

DEPARTMENT OF THE NAVY – NAVFAC SOUTHWEST
Naval Facilities Engineering Command
1220 Pacific Highway, San Diego, California 92132-5190



DRAFT

SITE CHARACTERIZATION REPORT

**BUILDING 500 FORMER UST SITE
(UST 500, ALSO KNOWN AS UST 000008)
NAVAL WEAPONS STATION SEAL BEACH, CALIFORNIA**

May 2014

Contract No.: N62473-10-D-4009
Task Order No.: 0068
Document Control No.: RBAE-4009-0068-0028

Prepared by:

BRADY

3710 Ruffin Road
San Diego, California 92123

DRAFT

SITE CHARACTERIZATION REPORT

**BUILDING 500 FORMER UST SITE
(UST 500, ALSO KNOWN AS UST 000008)
NAVAL WEAPONS STATION SEAL BEACH, CALIFORNIA**

May 2014

**Prepared for:
DEPARTMENT OF THE NAVY
Naval Facilities Engineering Command Southwest**

Prepared by:

BRADY

3710 Ruffin Road
San Diego, California 92123

Contract No.: N62473-10-D-4009

Task Order No.: 0068

Document Control No.: RBAE-4009-0068-0028

Prepared by:


Timothy Shields, P.G. #8727
Project Manager

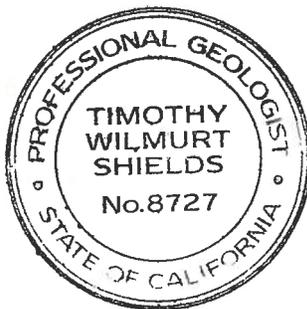


TABLE OF CONTENTS

SECTION.....	PAGE
1.0 INTRODUCTION	1
1.1 Scope of Work	1
1.2 Report Organization.....	2
1.3 Regulatory Status	2
2.0 SITE BACKGROUND AND ENVIRONMENTAL SETTING	3
2.1 Site Location and Description	3
2.2 Site History/Previous Investigation	3
2.3 Environmental Setting.....	4
2.3.1 Regional Setting and Topography.....	4
2.3.2 Land Use	5
2.3.3 Climate.....	5
2.3.4 Geology	5
2.3.5 Hydrogeology	5
3.0 INVESTIGATION RATIONALE	7
4.0 FIELD ACTIVITIES.....	8
4.1 Permitting and Notification	8
4.2 Utilities	8
4.3 SCAPS Investigation	8
4.4 Temporary Piezometer Installation	8
4.5 Soil Sampling	9
4.6 Sample Handling and Custody	9
4.7 Decontamination Procedures	9
4.8 Investigative Derived Waste	9
4.9 Geospatial Data Acquisition.....	10
5.0 INVESTIGATION RESULTS	11
5.1 Geology.....	11
5.2 SCAPS LIF Data	11
5.3 Soil Sample Analytical Results	12
6.0 CONCEPTUAL SITE MODEL.....	13
6.1 Potential Sources and Contaminants	13
6.2 Pathways	13
6.3 Receptors.....	13
7.0 CONCLUSIONS AND RECOMMENDATIONS	14
7.1 Data Quality Objective Conclusions	14
7.2 Recommendations	15
8.0 REFERENCES.....	16

FIGURES

Figure 1	Facility Location Map
Figure 2	Site Location Map
Figure 3	Sample Locations and Analytical Results
Figure 4	Cross Section A-A'

TABLES

Table 1 Soil Analytical Data

APPENDICES

Appendix A Boring Permit
Appendix B SCAPS CPT/LIF Boring Logs
Appendix C Chain-of-Custody and Laboratory Sample Receipt Forms
Appendix D Data Quality Review and Validated Laboratory Data
Appendix E Non-Hazardous Waste Manifest

ACRONYMS AND ABBREVIATIONS

BTEX	benzene, toluene, ethylbenzene, and xylenes
bgs	below ground surface
BRADY	Richard Brady & Associates
CPT	cone penetrometer test
DQO	data quality objective
DWR	California Department of Water Resources
LIF	laser induced fluorescence
mg/kg	milligrams per kilogram
NAVWPNSTA	Naval Weapons Station
NAVFAC SW	Naval Facilities Engineering Command Southwest
PAHs	polynuclear aromatic hydrocarbons
RSLs	U.S. EPA Region 9 Regional Screening Levels
SAP	Sampling and Analysis Plan
SCAPS	Site Characterization and Analysis Penetrometer System
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
µg/kg	micrograms per kilogram
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
UST 500	former underground storage tank at Building 500
VOCs	volatile organic compound

1.0 INTRODUCTION

This site characterization report describes the investigation conducted to delineate the extent of non-aqueous phase fuel and/or contaminated soil associated with a diesel fuel release from a former underground storage tank (UST) at Building 500 (UST 500), also known as UST 000008, on Naval Weapons Station (NAVWPNSTA) Seal Beach, California. This document was prepared by Richard Brady & Associates (BRADY) on behalf of Naval Facility Engineering Command Southwest (NAVFAC SW) under subcontract to CB&I Federal Services LLC in accordance with Task Order 0068 issued under contract N62473-10-D-4009.

1.1 Scope of Work

The objective of this investigation is to delineate the extent of diesel in soil at the UST 500 and to make recommendations for future work based the magnitude of the release. This investigation was designed to collect data to assess the exposure pathways to human health and the environment, and update the conceptual site model for UST 500. The investigation was performed using the Navy's Site Characterization and Analysis Penetrometer System (SCAPS) direct push Cone Penetrometer Test (CPT) and laser-induced fluorescence (LIF) technology.

To meet the investigation objective, BRADY pushed the SCAPS CPT/LIF at three locations to a maximum depth of approximately 25 feet below ground surface (bgs) to provide real-time stratigraphic and petroleum distribution screening data. Three soil samples were collected to confirm the LIF screening results. Soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (-g) and diesel (-d) by United States Environmental Protection Agency (U.S. EPA) Method 8015B, volatile organic compounds (VOCs) by U.S. EPA Method 8260B and polynuclear aromatic hydrocarbons (PAHs) by U.S. EPA Method 8270 selective ion monitoring.

1.2 Report Organization

This site characterization report describes the background and environmental setting, previous investigations, field activities, investigation results, conclusions and recommendations, and references.

Appendices that contain supporting data are as follows:

- Appendix A – Boring Permit
- Appendix B – SCAPS CPT/LIF Boring Logs
- Appendix C – Chain-of-Custodies and Laboratory Sample Receipt Forms
- Appendix D – Data Quality Review and Validated Laboratory Data
- Appendix E – Non-Hazardous Waste Manifest

Figures and tables are included in separate tabs at the end of the document.

1.3 Regulatory Status

The Department of the Navy is the lead agency on this project, and the lead regulatory agency is the California Regional Water Quality Control Board, Santa Ana Region.

2.0 SITE BACKGROUND AND ENVIRONMENTAL SETTING

2.1 Site Location and Description

NAVWPNSTA Seal Beach is located in the northwest corner of Orange County, California, in the City of Seal Beach, located approximately 20 miles south of Los Angeles (Figure 1). Seal Beach is bordered to the west and north by the cities of Long Beach and Los Alamitos. The city is bordered to the east by Westminster and to the south by Huntington Beach. Comprised of 5,256 acres, NAVWPNSTA Seal Beach is a Navy weapons and munitions loading, storage, and maintenance facility. NAVWPNSTA Seal Beach has been operated by the Navy and its contractors since its inception in 1944.

Former UST 500 is within a truck holding yard in the southeastern region of NAVWPNSTA Seal Beach (Figures 2 and 3). The former UST is located in a paved area adjacent to an electrical transformer pad.

2.2 Site History/Previous Investigation

The UST was discovered in November 2009 during site renovation of the holding yard at Building 500. To the best base personnel knowledge, the UST was used for supplying diesel fuel to an emergency generator, and was abandoned in the 1950s. An initial subsurface investigation ascertained that the UST was a 1200-gallon single-walled steel tank, and contained approximately 1000 gallons of diesel fuel. Under direction of the Orange County Health Care Agency, Environmental Health Division (a Certified Unified Program Agency implementing the UST Program), the remaining fuel was removed, the UST interior was triple rinsed, and soil samples were collected for analysis. In December 2009, a backhoe was used to pothole and collect three soil samples adjacent to the bottom of the UST. The precise location and depth of these samples is unknown. Because the UST was situated adjacent to the transformer pad, near underground utilities, and in a remote area that may not pose any environmental health risks to the public or any beneficial uses of water, the UST was allowed to be filled in-place with cement grout. Some of the sampling excavation surrounding the UST was also filled with cement grout (NAVFAC SW, Personal Communication).

The results reported by the laboratory from the analysis of the three soil samples are presented on the following page.

Summary of Results Reported from December 2009 Sampling

Sample SB-01-2	
Napthalene	0.0037 mg/kg
All other analytes were non-detect.	
Sample SB-02-8	
All analytes were non-detect	
Sample SB-03-8	
TPH quantified as gasoline	270 mg/kg
TPH quantified as diesel	7000 mg/kg
1,2,4-Trimethylbenzene	3.5 mg/kg
1,3,5-Trimethylbenzene	0.82 mg/kg
2-butanone	1.9 mg/kg Q
4-Isopropyltoluene	0.44 mg/kg
Isopropylbenzene	0.10 mg/kg
napthalene	5.6 mg/kg Q
n-butylbenzene	0.48 mg/kg
n-propylbenzene	0.22 mg/kg
sec-butylbenzene	0.23 mg/kg
m,p-xylenes	0.66 mg/kg
o-xylene	0.24 mg/kg
All other analytes were non-detect.	
mg/kg = milligrams per kilogram	
Q = One or more quality control criteria did not meet specifications.	

The laboratory report is provided in Appendix C of the Final Work Plan (BRADY, 2013).

2.3 Environmental Setting

The following sections describe the regional setting, land use, climate, geologic, and hydrologic settings at the site.

2.3.1 Regional Setting and Topography

NAVWPNSTA Seal Beach is located within the city boundaries of Seal Beach. The Seal Beach National Wildlife Refuge is located in the southwest region of the base, which is bordered by Anaheim Bay leading to the Pacific Ocean.

The topography in the region is generally flat ranging from near sea level to approximately 15 feet above mean sea level, as part of the Sunset Gap topographical area.

2.3.2 Land Use

Since NAVWPNSTA Seal Beach was first commissioned in 1944, the facility has been used for weapons and munitions loading, storage, and maintenance. Prior to 1962 it was known as the Naval Ammunition and Net Depot and was used to service anti-submarine nets used to protect fleet bases and anchorages around the world. NAVWPNSTA Seal Beach has evolved into the Navy's primary West Coast ordnance storage, loading and maintenance facility. All current facility operations are industrial, and the Navy's proposed future use for the entire facility will remain industrial, with controlled access restricted to authorized badged personnel.

2.3.3 Climate

The Seal Beach area is characterized by a Mediterranean climate, with warm to hot, dry summers and cool, wet winters. Based on Anaheim climate data, temperatures range from an average yearly high of 78° to an average low of 56° Fahrenheit, with an average annual rainfall of 13.5 inches (The Weather Channel, 2014).

2.3.4 Geology

Regionally, the Los Angeles Basin is a thick sedimentary sequence of Pliocene and Quaternary age alluvial sediments eroded from the mountains that surround the area. Deposition of these variably weathered sediments that form the broad synclinal depression of the basin was influenced by sea level changes and encroachment that occurred across the depositional time frame (United States Geological Survey, 2009). These sedimentary rocks lie on a pre-Tertiary, metamorphic and crystalline basement (Geological Survey, 1956).

The present topography in the area of the site was created by the geologically-recent and ongoing activity of the Newport Inglewood Structural Zone. This tectonic movement has formed the topographic low that incorporates the UST 500 Site within the Sunset gap and the flanking subtle elevation changes of the Bolsa Chica Mesa southeast of the site and Landing Hill to the northwest (California Department of Water Resources [DWR], 1968).

Within the Sunset Gap area, the near surface geology at the study area is expected to consist of Holocene age sediments characterized as silt, sand, gravel and clay deposited in a floodplain/lagoonal environment. Underlying the recent deposits are the shallow marine, littoral, and continental Pleistocene sediments consisting of interbedded sand, gravel, silt, and clay (Geological Survey, 1956).

2.3.5 Hydrogeology

NAVWPNSTA Seal Beach is located within the East Coastal Plain Hydrologic Subarea of the Lower Santa Ana River Hydrologic Area, which has designated existing or potential municipal, agricultural, and industrial beneficial uses for groundwater (Water Board, 2008).

According to the 1956 Geological Survey Water Supply Paper, there are at least three distinct bodies of groundwater in the Long Beach-Santa Ana area. The shallowest is the semiperched body of water which occurs in the Holocene sediments, commonly less than

50 feet bgs. The semiperched is essentially an unconfined fresh water body and is a minor groundwater producer of generally poorer quality than water from the deeper aquifer. Beneath the semiperched shallow aquifer and within primarily the Pleistocene sediments that underlie the Holocene deposition is the principal body of naturally fresh groundwater. This extensive, main fresh water body has its base 800 to 2,600 feet below sea level along the crest of the Newport-Inglewood zone, but extends to depths as great as 8,000 feet beneath the central part of Downey Plain. Connate, saline water underlies the main fresh water body in older Tertiary age rocks (Geological Survey, 1956).

The general groundwater gradient for the freshwater aquifers in the area is seaward (southwesterly). Historically however, variations in pumping and artificial recharge have affected groundwater gradient (DWR, 1968).

3.0 INVESTIGATION RATIONALE

The investigation rationale was based upon historical data from a previous investigation and the need to further delineate fuel contamination at former UST 500. Data design and collection followed the 7-step data quality objective (DQO) process (U.S. EPA, 2006). The process is used to determine the type, quantity, and quality of the data necessary to support decision-making regarding current site conditions and future site management decisions. DQOs for this investigation are presented in Worksheet #11 of the Sampling and Analysis Plan (SAP) (BRADY, 2013).

Three SCAPS CPT/LIF locations were chosen to allow efficient step outs from the former UST 500, delineating the non-aqueous phase fuel and/or contaminated soil in a dynamic manner guided by real-time LIF screening data.

4.0 FIELD ACTIVITIES

The field investigation at UST 500 was performed over 2 days on October 30-31, 2013. The following sections describe the field activities in relative chronology.

4.1 Permitting and Notification

A courtesy drilling permit application was submitted to the Orange County Health Care Agency, Environmental Health Division for the SCAPS borings and piezometer (Appendix A). In addition, digging permits were obtained from the NAVWPNSTA Seal Beach Public Works Department prior to any intrusive work at the site.

4.2 Utilities

Underground utility clearance was completed for each subsurface investigation location. The locations consisted of three locations in the immediate vicinity of former UST 500, and six additional potential step-out locations.

Proposed SCAPS locations and the utility lines in the area of interest were marked using color-coded surveyor paint. ULS Services Corporation cleared the SCAPS locations using geophysical methods.

Additionally, each intrusive location was hand augered to approximately 5 feet bgs by field personnel prior to using the SCAPS. SCAPS locations were placed at least 3 feet away from any marked or otherwise suspected underground utility.

4.3 SCAPS Investigation

A total of three SCAPS pushes were completed at the locations shown on Figure 3. The SCAPS investigation used a combined CPT/LIF probe. Lithologic data was collected using the CPT component, which provided continuous, real-time profiling of soil parameters (CPT tip resistance and sleeve friction) that are used to infer the subsurface lithology (Appendix B).

Screening data for fuel was collected using the LIF component. LIF provides measurements of fuel fluorescence with a vertical resolution of approximately 2 inches. Each SCAPS push yielded continuous LIF and CPT data to a depth of more than 10 feet below the water table. Following each LIF screening push, the real time LIF data was used to determine if the fuel in soil has been delineated or if a step-out push was needed. Screening level delineation was completed when the LIF screening data did not show elevated fluorescence intensity that infers the presence of fuel. The LIF probe was pushed to a maximum depth of approximately 25 feet bgs at each location.

4.4 Temporary Piezometer Installation

A temporary piezometer was installed at one push location (U500-01, Figure 3) to determine the depth to groundwater so that soil samples could be collected near the water table on the presumed downgradient (southwesterly) side adjacent to UST 500. The

temporary piezometer was installed to a depth of 24.55 feet bgs. Groundwater was allowed to infiltrate through the screen for approximately 16 hours.

4.5 Soil Sampling

The SAP specified that after the extent of fuel was delineated by the LIF and the depth to groundwater established, soil sampling, analysis, and validation be conducted to confirm the LIF results and to provide quantitative data. One soil sample was to be collected at the location and depth of the greatest LIF fluorescence. A second soil sample was to be collected from a depth interval of background fluorescence directly above the sample with the greatest fluorescence and a third soil sample from an area where background fluorescence is measured through the entire push interval, from a depth corresponding to the greatest fuel fluorescence at an adjacent push location.

Because elevated fluorescence was not detected by the LIF sensor at any location, soil samples were collected from near the water table at each location in accordance with the SAP to assess a potential fuel smear zone with possible detections lower than the LIF detection threshold. Soil samples were analyzed for TPH-d, TPH-g, VOCs and PAHs. Third party data validation was performed on the soil sample data.

4.6 Sample Handling and Custody

Samples were packaged to allow the samples to be delivered to EMAX Laboratories Inc. in Torrance, California undisturbed and in good condition in accordance with the Final SAP (BRADY, 2013). Upon receipt, the laboratory representative signed the chain of custody form and recorded the temperature of the temperature blank on the chain of custody form and on the sample receipt form (Appendix C). Validation was performed by Laboratory Data Consultants Inc. Validation reports and case narratives are presented in Appendix D.

4.7 Decontamination Procedures

For each SCAPS push, the push-rod assembly and probe were decontaminated as they were withdrawn from the subsurface by a manifold system located beneath the floor of the SCAPS truck.

Non-disposable sampling equipment was decontaminated to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. Decontamination of small non-disposable sample equipment was conducted in accordance with the SAP.

4.8 Investigative Derived Waste

Wastes generated during the fieldwork included decontamination water and soil cuttings. The wastes were containerized on site and stored temporarily in labeled 55-gallon drums inside a secondary containment area at the site. Upon completion of the investigation, the drums were moved to a secured building on the base for storage until laboratory results were available. All investigative derived waste was transported off site by a certified waste disposal contractor. The manifest for the disposal is located in Appendix E.

4.9 Geospatial Data Acquisition

SCAPS direct push location data were obtained by the SCAPS field crew using a portable Trimble Global Positioning System receiver capable of sub-meter horizontal accuracy. The location data are included on the SCAPS logs (Appendix B).

5.0 INVESTIGATION RESULTS

This section describes the results of the investigation. A data quality review was conducted to evaluate the data collected during this investigation and determine whether the data met the quality objectives outlined in the SAP. The data quality review and validated laboratory analytical reports for data collected during this investigation are provided in Appendix D.

5.1 Geology

Three SCAPS CPT/LIF pushes were completed at UST 500 at locations depicted on Figure 3. Lithologic data was collected using a CPT probe. Completed SCAP CPT/LIF logs are provided in Appendix B. The column labeled “Qc” is the measured CPT cone (tip) resistance, “Qs” is the measured CPT sleeve friction resistance, and the central column “Soil Class” depicts Robertson and Campanella’s 1988 soil behavior classification system.

The uppermost 5 feet of soil was not classified using CPT because the soil was disturbed by hand augering for underground utility clearance. Near-surface materials consisted of approximately 0.3 feet of asphalt overlying sandy gravel fill to a depth of approximately 1 foot bgs. The fill was underlain by dense silty sand to a depth of 2.0 to 2.7 feet bgs, which was in turn underlain by firm silty clay/clayey silt that extended to the bottom of the hole.

Soil samples collected between 9.5 and 12.5 feet bgs consisted predominantly of silty clay.

CPT data was collected from 5 feet bgs to the extent of the CPT push depth. CPT soil classifications corresponding to silty sand/sandy silt were encountered from approximately 6 to 10 feet bgs at two locations (U500-02 and -03). Otherwise, the CPT data generally inferred clay with very low cone pressures and sleeve frictions. The CPT soil classifications were similar or slightly finer grained than the soils observed in the hand auger cuttings and soil samples, indicating that in general the site is underlain by relatively low permeability silts and clays to the maximum depth of the investigation at approximately 25 feet bgs.

Groundwater was measured at a depth of approximately 11.6 feet bgs in the temporary piezometer at location U500-01.

5.2 SCAPS LIF Data

The SCAPS CPT/LIF data profiles are provided on logs in Appendix B. The column labeled “Wavelength” plots the wavelength of the highest fluorescent intensity. The column labeled “Peak Intensity” plots the maximum fluorescence intensity for each reporting point.

None of the SCAPS LIF pushes had elevated fluorescence response suggesting the presence of fuel. A typical fuel response is indicated by elevated fluorescence intensity exceeding 10,000 counts paired with decreased wavelength. As illustrated in the SCAPS

push logs, no peak intensity spikes were recorded and wavelength was consistently above 460 nanometers, consistent with a normal background response.

5.3 Soil Sample Analytical Results

Since no fuel fluorescence was observed by the LIF sensor, a piezometer was installed to determine the depth to groundwater and establish soil sampling depth intervals. Soil samples were collected near the water table at each of the three locations in order to target a potential fuel smear zone. A data quality review and the validated laboratory data are presented in Appendix D and the results are summarized in Table 1 and on Figure 3.

TPH-g, TPH-d, and PAHs were not reported above detection limits in any soil sample. Benzene, toluene, ethylbenzene, and xylenes (BTEX), were reported at concentrations above the limit of quantitation in sample U500-01-S-01, but at estimated concentrations below the limit of quantitation in the remaining two soil samples. Table 1 lists estimated concentrations below the limit of quantitation reported for other fuel-related VOCs.

None of the reported concentrations exceeded the project screening levels, which were based on November 2012 U.S. EPA Region 9 Regional Screening Levels (RSLs) for industrial soil. In addition, the reported concentrations did not exceed RSLs for residential soil.

6.0 CONCEPTUAL SITE MODEL

The conceptual site model for the NAVWPNSTA Seal Beach UST 500 was compiled from historical research, site visits and available hydrogeological and chemical data from the investigations to date.

6.1 Potential Sources and Contaminants

A historic release of diesel fuel related to the former operations of the UST occurred within a limited area of the UST. Mobile fuel product has not been observed and does not appear to exist at the site. Soil was impacted with residual fuel immediately adjacent to the tank bottom with a maximum historic TPH-d concentration of 7,000 mg/kg. LIF data from locations adjacent to the tank did not detect any elevated fluorescence that would suggest the presence of petroleum hydrocarbons. TPH-g, TPH-d, and PAHs were not reported above detection limits in any soil sample collected for this investigation. Low concentrations of BTEX were reported in one of the soil samples collected near the water table at approximately 11 feet bgs and approximately 7.5 feet from the UST in the apparent downgradient direction. The reported concentrations were 79 micrograms per kilogram ($\mu\text{g}/\text{kg}$) benzene, 15 $\mu\text{g}/\text{kg}$ ethylbenzene, 21 $\mu\text{g}/\text{kg}$ m & p xylenes, and 96 $\mu\text{g}/\text{kg}$ toluene. The samples from the remaining two locations had detections reported below the limit of quantitation. The reported detections of VOCs in soil samples collected near the water table suggest that shallow groundwater likely has relatively low concentrations of dissolved VOCs. A cross section showing the CPT data and analytical results in relation to the tank and the water table is presented as Figure 4.

6.2 Pathways

All concentrations reported in this investigation and in the original tank closure investigation are below RSLs for residential soil; therefore direct contact with soil does not appear to be a complete pathway for exposure.

Soil sample results from near the water table within approximately 7.5 feet of the UST suggest that low concentrations of dissolved-phase fuel constituents appear to have migrated a short distance away from the UST. UST 500 is located approximately 0.6 miles from any occupied building and approximately 0.6 miles east of the saltwater marsh. The silts and clays underlying the site would be expected to inhibit the migration of dissolved VOCs, therefore the groundwater pathway is expected to be incomplete. Similarly, due to the distance from occupied structures, the vapor intrusion pathway is incomplete.

6.3 Receptors

Based on the reported non-detections of TPH-d and TPH-g, the low concentrations of VOCs below RSLs, and the presence of fine grained subsurface soil, no complete pathways to human or ecological receptors have been identified for this site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This investigation consisted of using screening data from three SCAPS LIF pushes, the collection and analysis of three soil samples and consideration of analytical data from a previous investigation. Fieldwork for UST 500 was conducted in accordance with the Final Work Plan and SAP (BRADY, 2013).

The validated laboratory results reported no analyte concentrations above the project screening levels. TPH-d, TPH-g, and PAHs were not reported above detection limits in any samples collected for this investigation. BTEX compounds were reported at concentrations above the limit of quantification in one sample, but all concentrations were below the RLSs for industrial and residential soil. Due to the low concentrations and the fine-grained nature of the soil, dissolved phase VOCs are not expected to migrate to the nearest receptors located more than half a mile from the site.

The following conclusions and recommendations were formed based on the results of this investigation as they relate to the DQOs established for this project.

7.1 Data Quality Objective Conclusions

The following DQOs were established in the SAP and approved by the Navy and regulatory team. The DQOs addressed by this investigation are as follows:

1. *If the former diesel fuel release area is bounded vertically and horizontally by SCAPS LIF locations with LIF intensity counts below 10,000, and the fixed base laboratory samples confirm the LIF data, then the vertical and horizontal extent of fuel-related constituents in soil has been defined.*

The former diesel fuel release area is bounded vertically and horizontally by SCAPS LIF locations with LIF intensity counts below 10,000. Non-detections were reported for TPH-g and TPH-d for all samples, confirming the LIF data.

2. *If the validated soil sample data from the fixed-base laboratory reports concentrations of fuel-related constituents above project screening criteria, then a recommendation for future work will be made based on the magnitude of the petroleum release, otherwise a recommendation for no further action may be made.*

No reported concentrations of fuel-related constituents exceeded the project screening criteria.

3. **Primary Goal:** If the nature (i.e. concentrations relative to project screening criteria) and extent of the fuel release has been defined by the preceding decision rules, then a recommendation for site closure or for further action will be made based on the revised conceptual site model.

The nature and extent of the diesel release at UST 500 has been adequately defined by the SAP decision rules. The site history and analytical data indicate that the release consisted only of petroleum fuel. The UST has been cleaned and closed in place. No indication of free product has been found, and data from this investigation from within approximately 7.5 feet of the UST indicate that there is not a significant secondary

source. No complete pathways via direct exposure, groundwater, or vapor intrusion to human or ecological receptors have been identified.

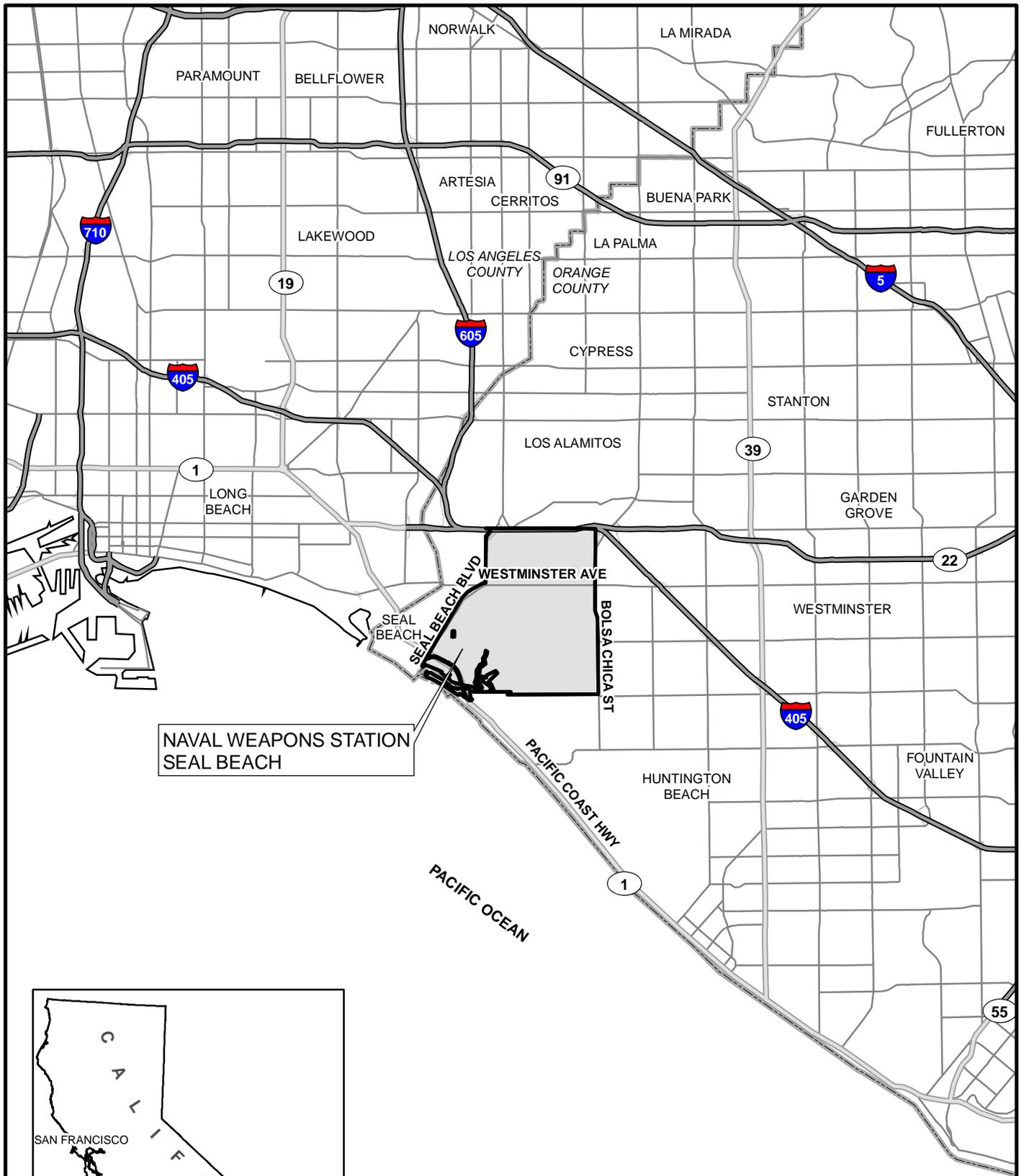
7.2 Recommendations

Based on the conclusions of this report, closure with no further action is recommended for UST 500.

8.0 REFERENCES

- BRADY, 2013. Final Work Plan, Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500, also known as UST 000008), NAVWPNSTA Seal Beach, California. February 21.
- DWR, 1968. Bulletin No. 63-2 Sea-Water Intrusion: Bolsa-Sunset Area Orange County. Jan.
- Geological Survey, 1956. Water Supply Paper 1109, Ground-water Geology of the Coastal Zone Long Beach-Santa Ana Area, California.
- Robertson, P.K. and R.G. Campanella, 1988. Guidelines for Use, Interpretation and Application of the CPT and CPTU, UBC, Soil Mechanics Series No. 105
- The Weather Channel, Monthly Weather Averages for Anaheim, California, accessed March 2014:
<http://www.weather.com/weather/wxclimatology/monthly/USCA0027>
- United States Geological Survey, 2009. Ground-Water Quality Data in the Coastal Los Angeles Basin Study Unit, 2006: Results from the California GAMA Program. March.
- U.S. EPA. 2006. Guidance on Systematic Planning Using the DQO Process. U.S. EPA QA/G-4. Office of Environmental Information PA/240/B-06/001. February.
- Water Board, 2008. The Water Quality control Plan (Basin Plan) for the Santa Ana River Basin (Updated). February.

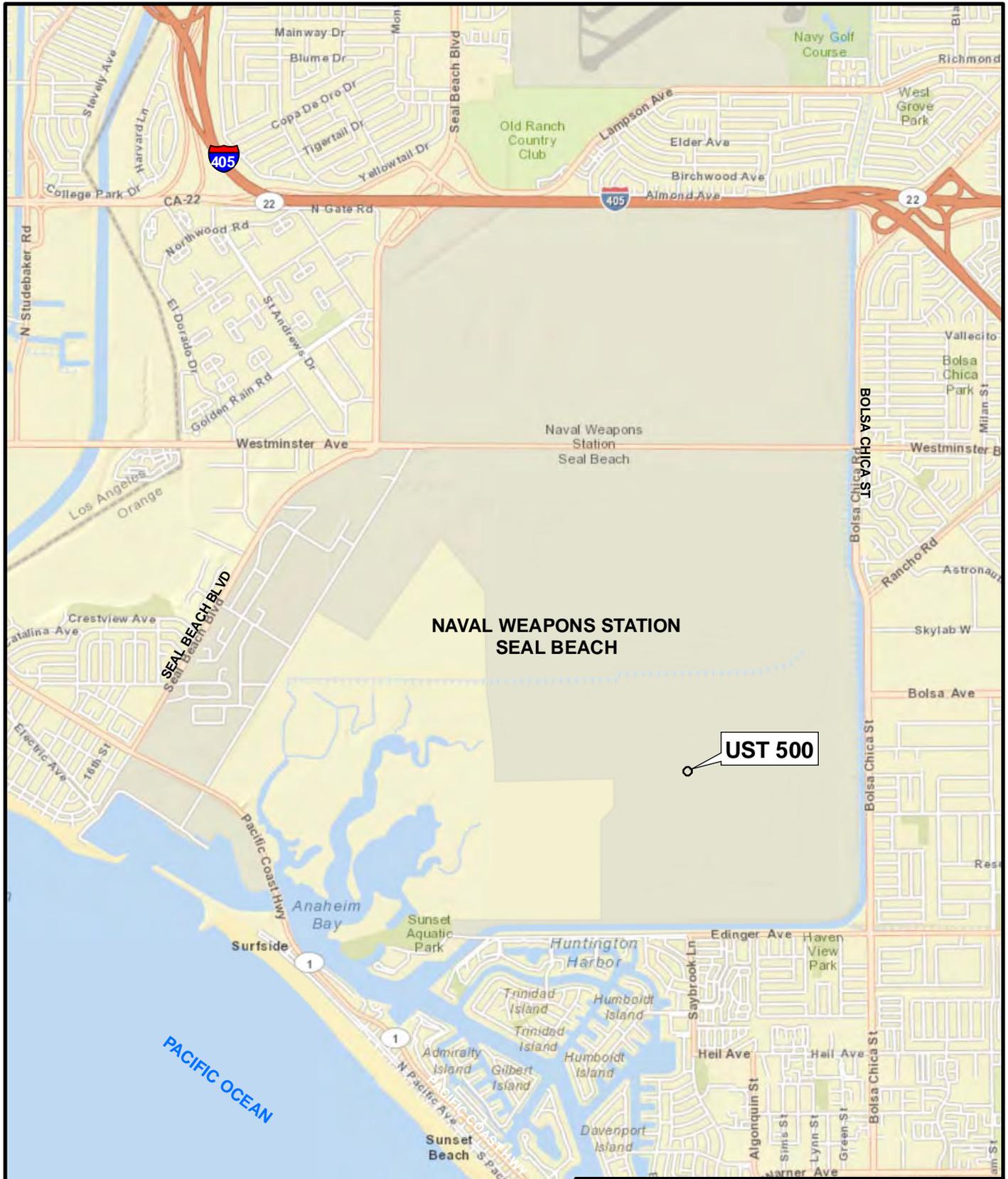
Figures



NAVAL WEAPONS STATION
SEAL BEACH



FACILITY LOCATION MAP	
NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA	
BRADY	DATE: Jan 7, 2014 FILE: LocMap
	FIGURE: 1



0 0.25 0.5
MILES

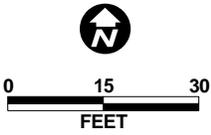
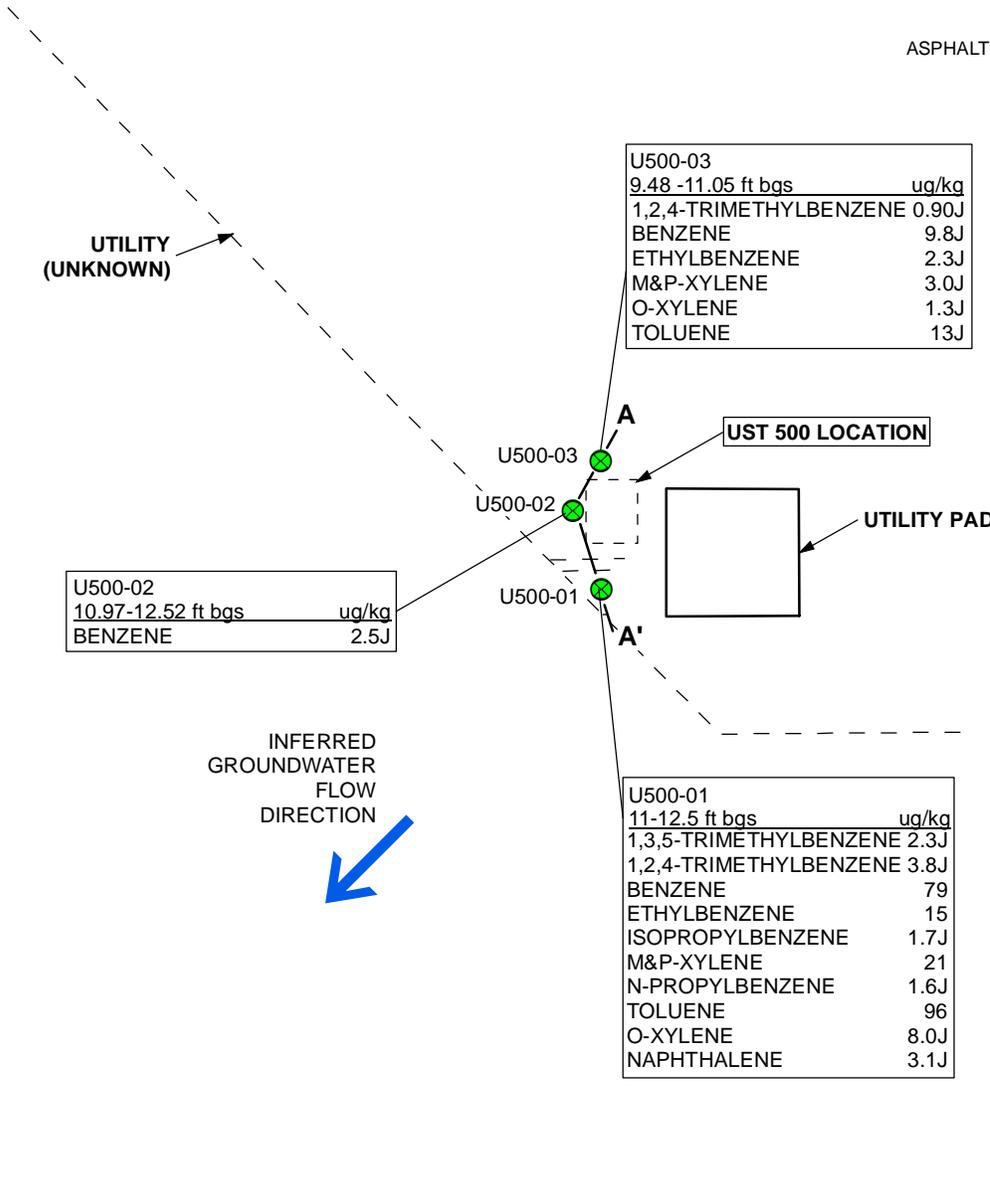
UST 500
SITE LOCATION MAP

NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CALIFORNIA

BRADY

DATE: Jan 6, 2014
FILE: SiteLocMap

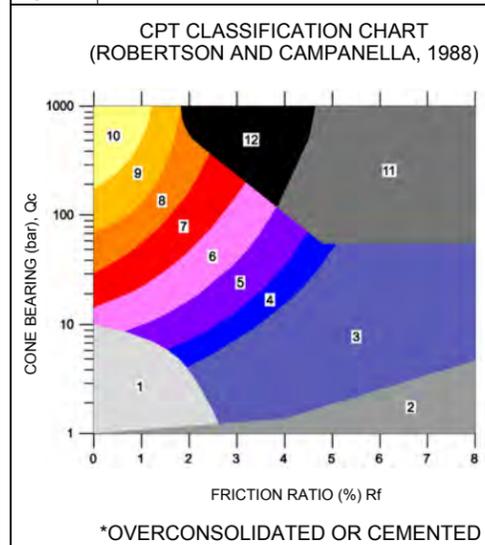
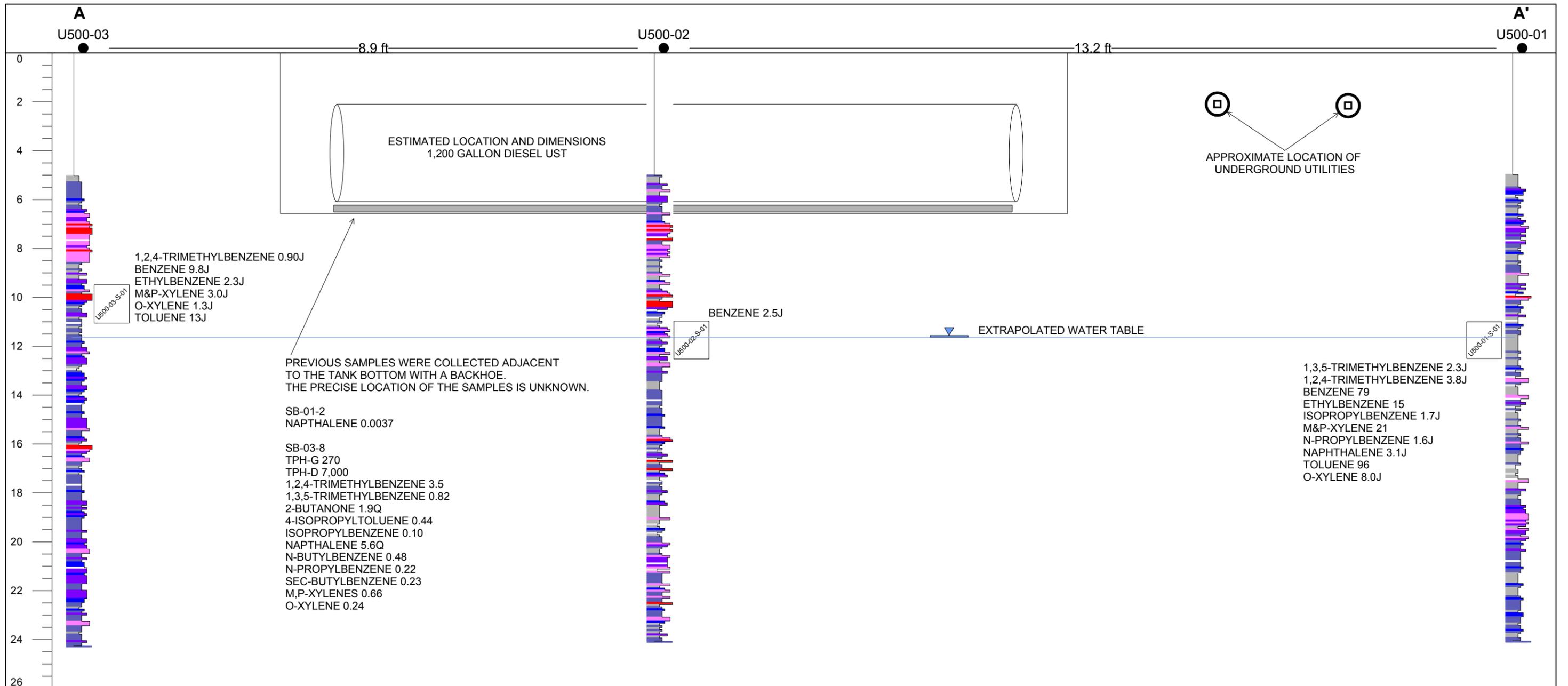
FIGURE
2



LEGEND
 SCAPS LIF LOCATION

ft bgs = FEET BELOW GROUND SURFACE
 J = ESTIMATED CONCENTRATION
 LIF = LASER INDUCED FLUORESCENCE
 ug/kg = MICROGRAMS PER KILOGRAM

UST 500 SAMPLE LOCATIONS AND ANALYTICAL RESULTS	
NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA	
	DATE: Mar 10, 2014 FILE: SoilResults
FIGURE: 3	



- 1 - SENSITIVE FINE GRAINED
- 2 - ORGANIC MATERIAL
- 3 - CLAY
- 4 - SILTY CLAY TO CLAY
- 5 - CLAYEY SILT TO SILTY CLAY
- 6 - SANDY SILT TO CLAYEY SILT
- 7 - SILTY SAND TO SANDY SILT
- 8 - SAND TO SILTY SAND
- 9 - SAND
- 10 - GRAVELLY SAND TO SAND
- 11 - VERY STIFF FINE GRAINED*
- 12 - SAND TO CLAYEY SAND*

NOTES:
 1. DEPTH PRESENTED IN FEET BELOW GROUND SURFACE.
 2. WATER TABLE IS ESTIMATED, AND IS BASED ON PIEZOMETER DATA IN U500-01.
 3. LOCATION OF THE UST AND UTILITIES ARE APPROXIMATE.
 4. ANALYTICAL DATA ARE PRESENTED IN MICROGRAMS PER KILOGRAM
 5. ALL BORINGS HAND AUGERED FOR UTILITY CLEARANCE CPT SOIL CLASS NOT VALID FOR FIRST 5 FEET

J = ESTIMATED CONCENTRATION
 Q = ONE OR MORE QUALITY CONTROL CRITERIA DID NOT MEET SPECIFICATIONS

HORIZONTAL SCALE IN FEET

0 1 2 3 4

CROSS SECTION A - A'

UST 500
NAVAL WEAPONS STATION
SEAL BEACH, CALIFORNIA

DATE: Mar 6, 2014
 FILE: UST500_SCAPS_Logs.sdg

FIGURE: **4**

(š̂ i

o ·)

Table 1
Soil Analytical Data
Building 500, Former UST Site
NWS Seal Beach, CA

Analyte		1,2,4-TRIMETHYLBENZENE	1,3,5-TRIMETHYLBENZENE	BENZENE	ETHYLBENZENE	ISOPROPYLBENZENE	M & P-XYLENE	NAPHTHALENE	N-PROPYLBENZENE	O-XYLENE	TOLUENE
Analytical Group		VOC	VOC	VOC	VOC	VOC	VOC	VOC	VOC	VOC	VOC
Residential RSL		62,000	780,000	1,100	5,400	2,100,000	590,000	3,600	3,400,000	690,000	5,000,000
PSL / Industrial RSL		260,000	10,000,000	5,400	27,000	11,000,000	2,500,000	18,000	21,000,000	3,000,000	45,000,000
Sample ID	Sample Date	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
U500-01-S-01	10/31/2013	3.8 J	2.3 J	79	15	1.7 J	21	3.1 J	1.6 J	8.0 J	96
U500-02-S-01	10/31/2013	1.3 U	1.3 U	2.5 J	1.3 U	1.3 U	2.6 U	2.6 U	1.3 U	1.3 U	1.3 U
U500-03-S-01	10/30/2013	0.90 J	1.2 UJ	9.8 J	2.3 J	1.2 UJ	3.0 J	2.4 UJ	1.2 UJ	1.3 J	13 J

Notes:

Bold - Reported (including estimates) analyte detection.

J - Analyte was detected between the detection limit and the limit of quantitation. The result is an estimated value.

µg/kg - micrograms per kilogram

PSL - project screening level (Industrial RSLs in this table are consistent with those from the Nov. 2012 update listed in the Final SAP (BRADY, 2013).)

RSL - Regional Screening Level (U.S. EPA Region 9, Nov. 2013)

U - Analyte not detected above the laboratory limit of detection shown.

UJ - Analyte not detected above the estimated limit of detection or limit of quantitation shown per validation report.

VOC - volatile organic compound

All TPH-g, TPH-d and PAH results were "non-detect". The following VOCs were also "non-detect" in site samples:

1,1,1,2-Tetrachloroethane	1,2-Dichloroethane	N-Butylbenzene	Trichloroethene
1,1,1-Trichloroethane	Chlorobenzene	P-Isopropyltoluene	Trichlorofluoromethane
1,1,2,2-Tetrachloroethane	Chloroform	Sec-Butylbenzene	Vinyl Acetate
1,1,2-Trichloroethane	Diisopropyl Ether	Styrene	Vinyl Chloride
1,1-Dichloroethene	Ethyl Tert-Butyl Ether	Tertiary-Amyl Methyl Ether	

Appendix A

Boring Permit

BRADY

June 4, 2013

Dan Yokoyama
Orange County Environmental Health
1241 East Dyer Road, Suite 120
City of Santa Ana, CA 92705-5611

Subject: NOTIFICATION OF WELL CONSTRUCTION FOR
PETROLEUM CONTAMINATION AT THE BUILDING 500
FORMER UST SITE (UST 500, ALSO KNOWN AS UST 000008)
NAVAL WEAPONS STATION SEAL BEACH, CALIFORNIA

DCN No.: RBAE-4009-0068-0022

Dear Mr. Yokoyama,

On June 24, 2013 through June 28, 2013, nine Site Characterization and Analysis Penetrometer System (SCAPS) cone penetrometer test/laser induced fluorescence (CPT/LIF) pushes will be advanced, and one temporary SCAPS piezometer will be installed by Richard Brady & Associates (BRADY) for Naval Facilities Engineering Command Southwest, under contract # N62473-10-D-4009. Proposed field activities will be conducted at Naval Weapons Station Seal Beach, Building 500 Former UST Site (UST 500), Seal Beach, CA, as part of the Navy's UST Program.

Please contact me at 858-496-0500 if you have any questions or comments. We appreciate this opportunity to be of service.

Sincerely,



Jason Williams
Richard Brady & Associates

cc. Mr. Paul Nguyen, NAVWPNSTA Seal Beach

APPLICATION FOR WELL CONSTRUCTION PERMIT

ORANGE COUNTY HEALTH CARE AGENCY
ENVIRONMENTAL HEALTH DIVISION

1241 E. DYER ROAD, SUITE 120
SANTA ANA, CA 92705-5611

(714) 433-6000
FAX: (714) 433-6481

CITY Seal Beach	DATE 6/4/2013	WELL PERMIT NUMBER
WELL LOCATION (ADDRESS IF AVAILABLE) Naval Weapons Station Seal Beach UST 500		
NAME OF WELL OWNER NAVWPNSTA Seal Beach c/o Pei-Fen Tamashiro	TYPE OF WELL (CHECK)	
ADDRESS 800 Seal Beach Blvd. Bldg. #110	PRIVATE DOMESTIC <input type="checkbox"/> MONITORING <input type="checkbox"/> PUBLIC DOMESTIC <input type="checkbox"/> SOIL BORING <input type="checkbox"/> IRRIGATION <input type="checkbox"/> OTHER <u>See Below</u> <input checked="" type="checkbox"/> CATHODIC <input type="checkbox"/> TOTAL NUMBER <u>10</u>	
CITY ZIP TELEPHONE Seal Beach 90740 562-496-7897	NOTE: 9 CPT/LIF, 1 Piezometer	
NAME OF CONSULTING FIRM Richard Brady & Associates	A. WELLS - SUBMIT A WELL CONSTRUCTION DIAGRAM (INCLUDE DIMENSIONS)	
BUSINESS ADDRESS 3710 Ruffin Road	B. SOIL BORINGS AND PROBES - TOTAL DEPTH <u>min. 25' bgs; TOTAL: TBD</u> SEALING MATERIAL <u>Cement & Bentonite</u>	
CITY ZIP TELEPHONE San Diego 92123 858-496-0500	C. PROPOSED START DATE <u>June 24, 2013</u>	
NAME OF DRILLING CO. C-57 LICENSE NO. NAVFAC Southwest - SCAPS Exempt - US Navy	I hereby agree to comply in every respect with all requirements of the Health Care Agency and with all ordinances and laws of the County of Orange and of the State of California pertaining to well construction, reconstruction and destruction, including the requirements to maintain the integrity of all significant confining zones.	
CITY ZIP TELEPHONE San Diego 92123	<div style="text-align: right; margin-bottom: 10px;"> APPLICANT'S SIGNATURE DATE <u>6/4/2013</u> </div> <div style="text-align: center; margin-bottom: 10px;"> Jason Williams PRINT NAME </div> <div style="display: flex; justify-content: space-between;"> 858-496-0500 PHONE NUMBER 858-496-0505 FAX NUMBER </div>	
DIAGRAM OF WELL SITE (Use additional sheets and/or attachments)		
<input checked="" type="checkbox"/> SITE PLAN ATTACHED		

FOR ACCOUNTING USE ONLY:

HSD NO. _____ CHECK NO. _____
 DATE _____ AMOUNT _____
 INTL. _____

APPROVAL BY OTHER AGENCIES:

JURISDICTION _____
 REMARKS _____

DISPOSITION OF PERMIT (DO NOT FILL IN):

APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

A. NOTIFY THIS AGENCY AT LEAST **48 HOURS**

PRIOR TO START.

PRIOR TO SEALING THE ANNULAR SPACE OR FILLING OF THE CONDUCTOR CASING.

B. SUBMIT TO THE AGENCY WITHIN 30 DAYS AFTER COMPLETION OF WORK, A WELL COMPLETION REPORT AND/OR DRILLING LOGS. PLEASE REFERENCE PERMIT NO.

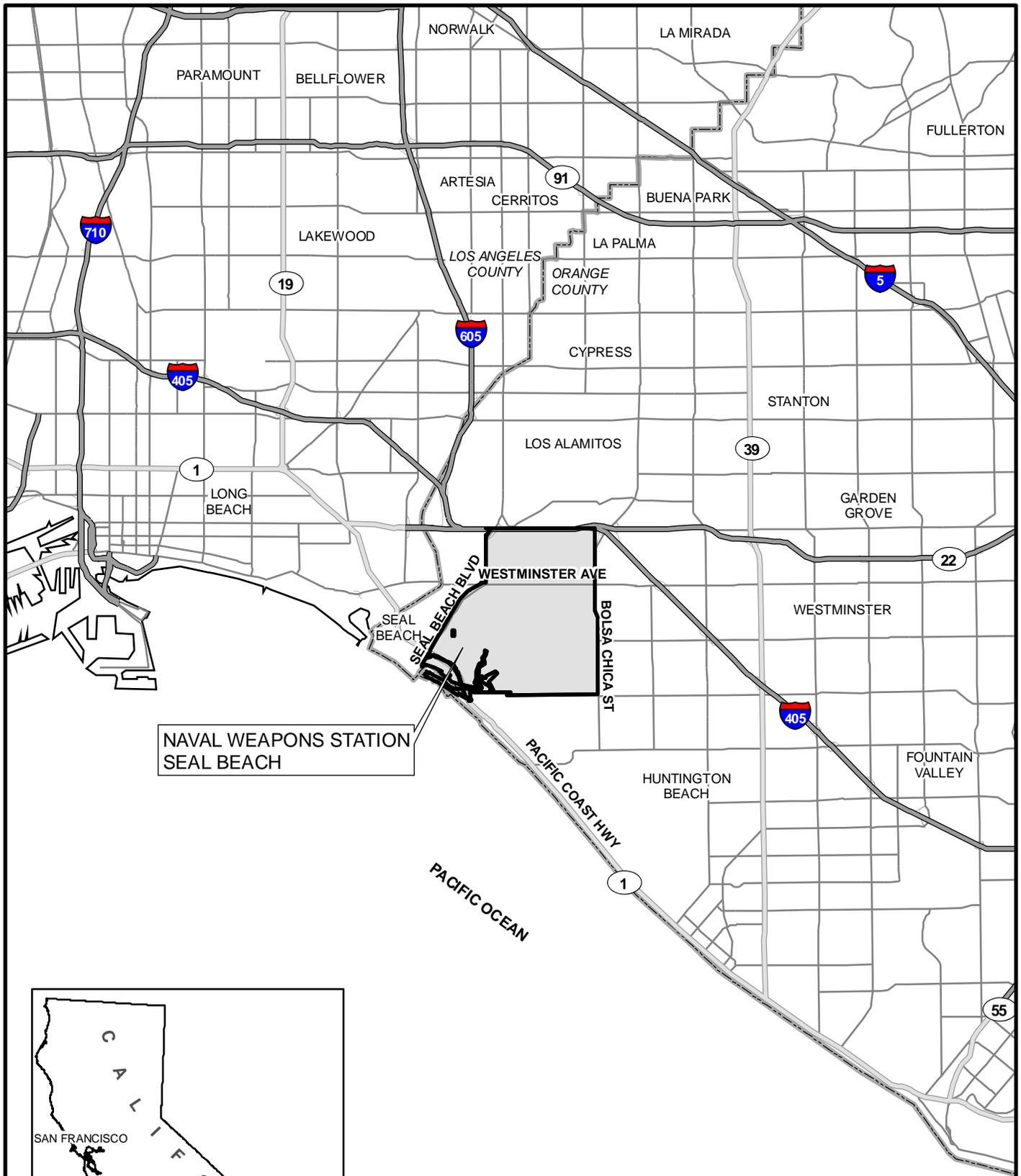
C. SECURE ALL MONITORING WELLS TO PREVENT TAMPERING.

D. OTHER _____

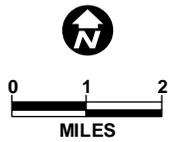
DENIED _____

PERMIT ISSUED BY _____ DATE _____
 PRINT NAME _____ PHONE NUMBER _____

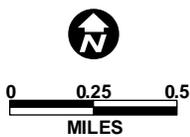
WHEN SIGNED BY ORANGE COUNTY HEALTH CARE AGENCY REPRESENTATIVE, THIS APPLICATION IS A PERMIT.



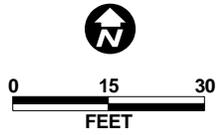
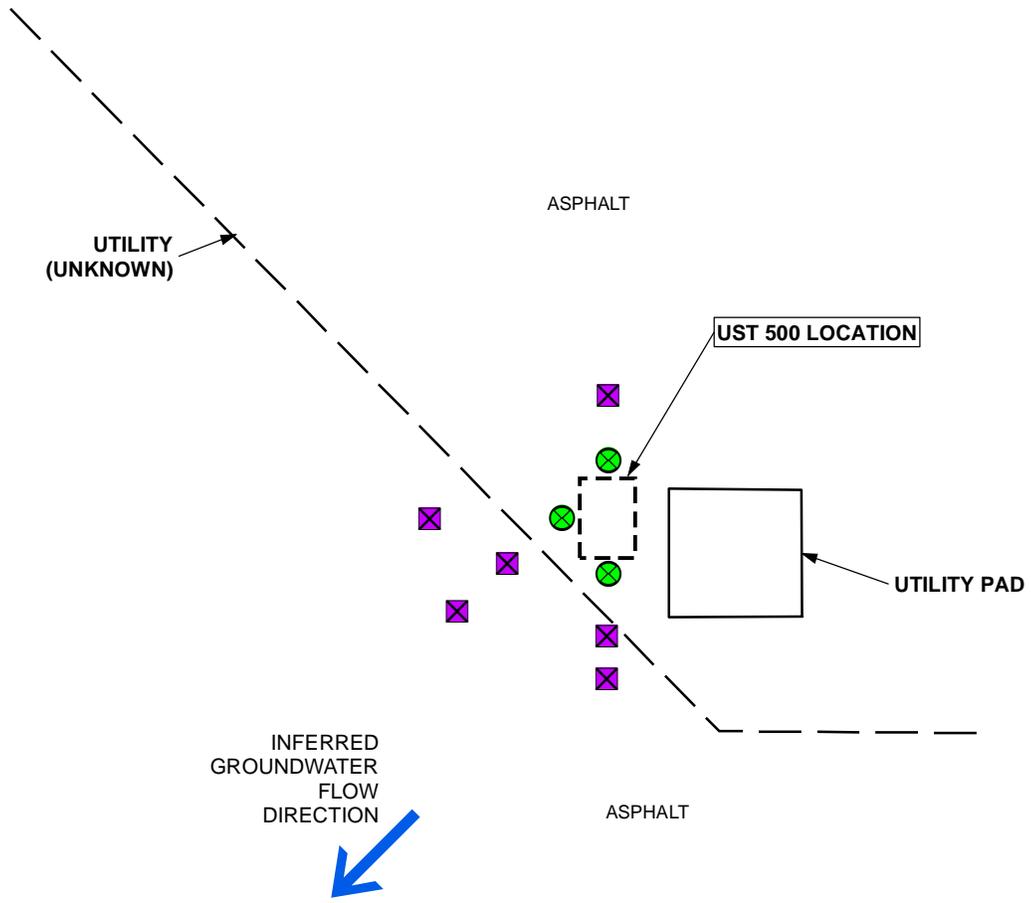
NAVAL WEAPONS STATION
SEAL BEACH



FACILITY LOCATION MAP	
NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA	
BRADY	DATE: July 31, 2012 FILE: LocMap _120731
FIGURE 1	



<p>UST 500 SITE LOCATION MAP</p>	
<p>NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA</p>	
<p>BRADY</p>	<p>DATE: Jan 4, 2013 FILE: SiteLocMap_120710</p>
<p>FIGURE 2</p>	



LEGEND

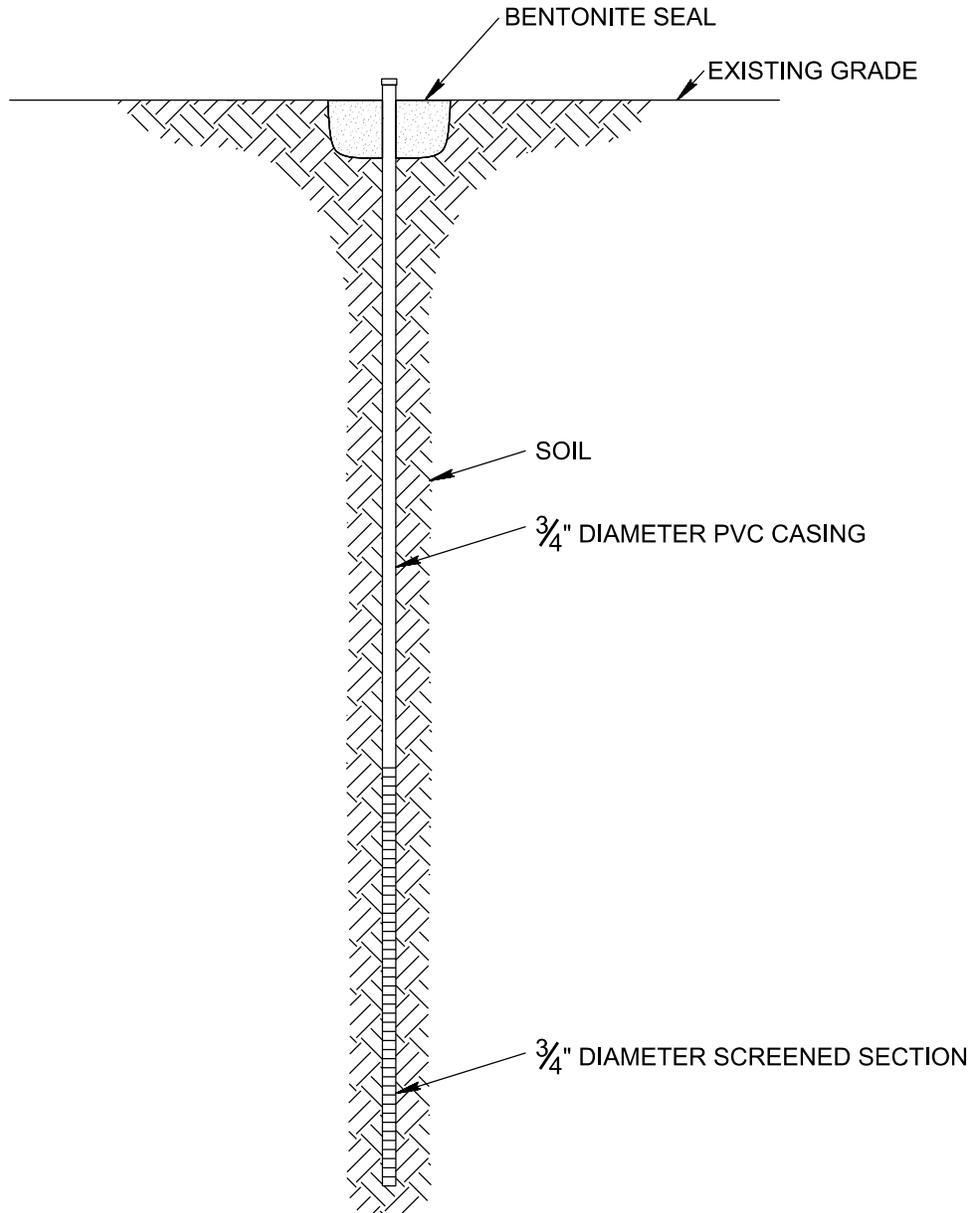
-  PROPOSED INITIAL LIF LOCATION
-  PROPOSED STEP-OUT LIF LOCATION

NOTES

LIF = LASER INDUCED FLUORESCENCE

UST 500 SITE PLAN AND PROPOSED LIF LOCATIONS	
NAVAL WEAPONS STATION SEAL BEACH SEAL BEACH, CALIFORNIA	
BRADY	DATE: Jan 8, 2013 FILE: PropLoc_130108
FIGURE: 3	

"DRAWING NOT TO SCALE"



SCAPS PIEZOMETER
CONSTRUCTION DIAGRAM

UST 500
NAVAL WEAPONS STATION SEAL BEACH
SEAL BEACH, CA

BRADY

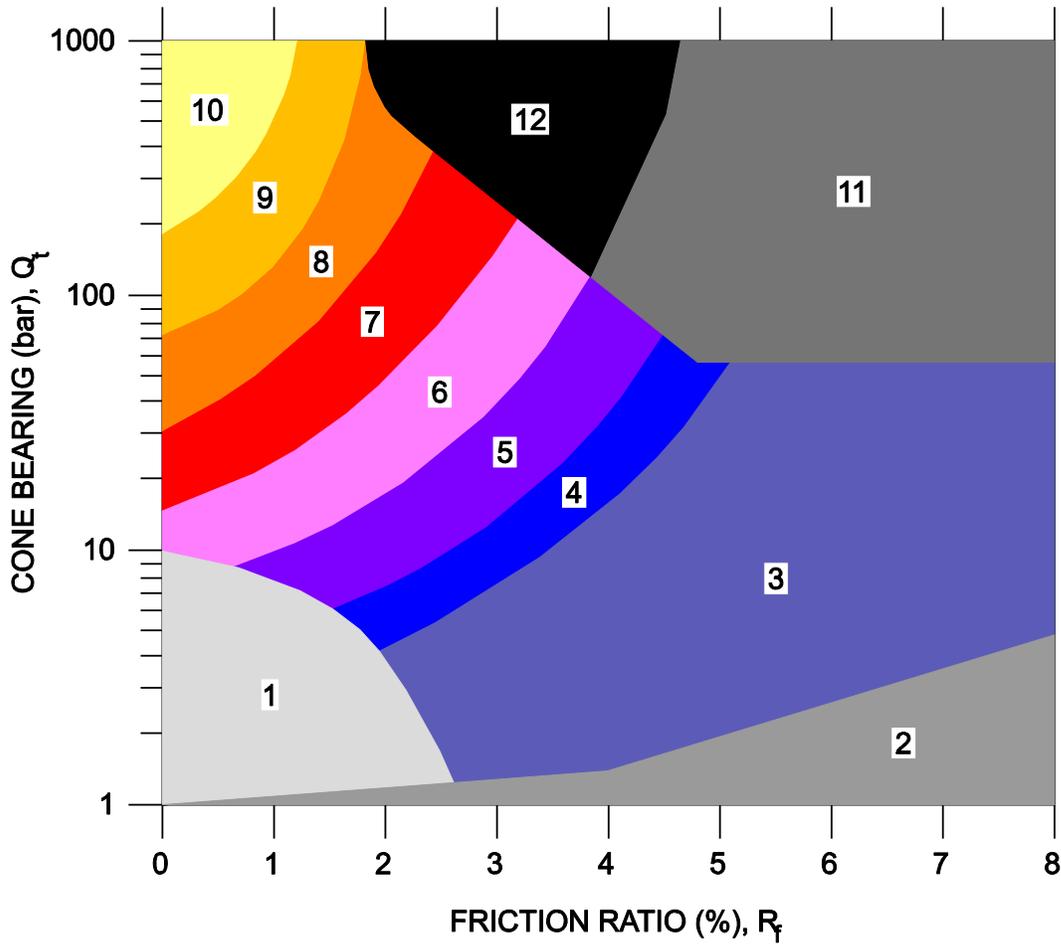
Date: June 3, 2013
File No. MonWellConstruct

FIGURE:
4

Appendix B

SCAPS CPT/LIF Boring Logs

CPT CLASSIFICATION CHART
(after Robertson and Campanella, 1988)



Friction Ratio (R_f) = Sleeve Friction (F_s)/Cone Pressure (Q_t) x 100%
 1 tons per square foot (tsf) ≈ 0.9576 bar
 N = Standard penetration value, blows/foot

Zone	Color	Q _t / N	Soil Behavior Type
1	Light Grey	2	sensitive fine grained
2	Dark Grey	1	organic material
3	Blue	1	clay
4	Dark Blue	1.5	silty clay to clay
5	Purple	2	clayey silt to silty clay
6	Pink	2.5	sandy silt to clayey silt
7	Red	3	silty sand to sandy silt
8	Orange	4	sand to silty sand
9	Yellow-Orange	5	sand
10	Yellow	6	gravelly sand to sand
11	Dark Grey	1	very stiff fine grained*
12	Black	2	sand to clayey sand*

* overconsolidated or cemented

FIGURE
B-1



SCAPS CPT/LIF BORING LOG

U500-01

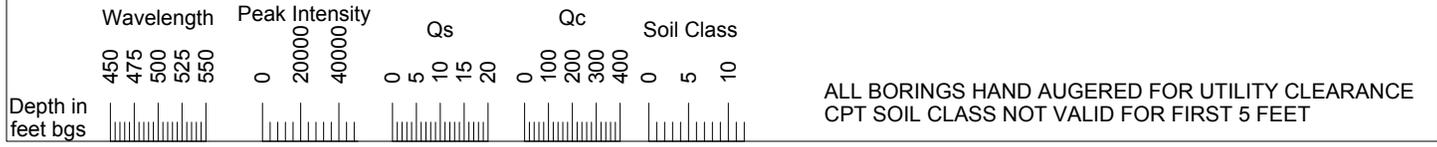
NAVAL WEAPONS STATION
SEAL BEACH
UST 500



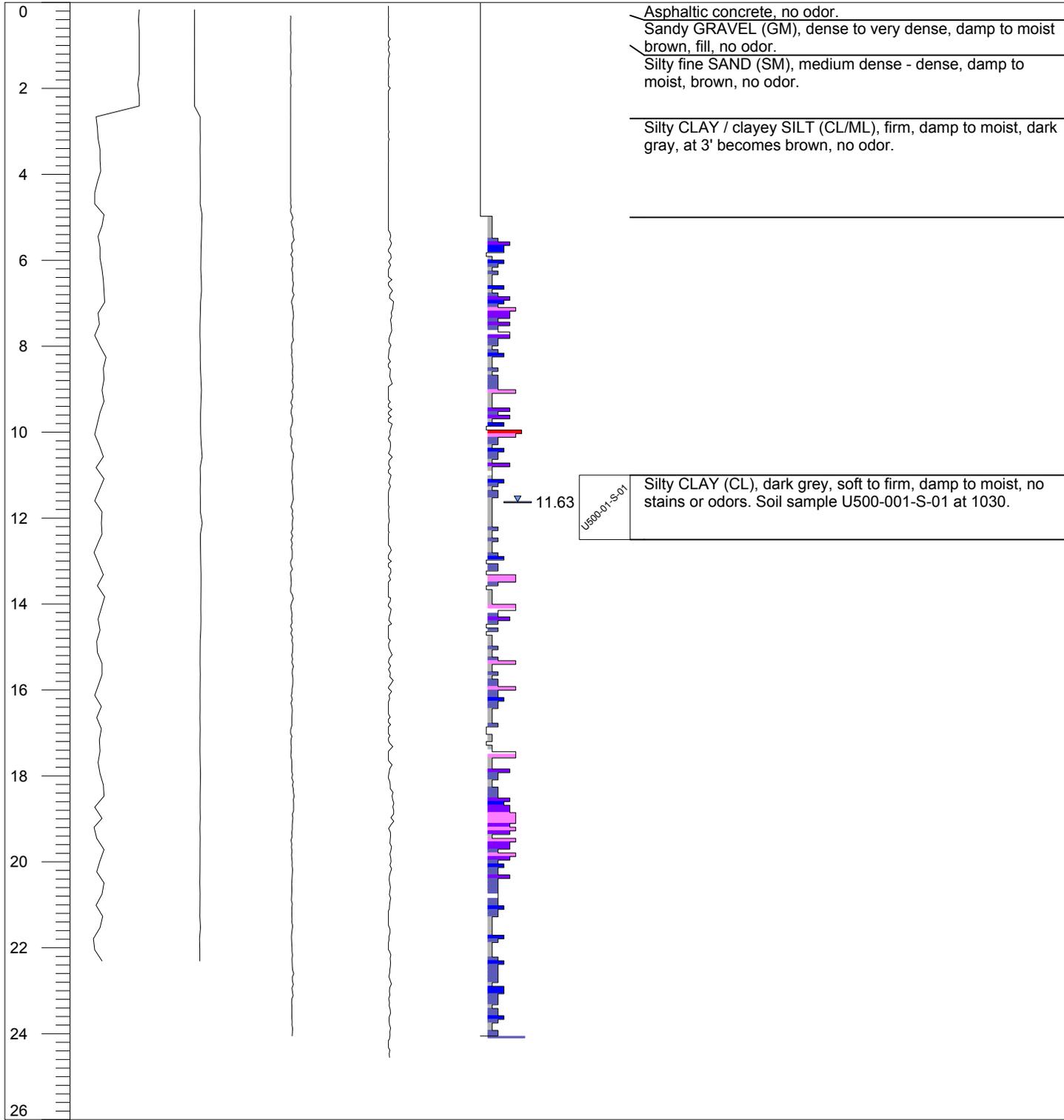
DATUM: NAD 1983/CA ZONE VI CPT DATE: 10/31/2013

NORTHING: 2217538.328 EASTING: 6012961.989

LOGGED BY: T. Shields METHOD: CPT GPS HEIGHT MSL (ft): 1.123 BORING DIAMETER (in): 2.25



ALL BORINGS HAND AUGERED FOR UTILITY CLEARANCE
CPT SOIL CLASS NOT VALID FOR FIRST 5 FEET



Asphaltic concrete, no odor.
Sandy GRAVEL (GM), dense to very dense, damp to moist brown, fill, no odor.
Silty fine SAND (SM), medium dense - dense, damp to moist, brown, no odor.

Silty CLAY / clayey SILT (CL/ML), firm, damp to moist, dark gray, at 3' becomes brown, no odor.

11.63
U500-01-S-01
Silty CLAY (CL), dark grey, soft to firm, damp to moist, no stains or odors. Soil sample U500-001-S-01 at 1030.



**SCAPS CPT/LIF
BORING LOG**
U500-02

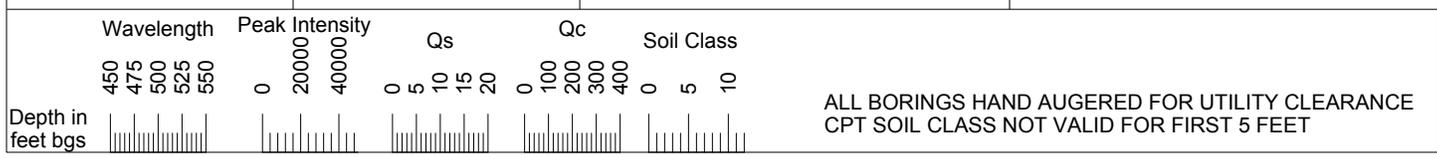
**NAVAL WEAPONS STATION
SEAL BEACH
UST 500**



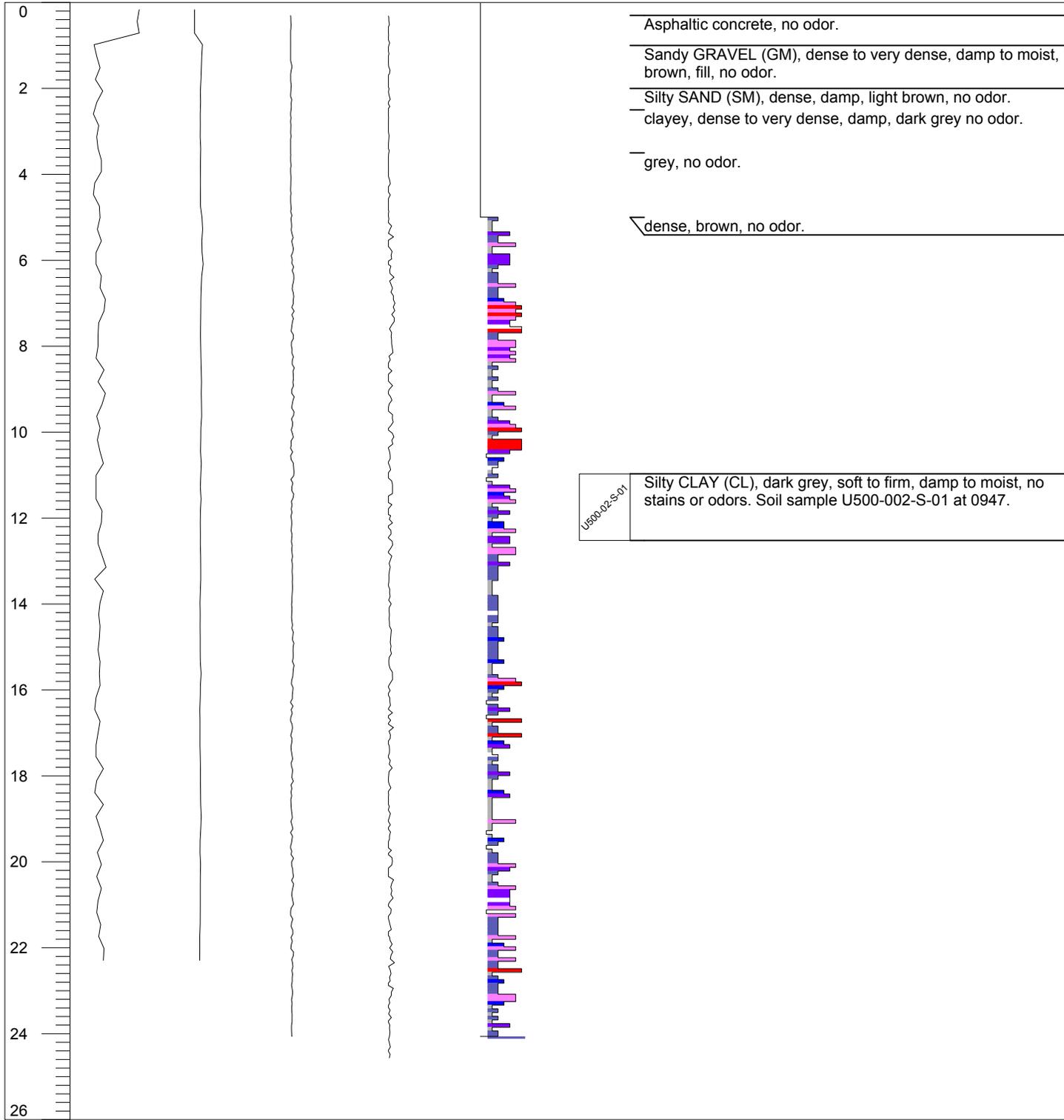
DATUM: NAD 1983/CA ZONE VI CPT DATE: 10/31/2013

NORTHING: 2217550.78 EASTING: 6012957.529

LOGGED BY: T. Shields METHOD: CPT GPS HEIGHT MSL (ft): 0.888 BORING DIAMETER (in): 2.25



ALL BORINGS HAND AUGERED FOR UTILITY CLEARANCE
CPT SOIL CLASS NOT VALID FOR FIRST 5 FEET



Asphaltic concrete, no odor.

Sandy GRAVEL (GM), dense to very dense, damp to moist, brown, fill, no odor.

Silty SAND (SM), dense, damp, light brown, no odor.

clayey, dense to very dense, damp, dark grey no odor.

grey, no odor.

dense, brown, no odor.

U500-02-S-01 Silty CLAY (CL), dark grey, soft to firm, damp to moist, no stains or odors. Soil sample U500-002-S-01 at 0947.



SCAPS CPT/LIF BORING LOG

U500-03

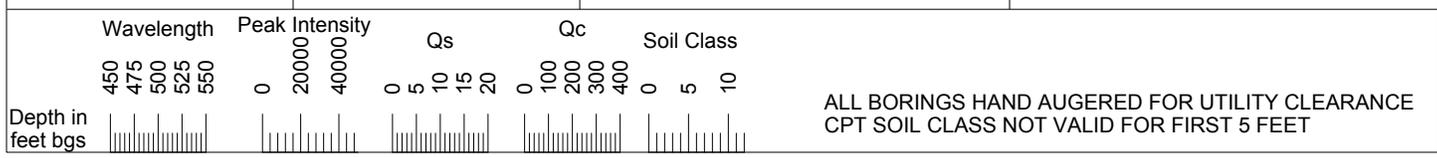
NAVAL WEAPONS STATION
SEAL BEACH
UST 500



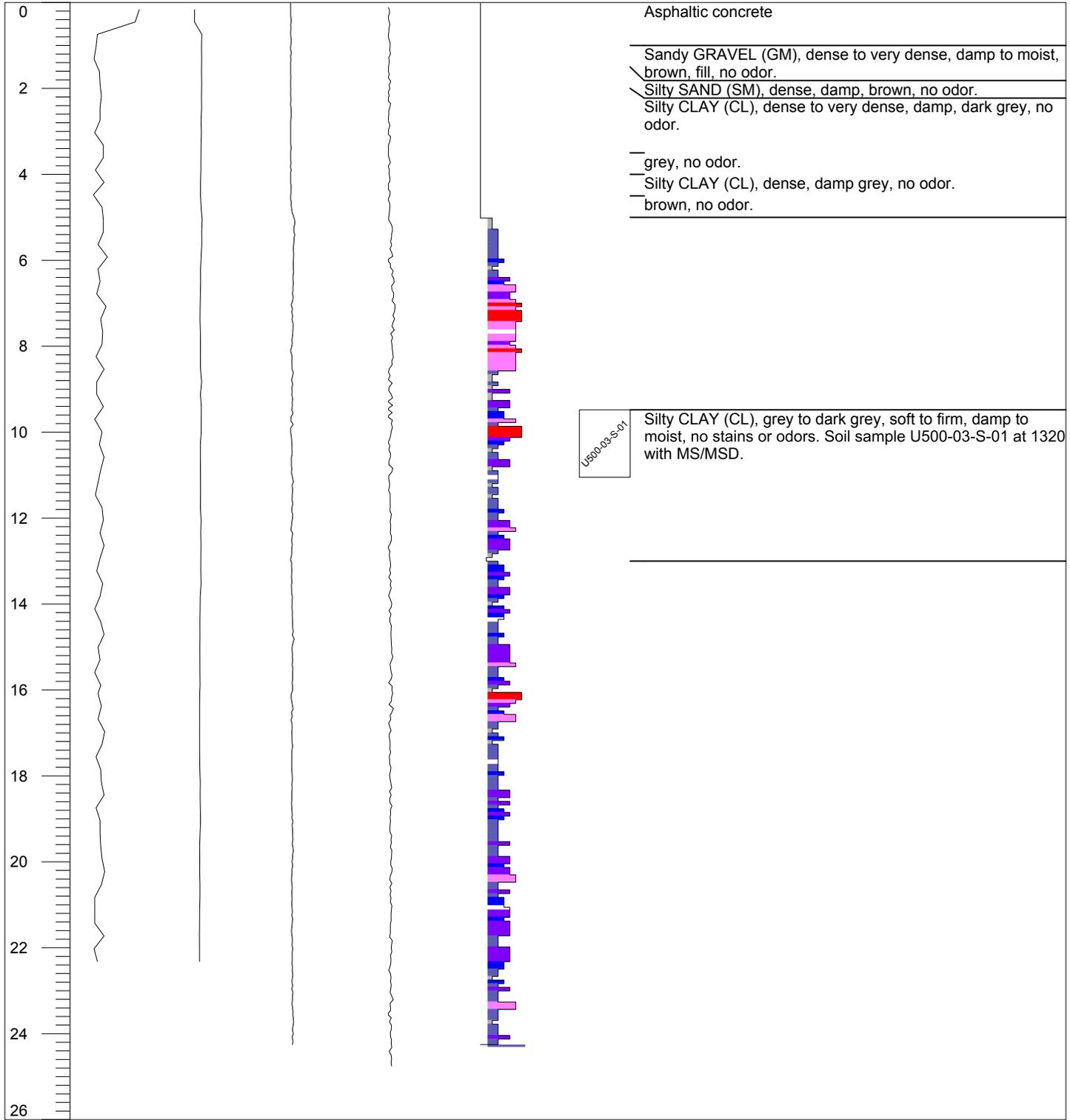
DATUM: NAD 1983/CA ZONE VI CPT DATE: 10/31/2013

NORTHING: 2217558.602 EASTING: 6012961.863

LOGGED BY: T. Shields METHOD: CPT GPS HEIGHT MSL (ft): 1.014 BORING DIAMETER (in): 2.25



ALL BORINGS HAND AUGERED FOR UTILITY CLEARANCE
CPT SOIL CLASS NOT VALID FOR FIRST 5 FEET



Asphaltic concrete

Sandy GRAVEL (GM), dense to very dense, damp to moist, brown, fill, no odor.

Silty SAND (SM), dense, damp, brown, no odor.

Silty CLAY (CL), dense to very dense, damp, dark grey, no odor.

grey, no odor.

Silty CLAY (CL), dense, damp grey, no odor.

brown, no odor.

U500-03-S-01 Silty CLAY (CL), grey to dark grey, soft to firm, damp to moist, no stains or odors. Soil sample U500-03-S-01 at 1320 with MS/MSD.

Appendix C

Chain-of-Custody and Laboratory Sample Receipt Forms

CHAIN OF CUSTODY

ORDER #: 8025 5029 9195

	1835 W. 205th Street, Torrance, CA 90501 Tel #: 310-618-8889 Fax #: 310-618-0818 Email: info@emaxlabs.com	PO NUMBER: SAMPLE STORAGE	EMAX CONTROL NO. * 135034 PROJECT CODE: SHAWIN.002.006.00
---	---	------------------------------	--

CLIENT BRADY PROJECT UST 500, NWS SEAL BEACH COORDINATOR JESSE MACNEILL TEL 619 496 0500 FAX 619 496 0505 EMAIL jmacneill@brady.net SEND REPORT TO JESSE MACNEILL COMPANY BRADY ADDRESS 3710 RUFFIN RD. SAN DIEGO CA 92123 EMAX PM MOLLY NGUYEN	MATRIX CODE DW=Drinking Water GW=Ground Water WW=Waste Water SD=Solid Waste SL=Sludge SS=Soil/ Sediment WP=Wipes PP=Pure Products AR=Air O=TRIP BLNK.	PRESERVATIVE CODE IC = Ice HC = HCI HN=HNO3 SH=NaOH ST=Na2S2O3 ZA=Zinc Acetate HS=H2SO4	ANALYSIS REQUIRED VOLs (BZ60B) TPH-g (B015M) TPH-d (B015M) PAHs (BZ60C SIM)	TAT <input type="checkbox"/> Rush ___ hrs. <input type="checkbox"/> Rush ___ days <input type="checkbox"/> 7 days <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input type="checkbox"/> 30 days <input type="checkbox"/> ___ days <input checked="" type="checkbox"/> STD.
--	---	--	---	---

LAB	SAMPLE ID	CLIENT	SAMPLING			CONTAINER			MATRIX CODE	QC	PRESERVATIVE CODE				COMMENTS
			LOCATION	DATE	TIME	NO.	SIZE	TYPE							
* 1	U500-03-S-01		U500-03	10/30/13	13:20	18	V	V	SS	III	X	X	X	X	
* 2	U500-03-W-01		U500-03		14:55	4	40mL	VCA	O	III	X	X			
* 3	U500-03-W-02		U500-03		15:15	8	V	V	GW	III	X	X	X	X	
* 4															
* 5															
* 6															
* 7															
* 8															
* 9															
* 0															

Instructions	Cooler #	Temp. (°C)	Sample #s
	1	23°	

SAMPLER	COURIER/AIRBILL		
RELINQUISHED BY 	Date	Time	RECEIVED BY 
	10/30/13	16:05	
	10/31/13	07:40	

NOTICE: Turn-around-time (TAT) for samples shall not begin until all discrepancies have been resolved. For samples received and discrepancies resolved after 1500 hrs, TAT shall start at 0800 hrs the next business day. The client is responsible for all cost associated with sample disposal. Samples shall be disposed of as soon as practical (but not prior to fifteen (15) calendar days) after issuance of analytical report unless a different sample disposal schedule is pre-arranged with EMAX. Disposal fee for samples defined by CA Title 22 as non-hazardous shall be \$5.00 per sample. EMAX will return hazardous samples to the client at the client's expense unless directed in writing otherwise.



SAMPLE RECEIPT FORM 1

Type of Delivery	Airbill / Tracking Number	ECN 135234
<input checked="" type="checkbox"/> Fedex <input type="checkbox"/> UPS <input type="checkbox"/> GSO <input type="checkbox"/> Others	8025 5029 9195	Recipient Cecilia
<input type="checkbox"/> EMAX Courier <input type="checkbox"/> Client Delivery		Date 10/31/13 Time 09:40

COC Inspection

<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Client PM/FC	<input type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location	<input checked="" type="checkbox"/> Sample ID	<input checked="" type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Tel # / Fax #	<input type="checkbox"/> Courier Signature	<input checked="" type="checkbox"/> Analysis Required	<input type="checkbox"/> Preservative (if any)	<input checked="" type="checkbox"/> TAT
Safety Issues (if any)	<input type="checkbox"/> High concentrations expected	<input type="checkbox"/> Superfund Site samples	<input type="checkbox"/> Rad screening required		

Comments:

Packaging Inspection

Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/> Other
Condition	<input checked="" type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged
Packaging	<input checked="" type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input type="checkbox"/> Popcorn
Temperatures (Cool, ≤6 °C but not frozen)	<input checked="" type="checkbox"/> Cooler 1 2.7°C	<input type="checkbox"/> Cooler 2 _____ °C	<input type="checkbox"/> Cooler 3 _____ °C
	<input type="checkbox"/> Cooler 6 _____ °C	<input type="checkbox"/> Cooler 7 _____ °C	<input type="checkbox"/> Cooler 8 _____ °C
Thermometer: A - S/N 101541371	B - S/N 101541382	C - S/N 122091701	D - S/N 122091758

Comments: Temperature is out of range. PM was informed IMMEDIATELY.

Note: pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

DISCREPANCIES				
LSID	LSCID	Description Code	Sample Label ID / Information	Corrective Action Code
1-3		H1		R6

Continue to next page.

REVIEWS

Sample Labeling	MC mxf	SRF	Cecilia	PM	[Signature]
Date	10/31/13	Date	10/31/13	Date	10/31/13

LEGEND:

Code	Description-Sample Management	Code	Description-Sample Management	Code	Description-Project Management
A1	Analysis is not indicated in COC.	G1	Sample indicated in COC is not received.	R1	Hold sample(s); wait for further instructions
A2	Analysis is not indicated in label.	G2	MS/MSD is not indicated in COC.	R2	Proceed as indicated in COC and inform client.
A3	Analysis is inconsistent in COC vis-à-vis label.	G3	No identified trip blank. proceed as indicated in COC.	R3	Refer to attached instruction
B1	Sample ID is not indicated in COC.	G4	Trip Blank is designated in SDG _____	R4	Cancel the analysis
B2	Sample ID is not indicated in label.	G5	Trip Blank has no sampling date & time. Log-in with latest sampling date and 1 minute past the time of the last sample collected on the same date.	R5	Inform client.
B3	Sample ID is inconsistent in COC vis-à-vis label.	H1	No preservation indicated in COC but NaHSO4, methanol and HCl preserved on labels.	R6	Proceed as indicated in COC
C1	Improper container				
C2	Broken container				
C3	Leaking container				
D1	Date and/or time is not indicated in COC.				
D2	Date and/or time is not indicated in label.				
D3	Date and/or time is inconsistent in COC vis-à-vis label.				
F1	Improper preservation				
F2	Insufficient Sample				
F3	Bubble is > 6mm. Use vial with smallest bubble first.				
F4	Bubble is > 6mm in all vials.				
F5	>20 % solid particle				
F6	Out of Holding Time				

CHAIN OF CUSTODY

Fax: 8025 5029 9200

		1835 W. 205th Street, Torrance, CA 90501 Tel #: 310-618-8889 Fax #: 310-618-0818 Email: info@emaxlabs.com			PO NUMBER: SAMPLE STORAGE		EMAX CONTROL NO. *13 K 003 PROJECT CODE: SHAWIN.002.00600							
CLIENT <u>BRAADY</u>		MATRIX CODE		PRESERVATIVE CODE		ANALYSIS REQUIRED				TAT				
PROJECT <u>UST 500, NWS SEAL BEACH</u>		DW=Drinking Water		IC=Ice		VOCs (B260B) TPH-g (B015M) TPH-d (B015M) PAHs (B270C SIM)				<input type="checkbox"/> Rush ____ hrs.				
COORDINATOR <u>JESSE MACNEIL</u>		GW=Ground Water		HC=HCl						<input type="checkbox"/> Rush ____ days				
TEL <u>6504960500</u> FAX <u>6504960525</u> EMAIL <u>jmacneil@brady.net</u>		WW=Waste Water		HN=HNO3						<input type="checkbox"/> 7 days				
SEND REPORT TO <u>JESSE MACNEIL</u>		SD=Solid Waste SL=Sludge		SH=NaOH						<input type="checkbox"/> 14 days				
COMPANY <u>BRAADY</u>		SS=Soil Sediment		ST=Na2S2O3						<input type="checkbox"/> 21 days				
ADDRESS <u>3710 RUPPIN RD.</u> <u>SAN DIEGO CA 92123</u>		WP=Wipes PP=Pure Products		ZA=Zinc Acetate		<input type="checkbox"/> 30 days								
EMAX PM <u>MOLLY NGUYEN</u>		AR=Air		HS=H2SO4		<input type="checkbox"/> ____ days								
		O=TRIP BLNK				<input checked="" type="checkbox"/> STD.								
SAMPLE ID		SAMPLING			CONTAINER			MATRIX CODE	QC	PRESERVATIVE CODE				COMMENTS
LAB	CLIENT	LOCATION	DATE	TIME	NO.	SIZE	TYPE							
* 1	U500-02-S-01	U500-02	10/31/13	09:47	6	V	V	SS	IV	X	X	X	X	
* 2	U500-02-W-01	U500-02		10:00	4	40ml	VOCs	O	III	X	X			
* 3	U500-01-S-01	U500-01		10:30	6	V	V	SS	II	X	X	X	X	
* 4	U500-01-W-01	U500-01		10:45	8	V	V	DW	III	X	X	X	X	
* 5	U500-01-W-02	U500-01		11:00	8	V	V	DW	III	X	X	X	X	
* 6														
* 7														
* 8														
* 9														
* 0														
Instructions										Cooler #	Temp. (°C)	Sample #s		
										1	2.3 C			
SAMPLER					COURIER/AIRBILL									
RELINQUISHED BY			Date	Time	RECEIVED BY									
			10/31/13	14:10										
			11/01/13	0915										

NOTICE: Turn-around-time (TAT) for samples shall not begin until all discrepancies have been resolved. For samples received and discrepancies resolved after 1500 hrs, TAT shall start at 0800 hrs the next business day. The client is responsible for all cost associated with sample disposal. Samples shall be disposed of as soon as practical (but not prior to fifteen (15) calendar days) after issuance of analytical report unless a different sample disposal schedule is pre-arranged with EMAX. Disposal fee for samples defined by CA Title 22 as non-hazardous shall be \$5.00 per sample. EMAX will return hazardous samples to the client at the client's expense unless directed in writing otherwise.



SAMPLE RECEIPT FORM 1

Type of Delivery <input checked="" type="checkbox"/> Fedex <input type="checkbox"/> UPS <input type="checkbox"/> GSO <input type="checkbox"/> Others <input type="checkbox"/> EMAX Courier <input type="checkbox"/> Client Delivery	Airbill / Tracking Number 8025 5029 9200	ECN 13 K003 Recipient J. PATEL Date 11/01/13 Time 0715
---	---	--

<input checked="" type="checkbox"/> Client Name	<input checked="" type="checkbox"/> Client PM/FC <i>NU</i>	<input type="checkbox"/> Sampler Name	<input checked="" type="checkbox"/> Sampling Date/Time/Location	<input checked="" type="checkbox"/> Sample ID	<input type="checkbox"/> Matrix
<input type="checkbox"/> Address	<input checked="" type="checkbox"/> Tel # / Fax #	<input type="checkbox"/> Courier Signature	<input checked="" type="checkbox"/> Analysis Required	<input type="checkbox"/> Preservative (if any)	<input type="checkbox"/> TAT
Safety Issues (if any)	<input type="checkbox"/> High concentrations expected	<input type="checkbox"/> Superfund Site samples	<input type="checkbox"/> Rad screening required		
Comments:					

Packaging Inspection					
Container	<input checked="" type="checkbox"/> Cooler	<input type="checkbox"/> Box	<input type="checkbox"/> Other		
Condition	<input type="checkbox"/> Custody Seal	<input checked="" type="checkbox"/> Intact	<input type="checkbox"/> Damaged		
Packaging	<input checked="" type="checkbox"/> Bubble Pack	<input type="checkbox"/> Styrofoam	<input type="checkbox"/> Popcorn	<input checked="" type="checkbox"/> Sufficient	<input checked="" type="checkbox"/> Plastic Bag
Temperatures (Cool, ≤6 °C but not frozen)	<input checked="" type="checkbox"/> Cooler 1 <i>2.3</i> °C	<input type="checkbox"/> Cooler 2 _____ °C	<input type="checkbox"/> Cooler 3 _____ °C	<input type="checkbox"/> Cooler 4 _____ °C	<input type="checkbox"/> Cooler 5 _____ °C
	<input type="checkbox"/> Cooler 6 _____ °C	<input type="checkbox"/> Cooler 7 _____ °C	<input type="checkbox"/> Cooler 8 _____ °C	<input type="checkbox"/> Cooler 9 _____ °C	<input type="checkbox"/> Cooler 10 _____ °C
Thermometers:	A - S/N 101541371	B - S/N 101541382	<i>C - S/N 122091701</i>	D - S/N 122091758	
Comments: <input type="checkbox"/> Temperature is out of range. PM was informed IMMEDIATELY.					
Note: pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.					

DISCREPANCIES				
LSID	LSCID	Description Code	Sample Label ID / Information	Corrective Action Code
2-5		D1	DATE 10/31/13 on labels	Use 10/31/13
<i>11-01-13</i>				

Continue to next page.

REVIEWS

Sample Labeling *J. Patel*

Date *11/01/13*

SRF *Client*

Date *11/1/13*

PM *[Signature]*

Date *11/1/13*

LEGEND:

Code Description-Sample Management

- A1 Analysis is not indicated in COC.
- A2 Analysis is not indicated in label.
- A3 Analysis is inconsistent in COC vis-à-vis label.
- B1 Sample ID is not indicated in COC.
- B2 Sample ID is not indicated in label.
- B3 Sample ID is inconsistent in COC vis-à-vis label.
- C1 Improper container
- C2 Broken container
- C3 Leaking container
- D1 Date and/or time is not indicated in COC.
- D2 Date and/or time is not indicated in label.
- D3 Date and/or time is inconsistent in COC vis-à-vis label.
- F1 Improper preservation
- F2 Insufficient Sample
- F3 Bubble is > 6mm. Use vial with smallest bubble first.
- F4 Bubble is > 6mm in all vials.
- F5 >20 % solid particle
- F6 Out of Holding Time

Code Description-Sample Management

- G1 Sample indicated in COC is not received.
- G2 MS/MSD is not indicated in COC.
- G3 No identified trip blank. proceed as indicated in COC.
- G4 Trip Blank is designated in SDG _____
- G5 Trip Blank has no sampling date & time. Log-in with latest sampling date and 1 minute past the time of the last sample collected on the same date.
- H1 _____

Code Description-Project Management

- R1 Hold sample(s); wait for further instructions
- R2 Proceed as indicated in COC and inform client.
- R3 Refer to attached instruction
- R4 Cancel the analysis
- R5 Inform client.
- R6 Proceed as indicated in COC

Appendix D

Data Quality Review and Validated Laboratory Data

TABLE OF CONTENTS

1.0	Introduction	1
2.0	Quality Assurance/Quality Control Measures	1
2.1.1	Field Quality Control Samples.....	1
2.1.2	Data Management	2
2.1.3	Analytical Method Reference Limits.....	3
2.1.4	Data Usability Assessment	4
3.0	References.....	4

ATTACHMENTS

Attachment D1 Data Validation Reports

ACRONYMS/ABBREVIATIONS

BRADY	Richard Brady & Associates
DL	detection limit
DQOs	data quality objectives
LIF	laser induced fluorescence
LOD	limit of detection
LOQ	limit of quantitation
MS	matrix spike
MSD	matrix spike duplicate
NAVWPNSTA	Naval Weapons Station
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
SCAPS	Site Characterization and Analysis Penetrometer System
SDG	sample delivery groups
TPH-g	total petroleum hydrocarbons quantified as gasoline
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
UST 500	former underground storage tank at Building 500
VOCs	volatile organic compounds

1.0 INTRODUCTION

The purpose of this review is to evaluate the data collected during investigation activities conducted during October 2013 at the former underground storage tank (UST) adjacent to Building 500 (UST 500) at Naval Weapons Station (NAVWPNSTA) Seal Beach, California and determine whether they meet the quality objectives outlined in the Final Work Plan which contains the Sampling and Analysis Plan (SAP) (Richard Brady & Associates [BRADY], 2013).

The investigation at UST 500 included the collection and analyses of 3 soil samples, and the associated quality control (QC) samples, used to confirm the Site Characterization and Analysis Penetrometer System (SCAPS) laser-induced fluorescence (LIF) screening results. The analyses were performed by the following methods:

- Total petroleum hydrocarbons quantified as gasoline (TPH-gas) by United States Environmental Protection Agency (U.S. EPA) Method 5030B/8015B
- Total petroleum hydrocarbons quantified as diesel by U.S. EPA Method 5030B/8015B
- Volatile Organic Compounds (VOCs) by U.S. EPA Method 5030B/8260B
- Polynuclear Aromatic Hydrocarbons by U.S. EPA Method 8270C SIM.

The overall quality of tasks performed for this investigation was assured by conformance to sample collection and data management protocols. Summaries of the quality assurance (QA)/QC protocols implemented during the investigation and any quality control issues encountered are provided in this appendix. Details of the QA/QC objectives and protocols are provided in the SAP (Attachment A of the Final Work Plan [BRADY, 2013]).

2.0 QUALITY ASSURANCE/QUALITY CONTROL MEASURES

Field and laboratory QA/QC samples were collected as described in the SAP. These samples included matrix spike/matrix spike duplicate (MS/MSD) and source blank samples, and daily equipment blanks and trip blanks. The purpose of the QA/QC samples is to help evaluate whether the data meet the quality objectives outlined in the SAP. The QA/QC sample results are presented in the validated lab reports.

2.1.1 Field Quality Control Samples

QA/QC was maintained throughout the investigation and sampling program. The following QA/QC procedures were implemented:

- One MS/MSD sample was collected from location U500-03 on October 30, 2013.
- One source blank was analyzed to evaluate the quality of the final rinsate water used for equipment decontamination. The source blank was collected on October 31, 2013 after sampling at location U500-01.
- Daily equipment blanks were collected and analyzed to evaluate the effectiveness of the decontamination process on the 6-inch stainless steel sleeves, which are inserted into the SCAPS push-rod assembly and probe. The equipment blanks were shipped in the sample cooler along with the samples to the laboratory.

- Trip blanks were prepared by the laboratory and transported in the sample cooler together with the samples. The trip blanks were analyzed for VOCs and TPH-g only.

2.1.2 Data Management

All field observations and laboratory results were linked to a unique sample location through the use of the sample identification system. Field observations and measurement data were recorded on the field forms and in a field logbook to provide a permanent record of field activities. All hand-entered data were subjected to a review by a second person to minimize data entry errors. Checks for completeness of field records (logbooks, field forms, databases, electronic spreadsheets) ensured that all requirements for field activities had been fulfilled, complete records existed for each activity, and the procedures specified in this SAP had been implemented. Field documentation ensures sample integrity and provides sufficient technical information to recreate each field event.

Hard copies of the data reports received from the laboratories were filed chronologically and were stored separately from the electronic files. Hard copies of data signed by a representative of the analytical laboratory were compared to the electronic versions of the data to confirm that the conversion process had not modified the reported results.

The data review process is summarized below; details are provided in the Final SAP (BRADY, 2013). Following the data review process, sample results were entered into an electronic database and submitted to Naval Facilities Engineering Command Southwest in Naval Electronic Data Deliverable format.

2.1.2.1 Data Verification

Field and laboratory data were reviewed and verified by the BRADY QA Manager. Field data verification tasks included confirmation that daily field logbook entries and chain of custody forms were complete and accurate, and that the information they provided matched the laboratory sample receipt forms. The laboratory sample receipt forms were required to be received by the BRADY QA Manager within 24 hours after the arrival of the samples to the laboratory.

Laboratory data verification ensured that holding times, precision, accuracy and detection limits met the acceptance criteria established in the SAP. Data verification results were reviewed for compliance with the project data quality objectives (DQOs). Verification also includes proofreading and editing hardcopy data reports to assure that the data correctly represent the analytical measurements, and in general, verification can also identify non-technical errors in the data package that can be corrected (e.g., typographical errors).

No significant instances of nonconformance were detected during the field and laboratory verification. Overall, the results of the data verification process indicate that the data generated during this investigation are within the established criteria outlined in the SAP.

2.1.2.2 Data Validation and Data Qualifiers

Data validation was performed by Laboratory Data Consultants, Inc. of Carlsbad, CA. Ninety percent of the data were subjected to Level III validation and 10% of the data were subjected to

Level IV validation in accordance with U.S. EPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, 2008) and U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (U.S. EPA, 2010).

Validation of the data included review of the technical holding time requirements, sample preparation, initial and continuing calibration data, laboratory QC sample data, equipment performance, raw data with the reduced results and any data anomalies. Data validation indicated that all of the results were acceptable for use.

Some analytical data were qualified during data validation. Qualifiers were consistent with the applicable U.S. EPA functional guidelines and were used to provide data users with an estimate of the level of uncertainty associated with the “flagged” result. Data validation results were evaluated with respect to the attached qualifiers to determine data usability issues, if any. The following qualifiers are typically assigned during the validation process:

- J – indicates an estimated value;
- R – quality control indicates the data are not usable (rejected value);
- U – the compound or analyte was analyzed but not detected at or above the stated limit; and
- UJ – the compound or analyte was analyzed but not detected, and the sample detection limit is an estimated value.

Exceptions to the analytical criteria can result in the assignment of J flags to the reported results. The J flag indicates an estimated value. The exceptions to the analytical criteria that impacted the reported results for the site are summarized below:

- Sample delivery group (SDG) 13J234 & 13K003: The relative response factors for tert-Butanol during the initial and continuing calibration were below the acceptable limits. All QC samples were qualified with a “UJ” for this compound.
- SDG 13J234: The surrogate recoveries were outside of the acceptable QC limits. All detects in sample U500-03-S-01 were qualified as estimated (“J”).
- SDG 13J234: The area and retention time for an internal standard was outside of QC limits. All detects in sample U500-03-S-01 were qualified as estimated, and all non-detects were qualified with a “UJ”.

2.1.3 Analytical Method Reference Limits

The analytical methods typically have three reference limits. The detection limit (DL) is defined as the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% confidence level. At the DL, the false positive rate is 1%. The limit of detection (LOD) is defined as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate is 1%. The limit of quantitation (LOQ) is at the lowest concentration

that produces a quantitative result within specified limits of precision and bias. Because the LOQ is typically the lowest calibration point, reported concentrations that are higher than the DL but lower than the LOQ are flagged as estimated with a “J” qualifier by the laboratory. Eleven results for this investigation were qualified as estimated by the laboratory. The majority of these detections (58%) were below the LOQ, and the remaining detections were below the LOD. None of these qualifiers were modified during data validation, however two compounds (benzene and toluene) had detects that were qualified as estimated during data validation.

2.1.4 Data Usability Assessment

All validated data collected during this investigation were evaluated for usability with respect to precision, accuracy, representativeness, completeness, comparability and sensitivity to assess compliance with project DQOs. The overall assessment based on those data quality indicators was that the data are acceptable. Minor QC elements associated with the analytical procedures were identified, but a thorough assessment of the data indicates that these elements did not adversely affect the quality, validity, usability, and overall data interpretation. Therefore, the data are considered valid and usable as indicated by their specific qualifiers.

3.0 REFERENCES

BRADY (Richard Brady & Associates), 2013. Final Work Plan, Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500, also known as UST 000008), NAVWPNSTA Seal Beach, California. February 21.

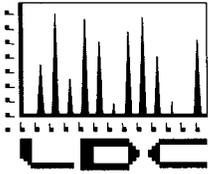
U.S. EPA, 2008. Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.

U.S. EPA, 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.

Attachment D1

Data Validation Reports

(Provided on Compact Disc)



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Richard Brady & Associates
3710 Ruffin Road
San Diego, CA 92123
ATTN: Mr. Jesse MacNeill

December 31, 2013

SUBJECT: NWS Seal Beach, UST Site 500, Data Validation

Dear Mr. MacNeill,

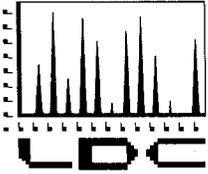
Enclosed are the final validation reports for the fractions listed below. This SDG was received on December 10, 2013. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 30976:

<u>SDG #</u>	<u>Fraction</u>
13J234	Volatiles, Polynuclear Aromatic Hydrocarbons, Total Petroleum
13K003	Hydrocarbons as Gasoline, Total Petroleum Hydrocarbons as Diesel

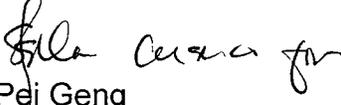
The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, QAPP, Site Characterization for Petroleum Contamination at the Building 500 Former UST Site, UST 500/UST 000008, at Naval Weapons Station, Seal Beach, California, February 2013
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2, October 2010
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007



Please feel free to contact us if you have any questions.

Sincerely,


Peji Geng
Project Manager/Senior Chemist

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500

Collection Date: October 30, 2013

LDC Report Date: December 27, 2013

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 13J234

Sample Identification

U500-03-S-01
U500-03-W-01
U500-03-W-02
U500-03-S-01MS
U500-03-S-01MSD

Introduction

This data review covers 3 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/1/13	tert-Butyl alcohol	0.012 (≥ 0.05)	All water samples in SDG 13J234	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/5/13	tert-Butyl alcohol	0.011 (≥0.05)	All water samples in SDG 13J234	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample U500-03-W-01 was identified as a trip blank. No volatile contaminants were found.

Sample U500-03-W-02 was identified as an equipment blank. No volatile contaminants were found.

Sample U500-01-W-02 (from SDG 13K003) was identified as a field blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
U500-03-S-01	Bromofluorobenzene Toluene-d8	129 (85-120) 119 (85-115)	All TCL compounds	J (all detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
U500-03-S-01MS/MSD (U500-03-S-01)	1,2,3-Trichloropropane tert-Butyl alcohol	- -	138 (65-130) 173 (40-150)	- -	J (all detects) J (all detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
U500-03-S-01	1,2-Dichlorobenzene-d4	257135 (331504-1326014)	1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane n-Propylbenzene 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene Naphthalene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Volatiles - Data Qualification Summary - SDG 13J234**

SDG	Sample	Compound	Flag	A or P	Reason
13J234	U500-03-W-01 U500-03-W-02	tert-Butyl alcohol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
13J234	U500-03-W-01 U500-03-W-02	tert-Butyl alcohol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
13J234	U500-03-S-01	All TCL compounds	J (all detects)	A	Surrogate spikes (%R)
13J234	U500-03-S-01	1,2,3-Trichloropropane tert-Butyl alcohol	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
13J234	U500-03-S-01	1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane n-Propylbenzene 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene Naphthalene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Internal standards (area)

**NWS Seal Beach, UST 500
Volatiles - Laboratory Blank Data Qualification Summary - SDG 13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Volatiles - Field Blank Data Qualification Summary - SDG 13J234**

No Sample Data Qualified in this SDG

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES	Date Collected: 10/30/13
Project : NWS SEAL BEACH, BLDG 500	Date Received: 10/31/13
Batch No. : 13J234	Date Extracted: 11/05/13 16:30
Sample ID: U500-03-W-01	Date Analyzed: 11/05/13 16:30
Lab Samp ID: J234-02	Dilution Factor: 1
Lab File ID: RKD031	Matrix : WATER
Ext Btch ID: V094K03	% Moisture : NA
Calib. Ref.: RKD007	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
BENZENE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROFORM	ND	1.0	0.10	0.20
ETHYLBENZENE	ND	1.0	0.10	0.20
ISOPROPYL BENZENE	ND	1.0	0.10	0.20
M,P-XYLENES	ND	2.0	0.21	0.40
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
MTBE	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.20
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERT-BUTANOL	ND	10	2.5	5.0
DIPE	ND	1.0	0.11	0.20
ETBE	ND	1.0	0.11	0.20
TAME	ND	1.0	0.11	0.20
VINYL ACETATE	ND	2.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.17	10.00	91.7	70-120
4-BROMOFLUOROBENZENE	9.31	10.00	93.1	75-120
TOLUENE-DB	9.90	10.00	99.0	85-120
DIBROMOFLUOROMETHANE	9.41	10.00	94.1	85-115

12/29/13 9

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES	Date Collected: 10/30/13
Project : NWS SEAL BEACH, BLDG 500	Date Received: 10/31/13
Batch No. : 13J234	Date Extracted: 11/05/13 17:09
Sample ID: U500-03-W-02	Date Analyzed: 11/05/13 17:09
Lab Samp ID: J234-03	Dilution Factor: 1
Lab File ID: RKD032	Matrix : WATER
Ext Btch ID: V094K03	% Moisture : NA
Calib. Ref.: RKD007	Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHANE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
BENZENE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROFORM	ND	1.0	0.10	0.20
ETHYLBENZENE	ND	1.0	0.10	0.20
ISOPROPYL BENZENE	ND	1.0	0.10	0.20
M,P-XYLENES	ND	2.0	0.21	0.40
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
MTBE	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.20
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERT-BUTANOL	ND	10	2.5	5.0
DIPE	ND	1.0	0.11	0.20
ETBE	ND	1.0	0.11	0.20
TAME	ND	1.0	0.11	0.20
VINYL ACETATE	ND	2.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.09	10.00	90.9	70-120
4-BROMOFLUOROBENZENE	9.84	10.00	98.4	75-120
TOLUENE-D8	9.98	10.00	99.8	85-120
DIBROMOFLUOROMETHANE	9.55	10.00	95.5	85-115

11/29/13

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES	Date Collected: 10/30/13
Project : NWS SEAL BEACH, BLDG 500	Date Received: 10/31/13
Batch No. : 13J234	Date Extracted: 11/12/13 19:16
Sample ID: U500-03-S-01	Date Analyzed: 11/12/13 19:16
Lab Samp ID: J234-01	Dilution Factor: 0.9
Lab File ID: RKP053	Matrix : SOIL
Ext Btch ID: VS02K06	% Moisture : 26.1
Calib. Ref.: RKP031	Instrument ID : T-002

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	6.1	0.61	1.2
1,1,1-TRICHLOROETHANE	ND	6.1	0.61	1.2
1,1,2,2-TETRACHLOROETHANE	ND <i>UJ</i>	6.1	0.61	1.2
1,1,2-TRICHLOROETHANE	ND	6.1	0.61	1.2
1,1-DICHLOROETHENE	ND	6.1	0.61	1.2
1,2,3-TRICHLOROBENZENE	ND <i>UJ</i>	6.1	1.2	2.4
1,2,3-TRICHLOROPROPANE	ND	6.1	1.2	2.4
1,2,4-TRIMETHYLBENZENE	0.90J <i>UJ</i>	6.1	0.67	1.2
1,2-DICHLOROETHANE	ND	6.1	0.61	1.2
1,3,5-TRIMETHYLBENZENE	ND <i>UJ</i>	6.1	0.72	1.2
BENZENE	9.8 <i>UJ</i>	6.1	0.61	1.2
CHLOROBENZENE	ND	6.1	0.61	1.2
CHLOROFORM	ND	6.1	0.61	1.2
ETHYLBENZENE	2.3J <i>UJ</i>	6.1	0.61	1.2
ISOPROPYL BENZENE	ND	6.1	0.78	1.2
M,P-XYLENES	3.0J <i>UJ</i>	12	1.2	2.4
METHYLENE CHLORIDE	ND	6.1	1.2	2.4
MTBE	ND	6.1	0.61	1.2
NAPHTHALENE	ND <i>UJ</i>	6.1	1.2	2.4
N-BUTYLBENZENE	ND <i>UJ</i>	6.1	0.85	1.2
N-PROPYLBENZENE	ND <i>UJ</i>	6.1	0.79	1.2
O-XYLENE	1.3J <i>UJ</i>	6.1	0.61	1.2
P-ISOPROPYLTOLUENE	ND <i>UJ</i>	6.1	0.76	1.2
SEC-BUTYLBENZENE	ND <i>UJ</i>	6.1	0.82	1.2
STYRENE	ND	6.1	0.61	1.2
TETRACHLOROETHENE	ND	6.1	0.61	1.2
TOLUENE	13 <i>UJ</i>	6.1	0.61	1.2
TRICHLOROETHENE	ND	6.1	0.61	1.2
TRICHLOROFLUOROMETHANE	ND	6.1	1.3	2.4
VINYL CHLORIDE	ND	6.1	1.2	2.4
TERT-BUTANOL	ND	24	11	12
DIPE	ND	6.1	0.61	1.2
ETBE	ND	6.1	0.61	1.2
TAME	ND	6.1	0.61	1.2
VINYL ACETATE	ND	6.1	1.5	2.4

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	78.3	60.89	129*	85-120
TOLUENE-DB	72.7	60.89	119*	85-115

12/29/13

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>10/30/13</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	<u>RSD ≤ 20/15, 12</u>
IV.	Continuing calibration/ICV	SW	<u>CCV/ICV ≤ 20</u>
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	<u>LCS/D</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	<u>EB = 3 TB = 2, FB = 0500-01-W-02(13K203)</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

S/W

1 ²	U500-03-S-01	11 ¹	<u>MBLK1W</u>	21		31	
2	U500-03-W-01	12 ²	<u>MBLK1S</u>	22		32	
3	U500-03-W-02	13 ³	<u>MBLK2S</u>	23		33	
4 ³	U500-03-S-01MS	14		24		34	
5 ³	U500-03-S-01MSD	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 30, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Polynuclear Aromatic Hydrocarbons
Validation Level: EPA Level III
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13J234

Sample Identification

U500-03-S-01
U500-03-W-02
U500-03-S-01MS
U500-03-S-01MSD

Introduction

This data review covers 3 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

Sample U500-03-W-02 was identified as an equipment blank. No polynuclear aromatic hydrocarbon contaminants were found.

Sample U500-01-W-02 (from SDG 13K003) was identified as a field blank. No polynuclear aromatic hydrocarbon contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Semivolatiles - Data Qualification Summary - SDG 13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Semivolatiles - Field Blank Data Qualification Summary - SDG 13J234**

No Sample Data Qualified in this SDG

METHOD SW3520C/8270C
PAHs BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/30/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 10/31/13
Batch No.   : 13J234                          Date Extracted: 11/04/13 11:30
Sample ID   : U500-03-W-02                   Date Analyzed: 11/06/13 17:27
Lab Samp ID : J234-03                         Dilution Factor: 1.12
Lab File ID : RKH115                          Matrix          : WATER
Ext Btch ID : SVK005W                         % Moisture     : NA
Calib. Ref.: RJH024                           Instrument ID   : T-OE7
=====
  
```

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND	11	2.8	5.6
ACENAPHTHYLENE	ND	11	2.8	5.6
ANTHRACENE	ND	11	2.8	5.6
BENZO(A)ANTHRACENE	ND	11	2.8	5.6
BENZO(A)PYRENE	ND	11	2.8	5.6
BENZO(B)FLUORANTHENE	ND	11	2.9	5.6
BENZO(G,H,I)PERYLENE	ND	11	2.8	5.6
BENZO(K)FLUORANTHENE	ND	11	2.8	5.6
CHRYSENE	ND	11	2.8	5.6
DIBENZO(A,H)ANTHRACENE	ND	11	2.8	5.6
FLUORANTHENE	ND	11	2.8	5.6
FLUORENE	ND	11	2.8	5.6
INDENO(1,2,3-CD)PYRENE	ND	11	2.8	5.6
NAPHTHALENE	ND	11	2.8	5.6
PHENANTHRENE	ND	11	2.8	5.6
PYRENE	ND	11	2.8	5.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	16.1	22.40	72.0	50-110
NITROBENZENE-D5	16.0	22.40	71.5	40-110
TERPHENYL-D14	22.8	22.40	102	50-135

12/9/13 9

METHOD SW3550B/8270C
PAHs BY GC/MS

```

=====
Client       : RICHARD BRADY & ASSOCIATES      Date Collected: 10/30/13
Project      : NWS SEAL BEACH, BLDG 500        Date Received: 10/31/13
Batch No.    : 13J234                          Date Extracted: 11/05/13 11:14
Sample ID    : U500-03-S-01                    Date Analyzed: 11/05/13 20:11
Lab Samp ID  : J234-01                         Dilution Factor: 1
Lab File ID  : RKH098                          Matrix          : SOIL
Ext Btch ID  : SVK007S                         % Moisture     : 26.1
Calib. Ref. : RJH024                           Instrument ID   : T-OE7
=====
  
```

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	450	110	230
ACENAPHTHYLENE	ND	450	110	230
ANTHRACENE	ND	450	110	230
BENZO(A)ANTHRACENE	ND	450	110	230
BENZO(A)PYRENE	ND	450	110	230
BENZO(B)FLUORANTHENE	ND	450	120	230
BENZO(G,H,I)PERYLENE	ND	450	120	230
BENZO(K)FLUORANTHENE	ND	450	110	230
CHRYSENE	ND	450	110	230
DIBENZO(A,H)ANTHRACENE	ND	450	110	230
FLUORANTHENE	ND	450	170	230
FLUORENE	ND	450	110	230
INDENO(1,2,3-CD)PYRENE	ND	450	110	230
NAPHTHALENE	ND	450	110	230
PHENANTHRENE	ND	450	110	230
PYRENE	ND	450	220	230

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	564	902.2	62.5	45-105
NITROBENZENE-D5	501	902.2	55.6	35-100
TERPHENYL-D14	885	902.2	98.1	30-125

12/29/13

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>10/30/13</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>RSD ≤ 30/15</u>
IV.	Continuing calibration/ICV	A	<u>CCV/ICV ≤ 20</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	<u>LCS/D</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	<u>EB = 2, EB = U500-01-W-02 (R003)</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: S/W

1	U500-03-S-01	11	<u>MBLEIW</u>	21		31	
2	U500-03-W-02	12	<u>MBLEIS</u>	22		32	
3	U500-03-S-01MS	13		23		33	
4	U500-03-S-01MSD	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 30, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13J234

Sample Identification

U500-03-S-01
U500-03-W-01
U500-03-W-02
U500-03-S-01MS
U500-03-S-01MSD

Introduction

This data review covers 3 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

Sample U500-03-W-01 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found.

Sample U500-03-W-02 was identified as an equipment blank. No total petroleum hydrocarbons as gasoline contaminants were found.

Sample U500-01-W-02 (from SDG 13K003) was identified as a field blank. No total petroleum hydrocarbons as gasoline contaminants were found.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG
13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification
Summary - SDG 13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Field Blank Data Qualification
Summary - SDG 13J234**

No Sample Data Qualified in this SDG

METHOD SW5035A/8015B
 TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/30/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 10/31/13
Batch No.   : 13J234                          Date Extracted: 11/02/13 05:55
Sample ID   : U500-03-S-01                    Date Analyzed: 11/02/13 05:55
Lab Samp ID: J234-01                          Dilution Factor: 1.01
Lab File ID: EK01032A                         Matrix          : SOIL
Ext Btch ID: GPK001S                          % Moisture     : 26.1
Calib. Ref.: EK01027A                         Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.4	0.48	0.68

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	2.35	2.733	85.9	70-140
1,1,1-TRIFLUOROTOLUENE	2.45	2.733	89.5	70-140

Bromofluorobenzene
 Bromofluorobenzene
 70-140

12/29/13 Q

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/30/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 10/31/13
Batch No.   : 13J234                          Date Extracted: 11/01/13 22:50
Sample ID   : U500-03-W-01                    Date Analyzed: 11/01/13 22:50
Lab Samp ID : J234-02                          Dilution Factor: 1
Lab File ID : EK01021A                        Matrix          : WATER
Ext Btch ID : VG39K01                          % Moisture      : NA
Calib. Ref. : EK01015A                        Instrument ID   : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.0050	0.010

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	0.0335	0.04000	83.8	70-140
1,1,1-TRIFLUOROTOLUENE	0.0341	0.04000	85.3	30-130

Bromofluorobenzene
Bromofluorobenzene
70-140

12/29/13 9

METHOD SW5030B/8015B
 TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/30/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 10/31/13
Batch No.   : 13J234                          Date Extracted: 11/01/13 23:29
Sample ID   : U500-03-W-02                    Date Analyzed: 11/01/13 23:29
Lab Samp ID: J234-03                          Dilution Factor: 1
Lab File ID: EK01022A                         Matrix          : WATER
Ext Btch ID: VG39K01                          % Moisture      : NA
Calib. Ref.: EK01015A                         Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.0050	0.010

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	0.0349	0.04000	87.2	70-140
1,1,1-TRIFLUOROTOLUENE	0.0354	0.04000	88.5	30-130

Bromofluorobenzene
 Bromofluorobenzene
 70-140

12/29/13

LDC #: 30976A7

VALIDATION COMPLETENESS WORKSHEET

Date: 2/26/13

SDG #: 13J234

Level III

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC TPH as Gasoline (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/30/13
II	Initial calibration	A	RSD ≤ 20
III.	Calibration verification/ICV	A	CV/19/ ≤ 20
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	ND	TB = 2 EB = 3, FB = U500-01-W-02 (13/003)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

S/W

1	U500-03-S-01	11	MBLKIS	21		31	
2	U500-03-W-01	12	MBLEIW	22		32	
3	U500-03-W-02	13		23		33	
4	U500-03-S-01MS	14		24		34	
5	U500-03-S-01MSD	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 30, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Diesel
Validation Level: EPA Level III
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13J234

Sample Identification

U500-03-S-01
U500-03-W-02
U500-03-S-01MS
U500-03-S-01MSD

Introduction

This data review covers 3 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Diesel.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as diesel contaminants were found in the method blanks.

Sample U500-03-W-02 was identified as an equipment blank. No total petroleum hydrocarbons as diesel contaminants were found.

Sample U500-01-W-02 (from SDG 13K003) was identified as a field blank. No total petroleum hydrocarbons as diesel contaminants were found.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Data Qualification Summary - SDG
13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Laboratory Blank Data Qualification
Summary - SDG 13J234**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Field Blank Data Qualification
Summary - SDG 13J234**

No Sample Data Qualified in this SDG

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client   : RICHARD BRADY & ASSOCIATES   Date Collected: 10/30/13
Project  : NWS SEAL BEACH, BLDG 500     Date Received: 10/31/13
Batch No. : 13J234                       Date Extracted: 11/05/13 14:55
Sample ID: U500-03-s-01                  Date Analyzed: 11/05/13 21:21
Lab Samp ID: J234-01                     Dilution Factor: 1
Lab File ID: LK05031A                    Matrix : SOIL
Ext Btch ID: DSK003S                     % Moisture : 26.1
Calib. Ref.: LK05027A                    Instrument ID : GCT105
=====

```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	14	4.1	6.8

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	114	135.3	84.2	50-130
HEXACOSANE	24.3	33.83	71.9	60-130

Parameter H-C Range
Diesel C10-C28

12/29/13 T

METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : RICHARD BRADY & ASSOCIATES   Date Collected: 10/30/13
Project      : NWS SEAL BEACH, BLDG 500     Date Received: 10/31/13
Batch No.    : 13J234                       Date Extracted: 11/04/13 10:30
Sample ID    : U500-03-W-02                 Date Analyzed: 11/05/13 15:40
Lab Samp ID  : J234-03                      Dilution Factor: 0.95
Lab File ID  : LK05011A                     Matrix          : WATER
Ext Btch ID  : DSK002W                      % Moisture     : NA
Calib. Ref.  : LK05003A                     Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.48	0.024	0.048

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.824	0.9500	86.7	50-130
HEXACOSANE	0.163	0.2375	68.6	60-130

Parameter H-C Range
Diesel C10-C28

12/29/13 Q

LDC #: 30976A8

VALIDATION COMPLETENESS WORKSHEET

Date: 12/20/13

SDG #: 13J234

Level III

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC TPH as Diesel (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/20/13
II	Initial calibration	A	2SD ≤ 20
III.	Calibration verification/ICV	A	CCV/ICV ≤ 20
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	ND	EB = 2, FB = (U500-01-W-02 (13K003))

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

S/W

1	U500-03-S-01	11	U500-03-S-01	21		31	
2	U500-03-W-02	12	U500-03-W-02	22		32	
3	U500-03-S-01MS	13		23		33	
4	U500-03-S-01MSD	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 31, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13K003

Sample Identification

U500-02-S-01**
U500-02-W-01
U500-01-S-01
U500-01-S-01RE
U500-01-W-01
U500-01-W-02

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 3 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
U500-01-S-01 MBLK1S	Vinyl acetate	Initial calibration was not performed for this compound.	Initial calibration must be performed for all target compounds.	R	P

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/1/13	tert-Butyl alcohol	0.012 (≥ 0.05)	All water samples in SDG 13K003	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/6/13	n-Propylbenzene	21.7	U500-01-S-01 MBLK1S	J (all detects) UJ (all non-detects)	A

Sample	Compound	Finding	Criteria	Flag	A or P
U500-01-S-01 MBLK1S	Vinyl acetate	Continuing calibration was not performed for this compound.	Continuing calibration must be performed for all target compounds.	R	P

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
U500-01-S-01 MBLK1S	Vinyl acetate	Second source calibration was not performed for this compound.	Second source calibration must be performed for all target compounds.	R	P

All of the continuing calibration relative response factors (RRF) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/5/13	tert-Butyl alcohol	0.011 (≥0.05)	U500-02-W-01 U500-01-W-01 MBLK1W	J (all detects) UJ (all non-detects)	A
11/7/13	tert-Butyl alcohol	0.012 (≥0.05)	U500-01-W-02 MBLK2W	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MBLK1S	11/6/13	Methylene chloride	2.4 ug/Kg	U500-01-S-01

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks.

Sample U500-02-W-01 was identified as a trip blank. No volatile contaminants were found.

Sample U500-01-W-01 was identified as an equipment blank. No volatile contaminants were found.

Sample U500-01-W-02 was identified as a field blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Sample (Associated Samples)	Compound	Finding	Criteria	Flag	A or P
U500-01-S-01 MBLK1S	Vinyl acetate	The LCS/LCSD associated with this sample was not spiked with the required full list of target compounds.	The LCS/LCSD must be performed according to the QAPP.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
U500-01-S-01RE	1,2-Dichlorobenzene-d4	324315 (331504-1326014)	1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane n-Propylbenzene 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene Naphthalene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment of Data

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Sample	Compound	Flag	A or P
U500-01-S-01	Vinyl acetate	R	A
U500-01-S-01RE	All TCL compounds except Vinyl acetate	R	A

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Volatiles - Data Qualification Summary - SDG 13K003**

SDG	Sample	Compound	Flag	A or P	Reason
13K003	U500-01-S-01	Vinyl acetate	R	P	Initial calibration (no ICAL)
13K003	U500-02-W-01 U500-01-W-01 U500-01-W-02	tert-Butyl alcohol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
13K003	U500-01-S-01	n-Propylbenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
13K003	U500-01-S-01	Vinyl acetate	R	P	Continuing calibration (no CCV)
13K003	U500-01-S-01	Vinyl acetate	R	P	Continuing calibration (no ICV)
13K003	U500-02-W-01 U500-01-W-01 U500-01-W-02	tert-Butyl alcohol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
13K003	U500-01-S-01	Vinyl acetate	None	P	Laboratory control samples (no LCS)
13K003	U500-01-S-01RE	1,1,1,2-Tetrachloroethane 1,2,3-Trichloropropane n-Propylbenzene 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene Naphthalene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Internal standards (area)
13K003	U500-01-S-01	Vinyl acetate	R	A	Overall assessment of data
13K003	U500-01-S-01RE	All TCL compounds except Vinyl acetate	R	A	Overall assessment of data

**NWS Seal Beach, UST 500
Volatiles - Laboratory Blank Data Qualification Summary - SDG 13K003**

No Sample Data Qualified in this SDG

NWS Seal Beach, UST 500
Volatiles - Field Blank Data Qualification Summary - SDG 13K003

No Sample Data Qualified in this SDG

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES Date Collected: 10/31/13
 Project : NWS SEAL BEACH, BLDG 500 Date Received: 11/01/13
 Batch No. : 13K003 Date Extracted: 11/05/13 17:47
 Sample ID: U500-02-W-01 Date Analyzed: 11/05/13 17:47
 Lab Samp ID: K003-02 Dilution Factor: 1
 Lab File ID: RKD033 Matrix : WATER
 Ext Btch ID: V094K03 % Moisture : NA
 Calib. Ref.: RKD007 Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
BENZENE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROFORM	ND	1.0	0.10	0.20
ETHYLBENZENE	ND	1.0	0.10	0.20
ISOPROPYL BENZENE	ND	1.0	0.10	0.20
M,P-XYLENES	ND	2.0	0.21	0.40
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
MTBE	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.20
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERT-BUTANOL	ND	10	2.5	5.0
DIPE	ND	1.0	0.11	0.20
ETBE	ND	1.0	0.11	0.20
TAME	ND	1.0	0.11	0.20
VINYL ACETATE	ND	2.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.47	10.00	94.7	70-120
4-BROMOFLUOROBENZENE	9.36	10.00	93.6	75-120
TOLUENE-D8	9.81	10.00	98.1	85-120
DIBROMOFLUOROMETHANE	9.74	10.00	97.4	85-115

12/29/13 9

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES Date Collected: 10/31/13
 Project : NWS SEAL BEACH, BLDG 500 Date Received: 11/01/13
 Batch No. : 13K003 Date Extracted: 11/05/13 18:24
 Sample ID: U500-01-W-01 Date Analyzed: 11/05/13 18:24
 Lab Samp ID: K003-04 Dilution Factor: 1
 Lab File ID: RKD034 Matrix : WATER
 Ext Btch ID: V094K03 % Moisture : NA
 Calib. Ref.: RKD007 Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
BENZENE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROFORM	ND	1.0	0.10	0.20
ETHYLBENZENE	ND	1.0	0.10	0.20
ISOPROPYL BENZENE	ND	1.0	0.10	0.20
M, P-XYLENES	ND	2.0	0.21	0.40
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
MTBE	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.20
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERT-BUTANOL	ND	10	2.5	5.0
DIPE	ND	1.0	0.11	0.20
ETBE	ND	1.0	0.11	0.20
TAME	ND	1.0	0.11	0.20
VINYL ACETATE	ND	2.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	9.24	10.00	92.4	70-120
4-BROMOFLUOROBENZENE	9.62	10.00	96.2	75-120
TOLUENE-DB	10.3	10.00	103	85-120
DIBROMOFLUOROMETHANE	9.77	10.00	97.7	85-115

11/29/13 R

METHOD SW5030B/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES Date Collected: 10/31/13
 Project : NWS SEAL BEACH, BLDG 500 Date Received: 11/01/13
 Batch No. : 13K003 Date Extracted: 11/07/13 12:21
 Sample ID: U500-01-W-02 Date Analyzed: 11/07/13 12:21
 Lab Samp ID: K003-05N Dilution Factor: 1
 Lab File ID: RKD072 Matrix : WATER
 Ext Btch ID: V094K05 % Moisture : NA
 Calib. Ref.: RKD007 Instrument ID : T-094

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
1,1,1,2-TETRACHLOROETHANE	ND	1.0	0.10	0.20
1,1,1-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1,2,2-TETRACHLOROETHANE	ND	1.0	0.11	0.20
1,1,2-TRICHLOROETHANE	ND	1.0	0.10	0.20
1,1-DICHLOROETHENE	ND	1.0	0.10	0.20
1,2,3-TRICHLOROBENZENE	ND	1.0	0.15	0.30
1,2,3-TRICHLOROPROPANE	ND	2.0	0.25	0.50
1,2,4-TRIMETHYLBENZENE	ND	1.0	0.11	0.20
1,2-DICHLOROETHANE	ND	1.0	0.10	0.20
1,3,5-TRIMETHYLBENZENE	ND	1.0	0.13	0.20
BENZENE	ND	1.0	0.10	0.20
CHLOROBENZENE	ND	1.0	0.10	0.20
CHLOROFORM	ND	1.0	0.10	0.20
ETHYLBENZENE	ND	1.0	0.10	0.20
ISOPROPYL BENZENE	ND	1.0	0.10	0.20
M, P-XYLENES	ND	2.0	0.21	0.40
METHYLENE CHLORIDE	ND	2.0	0.50	1.0
MTBE	ND	1.0	0.13	0.20
NAPHTHALENE	ND	2.0	0.50	1.0
N-BUTYLBENZENE	ND	1.0	0.17	0.20
N-PROPYLBENZENE	ND	1.0	0.13	0.20
O-XYLENE	ND	1.0	0.10	0.20
P-ISOPROPYLTOLUENE	ND	1.0	0.14	0.20
SEC-BUTYLBENZENE	ND	1.0	0.13	0.20
STYRENE	ND	1.0	0.25	0.50
TETRACHLOROETHENE	ND	1.0	0.15	0.20
TOLUENE	ND	1.0	0.10	0.20
TRICHLOROETHENE	ND	1.0	0.10	0.20
TRICHLOROFLUOROMETHANE	ND	1.0	0.15	0.30
VINYL CHLORIDE	ND	1.0	0.12	0.20
TERT-BUTANOL	ND	10	2.5	5.0
DIPE	ND	1.0	0.11	0.20
ETBE	ND	1.0	0.11	0.20
TAME	ND	1.0	0.11	0.20
VINYL ACETATE	ND	2.0	0.25	0.50

SURROGATE PARAMETERS	RESULTS	SPK AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	8.86	10.00	88.6	70-120
4-BROMOFLUOROBENZENE	9.67	10.00	96.7	75-120
TOLUENE-D8	9.86	10.00	98.6	85-120
DIBROMOFLUOROMETHANE	9.63	10.00	96.3	85-115

12/29/13 9

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

Client : RICHARD BRADY & ASSOCIATES	Date Collected: 10/31/13
Project : NWS SEAL BEACH, BLDG 500	Date Received: 11/01/13
Batch No. : 13K003	Date Extracted: 11/12/13 16:13
Sample ID: U500-02-S-01	Date Analyzed: 11/12/13 16:13
Lab Samp ID: K003-01N	Dilution Factor: 0.93
Lab File ID: RKP048	Matrix : SOIL
Ext Btch ID: VS02K06	% Moisture : 29.0
Calib. Ref.: RKP031	Instrument ID : T-002

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	6.5	0.65	1.3
1,1,1-TRICHLOROETHANE	ND	6.5	0.65	1.3
1,1,2,2-TETRACHLOROETHANE	ND	6.5	0.65	1.3
1,1,2-TRICHLOROETHANE	ND	6.5	0.65	1.3
1,1-DICHLOROETHENE	ND	6.5	0.65	1.3
1,2,3-TRICHLOROBENZENE	ND	6.5	1.3	2.6
1,2,3-TRICHLOROPROPANE	ND	6.5	1.3	2.6
1,2,4-TRIMETHYLBENZENE	ND	6.5	0.72	1.3
1,2-DICHLOROETHANE	ND	6.5	0.65	1.3
1,3,5-TRIMETHYLBENZENE	ND	6.5	0.77	1.3
BENZENE	2.5J	6.5	0.65	1.3
CHLOROBENZENE	ND	6.5	0.65	1.3
CHLOROFORM	ND	6.5	0.65	1.3
ETHYLBENZENE	ND	6.5	0.65	1.3
ISOPROPYL BENZENE	ND	6.5	0.84	1.3
M,P-XYLENES	ND	13	1.3	2.6
METHYLENE CHLORIDE	ND	6.5	1.3	2.6
MTBE	ND	6.5	0.65	1.3
NAPHTHALENE	ND	6.5	1.3	2.6
N-BUTYLBENZENE	ND	6.5	0.92	1.3
N-PROPYLBENZENE	ND	6.5	0.85	1.3
O-XYLENE	ND	6.5	0.65	1.3
P-ISOPROPYLTOLUENE	ND	6.5	0.81	1.3
SEC-BUTYLBENZENE	ND	6.5	0.88	1.3
STYRENE	ND	6.5	0.65	1.3
TETRACHLOROETHENE	ND	6.5	0.65	1.3
TOLUENE	ND	6.5	0.65	1.3
TRICHLOROETHENE	ND	6.5	0.65	1.3
TRICHLOROFLUOROMETHANE	ND	6.5	1.4	2.6
VINYL CHLORIDE	ND	6.5	1.3	2.6
TERT-BUTANOL	ND	26	12	13
DIPE	ND	6.5	0.65	1.3
ETBE	ND	6.5	0.65	1.3
TAME	ND	6.5	0.65	1.3
VINYL ACETATE	ND	6.5	1.7	2.6

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	65.2	65.49	99.6	85-120
TOLUENE-D8	68.1	65.49	104	85-115

12/19/13

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/06/13 14:16
Sample ID   : U500-01-S-01                    Date Analyzed: 11/06/13 14:16
Lab Samp ID : K003-03                          Dilution Factor: 1.19
Lab File ID : RKR028                            Matrix          : SOIL
Ext Btch ID : VSF3K02                          % Moisture     : 30.0
Calib. Ref.: RIR039                            Instrument ID  : F3
=====

```

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	8.5	0.85	1.7
1,1,1-TRICHLOROETHANE	ND	8.5	0.85	1.7
1,1,2,2-TETRACHLOROETHANE	ND	8.5	0.85	1.7
1,1,2-TRICHLOROETHANE	ND	8.5	0.85	1.7
1,1-DICHLOROETHENE	ND	8.5	0.85	1.7
1,2,3-TRICHLOROBENZENE	ND	8.5	1.7	3.4
1,2,3-TRICHLOROPROPANE	ND	8.5	1.7	3.4
1,2,4-TRIMETHYLBENZENE	3.8J	8.5	0.94	1.7
1,2-DICHLOROETHANE	ND	8.5	0.85	1.7
1,3,5-TRIMETHYLBENZENE	2.3J	8.5	1.0	1.7
BENZENE	79	8.5	0.85	1.7
CHLOROBENZENE	ND	8.5	0.85	1.7
CHLOROFORM	ND	8.5	0.85	1.7
ETHYLBENZENE	15	8.5	0.85	1.7
ISOPROPYL BENZENE	1.7J	8.5	1.1	1.7
M,P-XYLENES	21	17	1.7	3.4
METHYLENE CHLORIDE	ND	8.5	1.7	3.4
MTBE	ND	8.5	0.85	1.7
NAPHTHALENE	3.1J	8.5	1.7	3.4
N-BUTYLBENZENE	ND	8.5	1.2	1.7
N-PROPYLBENZENE	1.6J	8.5	1.1	1.7
O-XYLENE	8.0J	8.5	0.85	1.7
P-ISOPROPYLTOLUENE	ND	8.5	1.1	1.7
SEC-BUTYLBENZENE	ND	8.5	1.1	1.7
STYRENE	ND	8.5	0.85	1.7
TETRACHLOROETHENE	ND	8.5	0.85	1.7
TOLUENE	96	8.5	0.85	1.7
TRICHLOROETHENE	ND	8.5	0.85	1.7
TRICHLOROFUOROMETHANE	ND	8.5	1.8	3.4
VINYL CHLORIDE	ND	8.5	1.7	3.4
TERT-BUTANOL	ND	34	16	17
DIPE	ND	8.5	0.85	1.7
ETBE	ND	8.5	0.85	1.7
TAME	ND	8.5	0.85	1.7
# VINYL ACETATE	ND	8.5	2.1	3.4

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	102	85.00	120	85-120
TOLUENE-D8	91.9	85.00	108	85-115

Note : Not evaluated. The analyzite was evaluated from K003-03N.

12/29/13 Q

METHOD SW5035A/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/12/13 16:48
Sample ID   : U500-01-S-01RE                 Date Analyzed: 11/12/13 16:48
Lab Samp ID : K003-03N                       Dilution Factor: 1.06
Lab File ID : RKP049                          Matrix       : SOIL
Ext Btch ID : VS02K06                        % Moisture   : 30.0
Calib. Ref. : RKP031                         Instrument ID : T-002
=====
  
```

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
1,1,1,2-TETRACHLOROETHANE	ND	7.6	0.76	1.5
1,1,1-TRICHLOROETHANE	ND	7.6	0.76	1.5
1,1,2,2-TETRACHLOROETHANE	ND	7.6	0.76	1.5
1,1,2-TRICHLOROETHANE	ND	7.6	0.76	1.5
1,1-DICHLOROETHENE	ND	7.6	0.76	1.5
1,2,3-TRICHLOROBENZENE	ND	7.6	1.5	3.0
1,2,3-TRICHLOROPROPANE	ND	7.6	1.5	3.0
1,2,4-TRIMETHYLBENZENE	4.4J	7.6	0.83	1.5
1,2-DICHLOROETHANE	2.1J	7.6	0.76	1.5
1,3,5-TRIMETHYLBENZENE	1.6J	7.6	0.89	1.5
BENZENE	85	7.6	0.76	1.5
CHLOROBENZENE	ND	7.6	0.76	1.5
CHLOROFORM	ND	7.6	0.76	1.5
ETHYLBENZENE	14	7.6	0.76	1.5
ISOPROPYL BENZENE	1.2J	7.6	0.97	1.5
M,P-XYLENES	21	15	1.5	3.0
METHYLENE CHLORIDE	ND	7.6	1.5	3.0
MTBE	ND	7.6	0.76	1.5
NAPHTHALENE	4.9J	7.6	1.5	3.0
N-BUTYLBENZENE	ND	7.6	1.1	1.5
N-PROPYLBENZENE	1.6J	7.6	0.98	1.5
O-XYLENE	7.7	7.6	0.76	1.5
P-ISOPROPYLTOLUENE	ND	7.6	0.94	1.5
SEC-BUTYLBENZENE	ND	7.6	1.0	1.5
STYRENE	ND	7.6	0.76	1.5
TETRACHLOROETHENE	ND	7.6	0.76	1.5
TOLUENE	87	7.6	0.76	1.5
TRICHLOROETHENE	ND	7.6	0.76	1.5
TRICHLOROFLUOROMETHANE	ND	7.6	1.6	3.0
VINYL CHLORIDE	ND	7.6	1.5	3.0
TERT-BUTANOL	ND	30	14	15
DIPE	ND	7.6	0.76	1.5
ETBE	ND	7.6	0.76	1.5
TAME	ND	7.6	0.76	1.5
# VINYL ACETATE	ND	7.6	1.9	3.0
SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
4-BROMOFLUOROBENZENE	84.1	75.71	111	85-120
TOLUENE-D8	81.8	75.71	108	85-115

Note : Only evaluated for Vinyl Acetate result.

12/29/13 R

LDC #: 30976B1

VALIDATION COMPLETENESS WORKSHEET

Date: 12/26/13

SDG #: 13K003

Level III/IV

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/31/13
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD ≤ 20/15, 12
IV.	Continuing calibration/ICV	SW	CV/ICV ≤ 20
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	U500-03-S-01 (13J234) - no detect'd no qual
VIII.	Laboratory control samples	SW	LOSD
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	EB = 5 TB = 2 FB = 6

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

1	⁴ U500-02-S-01**	11	¹ MBLK1W	21		31	
2	¹ U500-02-W-01	12	² MBLK2W	22		32	
3	³ U500-01-S-01	13	³ MBLK1S	23		33	
4	⁴ U500-01-S-01RE	14	⁴ MBLK2S	24		34	
5	¹ U500-01-W-01	15		25		35	
6	² U500-01-W-02	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS CHECKLIST

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/	/		
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Was a curve fit used for evaluation?	/			
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	/			
Were all percent relative standard deviations (%RSD) ≤ 30%/15% and relative response factors (RRF) > 0.05?		/		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?		/		
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?		/		
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	/			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	/			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		/		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		/		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?		/		
Were retention times within ± 30 seconds of the associated calibration standard?	/			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	/			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	/			
Were chromatogram peaks verified and accounted for?	/			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	/			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			/	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?			/	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			/	
XIV. System performance				
System performance was found to be acceptable.	/			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
XVII. Field blanks				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.		/		

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

VALIDATION FINDINGS WORKSHEET Blanks

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Was a method blank associated with every sample in this SDG?
- N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
- N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/6/13

Conc. units: ug/lcg Associated Samples: 3 (ND)

Compound	Blank ID	Sample Identification							
	MPLKIS								
Methylene chloride	2.4								
Acetone									

Blank analysis date: _____

Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification							
Methylene chloride									
Acetone									

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is}) / (A_{is})(C_x)$
 average RRF = sum of the RRFs/number of standards
 %RSD = $100 * (S/X)$

A_x = Area of compound,
 C_x = Concentration of compound,
 S = Standard deviation of the RRFs
 X = Mean of the RRFs

A_{is} = Area of associated internal standard
 C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (5 ^σ std)	RRF (5 ^σ std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
1	19L (T002)	11/8/13	C (1st internal standard)	0.409	0.409	0.442	0.442	12.66	12.68
			AA (2nd internal standard)	0.310	0.310	0.314	0.314	4.08	4.05
			YY (3rd internal standard)	6.337	6.337	5.940	5.941	10.97	10.97
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
 RRF = (A_x)(C_{is})/(A_{is})(C_x)

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound, A_{is} = Area of associated internal standard
 C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	RkP041	11/2/13	C (1st internal standard)	0.442	0.406	0.406	8.1	8.2
			AA (2nd internal standard)	0.314	0.316	0.316	0.6	0.5
			XY (3rd internal standard)	5.940	6.500	6.500	9.4	9.4
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
5			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8	50	52.02	104	104	0
Bromofluorobenzene	↓	49.81	99.6	99.6	↓

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
 SA = Spike added

RPD = | LCSC - LCSDC | * 2 / (LCSC + LCSDC)

LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: LCS/LCSD25

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	50	50	48.4	48.6	97	97	97	97	0	0
Trichloroethene	↓	↓	49.2	48.1	98	98	96	96	2	2
Benzene	↓	↓	47.3	48.9	95	95	98	98	3	3
Toluene	↓	↓	45.0	47.6	90	90	95	95	6	6
Chlorobenzene	↓	↓	47.2	50.5	94	94	101	101	7	7

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 31, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Polynuclear Aromatic Hydrocarbons
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13K003

Sample Identification

U500-02-S-01**
U500-01-S-01
U500-01-W-01
U500-01-W-02

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 2 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the validation criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

Sample U500-01-W-01 was identified as an equipment blank. No polynuclear aromatic hydrocarbon contaminants were found.

Sample U500-01-W-02 was identified as a field blank. No polynuclear aromatic hydrocarbon contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Semivolatiles - Data Qualification Summary - SDG 13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Semivolatiles - Field Blank Data Qualification Summary - SDG 13K003**

No Sample Data Qualified in this SDG

METHOD SW3520C/8270C
PAHs BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500    Date Received: 11/01/13
Batch No.   : 13K003                      Date Extracted: 11/04/13 11:30
Sample ID   : U500-01-W-01                Date Analyzed: 11/06/13 17:46
Lab Samp ID : K003-04                     Dilution Factor: .97
Lab File ID : RKH116                      Matrix          : WATER
Ext Btch ID : SVK005W                     % Moisture      : NA
Calib. Ref.: RJH024                      Instrument ID   : T-OE7
=====

```

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND	9.7	2.4	4.9
ACENAPHTHYLENE	ND	9.7	2.4	4.9
ANTHRACENE	ND	9.7	2.4	4.9
BENZO(A)ANTHRACENE	ND	9.7	2.4	4.9
BENZO(A)PYRENE	ND	9.7	2.4	4.9
BENZO(B)FLUORANTHENE	ND	9.7	2.5	4.9
BENZO(G,H,I)PERYLENE	ND	9.7	2.4	4.9
BENZO(K)FLUORANTHENE	ND	9.7	2.4	4.9
CHRYSENE	ND	9.7	2.4	4.9
DIBENZO(A,H)ANTHRACENE	ND	9.7	2.4	4.9
FLUORANTHENE	ND	9.7	2.4	4.9
FLUORENE	ND	9.7	2.4	4.9
INDENO(1,2,3-CD)PYRENE	ND	9.7	2.4	4.9
NAPHTHALENE	ND	9.7	2.4	4.9
PHENANTHRENE	ND	9.7	2.4	4.9
PYRENE	ND	9.7	2.4	4.9

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	15.2	19.40	78.4	50-110
NITROBENZENE-D5	15.6	19.40	80.3	40-110
TERPHENYL-D14	20.7	19.40	107	50-135

12/9/13

METHOD SW3520C/8270C
PAHs BY GC/MS

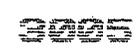
```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/04/13 11:30
Sample ID   : U500-01-W-02                    Date Analyzed: 11/06/13 18:05
Lab Samp ID : K003-05                          Dilution Factor: 1.03
Lab File ID : RKH117                           Matrix          : WATER
Ext Btch ID : SVK005W                          % Moisture      : NA
Calib. Ref.: RJH024                            Instrument ID   : T-OE7
=====
  
```

PARAMETERS	RESULTS (ug/L)	LOQ (ug/L)	DL (ug/L)	LOD (ug/L)
ACENAPHTHENE	ND	10	2.6	5.1
ACENAPHTHYLENE	ND	10	2.6	5.1
ANTHRACENE	ND	10	2.6	5.1
BENZO(A)ANTHRACENE	ND	10	2.6	5.1
BENZO(A)PYRENE	ND	10	2.6	5.1
BENZO(B)FLUORANTHENE	ND	10	2.7	5.1
BENZO(G,H,I)PERYLENE	ND	10	2.6	5.1
BENZO(K)FLUORANTHENE	ND	10	2.6	5.1
CHRYSENE	ND	10	2.6	5.1
DIBENZO(A,H)ANTHRACENE	ND	10	2.6	5.1
FLUORANTHENE	ND	10	2.6	5.1
FLUORENE	ND	10	2.6	5.1
INDENO(1,2,3-CD)PYRENE	ND	10	2.6	5.1
NAPHTHALENE	ND	10	2.6	5.1
PHENANTHRENE	ND	10	2.6	5.1
PYRENE	ND	10	2.6	5.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	13.7	20.60	66.6	50-110
NITROBENZENE-D5	14.1	20.60	68.5	40-110
TERPHENYL-D14	18.7	20.60	90.9	50-135

11/9/13 R



METHOD SW3550B/8270C
PAHs BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500     Date Received: 11/01/13
Batch No.   : 13K003                       Date Extracted: 11/05/13 11:14
Sample ID   : U500-02-S-01                 Date Analyzed: 11/05/13 17:38
Lab Samp ID : K003-01                       Dilution Factor: 1
Lab File ID : RKH090                         Matrix          : SOIL
Ext Btch ID : SVK007S                       % Moisture     : 29.0
Calib. Ref. : RJH024                         Instrument ID  : T-0E7
=====

```

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	470	120	240
ACENAPHTHYLENE	ND	470	120	240
ANTHRACENE	ND	470	120	240
BENZO(A)ANTHRACENE	ND	470	120	240
BENZO(A)PYRENE	ND	470	120	240
BENZO(B)FLUORANTHENE	ND	470	120	240
BENZO(G,H,I)PERYLENE	ND	470	120	240
BENZO(K)FLUORANTHENE	ND	470	120	240
CHRYSENE	ND	470	120	240
DIBENZO(A,H)ANTHRACENE	ND	470	120	240
FLUORANTHENE	ND	470	180	240
FLUORENE	ND	470	120	240
INDENO(1,2,3-CD)PYRENE	ND	470	120	240
NAPHTHALENE	ND	470	120	240
PHENANTHRENE	ND	470	120	240
PYRENE	ND	470	230	240

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	724	939.0	77.1	45-105
NITROBENZENE-D5	700	939.0	74.6	35-100
TERPHENYL-D14	935	939.0	99.5	30-125

12/29/13

METHOD SW3550B/8270C
PAHs BY GC/MS

```

=====
Client      : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500     Date Received: 11/01/13
Batch No.   : 13K003                       Date Extracted: 11/05/13 11:14
Sample ID   : U500-01-S-01                 Date Analyzed: 11/05/13 17:57
Lab Samp ID : K003-03                      Dilution Factor: 1
Lab File ID : RKH091                       Matrix          : SOIL
Ext Btch ID : SVK007S                      % Moisture     : 30.0
Calib. Ref. : RJH024                       Instrument ID   : T-OE7
=====

```

PARAMETERS	RESULTS (ug/kg)	LOQ (ug/kg)	DL (ug/kg)	LOD (ug/kg)
ACENAPHTHENE	ND	480	120	240
ACENAPHTHYLENE	ND	480	120	240
ANTHRACENE	ND	480	120	240
BENZO(A)ANTHRACENE	ND	480	120	240
BENZO(A)PYRENE	ND	480	120	240
BENZO(B)FLUORANTHENE	ND	480	120	240
BENZO(G,H,I)PERYLENE	ND	480	120	240
BENZO(K)FLUORANTHENE	ND	480	120	240
CHRYSENE	ND	480	120	240
DIBENZO(A,H)ANTHRACENE	ND	480	120	240
FLUORANTHENE	ND	480	180	240
FLUORENE	ND	480	120	240
INDENO(1,2,3-CD)PYRENE	ND	480	120	240
NAPHTHALENE	ND	480	120	240
PHENANTHRENE	ND	480	120	240
PYRENE	ND	480	230	240

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
2-FLUOROBIPHENYL	687	952.4	72.1	45-105
NITROBENZENE-D5	659	952.4	69.2	35-100
TERPHENYL-D14	897	952.4	94.1	30-125

11/29/13

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/31/13
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 30/15
IV.	Continuing calibration/ICV	A	CV/1CV ≤ 20
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	U500-03-S-01 (13J224)
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	EB = 3 FB = 4

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

1	U500-02-S-01**	11	MBLEW	21		31	
2	U500-01-S-01	12	MALIS	22		32	
3	U500-01-W-01	13		23		33	
4	U500-01-W-02	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS CHECKLIST

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Was a curve fit used for evaluation?		/		
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?			/	
Were all percent relative standard deviations (%RSD) ≤ 30%/15% and relative response factors (RRF) > 0.05?	/			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	/			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	/			
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	/			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			/	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			/	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	/			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	/			
Were retention times within + 30 seconds from the associated calibration standard?	/			
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?			/	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?			/	
Were chromatogram peaks verified and accounted for?	/			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?			/	
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			/	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			/	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			/	
XIV. System performance				
System performance was found to be acceptable.	/			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.		/		
XVII. Field blanks				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.	/			

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is}) / (A_{is})(C_x)$
 average RRF = sum of the RRFs/number of standards
 %RSD = $100 * (S/X)$

A_x = Area of compound, A_{is} = Area of associated internal standard
 C_x = Concentration of compound, C_{is} = Concentration of internal standard
 S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (40 std)	RRF (40 std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD
1	1CAL-E7	10/7/13	(1st internal standard)						
			Naphthalene (2nd internal standard)	1.030	1.030	1.041	1.041	2.85	2.87
			Fluorene (3rd internal standard)	1.513	1.513	1.423	1.423	5.87	5.88
			Phenanthrene (4th internal standard)	0.993	0.993	1.010	1.010	3.31	3.30
			Chrysene (5th internal standard)	0.976	0.976	1.008	1.008	3.70	3.68
			Benzo(a)pyrene (6th internal standard)	1.084	1.084	1.064	1.064	5.35	5.34
2			(1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			(1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
 RRF = (A_x)(C_{is})/(A_{is})(C_x)

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound, A_{is} = Area of associated internal standard
 C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported	Recalculated	Reported	Recalculated
					RRF (CC)	RRF (CC)	%D	%D
1	PKH075	11/5/13	(1st internal standard)					
			Naphthalene (2nd internal standard)	1.041	1.023	1.023	1.7	1.7
			Fluorene (3rd internal standard)	1.423	1.472	1.472	3.4	3.4
			Phenanthrene (4th internal standard)	1.015	1.019	1.019	0.9	0.9
			Chrysene (5th internal standard)	1.008	0.968	0.968	4.0	4.0
			Benzo(a)pyrene (6th internal standard)	1.064	1.109	1.109	4.2	4.3
2			(1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			(1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	10	7.46	74.6	74.6	0
2-Fluorobiphenyl	↓	7.71	77.1	77.1	↓
Terphenyl-d14	↓	9.95	99.5	99.5	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA)

Where: SSC = Spike concentration
 SA = Spike added

RPD = |LCSC - LCSDC| * 2 / (LCSC + LCSDC)

LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: LCS/DIS

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Acenaphthene	1330	1330	1150	1120	86	86	84	84	3	3
Pyrene	↓	↓	1280	1320	96	96	99	99	3	3

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 31, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13K003

Sample Identification

U500-02-S-01**
U500-02-W-01
U500-01-S-01
U500-01-W-01
U500-01-W-02

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 2 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

Sample U500-02-W-01 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found.

Sample U500-01-W-01 was identified as an equipment blank. No total petroleum hydrocarbons as gasoline contaminants were found with the following exceptions:

Blank ID	Sampling Date	Compound	Concentration	Associated Samples
U500-01-W-01	10/31/13	TPH as gasoline	0.0053 mg/L	All soil samples in SDG 13K003

Sample U500-01-W-02 was identified as a field blank. No total petroleum hydrocarbons as gasoline contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG
13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification
Summary - SDG 13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Gasoline - Field Blank Data Qualification
Summary - SDG 13K003**

No Sample Data Qualified in this SDG

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project      : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.    : 13K003                          Date Extracted: 11/02/13 07:51
Sample ID    : U500-02-S-01                    Date Analyzed: 11/02/13 07:51
Lab Samp ID  : K003-01                          Dilution Factor: 1
Lab File ID  : EK01035A                        Matrix          : SOIL
Ext Btch ID  : GPK001S                         % Moisture      : 29.0
Calib. Ref.  : EK01027A                       Instrument ID   : GCT039
=====

```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.4	0.49	0.70

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	2.38	2.817	84.6	70-140
1,1,1-TRIFLUOROTOLUENE	2.45	2.817	87.1	70-140

Bromofluorobenzene
Bromofluorobenzene
70-140

12/9/13 ✓

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project      : NWS SEAL BEACH, BLDG 500     Date Received: 11/01/13
Batch No.    : 13K003                       Date Extracted: 11/02/13 00:46
Sample ID    : U500-02-W-01                 Date Analyzed: 11/02/13 00:46
Lab Samp ID  : K003-02                       Dilution Factor: 1
Lab File ID  : EK01024A                     Matrix          : WATER
Ext Btch ID  : VG39K01                       % Moisture      : NA
Calib. Ref.  : EK01015A                     Instrument ID   : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.0050	0.010

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	0.0338	0.04000	84.5	70-140
1,1,1-TRIFLUOROTOLUENE	0.0347	0.04000	86.8	30-130

Bromofluorobenzene
Bromofluorobenzene
70-140

12/28/13 &

METHOD SW5035A/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project      : NWS SEAL BEACH, BLDG 500     Date Received: 11/01/13
Batch No.    : 13K003                       Date Extracted: 11/02/13 08:29
Sample ID    : U500-01-S-01                 Date Analyzed: 11/02/13 08:29
Lab Samp ID  : K003-03                       Dilution Factor: 0.98
Lab File ID  : EK01036A                      Matrix           : SOIL
Ext Btch ID  : GPK001S                       % Moisture      : 30.0
Calib. Ref.  : EK01027A                      Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
GASOLINE	ND	1.4	0.49	0.70

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	2.43	2.800	86.7	70-140
1,1,1-TRIFLUOROTOLUENE	2.50	2.800	89.4	70-140

Bromofluorobenzene
Bromofluorobenzene
70-140

12/29/13 9

METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : RICHARD BRADY & ASSOCIATES   Date Collected: 10/31/13
Project    : NWS SEAL BEACH, BLDG 500     Date Received: 11/01/13
Batch No.  : 13K003                       Date Extracted: 11/02/13 01:24
Sample ID  : U500-01-W-01                 Date Analyzed: 11/02/13 01:24
Lab Samp ID: K003-04                      Dilution Factor: 1
Lab File ID: EK01025A                    Matrix          : WATER
Ext Btch ID: VG39K01                     % Moisture      : NA
Calib. Ref.: EK01015A                    Instrument ID   : GCT039
=====

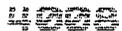
```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	0.0053J	0.10	0.0050	0.010

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	0.0346	0.04000	86.6	70-140
1,1,1-TRIFLUOROTOLUENE	0.0354	0.04000	88.5	30-130

Bromofluorobenzene
Bromofluorobenzene
70-140

12/29/13 9



METHOD SW5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/02/13 02:03
Sample ID   : U500-01-W-02                   Date Analyzed: 11/02/13 02:03
Lab Samp ID: K003-05                          Dilution Factor: 1
Lab File ID: EK01026A                        Matrix          : WATER
Ext Btch ID: VG39K01                         % Moisture      : NA
Calib. Ref.: EK01015A                       Instrument ID   : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
GASOLINE	ND	0.10	0.0050	0.010

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	0.0339	0.04000	84.7	70-140
1,1,1-TRIFLUOROTOLUENE	0.0348	0.04000	86.9	30-130

Bromofluorobenzene
Bromofluorobenzene
70-140

11/29/13

4000

METHOD: GC TPH as Gasoline (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/30/13
II.	Initial calibration	A	RSD = 20
III.	Calibration verification/ICV	A	COV/IOV = 20
IV.	Blanks	A	
V.	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	U500-03-S-01 (13J234)
VII.	Laboratory control samples	A	LCS/D
VIII.	Target compound identification	A	Not reviewed for Level III validation.
IX.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
X.	System Performance	A	Not reviewed for Level III validation.
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	SW	TB = 2* EB = 4 FB = 5*

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

* ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation
 S/W

1	U500-02-S-01**	11	MBLEIS	21		31	
2	U500-02-W-01	12	MBLEIW	22		32	
3	U500-01-S-01	13		23		33	
4	U500-01-W-01	14		24		34	
5	U500-01-W-02	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Method: GC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) < 20%?	/			
Was a curve fit used for evaluation?		/		
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?			/	
Were the RT windows properly established?	/			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) < 20%?	/			
Were all the retention times within the acceptance windows?	/			
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	/			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			/	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	/			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			/	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XII. System performance				
System performance was found to be acceptable.	/			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
XV. Field blanks				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.	/			

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: GC

N A Field blanks were identified in this SDG.
 Y N A Were target compounds detected in the field blanks?

Blank units: mg/L Associated sample units: mg/kg

Sampling date: 10/31/13

Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All soil (N₂)

Compound	Blank ID	Sample Identification												
	<u>4</u>													
<u>Gasoline</u>	<u>0.0053</u>													

Blank units: _____ Associated sample units: _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification												

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

METHOD: GC

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
Average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where: A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				CF (100 std)	CF (100 std)	Ave CF (initial)	Ave CF (initial)	%RSD	%RSD
1	10AL (61139)	6/7/13	Gasoline	20544	20544	20887.3	20887.3	4.5	4.5
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3097687

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: r
2nd Reviewer: D

METHOD: GC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF

A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (Ical)/ CCV Conc.	Reported	Recalculated	Reported	Recalculated
					CF/ Conc. CCV	CF/ Conc. CCV	%D	%D
1	EK01027A	11/2/13	Gasoline	20887.3	462.53	462.53	7	7
2								
3								
4								
5								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

METHOD: GC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Bromofluorobenzene		40	33.83	84.6	84.6	0
1,1,1-Trifluorotoluene		↓	34.83	87.1	87.1	↓

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Notes: _____

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

METHOD: GC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC-SC)/SA

Where: SSC = Spiked sample concentration

SC = Concentration

RPD = |SSCLCS - SSCLCSD| * 2 / (SSCLCS + SSCLCSD)

SA = Spike added

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: LCS/D19

Compound	Spike Added (mg/L)		Spiked Sample Concentration (mg/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline	25.0	25.0	21.2	23.7	85	85	95	95	11	11
Diesel										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NWS Seal Beach, UST 500
Collection Date: October 31, 2013
LDC Report Date: December 27, 2013
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Diesel
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 13K003

Sample Identification

U500-02-S-01**
U500-01-S-01
U500-01-W-01
U500-01-W-02

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 2 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Diesel.

This review follows the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan (QAPP), Site Characterization for Petroleum Contamination at the Building 500 Former UST Site (UST 500/UST 000008) at Naval Weapons Station, Seal Beach, California (February 2013), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.2 (October 2010), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Samples indicated by a double asterisk on the front cover underwent an EPA Level IV review. An EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as diesel contaminants were found in the method blanks.

Sample U500-01-W-01 was identified as an equipment blank. No total petroleum hydrocarbons as diesel contaminants were found.

Sample U500-01-W-02 was identified as a field blank. No total petroleum hydrocarbons as diesel contaminants were found.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IX. Compound Quantitation

All compound quantitations were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

X. System Performance

The system performance was acceptable for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Data Qualification Summary - SDG
13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Laboratory Blank Data Qualification
Summary - SDG 13K003**

No Sample Data Qualified in this SDG

**NWS Seal Beach, UST 500
Total Petroleum Hydrocarbons as Diesel - Field Blank Data Qualification
Summary - SDG 13K003**

No Sample Data Qualified in this SDG

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project    : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.  : 13K003                          Date Extracted: 11/04/13 10:43
Sample ID  : U500-02-S-01                   Date Analyzed: 11/04/13 15:05
Lab Samp ID: K003-01                        Dilution Factor: 1
Lab File ID: LK04009A                      Matrix          : SOIL
Ext Btch ID: DSK001S                       % Moisture     : 29.0
Calib. Ref.: LK04003A                      Instrument ID  : GCT105
=====

```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	14	4.2	7.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	100	140.8	71.2	50-130
HEXACOSANE	24.9	35.21	70.6	60-130

Parameter H-C Range
Diesel C10-C28

12/29/13 9

METHOD SW3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/04/13 10:43
Sample ID   : U500-01-S-01                    Date Analyzed: 11/04/13 15:22
Lab Samp ID: K003-03                          Dilution Factor: 1
Lab File ID: LK04010A                        Matrix          : SOIL
Ext Btch ID: DSK001S                          % Moisture     : 30.0
Calib. Ref.: LK04003A                        Instrument ID   : GCT105
=====

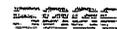
```

PARAMETERS	RESULTS (mg/kg)	LOQ (mg/kg)	DL (mg/kg)	LOD (mg/kg)
DIESEL	ND	14	4.3	7.1

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	109	142.9	76.0	50-130
HEXACOSANE	26.3	35.71	73.6	60-130

Parameter H-C Range
Diesel C10-C28

12/29/13



METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project     : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.   : 13K003                          Date Extracted: 11/04/13 10:30
Sample ID   : U500-01-W-01                    Date Analyzed: 11/05/13 15:58
Lab Samp ID: K003-04                          Dilution Factor: 1.02
Lab File ID: LK05012A                        Matrix          : WATER
Ext Btch ID: DSK002W                          % Moisture      : NA
Calib. Ref.: LK05003A                        Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.51	0.025	0.051

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.851	1.020	83.5	50-130
HEXACOSANE	0.167	0.2550	65.6	60-130

Parameter H-C Range
Diesel C10-C28

11/29/13 9



METHOD SW3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : RICHARD BRADY & ASSOCIATES      Date Collected: 10/31/13
Project      : NWS SEAL BEACH, BLDG 500        Date Received: 11/01/13
Batch No.    : 13K003                          Date Extracted: 11/04/13 10:30
Sample ID    : U500-01-W-02                    Date Analyzed: 11/05/13 16:15
Lab Samp ID  : K003-05                          Dilution Factor: 0.99
Lab File ID  : LK05013A                        Matrix          : WATER
Ext Btch ID  : DSK002W                          % Moisture     : NA
Calib. Ref.  : LK05003A                        Instrument ID   : GCT105
=====

```

PARAMETERS	RESULTS (mg/L)	LOQ (mg/L)	DL (mg/L)	LOD (mg/L)
DIESEL	ND	0.50	0.025	0.050

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
BROMOBENZENE	0.859	0.9900	86.8	50-130
HEXACOSANE	0.171	0.2475	69.1	60-130

Parameter H-C Range
Diesel C10-C28

12/29/13 Q

LDC #: 30976B8

VALIDATION COMPLETENESS WORKSHEET

Date: 10/26/13

SDG #: 13K003

Level III/IV

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC TPH as Diesel (EPA SW 846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/31/13
II	Initial calibration	A	RSD ≤ 20
III.	Calibration verification/ICV	A	CV/10V ≤ 20
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	A	LCS/D
VIII.	Target compound identification	A	Not reviewed for Level III validation.
IX.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Level III validation.
X.	System Performance	A	Not reviewed for Level III validation.
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	ND	EB = 3 FB = 4

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:** Indicates sample underwent Level IV validation

S/W

1	U500-02-S-01**	11	MBLEIS	21		31	
2	U500-01-S-01	12	MBLEIW	22		32	
3	U500-01-W-01	13		23		33	
4	U500-01-W-02	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Method: GC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) < 20%?	/			
Was a curve fit used for evaluation?		/		
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?			/	
Were the RT windows properly established?	/			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) < 20%?	/			
Were all the retention times within the acceptance windows?	/			
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	/			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			/	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		/		
Was a MS/MSD analyzed every 20 samples of each matrix?		/		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			/	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			/	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XII. System performance				
System performance was found to be acceptable.	/			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
XV. Field blanks				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.		/		

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated using the following calculations:

CF = A/C
 Average CF = sum of the CF/number of standards
 %RSD = 100 * (S/X)

Where: A = Area of compound
 C = Concentration of compound
 S = Standard deviation of calibration factors
 X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				CF (100 std)	CF (100 std)	Ave CF (initial)	Ave CF (initial)	%RSD	%RSD
1	1QAL-D5	10/18/13	Diesel	32533	32533	34250.8	34250.7	14.0	14.0
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3097638

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$

Where: ave. CF = initial calibration average CF
 CF = continuing calibration CF

A = Area of compound
 C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported	Recalculated	Reported	Recalculated
					CF/ Conc. CCV	CF/ Conc. CCV	%D	%D
1	LK04002A	11/4/13	Diesel	34250.8	48.52	48.52	9	9
2								
3								
4								
5								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

METHOD: GC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Bromobenzene		100	71.219	71.2	71.2	0
Hexacosane		25	17.650	70.6	70.6	0

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Notes:

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

METHOD: GC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC-SC)/SA

RPD = |SSCLCS - SSCLCSD| * 2 / (SSCLCS + SSCLCSD)

LCS/LCSD samples: LCS/DIS

Where: SSC = Spiked sample concentration

SA = Spike added

LCS = Laboratory control sample percent recovery

SC = Concentration

LCSD = Laboratory control sample duplicate percent recovery

Compound	Spike Added (mg/L)		Spiked Sample Concentration (mg/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline										
Diesel	500	500	416	409	83	83	82	82	2	2

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Appendix E

Non-Hazardous Waste Manifest

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. CA0170024491		Manifest Document No. 1152014		2. Page 1 of 1	
3. Generator's Name and Mailing Address NAVAL WEAPONS STATION SEAL BEACH 800 SEAL BEACH BLVD. SEAL BEACH, CALIFORNIA 90740							
4. Generator's Phone 5626267997							
5. Transporter 1 Company Name PACIFIC TRANS ENV. SERVICES INC		6. US EPA ID Number CAD881412356		A. State Transporter's ID			
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone			
9. Designated Facility Name and Site Address U.S. ECOLOGY HWY 95, 12 MILE SOUTH OF BEATTY, NEVADA 89003		10. US EPA ID Number NVT330010000		C. State Transporter's ID			
				D. Transporter 2 Phone			
				E. State Facility's ID			
				F. Facility's Phone 800-238-3943			
11. WASTE DESCRIPTION				Containers		13. Total Quantity	14. Unit Wt./Vol.
				No.	Type		
NON HAZARDOUS WASTE, SOLID(SOIL)				01	DM	EST. 0400	P
NON HAZARDOUS WASTE, LIQUID(WATER)				01	DM	0450	P
c.							
d.							
G. Additional Descriptions for Materials Listed Above 1: NON HAZ SOIL 2: NON HAZ LIQ				H. Handling Codes for Wastes Listed Above H134 H259			
15. Special Handling Instructions and Additional Information EMERGENCY RESPONSE GUIDE: 1: N/A 2: N/A 18004249300				GENERATOR SITE ADDRESS WORK ORDER: 58019 NAVAL WEAPONS STATION SEAL BEACH BLDG 230 SEAL BEACH, CALIFORNIA 90740			
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name JUSTIN WILHELM						Date Month Day Year 01 23 14	
Signature <i>[Signature]</i>							
17. Transporter 1 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name Kyle Higgs				Month Day Year 01 23 14			
Signature <i>[Signature]</i>							
18. Transporter 2 Acknowledgement of Receipt of Materials				Date			
Printed/Typed Name				Month Day Year			
Signature							
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.							
Printed/Typed Name Emily Salzman						Date Month Day Year 1 30 14	
Signature <i>[Signature]</i>							

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY