to land surface with the upper five feet of "clean" soil removed during trench excavation activities. The area will then be seeded with grass. The location as well as a typical cross section of the recovery trench system are illustrated in *Figures 3.1* and *3.2* respectively.

3.6 Free Product Recovery and Groundwater Monitoring

The following sections discuss implementation of the free product recovery and groundwater monitoring activities. Recovered liquids (free product and groundwater) will be transported and disposed in an on-Base water treatment system.

3.6.1 Mobile Multi-Phase Extraction (MMPE)

Following installation of the recovery trench, MMPE events will be completed on a monthly basis for one year. Each event is expected to last approximately 12 hours, however, the actual operating time will be dependant on the amount of free product recovered and/or the storage capacity of the vacuum truck. The MMPE will be completed by attaching a suction line installed in the recovery sump to a vacuum truck that will extract groundwater, free product and vapors from the trench system. This will lower the groundwater level within the area of influence of the trench inducing free product and contaminated groundwater to flow into the trench. The combination of groundwater level drawdown and the vacuum in the subsurface should enhance free product recovery.

Monitoring activities that will be completed as part of each MMPE event are as follows:

- Prior to each MMPE event, monitoring wells in the vicinity of the trench (i.e., USTAS497-MW01 through USTAS497-MW06, RR-11, RR-12 and RR-17) will be gauged for depth to groundwater and product thickness,
- During each MMPE event the following parameters will be measured and recorded
 - Vacuum applied to the recovery sump
 - Exhaust emissions
 - Amount of groundwater and free product recovered
 - Disposal volume of fluids disposed in the on-Base groundwater treatment system
- At the conclusion of each MMPE event, the above mentioned monitoring wells will be gauged for depth to groundwater and product thickness on a weekly basis.

3.6.2 Aggressive Fluid Vapor Recovery (AFVR) Events

In addition, AFVR events will continue to be completed at monitoring wells that display the presence of free phased product.

3.6.3 Groundwater Monitoring Activities

Semi-annual groundwater samples will be collected from monitoring wells that do not display the presence of free product. Approximately 47 monitoring wells are anticipated to be sampled at the Rapid Refueler site, and six monitoring wells are anticipated to be sampled at

the nearby JP-5 Line site. Monitoring wells displaying the presence of free product will not be sampled. *Figure 3.3* presents a site map of the JP-5 Line Area.

The samples from the Rapid Refueler will be analyzed for VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C plus 10 highest peaks, MADEP-VPH and MADEP-EPH. The samples from the JP-5 Line area will be analyzed for VOCs using EPA Method 8260B, PAHs using EPA Method 8270C, and lead using Method 6010B. In addition, eight piezometers will be gauged for the presence of free product for at least six months following remedial system implementation.

4.0 *TRANSPORTATION AND DISPOSAL*

This section deals with the offsite transportation and disposal of project generated waste streams. Currently, only contaminated soil (i.e., no construction debris) is expected to require off-site disposal from the work area. Based on previous work experience at the site, it is probable the excavated soil will require off site disposal as TPHC contaminated waste.

Most importantly, because of safety concerns with stockpiles of soil or debris along the flight line, all excavated materials will be transferred to a location specified by the Base EMD for proper stockpile management.

4.1 On-site Waste Management

4.1.1 *Contaminated Groundwater and Free Phased Product*

The Navy proposes to use a nearby existing Oil/Water Separator (OWS) to dispose of the contaminated groundwater and product recovered during the groundwater sampling events, MMPE and AFVR events.

4.1.2 *Soils*

As indicated, all excavated soils will be stockpiled and managed at a location specified by the Base EMD until they are sampled for disposal characterization analysis and transported to an appropriately permitted facility for final disposal. Based on Shaw experience with TPHC soil disposal history at the site, the soil will require off-site disposal. The excavated soil will be placed into 200 cubic yard (CY) stockpiles. One disposal sample per 200 CY of soil is required by the current NCDENR guidance and State permitted TPHC waste recycling facilities.

Shaw always employs best construction practices when managing excavated soils on site. If the designated stockpile area is on native soil (not paved), a non-pervious material such as polyethylene will be placed on the ground surface to place the excavated soils onto. Stockpiles will be covered with a like material and secured against wind at the end of each work day and during all non working hours.

4.1.3 *Concrete and debris*

Any concrete or debris removed, if any, will be staged separately from soils while awaiting disposal. Due to the low potential for contamination or contamination run-off, concrete and

debris are not generally covered. Debris will be sampled for disposal analysis and transported to a proper facility as described above.

4.2 Transportation

Following all necessary testing and obtaining analytical results, soils and/or debris will be loaded into the appropriate transport vehicles. Soil will be loaded onto trucks using a front-end loader. Concrete or debris loading will occur based on the size of the debris, either a front-end loader or an excavator. Transport vehicles will be guided to the designated loading location by the Shaw crew.

After loading the transport vehicle, Shaw and the driver will complete the necessary shipping papers as discussed in section 4.5. Any applicable DOT and/or RCRA placarding of the vehicle will then occur as well as a walk around inspection of the transport vehicle. Shaw reserves the right to reject any transport vehicle without proper permits, licenses, or appears to be unsuitable for transport according to DOT regulations

After loading of waste onto an approved transport vehicle, the truck will be weighed at a certified scales prior to over the road transport. It is expected that portable scales will be used to weigh outgoing trucks on this project.

4.3 Disposal

The following possible disposal scenarios are anticipated for the project:

- Soil or debris with less than 1 ppm of TPHC (via TPH GRO/DRO analysis) and non-hazardous by RCRA TCLP and characterization analysis will be disposed at the Base landfill
- Soil or debris with more than 1 ppm of TPHC and non-hazardous by RCRA TCLP and characterization analysis will be disposed at a State permitted landfill
- Contaminated groundwater and product recovered during the groundwater sampling, MMPE and AFVR events will be disposed in a nearby existing Oil/Water Separator (OWS) operated by the Base.

4.4 Disposal of PPE

PPE will be stored in plastic trash bags and placed in onsite trash bins as non-hazardous waste.

4.5 Documentation

All applicable transport documentation will be completed by Shaw and the transporter before the vehicle departs the site. For non-hazardous wastes this will consist of the Bill-of-Lading document and/or a State non-hazardous manifest. For hazardous wastes, a State or Uniform Hazardous Waste Manifest and Land Disposal Restriction form will be prepared.

5.0 DOCUMENTATION, REPORTS, AND SUBMITTALS

All field activities will be recorded in a field logbook. Entries will be made in real time and in permanent ink and will be sufficient to allow complete reconstruction of field activities in an accurate manner. A variety of field forms will be used to record data in the field, and these forms will be considered extensions of the field logbook and will be kept in the project file. Depending on daily field activities, forms will include a Field Activity Data Log, Chain of Custody Record, Sample Collection Log, Sample Tracking Form, Equipment Calibration Log, Project Photographic Record Index, Variance Report, and Daily Construction QC Report. Copies of logbooks and field forms will be maintained in the project files and included in reports submitted to NAVFAC.

A final report documenting the extraction trench installation and JP-5 Line Area well installation will be prepared. Groundwater monitoring reports will also be prepared and submitted on an annual basis. Any other submittals required at this time will be provided to NAVFAC as requested.

Tables

TABLE 1
Sampling and Analysis Summary

Sample Location	Sample Point	Matrix	Sampling Frequency	Approx Sample No	Sampling Method	Sampling Equipment	TAT	QC Level	Required Analysis	Analytical Method	Holding Time	Preservatives	Containers
Rapid Refueler	Monitoring Wells	Ground water	Semi-Annual	47 + 5 DUP + 3 MS/MSD x 2 events	Grab	Bailer/Pump	14 days	Project Standard	Extractable Petroleum Hydrocarbons	MADEP	7 / 40 days	Cool to 4°C	2x1L Amber
									Volatile Petroleum Hydrocarbons	MADEP	7 / 40 days	Cool to 4°C pH <2 HCl	3x40mL vials
									Volatile Organic Compounds	5030B/8260B	14 days	Cool to 4°C pH <2 HCl	3x40mL vials
									Semi-volatile Organic Compounds	8270C	7 / 40 days	Cool to 4°C	2x1L Amber
JP-5 Line	Monitoring Wells	Ground water	Semi-Annual	9 + 1 DUP + 1 MS/MSD x 2 events	Grab	Bailer/Pump	14 days	Project Standard	Volatile Organic Compounds	5030B/8260B	14 days	Cool to 4°C pH <2 HCl	3x40mL vials
									Semi-volatile Organic Compounds	8270C	7 / 40 days	Cool to 4°C	2x1L Amber
									ICP Lead	6010B	180 days	pH <2 HNO ₃	1x500mL HDPE
Disposal	Stockpiles	Soil & Debris	1 every 200 cubic yards	2	Composite	SS Spoon SS Bowl	14 days	Project Standard	Diesel Range Organics	8015B	14 / 40 days	Cool to 4°C	1x4oz Jar
									Gasoline Range Organics	5035/8015B	14 / 40 days		3 EnCore Samplers
									TCLP Volatiles	1311/8260B	14 / 14 days		1x4oz Glass Jar
									TCLP Semi-Volatiles	1311/8270C	14 / 14 / 40 days		2x16oz Glass Jar
									TCLP Pesticides	1311/8081A	14 / 14 / 40 days		
									TCLP Herbicides	1311/8151A	14 / 14 / 40 days		
									TCLP Metals	1311/6010B/7470A	14 / 180 days		1x4oz Jar
									pH	9045C	None		1x8oz Jar
									Ignitability	1010	None		
									Total Cyanide	9010B	None		
									Total Sulfide	9030	None		

TABLE B-2
Project Quality Control Objectives

Method No	Analyte / Component	Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
		Water	Water	Water	Water	Water	Water
TOTAL ORGANICS BY GC		ug/L	%	%	%	%	%
MADEP	C5-C18	5	30-170	<30	50-150	<50	95
MADEP	C9-C18	5	30-170	<30	50-150	<50	95
MADEP	C19-C36	10	30-170	<30	50-150	<50	95
MADEP	C9-C22	5	30-170	<30	50-150	<50	95
TCL VOLATILES BY GC/MS		ug/L	%	%	%	%	%
8260B	1,1,1,2-Tetrachloroethane	2.5	60-140	<30	62-108	<50	95
8260B	1,1,1-Trichloroethane	4	60-140	<30	65-135	<50	95
8260B	1,1,2,2-Tetrachloroethane	2	60-140	<30	64-135	<50	95
8260B	1,1,2-Trichloroethane	5	60-140	<30	65-135	<50	95
8260B	1,1-Dichloroethane	2	60-140	<30	62-135	<50	95
8260B	1,1-Dichloroethene	6	60-140	<30	65-135	<50	95
8260B	1,1-Dichloropropane	5	60-140	<30	65-135	<50	95
8260B	1,2,3-Trichlorobenzene	1.5	60-140	<30	65-147	<50	95
8260B	1,2,3-Trichloropropane	16	60-140	<30	65-135	<50	95
8260B	1,2,4-Trichlorobenzene	2	60-140	<30	65-145	<50	95
8260B	1,2,4-Trimethylbenzene	6.5	60-140	<30	65-135	<50	95
8260B	1,2-Dichloroethane	3	60-140	<30	58-137	<50	95
8260B	1,2-Dichlorobenzene	1.5	60-140	<30	65-135	<50	95
8260B	1,2-Dibromo-3-chloropropane	13	60-140	<30	49-135	<50	95
8260B	1,2-Dichloropropane	2	60-140	<30	60-135	<50	95
8260B	1,2-Ethylene Dibromide	3	60-140	<30	65-135	<50	95
8260B	1,3,5-Trimethylbenzene	2.5	60-140	<30	62-135	<50	95
8260B	1,3-Dichlorobenzene	6	60-140	<30	65-135	<50	95
8260B	1,3-Dichloropropane	2	60-140	<30	65-135	<50	95
8260B	1,4-Dichlorobenzene	1.5	60-140	<30	65-135	<50	95
8260B	1-Chlorohexane	2.5	60-140	<30	65-135	<50	95
8260B	2,2-Dichloropropane	17.5	60-140	<30	65-135	<50	95
8260B	2-Chlorotoluene	2	60-140	<30	63-135	<50	95
8260B	4-Chlorotoluene	3	60-140	<30	64-135	<50	95
8260B	Benzene	2	60-140	<30	65-135	<50	95
8260B	Bromobenzene	1.5	60-140	<30	65-135	<50	95
TCL VOLATILES BY GC/MS		ug/L	%	%	%	%	%

TABLE B-2
Project Quality Control Objectives

		Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
Method No	Analyte / Component	Water	Water	Water	Water	Water	Water
8260B	Bromochloromethane	2	60-140	<30	63-135	<50	95
8260B	Bromodichloromethane	4	60-140	<30	65-135	<50	95
8260B	Bromoform	6	60-140	<30	65-135	<50	95
8260B	Bromomethane	5.5	60-140	<30	62-135	<50	95
8260B	Carbon Tetrachloride	10.5	60-140	<30	52-135	<50	95
8260B	Chlorobenzene	2	60-140	<30	65-135	<50	95
8260B	Chloroethane	5	60-140	<30	55-135	<50	95
8260B	Chloroform	1.5	60-140	<30	64-135	<50	95
8260B	Chloromethane	6.5	60-140	<30	65-135	<50	95
8260B	Cis-1,2-Dichloroethene	6	60-140	<30	65-135	<50	95
8260B	Cis-1,3-Dichloropropene	5	60-140	<30	64-135	<50	95
8260B	Dibromochloromethane	2.5	60-140	<30	63-135	<50	95
8260B	Dibromomethane	12	60-140	<30	59-137	<50	95
8260B	Dichlorodifluoromethane	5	60-140	<30	65-135	<50	95
8260B	Ethylbenzene	3	60-140	<30	65-135	<50	95
8260B	Hexachlorobutadiene	5.5	60-140	<30	65-135	<50	95
8260B	Isopropylbenzene	2.5	60-140	<30	65-135	<50	95
8260B	m-Xylene	2.5	60-140	<30	65-135	<50	95
8260B	Methylene Chloride	1.5	60-140	<30	65-135	<50	95
8260B	n-Butylbenzene	5.5	60-140	<30	65-135	<50	95
8260B	n-Propylbenzene	2	60-140	<30	65-135	<50	95
8260B	Naphthalene	2	60-140	<30	65-135	<50	95
8260B	o-Xylene	5.5	60-140	<30	65-135	<50	95
8260B	p-Isopropyltoluene	6	60-140	<30	65-135	<50	95
8260B	p-Xylene	6.5	60-140	<30	65-135	<50	95
8260B	Sec-Butylbenzene	6.5	60-140	<30	65-135	<50	95
8260B	Styrene	2	60-140	<30	65-135	<50	95
8260B	Trichloroethylene	5	60-140	<30	61-135	<50	95
8260B	Tert-Butylbenzene	7	60-140	<30	65-135	<50	95
8260B	Tetrachloroethylene	7	60-140	<30	61-135	<50	95
TCL VOLATILES BY GC/MS		ug/L	%	%	%	%	%
8260B	Toluene	5.5	60-140	<30	64-135	<50	95

TABLE B-2
Project Quality Control Objectives

Method No	Analyte / Component	Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
		Water	Water	Water	Water	Water	Water
8260B	Trans-1,2-Dichloroethene	3	60-140	<30	65-135	<50	95
8260B	Trans-1,3-Dichloropropene	5	60-140	<30	56-135	<50	95
8260B	Trichlorofluoromethane	4	60-140	<30	57-135	<50	95
8260B	Vinyl Chloride	5.5	60-140	<30	36-144	<50	95
8260B	Dibromofluoromethane (surr)		75-125				
8260B	Toluene-d8 (surr)		75-125				
8260B	4-Bromofluorobenzene (surr)		75-1225				
8260B	1,2-Dichloroethane-d4 (surr)		62-139				
SEMI-VOLATILES BY GC/MS		ug/L	%	%	%	%	%
8270C	1,2,4-Trichlorobenzene	10	60-140	<30	44-142	<50	95
8270C	1,2-Dichlorobenzene	10	60-140	<30	42-155	<50	95
8270C	1,3-Dichlorobenzene	10	60-140	<30	36-125	<50	95
8270C	1,4-Dichlorobenzene	10	60-140	<30	30-125	<50	95
8270C	2,4-Dinitrotoluene	10	60-140	<30	39-139	<50	95
8270C	2,6-Dinitrotoluene	10	60-140	<30	51-125	<50	95
8270C	2-Chloronaphthalene	10	60-140	<30	60-125	<50	95
8270C	2-Methylnaphthalene	10	60-140	<30	41-125	<50	95
8270C	2-Nitroaniline	50	60-140	<30	50-125	<50	95
8270C	3,3'-Dichlorobenzidine	20	60-140	<30	29-175	<50	95
8270C	3-Nitroaniline	50	60-140	<30	51-125	<50	95
8270C	4-Bromophenyl-phenyl ether	10	60-140	<30	53-127	<50	95
8270C	4-Chloroaniline	20	60-140	<30	45-136	<50	95
8270C	4-Chlorophenyl-phenyl ether	10	60-140	<30	51-132	<50	95
8270C	4-Nitroaniline	50	60-140	<30	40-143	<50	95
8270C	Acenaphthylene	10	60-140	<30	47-125	<50	95
8270C	Acenaphthene	10	60-140	<30	49-124	<50	95
8270C	Anthracene	10	60-140	<30	45-165	<50	95
8270C	Benzo (a) anthracene	10	60-140	<30	51-133	<50	95
8270C	Benzo (a) pyrene	10	60-140	<30	41-125	<50	95
SEMI-VOLATILES BY GC/MS		ug/L	%	%	%	%	%
8270C	Benzo (b) fluoranthene	10	60-140	<30	37-125	<50	95
8270C	Benzo (g,h,i) perylene	10	60-140	<30	34-149	<50	95

TABLE B-2
Project Quality Control Objectives

		Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
Method No	Analyte / Component	Water	Water	Water	Water	Water	Water
8270C	Benzyl alcohol	20	60-140	<30	35-125	<50	95
8270C	Bis (2-chloroethoxy) methane	10	60-140	<30	49-125	<50	95
8270C	Bis (2-chloroethyl) ether	10	60-140	<30	44-125	<50	95
8270C	Bis (2-chloroisopropyl) ether	10	60-140	<30	36-166	<50	95
8270C	Bis (2-ethylhexyl) phthalate	10	60-140	<30	33-129	<50	95
8270C	Butyl benzyl phthalate	10	60-140	<30	26-125	<50	95
8270C	Chrysene	10	60-140	<30	55-133	<50	95
8270C	Di-n-butyl phthalate	10	60-140	<30	34-126	<50	95
8270C	Di-n-octyl phthalate	10	60-140	<30	38-127	<50	95
8270C	Dibenzo (a,h) anthracene	10	60-140	<30	50-125	<50	95
8270C	Dibenzofuran	10	60-140	<30	52-125	<50	95
8270C	Diethyl phthalate	10	60-140	<30	37-125	<50	95
8270C	Dimethyl phthalate	10	60-140	<30	25-175	<50	95
8270C	Fluoranthene	10	60-140	<30	47-125	<50	95
8270C	Fluorene	10	60-140	<30	48-139	<50	95
8270C	Hexachlorobenzene	10	60-140	<30	46-133	<50	95
8270C	Hexachlorobutadiene	10	60-140	<30	25-125	<50	95
8270C	Hexachlorocyclopentadiene	10	60-140	<30	41-125	<50	95
8270C	Hexachloroethane	10	60-140	<30	25-153	<50	95
8270C	Indeno (1,2,3-c,d) pyrene	10	60-140	<30	27-160	<50	95
8270C	Isophorone	10	60-140	<30	26-175	<50	95
8270C	N-Nitrosodi-n-propylamine	10	60-140	<30	37-125	<50	95
8270C	N-Nitrosodiphenylamine	10	60-140	<30	27-125	<50	95
8270C	Naphthalene	10	60-140	<30	50-125	<50	95
8270C	Nitrobenzene	10	60-140	<30	46-133	<50	95
8270C	Phenanthrene	10	60-140	<30	54-125	<50	95
8270C	Pyrene	10	60-140	<30	47-136	<50	95
8270C	2,4,5-Trichlorophenol	50	60-140	<30	25-175	<50	95
SEMI-VOLATILES BY GC/MS		ug/L	%	%	%	%	%
8270C	2,4,6-Trichlorophenol	10	60-140	<30	39-128	<50	95
8270C	2,4-Dichlorophenol	10	60-140	<30	46-125	<50	95
8270C	2,4-Dimethylphenol	10	60-140	<30	45-139	<50	95

TABLE 2-2
Project Quality Control Objectives

Method No	Analyte / Component	Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
		Water	Water	Water	Water	Water	Water
8270C	2,4-Dinitrophenol	50	60-140	<30	30-151	<50	95
8270C	2-Chlorophenol	10	60-140	<30	41-125	<50	95
8270C	2-Methylphenol	10	60-140	<30	25-125	<50	95
8270C	2-Nitrophenol	10	60-140	<30	44-125	<50	95
8270C	4,6-Dinitro-2-methyl phenol	50	60-140	<30	26-134	<50	95
8270C	4-Chloro-3-methyl phenol	20	60-140	<30	44-125	<50	95
8270C	4-Methylphenol	10	60-140	<30	33-125	<50	95
8270C	4-Nitrophenol	50	60-140	<30	25-131	<50	95
8270C	Benzoic acid	50	60-140	<30	25-162	<50	95
8270C	Pentachlorophenol	50	60-140	<30	28-136	<50	95
8270C	Phenol	10	60-140	<30	25-125	<50	95
8270C	3-Methylphenol	10	60-140	<30	25-125	<50	95
8270C	Benzo (k) fluoranthene	10	60-140	<30	37-123	<50	95
8270C	Carbazole	10	60-140	<30	34-132	<50	95
8270C	p-Chloroaniline	10	60-140	<30	56-107	<50	95
8270C	2,4,6-Tribromophenol		25-134				
8270C	2-Fluorobiphenyl		43-125				
8270C	2-Fluorophenol		25-125				
8270C	Nitrobenzene-d5		32-125				
8270C	Phenol-d5		25-125				
8270C	Terphenyl-d14		42-126				

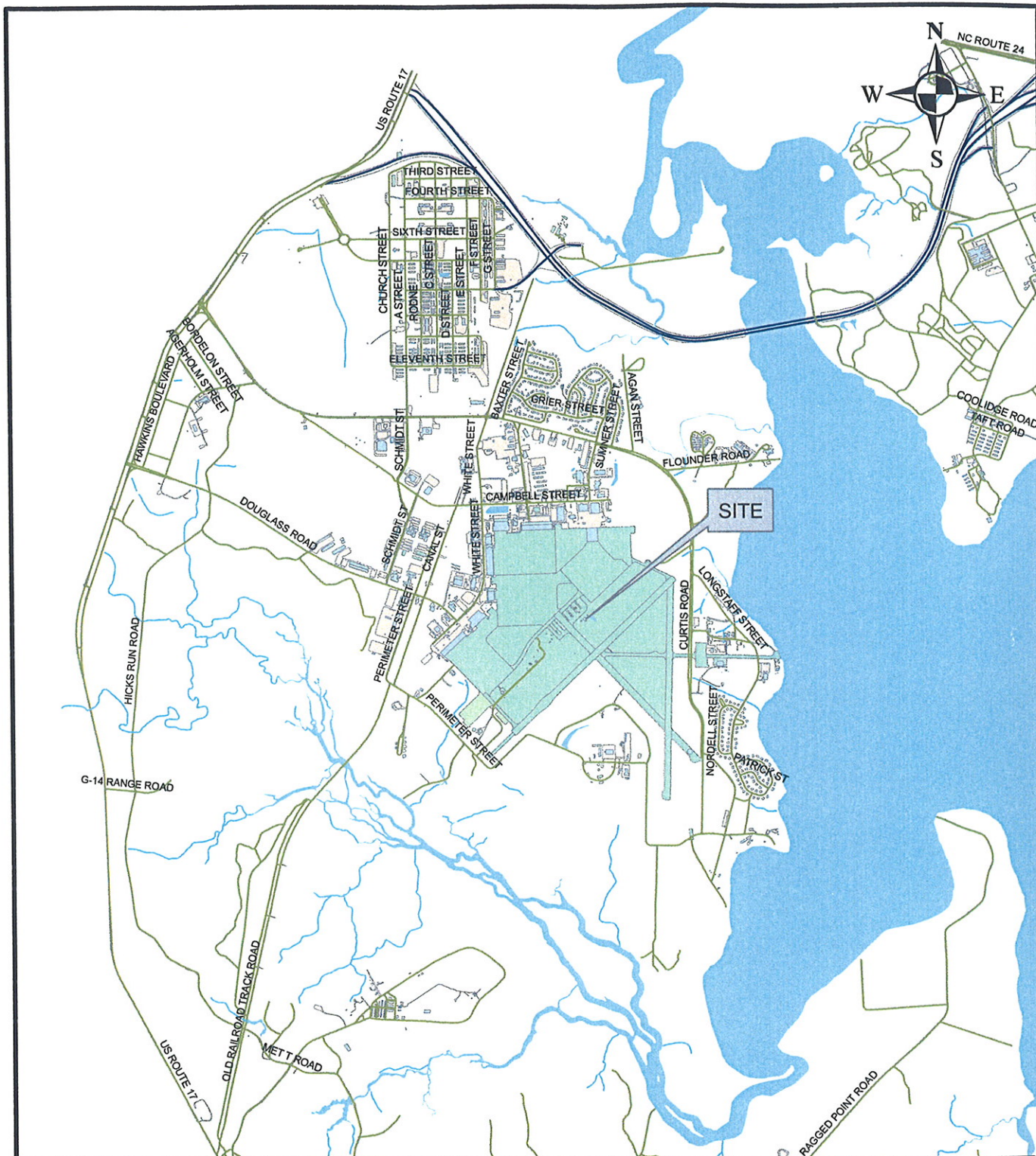
TABLE B-2
Project Quality Control Objectives

Method No	Analyte / Component	Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
		Soil	Soil	Soil	Soil	Soil	Soil
	CHARACTERISTICS	(mg/kg)	(%)	(%)	(%)	(%)	(%)
8015B	Diesel Range Organics	10	30-170	<50	61-143	<75	90
8015B	Gasoline Range Organics	1	30-170	<50	67-136	<75	90
9030	Total Sulfide	50	N/A	<50	N/A	<50	90
9010B	Total Cyanide	25	N/A	<50	N/A	<50	90
1010	Ignitability (Pensky Martens)	100°F	N/A	<50	N/A	<50	90
9040	pH (Corrosivity)	N/A	N/A	<50	N/A	<50	90
	TCLP VOLATILES	(mg/L)	(%)	(%)	(%)	(%)	(%)
8260B	1,1-Dichloroethylene	0.1	50-150	<50	70-130	<50	90
8260B	1,2-Dichloroethane	0.1	50-150	<50	70-130	<50	90
8260B	Benzene	0.1	50-150	<50	70-130	<50	90
8260B	Carbon Tetrachloride	0.1	50-150	<50	70-130	<50	90
8260B	Chlorobenzene	20	50-150	<50	70-130	<50	90
8260B	Chloroform	1	50-150	<50	70-130	<50	90
8260B	Methyl Ethyl Ketone	20	50-150	<50	70-130	<50	90
8260B	Tetrachloroethylene	0.7	50-150	<50	70-130	<50	90
8260B	Trichloroethylene	0.1	50-150	<50	70-130	<50	90
8260B	Vinyl Chloride	0.05	50-150	<50	70-130	<50	90
	TCLP SEMI-VOLATILES	(mg/L)	(%)	(%)	(%)	(%)	(%)
8270C	1,4-Dichlorobenzene	1	50-150	<50	70-130	<50	90
8270C	2,4,5-Trichlorophenol	80	50-150	<50	70-130	<50	90
8270C	2,4,6-Trichlorophenol	0.4	50-150	<50	70-130	<50	90
8270C	2,4-Dinitrotoluene	0.02	50-150	<50	70-130	<50	90
8270C	Cresol	40	50-150	<50	70-130	<50	90
8270C	Hexachlorobenzene	0.02	50-150	<50	70-130	<50	90
8270C	Hexachloroethane	0.5	50-150	<50	70-130	<50	90
8270C	Hexachlorobutadiene	0.4	50-150	<50	70-130	<50	90
8270C	Nitrobenzene	0.4	50-150	<50	70-130	<50	90
8270C	Pentachlorophenol	80	50-150	<50	70-130	<50	90
8270C	Pyridine	1	50-150	<50	70-130	<50	90

TABLE 2
Project Quality Control Objectives

Method No	Analyte / Component	Minimum PQL	Accuracy Limits MS/MSD	Precision Limits MS/MSD	Accuracy Limits LCS	Precision Limits Field DUP	Completeness Limits
		Soil	Soil	Soil	Soil	Soil	Soil
	TCLP PESTICIDES	(mg/L)	(%)	(%)	(%)	(%)	(%)
8081A	Endrin	0.004	50-150	<50	70-130	<50	90
8081A	Lindane	0.08	50-150	<50	70-130	<50	90
8081A	Methoxychlor	1	50-150	<50	70-130	<50	90
8081A	Toxaphene	0.1	50-150	<50	70-130	<50	90
8081A	Chlordane	0.005	50-150	<50	70-130	<50	90
8081A	Heptachlor and its Hydroxide	0.001	50-150	<50	70-130	<50	90
	TCLP HERBICIDES	(mg/L)	(%)	(%)	(%)	(%)	(%)
8151A	2,4-D	2	50-150	<50	70-130	<50	90
8151A	2,4,5-TP	0.2	50-150	<50	70-130	<50	90
	TCLP METALS	(mg/L)	(%)	(%)	(%)	(%)	(%)
6010B	Arsenic	1	50-150	<50	70-130	<50	90
6010B	Barium	20	50-150	<50	70-130	<50	90
6010B	Cadmium	0.2	50-150	<50	70-130	<50	90
6010B	Chromium	1	50-150	<50	70-130	<50	90
6010B	Lead	1	50-150	<50	70-130	<50	90
7470A	Mercury	0.04	50-150	<50	70-130	<50	90
6010B	Selenium	0.2	50-150	<50	70-130	<50	90
6010B	Silver	1	50-150	<50	70-130	<50	90

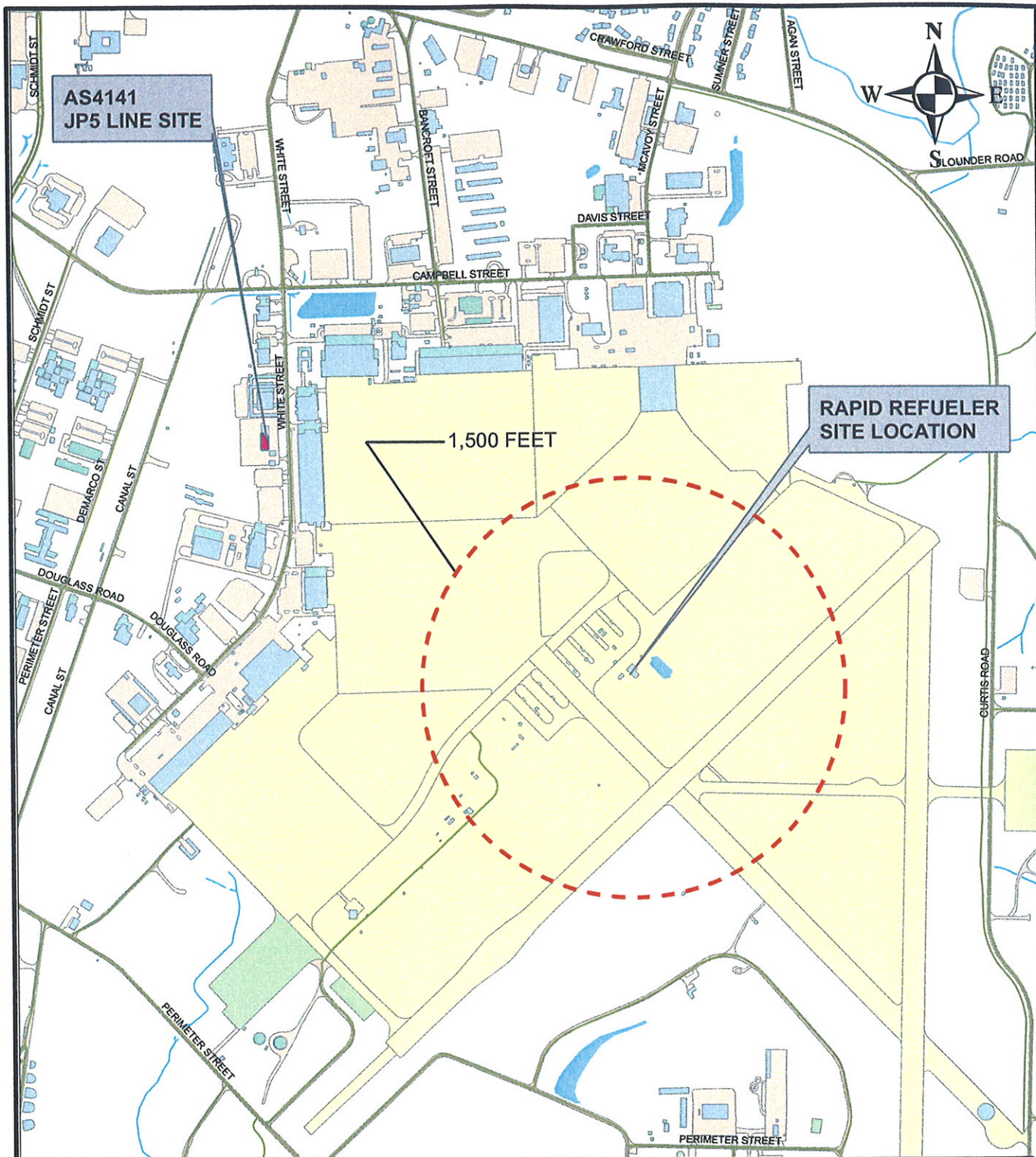
FIGURES



 **Shaw**™ Shaw Environmental, Inc.

**FIGURE 1.1
VICINITY MAP**

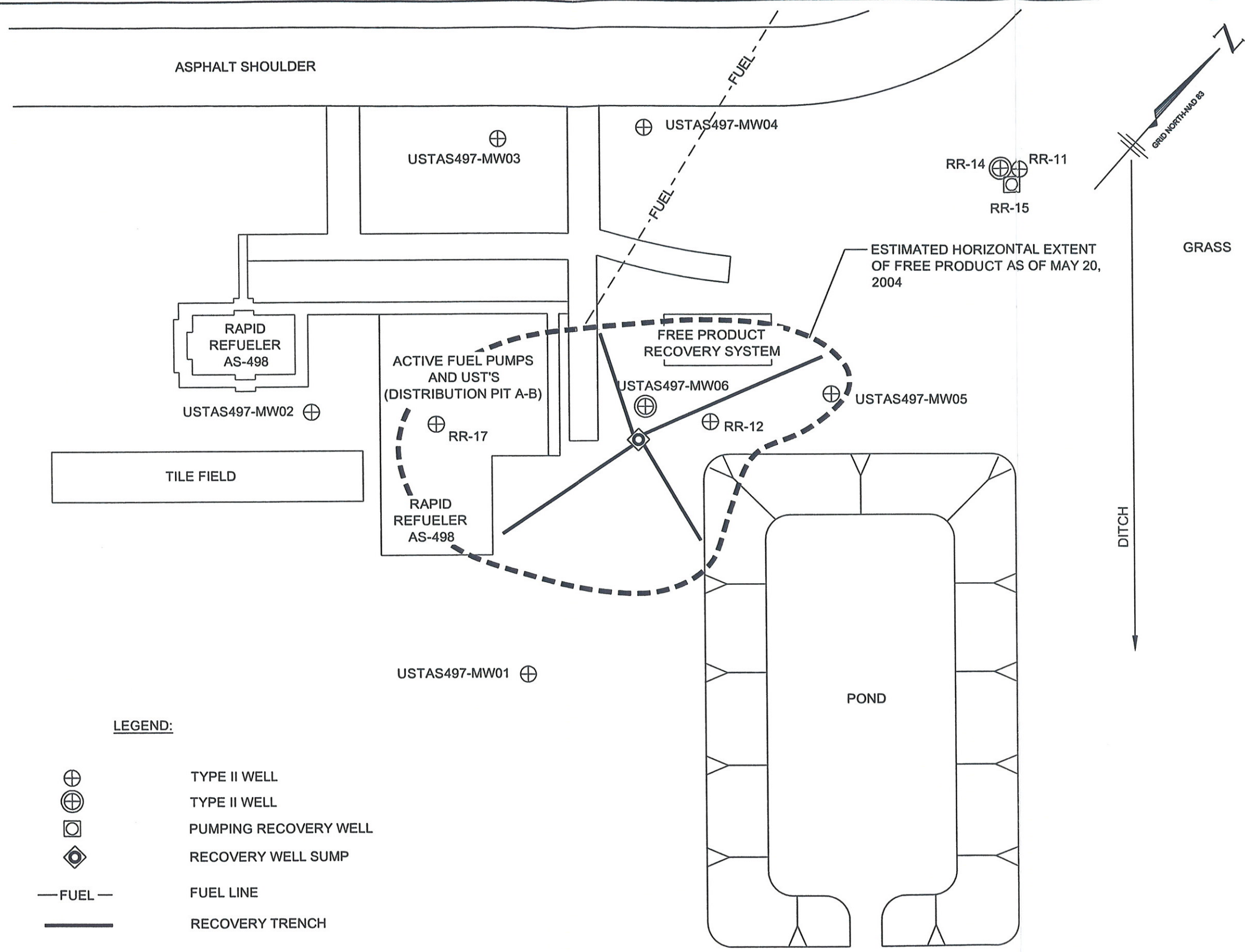
**RAPID REFUELER A-B TANKS CAP IMPLEMENTATION
MARINE CORPS AIR STATION
CAMP LEJEUNE, NORTH CAROLINA**



0 270 540 1,080 1,620 2,160 Feet

 Shaw™ Shaw Environmental, Inc.

**FIGURE 1.2
SITE LOCATION MAP**
RAPID REFUELER AND JP5 LINE CAP IMPLEMENTATION
MARINE CORPS AIR STATION, NORTH CAROLINA

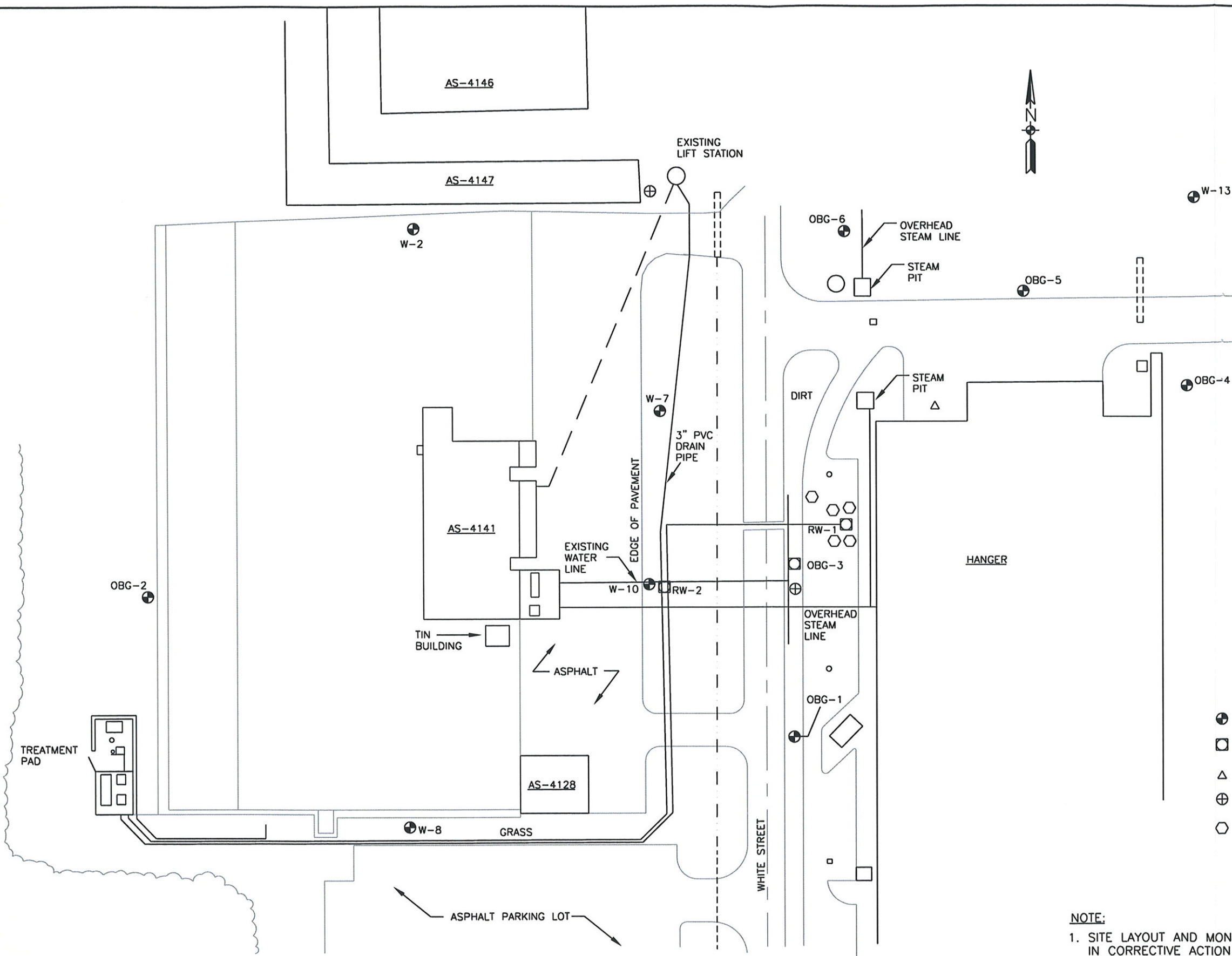


LEGEND:

-  TYPE II WELL
-  TYPE II WELL
-  PUMPING RECOVERY WELL
-  RECOVERY WELL SUMP
-  FUEL LINE
-  RECOVERY TRENCH

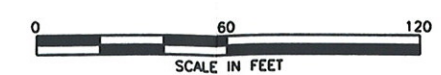
REFERENCE:
 BASE MAP INFORMATION WAS OBTAINED FROM DRAWING BY CATLIN ENGINEERS AND
 SCIENTISTS TITLED: PROPOSED LAYOUT OF RECOVERY SUMP WELL AND TRENCHES
 FIGURE 10 AND DATED JULY 2004.

 Shaw Environmental, Inc.		PROJECT NO. 109927	
		CHECKED BY: RBK	APPROVED BY: JEL
DESIGNED BY: RBK		DRAWN BY: JEL	
REVISIONS		APPROVED BY: RBK	
DESCRIPTION/ISSUE		DATE	
BY		CHKD	
REV		APRVD	
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NORFOLK, VIRGINIA NAVAL STATION FIGURE 3.1 PROPOSED LAYOUT OF RECOVERY SUMP WELL AND TRENCHES			
SCALE: AS SHOWN		SIZE: D	
DELIVERY ORDER NO.			
CONSTR. CONTRACT NO. N62470-02-D-3260			
NAVFAC DRAWING NO.			
SHEET I.D. 3.1			



- LEGEND**
- ⊕ TYPE II MONITORING WELL
 - RECOVERY WELL
 - △ PROPOSED TYPE III MONITORING WELL
 - ⊕ PROPOSED TYPE II MONITORING WELL
 - PROPOSED PIEZOMETER

NOTE:
 1. SITE LAYOUT AND MONITORING WELL LOCATIONS DETERMINED IN CORRECTIVE ACTION PLAN PREPARED BY O'BRIEN & GERE ENGINEERS, DATED JUNE 1991.



REFERENCE: J. A. JONES MONITORING REPORT.

SITE MAP

DEPARTMENT OF THE NAVY NAVAL STATION		NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION		NORFOLK, VIRGINIA	
DESIGNED BY RBK		CHECKED BY RBK		PROJECT NO. 845823	
DRAWN BY JEL		APPROVED BY		SHAW ENVIRONMENTAL, INC.	
SHEET I.D. 3.3		REV DATE		BY CHK'D APP'VD	
				DESCRIPTION/ISSUE REVISIONS	

APPENDIX A

Site Specific Health and Safety Plan Addendum

Site Specific Health & Safety Plan Amendment Documentation

Project Name: MCB-Camp Lejeune: **Project No.** 115122
Rapid Refueler and JP 5 Line CAP Implementation

Amendment No. 25 **Date:** 6/16/05

The Amendment Addresses the Following Sections:

Section 2.2	Scope of Work
Section 4.1	Chemical Hazards
Section 4.3	Physical Hazards
Section 6.0	Protective Equipment
Section 8.0	Air Monitoring

Task(s) Amendment Affects:

The Rapid Refueler site is located at the Marine Corps Air Station, New River and is responsible for providing aviation fuels to the flight line. It is located northeast of Instrument Runway 5-23. Fuel is transferred to the Rapid Refueler from the Michael Road Fuel Farm, located at MCB Main Side.

The Refueler has typically been identified by two sections, A-B associated with Building AS-498, and section C-D associated with structure AS-511. Several releases have been recorded from the system requiring repair and contamination removals. Recently Camp Lejeune employed a pipe leak detection contractor who identified suspect areas using a tracer based method, with one area within the A-B section identified as requiring immediate attention. The pipeline was repaired in January 2005, immediately following discovery of the leak.

The JP-5 Line area is in the vicinity of the Rapid Refueler area and is associated with the piping that transfers fuel from the Michael Road Fuel Farm to the Rapid ReFueler.

Reason for Amendment:

The additional work was not addressed in original Site Specific Health and Safety Plan.

Amendment:

Section 2.2: Scope of Work

RAPID REFUELER

This remedial system installation action Work Plan proposes the following focused tasks for the CAP implementation:

- Install an 8-inch diameter sump well in the vicinity of the center of the free phase product plume.
- Excavate four trenches extending radially from the central sump well to the free phase product plume boundary.
- Each trench will be excavated to a depth of nine feet bls, approximately two feet below the groundwater surface.
- Install 4-inch diameter slotted pipe in the bottom of each excavation and backfill with coarse gravel to roughly five feet bls.
- Install two 2-inch diameter wells in the trench (one in the center and one at the end of the trench) prior to backfilling to facilitate free product recovery from the trench.

JP-5 Line Area

Field activities to be completed at the JP-5 Line during Revised CAP implementation are as follows:

- Installation of two Type II and one Type III 2-inch diameter PVC monitoring wells.

Section 4.1: Chemical Hazards

Chemical hazards on this portion of the project are those associated with Jet Fuel.

Summary of Site Contaminants

CHEMICAL	EXPOSURE ROUTES	PEL/TLV	HEALTH HAZARDS/ PHYSICAL HAZARDS
Jet Fuel	Inhalation Ingestion, Skin & Eye Contact	Not established	• Respiratory system irritation, headache, giddiness, vertigo and anesthetic stupor. Ingestion may cause aspiration into lungs causing lung damage or death. Prolonged or repeated skin contact can cause defatting and drying of the skin which may produce severe irritation or dermatitis. • Combustible liquid, avoid heat and open flames; avoid strong oxidizers such as nitrates, perchlorates, chlorine, and fluorine.

Section 4.3: Physical Hazards

Physical hazards on this site include heavy equipment operation, deep excavations, drilling operations, contact with above/underground utilities, and the potential for explosive/combustible atmospheres.

- Review attached Activity Hazard Analysis prior to initiation of each activity.
- Removal/disconnecting of power sources that may be present will require adherence to HS-315, Control of Hazardous Energy Sources.
- Obtain a hot work permit and conduct all hot work in accordance with HS-314.
- Utilize spark and explosion proof equipment.
- Conduct excavation activities in accordance with HS-307.
- Deep excavations present confined space hazards. In the event entry is necessary, conduct work in accordance with HS-300.
- Isolate equipment swing areas and maintain safe distances to eliminate potential for contact with equipment.
- All above and underground utilities shall be identified and marked by the appropriate authority, as required by HS-308, prior to the initiation of activities. Utility mark-out documentation shall be completed prior to beginning all demolition activities.

Section 6.0: Personal Protective Equipment:

PPE to be utilized will consist of the following:

Task	Initial PPE Level	Upgrade PPE Level	Skin Protection	Respiratory Protection	Other PPE
Trench Excavation	Level 'D'	Modified Level 'D' in the event of contact with contaminated soils.	Leather-work gloves; Poly-Coated Tyvek® coveralls may be used to prevent gross contamination.	Not Anticipated	Hard-hat, steel-toe work boots, eye protection and hearing protection >85 dBA.
Well Installation	Level 'D'	Modified Level 'D' in the event of contact with	Leather-work gloves; Poly Coated Tyvek® coveralls	Not Anticipated	Hard-hat, steel-toe work boots, eye protection, hearing protection >85 dBA.

Task	Initial PPE Level	Upgrade PPE Level	Skin Protection	Respiratory Protection	Other PPE
		contaminated soils.	may be used to prevent gross contamination.		
Install Piping	Level 'D'	Modified Level 'D' in the event of contact with contaminated soils or entry into trenches.	Leather work gloves. Poly Coated Tyvek® coveralls	Not anticipated	Hard-hat, steel-toe work boots, eye protection and hearing protection >85 dBA.

Section 8.0 Air Monitoring:

Air monitoring will be conducted in order to characterize personnel exposures and fugitive emissions from site contaminants. The principle contaminant is Jet Fuel. An FID will be utilized to conduct air monitoring in the breathing zone and work area during all trench excavation, well installation, and installation of piping.

Monitoring will be conducted to detect oxygen levels and the presence of explosive vapors in the work area with a combustible gas/oxygen meter.

Direct Reading Air Monitoring Requirements

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
FID	Breathing zone/Equipment Operator (EO) and Recovery Technician (RT) during the excavation, drilling, and piping.	Continuously during excavation activities. Monitoring will be performed during sampling and soil relocation activities at the discretion of the SSO	<5.0 ppm* >5.0 ppm*	Level D Stop work and contact Health and Safety Coordinator
Multi-Gas Detector (LEL/O ₂)	Work area during tank/piping removal. Work area in the event entry into excavation is necessary	Duration of operations. Prior to entry; and continuously during entry	Oxygen ≥ 19.5 % and ≤ 22.5%; LEL <10% Oxygen < 19.5% and >22.5%; LEL ≥ 10%	Monitor continuously and watch for levels to fluctuate Stop Work, evacuate area and contact Health and Safety Coordinator.

*Sustained readings above background.

Completed by: Kym Edelman,
Health and Safety Coordinator

Approved by: David Mummert, CIH
Health and Safety Manager

[illegible]

ATTACHMENT 2

Material Safety Data Sheets

1) Jet Fuel

Material Safety Data Sheet

ChevronTexaco

24-Hour Emergency Telephone Numbers

HEALTH : Chevron Emergency Information Center (800) 231-0623 or (510) 231-0623

TRANSPORTATION : CHEMTREC (800) 424-9300 or (703) 527-3887

Emergency Information Centers are located in the U.S.A. International collect calls accepted.

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

JP-8

Product Use: Fuel

Product Number(s): CPS243791

Synonyms: AVTUR

Company Identification

ChevronTexaco Global Aviation
a division of Chevron U.S.A., Inc.
1111 Bagby Street
Houston, TX 77002

Product Information

MSDS Requests: 800-689-3998 (USA)

Product Information: 510-242-5357 (USA)

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Kerosine	8008-20-6	> 99 %weight
Diethylene glycol monomethyl ether	111-77-3	< 1 %weight

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear to light yellow liquid with petroleum odor.

- COMBUSTIBLE LIQUID AND VAPOR
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED
- CAUSES SKIN IRRITATION
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin causes irritation. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or

death. May be irritating to mouth, throat, and stomach. Symptoms may include nausea, vomiting, and diarrhea.

Inhalation: Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death. Mists of this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Combustible liquid.

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Tagliabue Closed Cup) 100 °F (38 C) (Min)

Autoignition: 410°F (210°C)

Flammability (Explosive) Limits (% by volume in air): Lower: 0.7 Upper: 5

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as

applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85F. Do not get in eyes, on skin, or on clothing. Do not breathe vapor or fumes. Do not breathe mist. Do not taste or swallow. Wash thoroughly after handling.

Do not use as a portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear

safety glasses with side shields as a good safety practice.

Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted.

Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Polyvinyl Alcohol (PVA) (Note: Avoid contact with water. PVA deteriorates in water.), Viton

Respiratory Protection: Determine if airborne concentrations are below the recommended exposure limits. If not, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors

Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
Kerosine	CHEVRON	350 mg/m3	1000 mg/m3		

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear to light yellow liquid with petroleum odor.

pH: NA

Vapor Pressure: 1 kPa (0.14 psi) @ 100 °F

Vapor Density (Air = 1): 5.7

Boiling Point: 160 - 300 °C (320 - 572 F)

Solubility: Low PPM range in water.

Freezing Point: -47 °C (-53 F) (Max)

Density: 0.755 - 0.84 g/ml @ 15 °C

Viscosity: 8 cSt @ -20 °C (Max)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar

materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is expected to be toxic to aquatic organisms.

ENVIRONMENTAL FATE

Ready Biodegradability:

This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: FUEL, AVIATION, TURBINE ENGINE

DOT Hazard Class: 3 (Flammable Liquid)

DOT Identification Number: UN1863

DOT Packing Group: III

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:

- | | |
|---------------------------------------|-----|
| 1. Immediate (Acute) Health Effects: | YES |
| 2. Delayed (Chronic) Health Effects: | NO |
| 3. Fire Hazard: | YES |
| 4. Sudden Release of Pressure Hazard: | NO |
| 5. Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

4A=IARC Group 1	12=TSCA Section 8(a) PAIR	21=TSCA Section 5(a)
4B=IARC Group 2A	13=TSCA Section 8(d)	25=CAA Section 112 HAPs
4C=IARC Group 2B	15=SARA Section 313	26=CWA Section 311
05=NTP Carcinogen	16=CA Proposition 65	28=CWA Section 307
06=OSHA Carcinogen	17=MA RTK	30=RCRA Waste P-List
09=TSCA 12(b)	18=NJ RTK	31=RCRA Waste U-List
10=TSCA Section 4	19=DOT Marine Pollutant	32=RCRA Appendix VIII
11=TSCA Section 8(a) CAIR	20=PA RTK	

The following components of this material are found on the regulatory lists indicated.

Kerosine 17, 18, 20
Diethylene glycol monomethyl ether 17, 20, 25

CHEMICAL INVENTORIES:

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

WHMIS CLASSIFICATION:

Class B, Division 3: Combustible Liquids

Class D, Division 2, Subdivision B: Toxic Material -

Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: REVISION STATEMENT: This document has been prepared using a new MSDS format and all 16 sections have been revised. Please read the entire document. Also, this is the first MSDS from ChevronTexaco Global Aviation, a division of Chevron USA, Inc.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	-	Threshold Limit Value	TWA	-	Time Weighted Average
STEL	-	Short-term Exposure Limit	PEL	-	Permissible Exposure Limit
			CAS	-	Chemical Abstract Service Number
NDA	-	No Data Available	NA	-	Not Applicable
<=	-	Less Than or Equal To	>=	-	Greater Than or Equal To

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1).

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

ATTACHMENT 3

Activity Hazard Analysis

ACTIVITY HAZARD ANALYSIS FOR TRENCH EXCAVATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Air Monitoring Devices
Trench Excavation	Underground/ Overhead Utilities	- Identify all utilities around the site before work commences - Cease work immediately if unknown utility markers are uncovered - Use manual excavation within 3 feet of known utilities - Utility clearance shall conform with 29 CFR 1926.955 (high voltage >700 kv) 15 feet phase to ground clearance; 31 feet phase to phase clearance		
	Excavation Wall Collapse	- Construct diversion ditches or dikes to prevent surface water from entering excavation - Provide good drainage of area adjacent to excavation - Collect ground water/rain water from excavation and dispose of properly - Store excavated material at least 2 feet from the edge of the excavation; prevent excessive loading of the excavation face - Provide sufficient stairs, ladders, or ramps when workers enter excavations over 4 feet in depth - Place ladders no more than 25 feet apart laterally - Treat excavations over 4 feet deep as confined spaces - Complete confined space permit entry procedure - Monitor atmosphere for flammable/toxic vapors, and oxygen deficiency - Slope, bench, shore, or sheet excavations over 5 feet deep if worker entry is required - Assign a competent person to inspect, decide soil classification, proper sloping, the correct shoring, or sheeting - Inspect excavations (when personnel entry is required) daily, whenever conditions change - Provide at least two means of exit for personnel working in excavations.	Hard hat, Safety glasses, Steel toe work boots	
	Struck By/ Against Heavy Equipment	- Wear reflective warning vests when exposed to vehicular traffic - Isolate equipment swing areas	Warning vest, Hard hat, Safety glasses, Steel toe work boots	

ACTIVITY HAZARD ANALYSIS FOR TRENCH EXCAVATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Air Monitoring Devices
Trench Excavation (Continued)		- Make eye contact with operators before approaching equipment - Understand and review hand signals		
	Handling Heavy Objects	- Observe proper lifting techniques - Obey sensible lifting limits (60 lb. maximum per person manual lifting) - Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Slips, Trips, Falls	- Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris - Mark, identify, or barricade other obstructions - Evaluate fall hazards above 4 ft.; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 ft.		
	Sharp Objects	- Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects - Maintain all hand and power tools in a safe condition - Keep guards in place during use	Wizard or similar cut resistant gloves	
	High Noise Levels	- Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) - Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	Ear plugs	
	Inhalation and Contact with Hazardous Substances	- Provide workers proper skin, eye and respiratory protection based on the exposure hazards present - Review hazardous properties of site contaminants with workers before operations begin - Monitor breathing zone air to determine levels of contaminants	Leather work gloves. Butyl Rubber gloves if free product is encountered.	Multi-gas Detector, FID
	High/Low Ambient Temperature	Monitor for Heat/Cold stress in accordance with Shaw Health and Safety Procedures # HS400, HS401	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment

ACTIVITY HAZARD ANALYSIS FOR TRENCH EXCAVATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Air Monitoring Devices
		- Provide fluids to prevent worker dehydration - Follow work/rest schedules.		
	Fire/ Explosion	- Eliminate sources of ignition from the work area - Prohibit smoking - Provide ABC (or equivalent) fire extinguishers in all work, flammable storage areas and with fuel powered generators and compressors - Store flammable liquids in well ventilated areas - Prohibit storage, transfer of flammable liquids in plastic containers - Post "NO SMOKING" signs - Store combustible materials away from flammables	Portable fire extinguisher	Multi-gas Detector
	Flammable, Toxic, Oxygen deficient Atmospheres	- Test atmosphere of excavations prior to entry for flammable/toxic vapors, and oxygen deficiency - Review hazardous properties of site contaminants with employees before work starts - Review emergency procedures before work commences	Portable fire extinguisher	Multi-gas Detector
	High Noise Levels	Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Hearing protection	
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
- Heavy Equipment - Air Monitoring Equipment - Hand and power tools		- Equipment inspections - Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)	- Review SSHP - Review site-specific AHA with all task personnel - Review Health and Safety Procedures - Review site specific contamination	

ACTIVITY HAZARD ANALYSIS FOR WELL INSTALLATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Well Installation	Improper Work Practices/Procedures	• Driller and helper must be present during all active operations and TEST KILL SWITCH DURING EACH STARTUP. • Driller helper and other site personnel must know location of emergency shutoff switch. • Ensure jewelry is removed, loose clothing is buttoned • Area of drilling operation must be cordoned off/barricaded. • Inspect wire ropes daily. • When hazardous conditions (including weather) are deemed present, operation must be shut down. • Set rig on stable, level ground; attach guy wires if necessary for stability. • Use adequate blocking materials. • Do not allow drillers to climb to mast while it is erected. • The drilling subcontractor shall have documented safety and emergency action procedures for the equipment to be operated. • Pipe, drill rods, casing, augers, and similar drilling tools should be orderly stacked on racks or sills to prevent spreading, rolling or sliding. • Work areas, platforms, and walkways should be kept free of materials, debris, and obstructions such as ice, grease or oil that could cause a surface to become slick or otherwise hazardous. • Before raising the mast, check for overhead obstructions. • Equipment shall be shut down during manual lubrication and while repairs or adjustments are being made. • Do not move the drill rig from hole to hole with the mast in the raised position. • Before the mast of the drill rig is raised and drilling is commenced, the drill rig must first be leveled and stabilized with leveling jacks and/or solid cribbing. The drill rig should be re-leveled if it settles after the initial setup.		

ACTIVITY HAZARD ANALYSIS FOR WELL INSTALLATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Well Installation (continued)	Slips, Trips, Falls	- Mark, identify, or barricade other obstruction - Work areas, platforms, and walkways should be kept free of materials, debris, and obstructions such as ice, grease or oil that could cause a surface to become slick or otherwise hazardous - Clear walkways and drilling overburden - Clean mud and grease from your boots before mounting a drill platform. Watch for slippery ground when dismounting from the platform - All unattended boreholes must be adequately covered or otherwise protected to prevent drill rig personnel or site visitors from stepping or falling into the holes		
	Underground/ Overhead Utilities	- Identify all utilities around the site before work commences. - Cease work immediately if unknown utility markers are uncovered. - Use manual excavation within 3 feet of known utilities - Utility clearance shall conform with 29 CFR 1926.955 (high voltage >700 kv) 15 feet phase to ground clearance; 31 feet phase to phase clearance. - Complete the underground utility permit in accordance with Shaw Health and Safety Procedure HS308.		
	Struck by/ Against Flying Particles, Protruding Objects	- Wear reflective warning vests when exposed to vehicular traffic - Isolate equipment swing areas - Make eye contact with operators before approaching equipment - Barricade or enclose the drilling area - Require backup alarms on all heavy construction equipment - Restrict work area entry to authorized personnel during drilling activities. - Wear hard hats, safety glasses with side shields, or splash/face shields and goggles and steel-toe safety boots at all times. - Understand and review hand signals. - Use "spotter" when backing.	Warning vests, hard hat, safety glasses, goggles, face shield and steel toe work boots	

ACTIVITY HAZARD ANALYSIS FOR WELL INSTALLATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Well Installation (continued)	Caught In/ Between Moving Parts	Ensure the excavator and pump truck are equipped with back-up alarms.		
	Handling Heavy Objects	- Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar injuries. - Assure guards are in place during equipment operations. - Provide and wear proper work gloves when the possibility of crush, pinch, or other injury may be caused by moving/stationary edges or objects - Maintain all equipment in a safe condition. - Keep all guards in place during use. - De-energize and lock-out machinery before maintenance or service in accordance with Shaw Health and safety Procedure HS315 Control of Hazardous Energy Sources.		
	Sharp Objects	- Observe proper lifting techniques. - Obey sensible lifting limits (60 lb. maximum per person manual lifting). - Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads.	Leather gloves	
	Inhalation and Contact with Hazardous Substances	- Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects. - Maintain all tools in a safe condition. - Keep guards in place during use. - Use a long handle shovel to move auger cuttings away from the auger.	Modified D	FID
	High/Low Ambient Temperature	- Provide workers proper skin, eye and respiratory protection based on the exposure hazards present - Review hazardous properties of site contaminants before starting work. - Monitor breathing zone air to determine levels of contaminants. - Monitor perimeter air		Meteorological Equipment
		Monitor for heat/cold stress in accordance with Shaw Health and Safety Procedures HS400 and HS401.		

ACTIVITY HAZARD ANALYSIS FOR WELL INSTALLATION

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		Provide fluids to prevent worker dehydration.		
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
- Drill rig - Well materials - FID		- Daily equipment inspections as per manufacturers requirements - Inspect Drill Rig in accordance with HS316 - Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers) - Complete underground utility permit in accordance with HS308	- Review AHA with all task personnel - Review Base-wide SSHSP - Review operations/safety manuals for all equipment utilized - Review site specific contaminants of concern - Review all applicable Shaw Health and Safety Procedures	

ACTIVITY HAZARD ANALYSIS FOR INSTALLATION OF PIPING

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Installation of Piping	Underground/ Overhead Utilities	- Identify all utilities around the site before work commences - Cease work immediately if unknown utility markers are uncovered - Complete the underground utility permit in accordance with Health and Safety Procedure HS308 - Use manual excavation within 3 feet of known utilities - Utility clearance shall conform with 29 CFR 1926.955 (high voltage >700 kv) 15 feet phase to ground clearance; 31 feet phase to phase clearance		
	Struck By/ Against Heavy Equipment	- Wear reflective warning vests when exposed to vehicular traffic - Isolate equipment swing areas - Make eye contact with operators before approaching equipment - Understand and review hand signals - Step away from equipment when bucket adjustments are made - Use "spotter" when backing. - Ensure the excavator and pump truck are equipped with back-up alarms.	Warning vests, hard hat, safety glasses and steel toe work boots	
	Sharp Objects	- Wear cut resistant work gloves when the possibility of injury may be caused by sharp edges or objects - Maintain all hand and power tools in a safe condition - Keep guards in place during use	Leather gloves	
	High Noise Levels	- Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) - Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	Hearing protection	
	Slips, Trips, Falls	- Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris - Mark, identify, or barricade other obstructions - Exit equipment slowly and maintain three point contact - Evaluate the site for fall hazards.		

ACTIVITY HAZARD ANALYSIS FOR INSTALLATION OF PIPING

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		Conform with the provisions of HS301-Fall Protection		
Installation of Piping (continued)	Forklift Operations	- Conduct pre-operation equipment inspections using checklist - Only trained qualified operators may operate forklifts - Do not exceed rated capacity of forklift - Use spotters when backing or when view is obstructed by objects - Use horn to warn when rounding corners - Use only approved lifting devices that are properly rated and certified for the load being moved - Conform with all requirements of Health and Safety procedure HS820 – Forklifts		
Installation of Piping (continued)	Electrical Shock	- De-energize or shut off utility lines at their source before work begins - Use double insulated or properly grounded electric power-operated tools - Label equipment that is 480 and above with high voltage signs. - Provide an equipment-grounding conductor program or employ ground-fault circuit interrupters - Use qualified electricians to hook up electrical circuits - Inspect all extension cords daily for structural integrity, ground continuity, and damaged insulation - Cover or elevate electric wire or flexible cord passing through work areas to protect from damage - Keep all plugs and receptacles out of water - Use approved water-proof, weather-proof type if exposure to moisture is likely - Inspect all electrical power circuits prior to commencing work - Follow Lockout-Tagout procedures in accordance with Health and Safety Procedures HS315	Lockout-Tagout Devices	Voltage Meter or "Tic" Tracer
	Inhalation and Contact with Hazardous Substances	- Provide workers proper skin, eye and respiratory protection based on the exposure hazards present - Review hazardous properties of site contaminants before starting work. - Monitor breathing zone air to determine levels of	Modified D	FID

ACTIVITY HAZARD ANALYSIS FOR INSTALLATION OF PIPING

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		contaminants		
	Operation of Hand Tools	- Review power tool operation before starting work - Maintain steady even pressure when drilling into concrete/hard materials - Avoid actions that cause over exertion or binding of drills		
	Horseplay	- Prohibit horseplay on all project sites - Review rules about horseplay with subcontractors		
	High/Low Ambient Temperature	- Monitor for heat/cold stress in accordance with Health and Safety Procedures HS400 & HS401 - Provide fluids to prevent worker dehydration		
EQUIPMENT REQUIRED		INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
- Forklift - Piping - Glues and primer - Hand tools - Air monitoring equipment		- Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers) - Forklift inspection	- Review AHA with all task personnel - Review Site Specific Health and Safety Plan - Review operations/safety manuals for all equipment utilized - Review MSDS's for primers and glues - Review the all applicable Shaw Health and Safety Procedures.	

APPENDIX B

Sampling and Analysis Plan Addendum

Addendum to the Camp Lejeune Basewide Sampling and Analysis Plan for Rapid Refueler A-B Tanks and JP-5 Line Site CAP Implementation

1.0 Introduction

This Addendum to the Basewide SAP for Camp Lejeune (CLJ) Marine Corps Base (MCB) was developed to provide task-specific requirements for remedial measures at the Rapid Refueler A-B Tanks and JP-5 Line sites as defined herein. This Addendum is to be used in conjunction with the Basewide SAP. In the case of discrepancies between this Addendum and the Basewide SAP, this document takes precedence.

2.0 Scope of Investigation

The Rapid Refueler site is located at the Marine Corps Air Station (MCAS), New River, northeast of Instrument Runway 5-23. It is responsible for providing aviation fuels to the flight line. Additionally, a fuel transfer pipeline at the MCAS New River transfers JP-5 fuel from the Michael Road Bulk Fuel Farm to four underground storage tanks (USTs) at rapid jet systems A-B and C-D. The objective of this remedial action is to install a free product recovery system that will contain and recover product from the Rapid Refueler A-B Tanks area. This scope includes installing new monitoring wells and sampling new and existing monitoring wells as specified in the Work Plan. Stockpiled soils from the well installation activities will also be sampled to determine appropriate disposal.

3.0 Sampling and Analytical Methodology

The samples will be collected in accordance with the requirements of the CLJ Basewide SAP. Also reference Table B-1 of this SAP Addendum for sampling procedures. Groundwater and soil samples will be analyzed by a fixed-base laboratory using appropriate SW-846 Update III and other EPA-approved methods. Reference Table B-2 for site-specific quality objectives.

3.1 *Rapid Refueler A-B Tanks*

Semi-annual groundwater samples will be collected from the monitoring wells that do not display the presence of free product. An estimated 47 monitoring wells will be sampled at the Rapid Refueler A-B Tanks site. These samples will be analyzed for Extractable Petroleum Hydrocarbons and Volatile Petroleum Hydrocarbons both by MADEP methods, Volatile Organic Compounds by Method 8260B, and Semi-volatile Organic Compounds by Method 8270C. As part of the 8270C analysis, the laboratory will report the ten highest Tentatively Identified Compound peaks.

3.2 JP-5 Line

Semi-annual groundwater samples will be collected from the monitoring wells that do not display the presence of free product. An estimated nine monitoring wells will be sampled at the JP-5 Line site. These samples will be analyzed for Volatile Organic Compounds by Method 8260B, Semi-volatile Organic Compounds by Method 8270C, and Lead by Method 6010B.

3.3 Backfill Material

The backfill source has been verified, and no analytical testing will be required.

3.4 Disposal Samples

One composite disposal sample will be collected from every 200 cubic yards of segregated soil and debris stockpiles. These samples will be analyzed by a fixed-base laboratory for Diesel Range and Gasoline Range Organics by Method 8015B and Full TCLP including pH by Method 9045C, Ignitability by Method 1010, Reactivity compounds Cyanide by Method 9010B and Sulfide by Method 9030, Volatiles by Method 1311/8260B, Semi-volatiles by Method 1311/8270C, Pesticides by Method 8081A, Herbicides by Method 8151A, and Metals by Methods 1311/6010B/7000. The analytical results will be used to determine appropriate disposal.

4.0 Subcontracted Laboratory

A laboratory previously procured for Navy Atlantic Division work will be assigned this task based on the capacity and capabilities of the pre-approved laboratories at the time of sampling.

APPENDIX C

Program Quality Control Plan Addendum

**PROGRAM QUALITY CONTROL PLAN ADDENDUM
FOR
RAPID REFUELER A-B TANKS
And
JP-5 LINE SITE CAP IMPLEMENTATION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

Prepared for:

**DEPARTMENT OF THE NAVY
Naval Facilities Engineering Command
Contract No. N62470-02-D-3260
Task Order No. 0046**

Prepared by:

**Shaw Environmental, Inc.
11560 Great Oaks Way
Suite 500
Alpharetta, Georgia 30022-2424**

**August 2005
Shaw Project 115122**

TABLE OF CONTENTS

STATEMENT OF QC PROGRAM.....	1
I. QUALITY CONTROL ORGANIZATION	2
II. IDENTIFICATION OF PERSONNEL ASSIGNED TO THE QC ORGANIZATION.....	2
III. APPOINTMENT LETTERS	2
IV. OUTSIDE ORGANIZATIONS ,.....	2
V. INITIAL SUBMITTAL REGISTER & REVIEWERS	2
VI. TESTING LABORATORY ACCREDITATION.....	3
VII. TESTING PLAN AND LOG	3
VIII. REWORK ITEMS.....	3
IX DOCUMENTATION PROCEDURES	3
X. QUALITY CONTROL INSPECTION PLAN	3
XI. PERSONNEL MATRIX	3

FIGURES

- I-1 QC Organizational Relationship with Production Personnel
- II-1 Site QC Manager / Representative - Resume
- III-1 Site QC Manager / Representative - Letter of Appointment

EXHIBITS

- IV-1 Approved Consultant and Subcontractor List
- V-1 Submittal Register
- V-2 List of Personnel Authorized to Review and Certify Submittals
- VII-1 Test Plan and Log
- VIII-1 Rework Items Log
- X-1 Quality Control Inspection Plan
- XI-1 Personnel Matrix

STATEMENT OF QC PROGRAM

This Site Specific Addendum to the Program QC Plan is prepared and submitted for Task Order 0046, Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation at the Marine Corps Base, Camp Lejeune, North Carolina. This plan incorporates methods and procedures from the Program Quality Control Plan approved by the Atlantic Division, Naval Facilities Engineering Command. The Program Quality Control Plan was developed specifically to be responsive to the Contract Specification, Contract No. N62470-02-D-3260, Atlantic Division, Naval Facilities Engineering. Shaw Environmental, Inc. (Shaw) will perform the inspections and tests required to ensure that materials, workmanship, and construction conform to drawings, specifications, and contract requirements.

Note to Employees – Concept of Quality Control

Quality control should not be considered a person or an organization of personnel, but a concept to perform in such a manner that the end product of our efforts provides a quality product and customer satisfaction. The quality control individual or group cannot inspect quality into the final product, but only inspect and document the results of our efforts. The only people that can build quality into the product are the individuals performing the task of producing the end product.

It should be noted by all employees that the documentation requirements of Shaw procedures, plans, and the Task Order Specifications are considered equally as important as the end product itself. When it is stated that the documentation will be approved prior to the start of work, this is exactly what is intended. To eliminate problems in this area requires careful planning and execution by everyone.

We would do well to remember that our livelihood depends on how well we satisfy our customer. To accomplish this requires teamwork and attention to detail by all employees and contractors.

I. QUALITY CONTROL ORGANIZATION

The QC Manager will have the authority to implement and manage the QC Plan, the three phases of quality control and the authority to stop work, which is not in compliance with the contract.

Mr. Cano Hernandez will function as the Site QC Manager and also as the Supervisor for this Task Order. Mr. Hernandez has more than 5 years construction management and QA/QC experience and maintains current US Army Corps of Engineers (USACE) Construction Quality Management for Contractors, QC certification.

Mr. Hernandez will work closely with Mr. Charles Wallace who is the Site Superintendent, concerning the operational activities at the sites, but will report directly to Mr. Ernie Duke, Program QC Manager regarding QC related issues on the site.

Mr. Ernie Duke, Shaw Program QC Manager will serve to resolve any QC related issues, which need his involvement. The Site QC Manager will have a direct line of communication to the Program QC Manager on QC issues.

The relationship between the QC Organization, and Production Personnel of the Task Order, is presented in the Organizational Chart, Figure I-1.

II. IDENTIFICATION OF PERSONNEL ASSIGNED TO THE QC ORGANIZATION

Figure II-1 provides the resume of the Site QC Manager. The resumes of Alternate QC personnel will be submitted to the CO or designated representative upon request.

III. APPOINTMENT LETTERS

The Site QC Manager appointment letter is provided as Figure III-1. Similar letters will be provided when necessary to describe the duties and authorities of personnel assigned to the position of Alternate QC Manager or Assistant.

IV. OUTSIDE ORGANIZATIONS

A list of outside organizations such as subcontractors employed by Shaw for work under this task order is provided in Exhibit IV-1. This list provides each firm's name and address and a description of the services each firm will provide. This list will be maintained current and will be available for review.

V. INITIAL SUBMITTAL REGISTER & REVIEWER

V.1 Submittal Register

The Initial Submittal Register is provided as Exhibit V-1. The status of each submittal will be recorded as changes occur.

V.2 Personnel Authorized to Review and Certify Submittals

Personnel authorized to review and certify submittals other than the Site QC Manager are identified on Exhibit V-2. Any additional personnel assigned to perform submittal review and certification must be approved by the CO prior to performance.

VI. TESTING LABORATORY ACCREDITATION

Testing laboratory accreditation requirements are addressed in the Program QC Plan Section 1, part 4.7, Construction Testing.

VII. TESTING PLAN & LOG PREPARATION

A Testing Plan and Log has been prepared for this TO and is provided as Exhibit VII-1.

VIII. REWORK ITEMS

Rework Items will be documented on the Daily QC Report and on the Rework Items Log. This will be used to report and track rework Items.

IX. DOCUMENTATION PROCEDURES

The Daily QC Report form and Daily Production Report form will be used to document daily activities at the site.

X. QUALITY CONTROL INSPECTION PLAN

The Quality Control Inspection Plan, Exhibit X-1, lists the TO Workplan section and definable feature of work with provisions for recording the corresponding checklist/report for each phase of the three-phase control process. As each control phase is satisfactorily preformed, the Site QC Manager will record the corresponding checklist/report number and date.

This list has been prepared to correspond to the subtasks of the task order. It will be maintained as provided in Section 1, Part 4.4 of the PQCP. Each preparatory, initial and follow-up phase checklist/report will reflect the construction activity number derived from the construction schedule.

XI. PERSONNEL MATRIX

The personnel matrix, Exhibit XI-1, shows each section of the TO Workplan with identification of who will review and certify submittals, who will perform and document the

three phases of control, and who will perform and document testing. This matrix should be completed as much as possible prior to and during site mobilization.

FIGURE I-1

**QC ORGANIZATIONAL RELATIONSHIP WITH
PRODUCTION PERSONNEL
SHAW ENVIRONMENTAL, INC.
TASK ORDER NO. 0046**

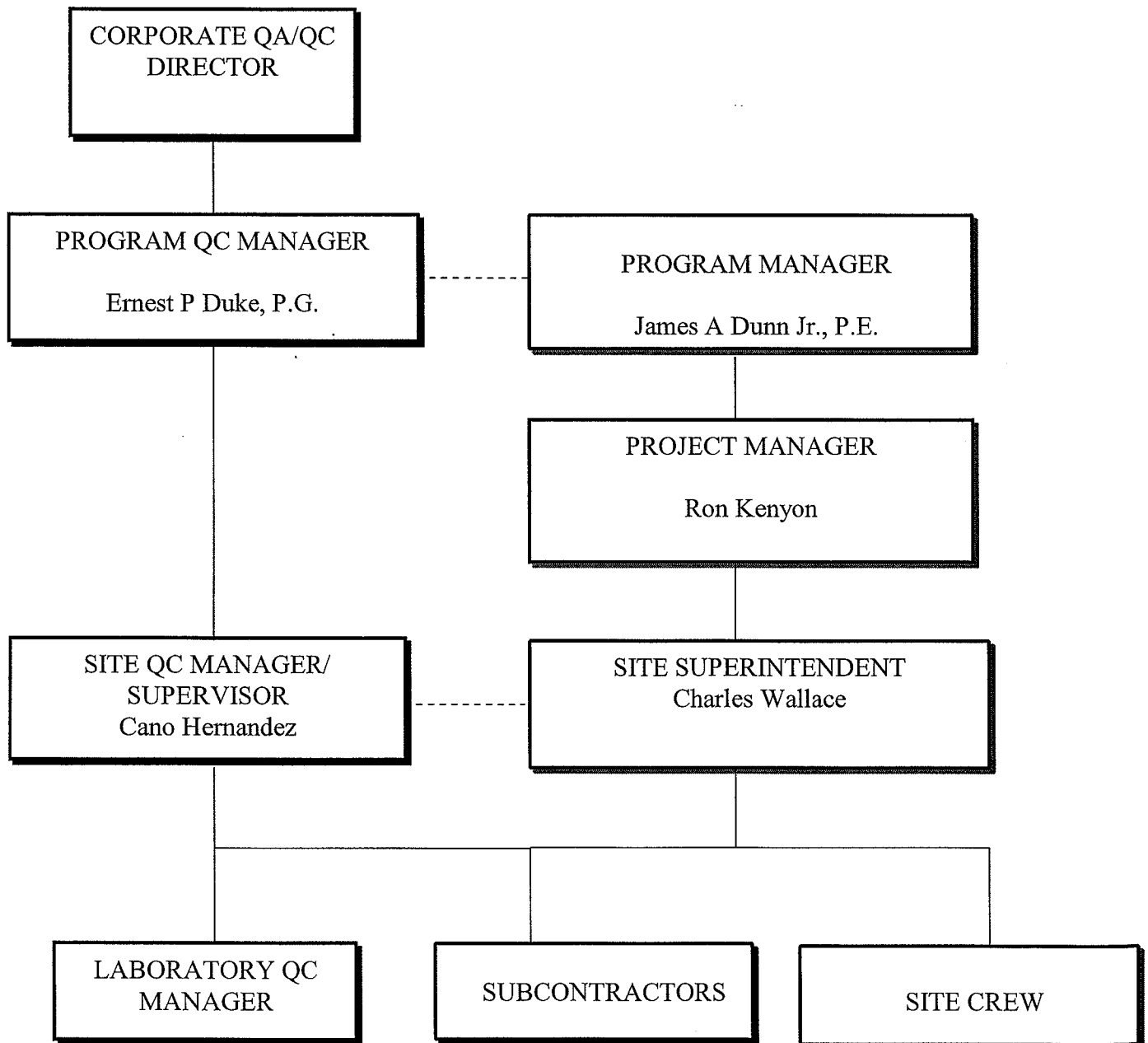


Figure II-1

Cano R. Hernandez Jr. Professional Qualifications

Mr. Hernandez joined Shaw Environmental & Infrastructure, Inc. in 1990 with fifteen years of experience in the petro-chemical, civil, and pipeline construction industry. Last ten years of construction experience has been in the environmental industry and included the following positions: acting project supervisor, project coordinator, equipment supervisor, and lead equipment operator. Supervisory duties included site management of multi-million dollar projects consisting of contaminated soil excavation, monitoring well removal, installation, drum removal (Level "B"), thermal desorption of soils (Level "B"), soil solidification (long stick operator), slurry wall installation (long stick operator), grading, rerouting of water channels in the Florida Everglades, EOD and Non-EOD landfill construction.

Additionally, participation in bid preparation, on-site evaluation, project scheduling, budgeting, and cost estimating.

Education

Additional Training:

40-Hour OSHA 1910.120 Training; 1991

8-Hour OSHA Refresher Certification, Annually

8-Hour Training in Supervision of Hazardous Waste Operations – OSHA 29 CFR 1910.120 (3-26-92)

Confined Space Supervisor; 2002

USACE Contractor Quality Management, 2003

CFR 192.285 #14 Butt Fusion Weld (01-27-00)

First-Aid/CPR (6-11-05)

Hazardous Materials Emergency Response Training

Experience and Background

1990 – Present

Supervisor/ Superintendent, Shaw Environmental & Infrastructure, Inc., Monroeville, Pennsylvania

Supervises on-site Shaw personnel performing multiple tasks and site subcontractors. Directs the operation of heavy equipment and field operational activities at hazardous waste, chemical waste, and non-hazardous remediation sites. Responsible for the daily completion of and adherence to remedial site plan documentation including cost tracking, work plans, spill prevention plans, health and safety plans. Through supervision of construction activities either performs quality control or ensures that all site operations are conducted in compliance with quality control program specifications.

Quality Control Plan TO 0046

Various locations of Supervision / Management:

11/04 – 12/04, Site Superintendent under the USACE in Wachoula, Florida

The project was performed under FEMA emergency response actions for the construction of a temporary mobile home park.

5/04 – 8/04, Site Superintendent under USACE at Jacksonville, Florida

Construction of a large retention pond and associated structures was the primary scope of the project.

3/03 – 7/03, Site Superintendent under LANTDIV RAC at Bogue Field, North Carolina

The project involved the excavation and disposal of contaminated soil to attain the required cleanup goals. UXO support was necessary due to ordnance encountered at the location.

1/02 – 2/03, Site Supervisor under LANTDIV RAC at Portsmouth, Virginia

An area of calcium hydroxide was excavated adjacent to the James River. Groundwater controls were necessary to reduce inflow of the shallow groundwater. The restoration of a wetland area was also part of the project.

7/01 - 1/02, Site Foreman/Lead Operator under LANTDIV RAC at Dahlgren NSWC, Dahlgren, Virginia

The project consisted of the mitigation of contamination and the reconstruction of two adjacent wetland areas, and the installation of a concrete box culvert to maintain appropriate water levels. Activities were conducted simultaneously, and in close coordination with Base range control, that allowed for the successful completion of this project without interference of explosive testing. The \$2.4 million project was completed within budget and received a 98% award fee. Maintained the daily contact with subcontractors and Base personnel to allow efficient movement of resources.

12/00 - 7/01, Site Foreman/Lead Operator under LANTDIV RAC at the Bainbridge Training Facility in Port Deposit, Maryland

Demolition of failing drainage channel and the reconstruction of the channel. Project was completed on time, within budget, and received a 100% award fee.

4/00 -12/00, Site Foreman/Lead Operator under the LANTDIV RAC at Dahlgren, Virginia.

This project consisted of the consolidation and relocation of approximately 16,000 cubic yards of solid waste. The project incorporated photo-remediation as a means of long-term remedial action to remove mercury and heavy metals from underlying materials. Creation of a 1-acre wetland which included the planting of 40,000+ trees and the installation of an irrigation system to ensure vegetative survivability. This

\$2.2 million project was completed on time, \$300K under budget, with a 98% award fee.

1999, Sr. Operator under the LANTDIV RAC at the Dahlgren Naval Surface Warfare Center (NSWC) in Dahlgren, Virginia.

Sr. Operator, of various equipment on a daily field operation for the construction of a multi-layer composite cap over a 5.5-acre sanitary landfill. Completion of the project included the installation of 300 linear feet of slurry wall. During the excavation of the landfill area, approximately 900 unexploded ordnances were removed from the landfill. This was a \$3.3 million project, completed at \$200,000 under budget.

Field Supervisor/Lead Operator at the Lake Opopka Project

Supervisor of a sector client. In charge of all new excavation work and haul road maintenance, as well as maintenance of all the off road equipment. This was very critical to the operation, because of the Everglades with its high water levels that were encountered on a daily basis. In charge of all equipment maintenance and service records for all equipment.

Sr. Operator of the Slurry Wall Team Various Cities.

In charge of slurry wall activities, such as moving HDPE pipe to slurry wall for transfer of slurry to the ditch, and checking height in slurry wall to prevent wall from collapsing. Other activities included preparing Bentonite mixture for backfill of trench. Also operated the long stick excavator, when it was necessary. Four years of travel with the IT Slurry Wall Group across country to various cities such as Point Malotie, California, Port of Seattle, Washington, Philadelphia, Pennsylvania, Syracuse, and New York. Also operated hydraulic, mechanical cranes up to 140 ton to load and unload slurry wall equipment, when necessary.

Feed Prep Supervisor/Operator for the IT Thermal Group at Crosby, Texas.

This was a fast pace incineration project that operated seven days a week, twenty-four hours a day. Supervisor of three, three-man crews on rotation; two shifts on and one shift off. This was a Level "B" project which meant that there was a 30 ft. fresh air trailer hooked to the crew's breathing system at all times. A crew continuously operated a Komatsau Wheel Loader inside the feed prep building while on supplied air with ten minute escape packs. Managed the operation and maintenance in weather temperatures on summer days of 120 degrees in the enclosed buildings of the radial stacker, power screen equipment and mass flow feeder all while on supplied air. Feed was supplied to the kiln twenty-fours a day. This was a \$110 million project.

President/Owner of Hernandez Concrete Pavers in LaPorte, Texas.

Successfully operated a business for four years in and around the Houston Metro, Clear Lake area. Installed sidewalks for theme parks such as Astro World in Houston and also pool decks, driveways, and sidewalks for private sector clients in and around the Houston area.

Figure III-1



June 29, 2005

Shaw Environmental, Inc.
5700 Thurston Avenue Suite 116
Virginia Beach, Virginia 23455-3302

RE: Site QC Manager
Contract N62470-02-D-3260
Task Order 0046

Dear Mr Hernandez:

This letter will serve as your appointment as the Site Quality Control Manager on the referenced project and will also clarify your duties and authority in this position. In this position, you will be authorized to use available resources to satisfy all applicable requirements of the Program and Task Order Quality Control Plans.

This authorization specifically gives you the authority to direct removal and replacement or correction of nonconforming materials or work and stop work authority when continuation would be unsafe to personnel, harmful to the environment, or result in a significant degradation of quality.

You will be expected to work closely with the Project Manager, Site Supervisor and other project personnel, but you will not be directly responsible to anyone but myself for resolution of quality issues when working in the capacity of Quality Control Manager.

If you have any question in this matter, please contact me.

Respectfully,

Ernest P. Duke
Program QC Manager
LANTDIV RAC Program

Quality Control Plan TO 0046

EXHIBIT IV-1

SUBCONTRACTOR LIST Shaw Environmental, Inc. Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation Task Order No. 046	
COMPANY NAME AND ADDRESS	DESCRIPTION OF SERVICES PROVIDED
Les Craft, Locating Contractor	Utility Locations
TBD	Drilling Services
Donald Hatcher	Welding, Steel Pipe Fabrication
Accutest Laboratories	Chemical Analytical Testing
TBD	Transportation and Disposal Services

EXHIBIT V-1

SUBMITTAL REGISTER

[illegible]

[illegible]

EXHIBIT V-2

LIST OF PERSONNEL AUTHORIZED TO REVIEW AND CERTIFY SUBMITTALS Shaw Environmental, Inc. Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation Task Order No. 046		
	SUBMITTAL TYPE:	AUTHORIZED PERSONNEL:
Work Plan Submittals	Preconstruction	Project Manager
Technical and Documentation Submittals	All Types	QC Manager, Program QC Manager, Project Manager and Site Engineer

(1) Note: QC Manager shall perform the final review and certification for submittals requiring Government approval.
QC Manager shall perform the final review and approval for submittals requiring Contractor approval.

EXHIBIT VII-1

TESTING PLAN AND LOG Shaw Environmental, Inc. Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation Task Order No. 046											
CONTRACT NUMBER			PROJECT TITLE: Rapid Refueler and JP-5 Line Site Cap								
N62470-02-D-3260			LOCATION: Camp Lejeune, NC								
WORK PLAN SECTION AND PARAGRAPH NUMBER	ITEM OF WORK	TEST REQUIRED	ACCREDITED/ APPROVED LAB		SAMPLED BY	TESTED BY	LOCATION OF TEST		DATE COMPLETED	DATE FORWARDED TO CONTR. OFF.	REMARKS
			YES	NO			ON SITE	OFF SITE			
WP 3.1 & 3.5	Rapid Refueler Recovery System	Depth to Groundwater and free product survey									Te determine the extent of free prouct at the site
WP 3.1 & 3.5	Rapid Refueler Recovery System	FID Measurements and field observations									To segregate soils for reuse or disposal
WP 3.2	JP-5 Line Area	Weekly Monitoring Well gauging									To deetermine the presence of free product
WP 3.2	JP-5 Line Area	VOCs by 8260B, PAHs by 8270C, and Lead by 6010B									Semi-Annual Groundwater Sampling
WP 3.6.1	Free Product Recovery and Groundwater Monitoring	Monitorin Well gauging prior to each MMPE event									To determine depth to groundwater and product thickness
WP 3.6.1	Free Product Recovery and Groundwater Monitoring	During each MMPE event measure and record the following: Vacuum applied, Exhaust emmisions, Amount of groundwater and free product recovered, disposal volume									During each MMPE event

WP 3.6.1	Free Product Recovery and Groundwater Monitoring	At the conclusion of each MMPE event gauge MWs for depth to groundwater and product thickness									On a weekly basis
WP 3.6.3	Groundwater Monitoring	Rapid Refueler MWs - VOCs by 8260B, SVOCs by 8270C plus 10 highest peaks by MADEP-VPH and MADEP-EPH.									Rapid Refueler MWs - Semi-Annual Groundwater Sampling of wells that do not have free product,
WP 3.6.3	Groundwater Monitoring	JP-5 Line Area - VOCs by 8260B, PAHs by 8270C, and Lead by 6010B plus eight temporary piezometers gauged for free product									JP-5 Line Area - Semi-Annual Groundwater Sampling of wells that do not have free product and piezometers gauged for at least 3-months
	Disposal	DRO, GRO, TCLP/VOC. TCLP/SVOC & TCLP/Metals									Soil Stockpile - Composite sample analyzed for RCRA TCLP Metals, TCLP VOC, TCLP SVOC (1/1000cy) AND TPH-DRO/GRO (1/200CY)

Location: Camp Lejeune NC

[illegible]

EXHIBIT X-1

QUALITY CONTROL INSPECTION PLAN Shaw Environmental, Inc. Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation Task Order No. 046								
Specification Section	Definable Feature of Work	Activity Number	Control Check Verification					
			Date	Preparatory Phase Checklist/Report No.	Date	Initial Phase Checklist/Report No.	Follow-up Phase Checklist/Report No.	
WP 3.1, 3.3, 3.4 & 3.5	Rapid Refueler Recovery System							
WP 3.2, 3.3 & 3.4	JP-5 Line Area							
WP 3.6	Free Product Recovery and Groundwater Monitoring							
WP 4.1	On-site Waste Management							
WP 4.2 & 4.3	Transportation and Disposal							

EXHIBIT XI-1

PERSONNEL MATRIX Shaw Environmental, Inc. Rapid Refueler A-B Tanks and JP-5 Line Site Cap Implementation Task Order No. 046			
SPECIFICATION SECTION	SUBMITTALS TO BE REVIEWED BY:	THREE PHASE TO BE PERFORMED BY:	TESTING TO BE PERFORMED BY:
All Sectons	Site QC Manager, Program QC Manager, Project Manager or Project Engineer	Site QC Manager	Chemical Analysis - Accutest Laboratories

(1) Note: QC Manager shall perform the final review and certification for submittals requiring Government approval.
QC Manager shall perform the final review and approval for submittals requiring Contractor approval.