Final
Third Quarter 2013 - Quarterly Groundwater Monitoring Report Outside Tunnel Wells

Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam, Oahu, Hawaii

DOH Facility ID: 9-102271
DOH Release ID: 990051, 010011, and 020028

September 2013

Department of the Navy
Naval Facilities Engineering Command, Hawaii
400 Marshall Road
JBPHH, HI 96860-3139

Contract Number N62742-12-D-1853, CTO 0002

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Prepared for:

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400 Marshall Road
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Prepared by:

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Kailua, HI 96734

Prepared under:

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FINAL
THIRD QUARTER 2013 - QUARTERLY GROUNDWATER MONITORING REPORT
OUTSIDE TUNNEL WELLS
RED HILL BULK FUEL STORAGE FACILITY

Long-Term Groundwater and Soil Vapor Monitoring
Red Hill Bulk Fuel Storage Facility
Joint-Base Pearl Harbor-Hickam, Oahu, Hawaii

Prepared for:
Department of the Navy
Commanding Officer, Naval Facilities Engineering Command, Hawaii
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Prepared under:
Contract Number: N62742-12-D-1853
Contract Task Order: 0002

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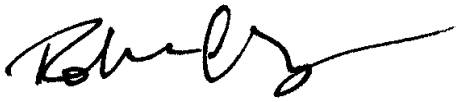
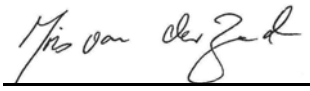
Darren Uchima, Navy Technical Representative Date



Approval Signature: _____
Robert Chong, ESI Project Manager Date



Approval Signature: _____
Iris van der Zander, ESI QA Manager Date

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
%	percent
COPC	Contaminant of Potential Concern
DLNR	State of Hawaii Department of Land and Natural Resources
DOH	State of Hawaii Department of Health
DON	Department of the Navy
EAL	Environmental Action Level
EPA	Environmental Protection Agency
ESI	Environmental Science International
F-76	Marine Diesel Fuel
ID	Identification
JBPHH	Joint Base Pearl Harbor-Hickam
JP-5	Jet Fuel Propellant-5
JP-8	Jet Fuel Propellant-8
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
µg/L	micrograms per liter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NAVFAC	Naval Facilities Engineering Command
NAVSUP FLC	Naval Supply Systems Command Fleet Logistics Center
N.D.	Not Detected
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
pH	hydrogen activity
QC	Quality Control
RHSF	Red Hill Bulk Fuel Storage Facility
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
TEC	The Environmental Company, Inc.
TPH-d	Total Petroleum Hydrocarbons as diesel
TPH-g	Total Petroleum Hydrocarbons as gasoline
U.S.	United States of America
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WP	Work Plan

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EXECUTIVE SUMMARY

This quarterly monitoring report presents the results of the third quarter 2013 groundwater sampling event conducted on July 24, 2013, at the outside tunnel wells of the Red Hill Bulk Fuel Storage Facility [RHSF], Joint Base Pearl Harbor-Hickam [JBPHH], Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. There are 18 active and 2 inactive underground storage tanks [USTs] located at the RHSF. The State of Hawaii Department of Health [DOH] Facility Identification [ID] number is 9-102271. The DOH Release ID numbers are 990051, 010011, and 020028.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under Naval Facilities Engineering Command [NAVFAC] Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved Work Plan [WP]/Sampling and Analysis Plan [SAP] prepared by Environmental Science International [ESI].

On July 24, 2013, ESI personnel collected groundwater samples from two outside tunnel monitoring wells (wells HDMW2253-03 and OWDFMW01). A summary of the analytical results is provided below.

- **HDMW2253-03** – Naphthalene (0.03 micrograms per liter [µg/L]) was detected. The Contaminant of Potential Concern [COPC] was not detected at a concentration above the DOH Environmental Action Levels [EALs] for drinking water toxicity or gross contamination.

- **OWDFMW01** – Total Petroleum Hydrocarbons as diesel [TPH-d] (470 and 340 µg/L), acetone (88 and 83 µg/L), naphthalene (0.081 and 0.12 µg/L), and benzene (0.42 and 0.44 µg/L) were detected in both the primary and duplicate samples. TPH-d (470 and 340 µg/L) was detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination in both samples.

TPH-d was not detected in well HDMW2253-03 during this round of quarterly sampling. TPH-d concentrations last exceeded the DOH EALs for both drinking water toxicity and gross contamination in January 2013 (600 µg/L). Naphthalene was detected but remained at a low concentration, below the DOH EALs and consistent with historical results.

With the exception of TPH-d in well OWDFMW01, groundwater contaminant concentrations remained at low concentrations and did not change significantly, or were not detected. TPH-d concentrations detected during this round of sampling were above the DOH EALs for both drinking water toxicity and gross contamination, but decreased significantly from the last event, and were the lowest they have been since July 2012.

Based on the results of the assessment, continued groundwater monitoring at the RHSF is recommended. If the TPH-d concentrations significantly increase, the monitoring frequency

should be increased to monthly, even though the two outside wells are not included in the RHSF Groundwater Protection Plan.

SECTION 1 – INTRODUCTION

This quarterly monitoring report presents the results of the third quarter 2013 groundwater sampling event conducted on July 24, 2013, at the outside tunnel wells of the RHSF, JBPHH, Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. The purpose of the sampling is to (1) assess the condition of groundwater beneath and in the vicinity of the RHSF with respect to chemical constituents associated with jet fuel propellant and marine diesel fuel, and (2) to ensure the Navy remains in compliance with DOH UST release response requirements as described in Hawaii Administrative Rules 11-281 Subchapter 7, Release Response Action (DOH, 2000). The DOH Facility ID number for the RHSF is 9-102271. The DOH Release ID numbers are 990051, 010011, and 020028.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI (ESI, 2012).

1.1 SITE DESCRIPTION

The RHSF is located on federal government land (zoned F1- Military and Federal), located in Halawa Heights, approximately 2.5 miles northeast of Pearl Harbor (Figure 1). It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The RHSF is bordered on the north by Halawa Correctional Facility and private businesses, on the west by the United States of America [U.S.] Coast Guard reservation, on the south by residential neighborhoods, and on the east by Moanalua Valley. A quarry is located less than a quarter mile away to the northwest. The RHSF occupies 144 acres of land and the majority of the site is at an elevation of approximately 200 to 500 feet above mean sea level.

The RHSF contains 18 active and 2 inactive USTs, which are operated by Naval Supply Systems Command Fleet Logistics Center [NAVSUP FLC] Pearl Harbor (formerly Fleet and Industrial Supply Center). Each UST has a capacity of approximately 12.5 million gallons. The RHSF is located approximately 100 feet above the basal aquifer. The USTs contain Jet Fuel Propellant-5 [JP-5], Jet Fuel Propellant-8 [JP-8], and Marine Diesel Fuel [F-76]. The current status of each of the USTs is summarized in Table 1.1.

Two groundwater monitoring wells (well HDMW2253-03 and OWDFMW01) are located outside of the RHSF tunnel system (Figure 2). Well HDMW2253-03 is located at the Halawa Correctional Facility (outside the RHSF) and well OWDFMW01 is located at the Oily Waste Disposal Facility near Adit 3. Five groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01) are located within the RHSF lower access tunnel. Monitoring data for the five wells located inside the tunnel are included in a separate report.

Monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 are located inside the underground tunnels. Monitoring well RHMW2254-01 is located inside the infiltration gallery of

the Department of the Navy [DON] Well 2254-01. DON Well 2254-01 is located approximately 2,400 feet downgradient of the USTs and provides approximately 24 percent [%] of the potable water to the Pearl Harbor System, which serves approximately 52,200 military customers. NAVFAC Public Works Department operates the infiltration gallery and DON Well 2254-01.

TABLE 1.1
Current Status of the USTs
Red Hill Bulk Fuel Storage Facility
April 2013 Quarterly Monitoring Report

Tank Identification	Fuel Type	Status	Capacity
F-1	None	Inactive	12.5 million gallons
F-2	JP-8	Active	12.5 million gallons
F-3	JP-8	Active	12.5 million gallons
F-4	JP-8	Active	12.5 million gallons
F-5	JP-8	Active	12.5 million gallons
F-6	JP-8	Active	12.5 million gallons
F-7	JP-5	Active	12.5 million gallons
F-8	JP-5	Active	12.5 million gallons
F-9	JP-5	Active	12.5 million gallons
F-10	JP-5	Active	12.5 million gallons
F-11	JP-5	Active	12.5 million gallons
F-12	JP-5	Active	12.5 million gallons
F-13	F-76	Active	12.5 million gallons
F-14	F-76	Active	12.5 million gallons
F-15	F-76	Active	12.5 million gallons
F-16	F-76	Active	12.5 million gallons
F-17	JP-5	Active	12.5 million gallons
F-18	JP-5	Active	12.5 million gallons
F-19	None	Inactive	12.5 million gallons
F-20	JP-5	Active	12.5 million gallons

F-76 Marine Diesel Fuel
JP-5 Jet Fuel Propellant-5
JP-8 Jet Fuel Propellant-8

1.2 PHYSICAL SETTINGS

Climatological conditions in the area of the RHSF consist of warm to moderate temperatures and low to moderate rainfall. The RHSF is leeward of the prevailing northeasterly trade winds. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (State of Hawaii Department of Land and Natural Resources [DLNR], 1986). Annual pan evaporation is approximately 75 inches (DLNR, 1985). Average temperatures range from the low 60's to high 80's (degrees Fahrenheit) (Atlas of Hawaii, 1983).

Oahu consists of the eroded remnants of two shield volcanoes, Waianae and Koolau. The RHSF is located on the southwest flank of the Koolau volcanic shield. Lavas erupted during the shield-building phase of the volcano belong to the *Koolau Volcanic Series* (Stearns and Vaksvik, 1935). Following formation of the Koolau shield, a long period of volcanic quiescence occurred, during which the shield was deeply eroded. Following this erosional period, eruptive activity resumed. Lavas and pyroclastic material erupted during this period belong to the *Honolulu Volcanic Series* (Stearns and Vaksvik, 1935).

In the immediate area of the RHSF, Koolau Volcanic Series lavas dominate, although there are consolidated and unconsolidated non-calcareous deposits in the vicinity that consist of alluvium generated during erosion of the Koolau volcanic shield. South-southwest of the Site, and in isolated exposures to the west, are pyroclastic deposits formed during eruptions from three Honolulu Volcanic Series vents, Salt Lake, Aliamanu, and Makalapa (Stearns and Vaksvik, 1935). Based on established geology and records of the drilled wells (Stearns and Vaksvik, 1938), the RHSF is underlain by Koolau Volcanic Series basalts. The area of the RHSF is classified as *Rock Land*, where 25 to 90% of the land surface is covered by exposed rock and there are only shallow soils (Foote, et al., 1972).

Groundwater in Hawaii exists in two principal types of aquifers. The first and most important type, in terms of drinking water resources, is the basal aquifer. The basal aquifer exists as a lens of fresh water floating on and displacing seawater within the pore spaces, fractures, and voids of the basalt that forms the underlying mass of each Hawaiian island. In parts of Oahu, groundwater in the basal aquifer is confined by the overlying caprock and is under pressure. Waters that flow freely to the surface from wells that tap the basal aquifer are referred to as *artesian*.

The second type of aquifer is the caprock aquifer, which consists of various kinds of unconfined and semi-confined groundwater. Commonly, the caprock consists of a thick sequence of nearly impermeable clays, coral, and basalt, which separates the caprock aquifer from the basal aquifer. The impermeable nature of these materials and the artesian nature of the basal aquifer severely restrict the downward migration of groundwater from the upper caprock aquifer. In the area of the RHSF, there is no discernible caprock.

Groundwater in the area of the RHSF is part of the *Waimalu Aquifer System* of the *Pearl Harbor Aquifer Sector.* The aquifer is classified as a basal, unconfined, flank-type; and is currently used as a drinking water source. The aquifer is considered fresh with less than 250 milligrams per liter of chloride and is considered an irreplaceable resource with a high vulnerability to contamination (Mink and Lau, 1990).

The nearest drinking water supply well is the DON Well 2254-01, located in the infiltration gallery within the RHSF. DON Well 2254-01 is located approximately 2,400 feet downgradient of the USTs (Figure 2).

1.3 BACKGROUND

The RHSF was constructed by the U.S. Government in the early 1940s. Twenty USTs and a series of tunnels were constructed to supply fuel to the Navy. The USTs were constructed of steel and they currently contain JP-5, JP-8, and F-76. Several tanks in the past have stored DON special fuel oil, DON distillate, aviation gasoline, and motor gasoline (Environet, 2010). The fueling system is a self-contained underground unit that was installed into native rock comprised primarily of basalt with some interbedded tuffs and breccias (Environet, 2010). Each

UST measures approximately 245 feet in height and 100 feet in diameter. The upper domes of the tanks lie at depths varying between 100 feet and 200 feet below ground surface.

In response to increasing concentrations of COPCs in the groundwater monitoring wells within the facility (specifically RHMW02) during the 2008 sampling events, quarterly groundwater monitoring was initiated in 2009 at the outside tunnel wells.

In 2009, groundwater samples were collected from wells RHMW04, OWDFMW01, and HDMW2253-03. Samples were collected in August and October 2009. None of the COPCs were detected at concentrations exceeding the gross contamination or drinking water toxicity DOH EALs.

In 2010, groundwater samples were collected from wells RHMW04, OWDFMW01, and HDMW2253-03. Samples were collected from well RHMW04 in January and April 2010. Samples were collected from well OWDFMW01 in January, April, and October 2010. Samples were collected from well HDMW2253-03 in January, April, July and October 2010. The COPCs concentrations exceeding DOH EALs are summarized below.

- **HDMW2253-03** – TPH-d was detected at a concentration above the gross contamination and drinking water toxicity DOH EAL in January 2010 (The Environmental Company, Inc. [TEC], 2010a).
- **OWDFMW01** – TPH-d was detected at a concentration above the gross contamination and drinking water toxicity DOH EALs in January and April 2010 (TEC, 2010a; TEC, 2010b).

In 2011, groundwater samples were collected from wells OWDFMW01 and HDMW2253-03. Samples were collected in January, April, July, and October 2011. None of the COPCs were detected at concentrations exceeding the gross contamination or drinking water toxicity DOH EALs.

In 2012, groundwater samples were collected from wells OWDFMW01 and HDMW2253-03. Samples were collected in January, April, July, and November 2012. TPH-d was detected at a concentration above the DOH EALs in samples collected from wells HDMW2253-03 and OWDFMW01 (Environet, 2012; ESI, 2013a). The COPCs concentrations exceeding DOH EALs are summarized below.

- **HDMW2253-03** – TPH-d was detected at a concentration above the DOH EALs for gross contamination and drinking water toxicity in April and November 2012.
- **OWDFMW01** – TPH-d was detected at a concentration above the DOH EALs for gross contamination and drinking water toxicity in April 2012.

In January 2013, groundwater samples were collected from wells OWDFMW01 and HDMW2253-03 (ESI 2013b). TPH-d was detected at a concentration above the DOH EALs in samples collected from wells HDMW2253-03 and OWDFMW01. The COPCs concentrations exceeding DOH EALs are summarized below.

- **HDMW2253-03** – TPH-d was detected at a concentration above the DOH EALs for gross contamination and drinking water toxicity in January 2013.
- **OWDFMW01** – TPH-d was detected at a concentration above the DOH EALs for gross contamination and drinking water toxicity in January 2013.

In April 2013, groundwater samples were collected from wells OWDFMW01 and HDMW2253-03 (ESI 2013c). TPH-d was detected at a concentration above the DOH EALs in samples collected from well OWDFMW01. The COPC concentrations exceeding DOH EALs are summarized below.

- **OWDFMW01** – TPH-d was detected at a concentration above the DOH EALs for gross contamination and drinking water toxicity in April 2013.

1.3.1 Previous Reports

The following groundwater monitoring reports were previously submitted to the DOH:

1. Groundwater Monitoring Report, August 2009 (submitted September 2009).
2. Groundwater Monitoring Report, October 2009 (submitted December 2009).
3. Groundwater Monitoring Report, January, 2010 (submitted April 2010).
4. Groundwater Monitoring Report, April 2010 (submitted May 2010).
5. Groundwater Monitoring Report, July 2010 (submitted August 2010).
6. Groundwater Monitoring Report, October 2010 (submitted December 2010).
7. Groundwater Monitoring Report, January 2011 (submitted March 2011).
8. Groundwater Monitoring Report, April 2011 (submitted June 2011).
9. Groundwater Monitoring Report, July 2011 (submitted September 2011).
10. Groundwater Monitoring Report, October 2011 (submitted December 2011).
11. Groundwater Monitoring Report, January 2012 (submitted March 2012).
12. Groundwater Monitoring Report, April 2012 (submitted July 2012).
13. Groundwater Monitoring Report, July 2012 (submitted August 2012).
14. Groundwater Monitoring Report, November 2012 (submitted January 2013).

15. Groundwater Monitoring Report, January 2013 (submitted April 2013).

16. Groundwater Monitoring Report, April 2013 (submitted July 2013).

SECTION 2 – GROUNDWATER SAMPLING

On July 24, 2013, ESI personnel collected groundwater samples from two monitoring wells (wells OWDFMW01 and HDMW2253-03). The samples were collected in accordance with DOH UST release response requirements and the RHSF Groundwater Protection Plan (TEC, 2008). Prior to purging and sampling, the depth to groundwater and the depth to the bottom of the wells were measured. Well OWDFMW01 was measured by ESI using a Geotech oil/water interface probe. Well HDMW2253-03 was measured by the DLNR using their Geotech oil/water interface probe. The measurements are included in the groundwater sampling logs. No measurable product, sheen, or petroleum hydrocarbon odor was observed in either well.

2.1 GROUNDWATER SAMPLING

Prior to collecting groundwater samples, disposable bailers were used to purge groundwater from the monitoring wells. Wells OWDFMW01 and HDMW2253-03 were purged at a rate of 0.29 and 0.11 liters per minute, respectively.

Water quality parameters were monitored on a periodic basis during well purging. The water quality parameters that were measured included hydrogen activity [pH], temperature, conductivity, dissolved oxygen, and oxidation reduction potential. The water quality parameters were evaluated to demonstrate that the natural characteristics of the aquifer formation water were present within the monitoring well before collecting the sample. At least four readings were collected during the purging process. Purging was considered complete when at least three consecutive water quality measurements stabilized within approximately 10%. The readings were recorded on groundwater monitoring logs which are included in Appendix A. The field notes are included in Appendix B.

When the water quality parameters stabilized, groundwater samples were collected from the wells. The disposable bailers were used to collect the groundwater samples from the monitoring wells. For each monitoring well, the groundwater samples were collected no more than two hours after purging was completed to prevent groundwater interaction with the monitoring well casing and atmosphere. Samples collected for dissolved lead were filtered in the field using a peristaltic pump and a 0.45 micron filter.

2.2 ANALYTICAL RESULTS

The samples were analyzed for TPH-d using U.S. Environmental Protection Agency [EPA] Method 8015M, Total Petroleum Hydrocarbons as gasoline [TPH-g] and Volatile Organic Compounds [VOCs] using EPA Method 8260B, Polycyclic Aromatic Hydrocarbons [PAHs] using EPA Method 8270C SIM, and dissolved lead using EPA Method 6020. The analytical results are summarized below and in Table 2.1. A copy of the laboratory report is included in Appendix C.

- **HDMW2253-03** – Naphthalene (0.03 µg/L) was detected. The COPC was not detected at a concentration above the DOH EALs.

- **OWDFMW01** – TPH-d (470 and 340 µg/L), acetone (88 and 83 µg/L), naphthalene (0.081 and 0.012 µg/L), and benzene (0.42 and 0.44 µg/L) were detected in both the primary and duplicate samples. TPH-d (470 and 340 µg/L) was detected at a concentration above the DOH EALs for both drinking water toxicity and gross contamination in both samples.

2.2.1 Groundwater Contaminant Trends

Historical groundwater contaminant concentration trends of COPCs that exceed the DOH EALs are presented in Appendix D. A summary of groundwater contaminant trends is provided below.

- **HDMW2253-03** – TPH-d was not detected during this round of quarterly sampling. TPH-d concentrations last exceeded the DOH EALs for both drinking water toxicity and gross contamination in January 2013 (600 µg/L). Naphthalene was detected but remained at a low concentration, below the DOH EALs and consistent with historical results.

- **OWDFMW01** – With the exception of TPH-d, groundwater contaminant concentrations remained at low concentrations and did not change significantly, or were not detected. TPH-d concentrations detected during this round of sampling were above the DOH EALs for both drinking water toxicity and gross contamination, but decreased significantly from the last event, and were the lowest they have been since July 2012.

2.3 WASTE DISPOSAL

The purged groundwater and decontamination water generated during sampling of the wells was stored in a 55-gallon drum along with the purged water and decontamination water from the inside tunnel wells. The drum was stored onsite at Adit 3. On August 23, 2013, the drum of water was picked up by Pacific Commercial Services, LLC and disposed at Unitek Solvent Services, Inc. The waste disposal manifest is included in Appendix E.

TABLE 2.1
Analytical Results for Groundwater Sampling (July 24, 2013)
Red Hill Bulk Fuel Storage Facility
July 2013 Quarterly Monitoring Report

Method	Chemical	DOH EALs		OWDFMW01 (ES034)					OWDFMW01 (ES035) (Dup)					HDMW2253-03 (ES036)				
		Drinking Water Toxicity	Gross Contamination	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	**470**	HD	52	21	15	**340**	HD	52	21	15	N.D.	U	52	21	15
EPA 8260B	TPH-g	100	100	N.D.	U	50	30	13	N.D.	U	50	30	13	N.D.	U	50	30	13
EPA 8270C SIM	Acenaphthene	370	20	N.D.	U	0.2	0.05	0.021	N.D.	U	0.19	0.048	0.020	N.D.	U	0.19	0.047	0.020
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	N.D.	U	0.19	0.048	0.017	N.D.	U	0.19	0.047	0.017
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	N.D.	U	0.19	0.048	0.033	N.D.	U	0.19	0.047	0.032
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	N.D.	U	0.19	0.048	0.023	N.D.	U	0.19	0.047	0.022
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	N.D.	U	0.19	0.048	0.021	N.D.	U	0.19	0.047	0.021
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.036	N.D.	U	0.19	0.048	0.035	N.D.	U	0.19	0.047	0.034
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	N.D.	U	0.19	0.048	0.024	N.D.	U	0.19	0.047	0.024
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	N.D.	U	0.19	0.048	0.023	N.D.	U	0.19	0.047	0.022
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	N.D.	U	0.19	0.048	0.018	N.D.	U	0.19	0.047	0.018
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	N.D.	U	0.19	0.048	0.026	N.D.	U	0.19	0.047	0.025
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	N.D.	U	0.19	0.048	0.026	N.D.	U	0.19	0.047	0.026
	Fluorene	240	950	N.D.	U	0.2	0.05	0.024	N.D.	U	0.19	0.048	0.024	N.D.	U	0.19	0.047	0.023
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	N.D.	U	0.19	0.048	0.021	N.D.	U	0.19	0.047	0.021
	1,-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.05	0.028	N.D.	U	0.19	0.048	0.027	N.D.	U	0.19	0.047	0.027
	2,-Methylnaphthalene	24	10	N.D.	U	0.2	0.05	0.026	N.D.	U	0.19	0.048	0.026	N.D.	U	0.19	0.047	0.025
	Naphthalene	17	21	0.081	J	0.2	0.05	0.023	0.12	J	0.19	0.048	0.022	0.030	J	0.19	0.047	0.022
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.030	N.D.	U	0.19	0.048	0.029	N.D.	U	0.19	0.047	0.029
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	N.D.	U	0.19	0.048	0.024	N.D.	U	0.19	0.047	0.023
EPA 8260B	1,1,1-Trichloroethane	200	970	N.D.	U	5.0	0.5	0.30	N.D.	U	5.0	0.5	0.30	N.D.	U	5.0	0.5	0.30
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1.0	0.5	0.38	N.D.	U	1.0	0.5	0.38	N.D.	U	1.0	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5.0	0.5	0.28	N.D.	U	5.0	0.5	0.28	N.D.	U	5.0	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5.0	1.0	0.5	N.D.	U	5.0	1.0	0.5	N.D.	U	5.0	1.0	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	2.0	1.2	N.D.	U	10	2.0	1.2	N.D.	U	10	2.0	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1.0	0.5	0.36	N.D.	U	1.0	0.5	0.36	N.D.	U	1.0	0.5	0.36
	1,2-Dichlorobenzene	600	10	N.D.	U	1.0	0.5	0.46	N.D.	U	1.0	0.5	0.46	N.D.	U	1.0	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5.0	0.5	0.42	N.D.	U	5.0	0.5	0.42	N.D.	U	5.0	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1.0	0.5	0.4	N.D.	U	1.0	0.5	0.4	N.D.	U	1.0	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43
	Acetone	22,000	20,000	88		20	10	6.0	83		20	10	6.0	N.D.	U	20	10	6.0
	Benzene	5	170	0.42	J	1.0	0.5	0.14	0.44	J	1.0	0.5	0.14	N.D.	U	1.0	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5.0	0.5	0.21	N.D.	U	5.0	0.5	0.21	N.D.	U	5.0	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1.0	0.50	N.D.	U	10	1.0	0.50	N.D.	U	10	1.0	0.50
	Bromomethane	8.7	50,000	N.D.	U	20	5.0	3.9	N.D.	U	20	5.0	3.9	N.D.	U	20	5.0	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1.0	0.5	0.23	N.D.	U	1.0	0.5	0.23	N.D.	U	1.0	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5.0	0.5	0.17	N.D.	U	5.0	0.5	0.17	N.D.	U	5.0	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5.0	2.3	N.D.	U	10	5.0	2.3	N.D.	U	10	5.0	2.3
	Chloroform	70	2,400	N.D.	U	5.0	0.5	0.46	N.D.	U	5.0	0.5	0.46	N.D.	U	5.0	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U	10	2.0	1.8	N.D.	U	10	2.0	1.8	N.D.	U	10	2.0	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1.0	0.5	0.48	N.D.	U	1.0	0.5	0.48	N.D.	U	1.0	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25
	Ethylbenzene	700	30	N.D.	U	1.0	0.5	0.14	N.D.	U	1.0	0.5	0.14	N.D.	U	1.0	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1.0	0.5	0.32	N.D.	U	1.0	0.5	0.32	N.D.	U	1.0	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2
	Methyl isobutyl ketone (4-Methyl-2-Pentanone)	2,000	1300	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4
	Methyl tert-butyl Ether	12	5	N.D.	U	1.0	0.5	0.31	N.D.	U	1.0	0.5	0.31	N.D.	U	1.0	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64
	Styrene	100	10	N.D.	U	1.0	0.5	0.17	N.D.	U	1.0	0.5	0.17	N.D.	U	1.0	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1.0	0.5	0.40	N.D.	U	1.0	0.5	0.40	N.D.	U	1.0	0.5	0.40
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	UJ	1.0	0.5	0.41	N.D.	UJ	1.0	0.5	0.41	N.D.	UJ	1.0	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5.0	0.5	0.39	N.D.	U	5.0	0.5	0.39	N.D.	U	5.0	0.5	0.39
	Toluene	1,000	40	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1.0	0.5	0.30	N.D.	U	1.0	0.5	0.30	N.D.	U	1.0	0.5	0.30
	Xylenes	10,000	20	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23
EPA 6020	Dissolved Lead	15	50,000	N.D.	U	1.0	0.2	0.0898	N.D.	U	1	0.2	0.0898	N.D.	U	1	0.2	0.0898

The data are in micrograms per liter (µg/L). Shaded values exceeded the DOH EALs.

DOH EALs DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).
DL Detection Limit or Method Detection Limit (MDL)
EPA Environmental Protection Agency
HD The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
J Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
LOD Limit of Detection
LOQ Limit of Quantitation
N.D. Not Detected
Q Qualifiers
TPH-g Total Petroleum Hydrocarbons as gasoline
TPH-d Total Petroleum Hydrocarbons as diesel
U Undetected at DL and is reported as less than the LOD.

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SECTION 3 – DATA QUALITY ASSESSMENT

A data quality assessment, which consists of a review of the overall groundwater sample collection and analysis process, was performed in order to determine whether the analytical data generated meet the quality objectives for the project. The field Quality Control [QC] program consisted of standardized sample collection and management procedures, and the collection of field duplicate samples, matrix spike samples, and trip blank samples. The laboratory quality assurance program consisted of the use of standard analytical methods and the preparation and analyses of Matrix Spike [MS]/Matrix Spike Duplicate [MSD] samples, surrogate spikes, blanks, Laboratory Control Samples [LCS] and Laboratory Control Sample Duplicate [LCSD].

3.1 Data Validation and Assessment

The objective of data validation is to provide data of known quality for project decisions. Data quality is judged in terms of Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity [PARCCS]. A number of factors may affect the quality of data, including: sample collection methods, sample analysis methods, and adherence to established procedures for sample collection, preservation, management, shipment, and analysis.

Precision

Precision is defined as the reproducibility of replicate measurements. Precision is evaluated by Relative Percentage Difference [RPD] of field duplicates and laboratory LCS/LCSD or MS/MSD results. Field duplicate and MS/MSD samples were collected at a rate of approximately 10% of project samples. Field duplicates were sent to the laboratory along with the primary samples.

The RPDs of detected analytes for the primary and field duplicate samples (ES034 and ES035) are provided in Table 3.1. A precision of less than 50% for duplicate pairs is required by the DoN Project Procedures Manual to be considered acceptable (DoN 2007). For this monitoring event, the RPDs for duplicate sample pairs were all within the acceptable range except for TPH-d (32%) and naphthalene (39%). In samples ES034 and ES035, TPH-d was detected at concentrations approximately double the DOH EALs, and naphthalene was detected approximately two order of magnitude below the DOH EALs. Therefore, this slight reduction in precision is unlikely to affect data usability. The naphthalene concentrations detected in the samples were below the respective limits of quantitation [LOQs] implying a higher uncertainty for these results than for values detected above the LOQs (i.e. estimated, J-flagged). Consequently, the assigned RPDs signified the anticipated decrease in precision below the LOQs but were not indicative of a QC issue. Therefore the data precision is considered acceptable based on the sample duplicated evaluation.

The RPD of the MS/MSD results for benzo[b]fluoranthene, dibenzo[a,h]anthracene, flourene, phenanthrene, and 1,1,2,2-tetrachloroethane were above the acceptable maximum of 20%. Only 1,1,2,2-tetrachloroethane was above 50%, an RPD recommended in the NAVFAC Project

Procedures Manual [DON 2007]. None of these COPCs were detected during this sampling event or have been historically detected. Therefore, this is unlikely to affect data usability.

Accuracy

Accuracy is defined as the degree of conformity of a measurement to a standard or true value. Accuracy is evaluated through measurement of the percent recovery of an analyte in a reference standard or spiked sample. Accuracy limits for surrogates, laboratory control spike, MS, and MSD samples are established by the individual laboratory. The acceptance criteria for accuracy are dependent on the analytical method and are based on historical laboratory data.

Results for TPH-d in samples ES034 and ES035 were flagged "HD." The laboratory indicated a mismatch between the calibration standard and the TPH-d chromatographic profile. Mismatches of this type are not uncommon. The chromatograms are not part of the standard laboratory package and were not reviewed by ESI.

With the exception of acetone, all of the LCS and surrogate spike recoveries for analyzed constituents were within acceptable percent recovery limits. The MS and/or MSD recoveries were below the control limits for 1,1,2,2-tetrachloroethane and the associated sample results may be biased low. Sample results for 1,1,2,2-tetrachloroethane were flagged "UJ." 1,1,2,2-Tetrachloroethane was not detected in any of the groundwater samples. However the drinking water EAL for 1,1,2,2-Tetrachloroethane is below the respective limits of detection [LODs]. Based on historical results and the results of other VOCs in the sample; it is not likely that 1,1,2,2-tetrachloroethane is present at concentrations above the DOH EALs.

The MS and/or MSD recoveries were above the control limits for acetone, tetrachloroethylene, and trichloroethylene, and the associated sample results may be biased high. None of the COPCs were detected at concentrations above the DOH EALs, so a potential high bias should not affect data usability. The LCS recovery for acetone was also above the control limits.

All other MS/MSD recoveries were within acceptable recovery limits; therefore, the data accuracy for this monitoring event is considered acceptable.

Representativeness

Representativeness is the degree that data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was achieved by conducting sampling in compliance with the sample collection procedures described in the WP/SAP specifically written for this project (ESI, 2012).

Representativeness is also evaluated through the compliance with the sample holding time, sample preservation, and the analysis of blank samples, including method blank and trip blank samples. The sample holding time and sample preservation complied with the EPA criteria. For this sampling event, one trip blank was included in the cooler to assess contamination during sample transport for TPH-g and VOCs. TPH-g and VOCs were not detected in the trip blank.

Therefore, the groundwater sample data are considered representative of the groundwater quality on site.

Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated results) compared to the total number of analytical results reported by the laboratory. No data were rejected for this project, and therefore the completeness goal for this project (90%) was successfully met.

Comparability

Comparability expresses the confidence with which one data set can be compared to another data set. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data, with acceptable precision and accuracy, are considered comparable if collection techniques, analytical procedures, methods and reporting are equivalent. For this monitoring event, the samples were collected using approaches consistent with those in the previous events, and the same analytical methods/procedures were used to measure the concentration of COPCs. Therefore, the results are considered comparable within this data set and with the data collected from previous sampling events. The field and laboratory personnel followed standard operation procedures.

All TPH-g data through July 2010 was analyzed by EPA Method 8015; beginning in October 2010, EPA Method 8260B was used. There was no event where both methods were used, and so there is no way to directly compare the results using each method and determine if one method produces biased results. However, there is no reason to believe that using either method should bias the data, and the TPH-g data for all events should be comparable.

Between August 2009 and July 2010, naphthalene was analyzed for by both EPA Methods 8260B and 8270C, and both results were reported. Beginning in October 2010, only results using EPA Method 8270C were reported. Naphthalene was not detected in any well until November 2012, so comparability with older results should not be a concern. However, the low bias associated with EPA Method 8270C must be considered when making project decisions.

Sensitivity

The LOQs are established by the laboratory based on the LODs or instrument detection limits, historical data, and EPA limits established for the methods. The LOQs for samples may require adjustment due to matrix interference or if high levels of target analytes necessitate dilution before analysis. Matrix interference and sample dilutions have the effect of increasing the LOQs. Laboratory LODs and LOQs for several analytes differed from the LODs and LOQs in the WP/SAP because the laboratory updates them quarterly. LODs and LOQs for several analytes were greater than the DOH EALs (as stated in the WP/SAP) and therefore it is not possible to determine whether the analytes are present at concentrations greater than or equal to the DOH EALs. As suggested by the DOH Technical Guidance Manual, the project action level will be the LOQ for these analytes.

3.2 Data Assessment and Usability Conclusions

The PARCCS criteria were evaluated, and with a few exceptions, all criteria were met. These exceptions include the exceedances of recovery criteria for MS/MSDs for several VOCs and PAHs. Since the surrogate recoveries and the recoveries of the VOCs and PAHs in the LCS/LCSD are all within recovery criteria, the MS/MSD exceendaces are not considered to affect the usability of the data, but may indicate some matrix heterogeneity. The data assessment concludes that all data generated during this event are usable for their intended purpose.

TABLE 3.1
Quality Control Results for Groundwater Sampling (July 24, 2013)
Red Hill Bulk Fuel Storage Facility
July 2013 Quarterly Monitoring Report

Method	Chemical Constituent	DOH EALs		OWDFMW01 (ES034)					OWDFMW01 (ES035) (DUP)					RPD Duplicate (%)	ES Trip				
		Drinking Water Toxicity	Gross Contamination	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL		Results	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	**470**	HD	52	21	15	**340**	HD	52	21	15	32.10	-	-	-	-	-
EPA 8260B	TPH-g	100	100	N.D.	U	50	30	13	N.D.	U	50	30	13	NA	N.D.	U	50	30	13
EPA 8270C SIM	Acenaphthene	370	20	N.D.	U	0.2	0.05	0.021	N.D.	U	0.19	0.048	0.020	NA	-	-	-	-	-
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	N.D.	U	0.19	0.048	0.017	NA	-	-	-	-	-
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	N.D.	U	0.19	0.048	0.033	NA	-	-	-	-	-
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	N.D.	U	0.19	0.048	0.023	NA	-	-	-	-	-
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	N.D.	U	0.19	0.048	0.021	NA	-	-	-	-	-
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.036	N.D.	U	0.19	0.048	0.035	NA	-	-	-	-	-
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	N.D.	U	0.19	0.048	0.024	NA	-	-	-	-	-
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	N.D.	U	0.19	0.048	0.023	NA	-	-	-	-	-
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	N.D.	U	0.19	0.048	0.018	NA	-	-	-	-	-
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	N.D.	U	0.19	0.048	0.026	NA	-	-	-	-	-
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	N.D.	U	0.19	0.048	0.026	NA	-	-	-	-	-
	Fluorene	240	950	N.D.	U	0.2	0.05	0.024	N.D.	U	0.19	0.048	0.024	NA	-	-	-	-	-
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	N.D.	U	0.19	0.048	0.021	NA	-	-	-	-	-
	1,-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.05	0.028	N.D.	U	0.19	0.048	0.027	NA	-	-	-	-	-
	2,-Methylnaphthalene	24	10	N.D.	U	0.2	0.05	0.026	N.D.	U	0.19	0.048	0.026	NA	-	-	-	-	-
	Naphthalene	17	21	0.081	J	0.2	0.05	0.023	0.12	J	0.19	0.048	0.022	38.81	-	-	-	-	-
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.030	N.D.	U	0.19	0.048	0.029	NA	-	-	-	-	-
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	N.D.	U	0.19	0.048	0.024	NA	-	-	-	-	-
EPA 8260B	1,1,1-Trichloroethane	200	970	N.D.	U	5.0	0.5	0.30	N.D.	U	5.0	0.5	0.30	NA	N.D.	U	5.0	0.5	0.30
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1.0	0.5	0.38	N.D.	U	1.0	0.5	0.38	NA	N.D.	U	1.0	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5.0	0.5	0.28	N.D.	U	5.0	0.5	0.28	NA	N.D.	U	5.0	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43	NA	N.D.	U	1.0	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64	NA	N.D.	U	5.0	1.0	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5.0	1.0	0.5	N.D.	U	5.0	1.0	0.5	NA	N.D.	U	5.0	1.0	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	2.0	1.2	N.D.	U	10	2.0	1.2	NA	N.D.	U	10	2.0	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1.0	0.5	0.36	N.D.	U	1.0	0.5	0.36	NA	N.D.	U	1.0	0.5	0.36
	1,2-Dichlorobenzene	600	10	N.D.	U	1.0	0.5	0.46	N.D.	U	1.0	0.5	0.46	NA	N.D.	U	1.0	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24	NA	N.D.	U	1.0	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5.0	0.5	0.42	N.D.	U	5.0	0.5	0.42	NA	N.D.	U	5.0	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1.0	0.5	0.4	N.D.	U	1.0	0.5	0.4	NA	N.D.	U	1.0	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25	NA	N.D.	U	2.0	1.0	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1.0	0.5	0.43	N.D.	U	1.0	0.5	0.43	NA	N.D.	U	1.0	0.5	0.43
	Acetone	22,000	20,000	88		20	10	6.0	83		20	10	6.0	5.85	N.D.	U	20	10	6.0
	Benzene	5	170	0.42	J	1.0	0.5	0.14	0.44	J	1.0	0.5	0.14	4.65	N.D.	U	1.0	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5.0	0.5	0.21	N.D.	U	5.0	0.5	0.21	NA	N.D.	U	5.0	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1.0	0.50	N.D.	U	10	1.0	0.50	NA	N.D.	U	10	1.0	0.50
	Bromomethane	8.7	50,000	N.D.	U	20	5.0	3.9	N.D.	U	20	5.0	3.9	NA	N.D.	U	20	5.0	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1.0	0.5	0.23	N.D.	U	1.0	0.5	0.23	NA	N.D.	U	1.0	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5.0	0.5	0.17	N.D.	U	5.0	0.5	0.17	NA	N.D.	U	5.0	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5.0	2.3	N.D.	U	10	5.0	2.3	NA	N.D.	U	10	5.0	2.3
	Chloroform	70	2,400	N.D.	U	5.0	0.5	0.46	N.D.	U	5.0	0.5	0.46	NA	N.D.	U	5.0	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U	10	2.0	1.8	N.D.	U	10	2.0	1.8	NA	N.D.	U	10	2.0	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1.0	0.5	0.48	N.D.	U	1.0	0.5	0.48	NA	N.D.	U	1.0	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1.0	0.5	0.25	N.D.	U	1.0	0.5	0.25	NA	N.D.	U	1.0	0.5	0.25
	Ethylbenzene	700	30	N.D.	U	1.0	0.5	0.14	N.D.	U	1.0	0.5	0.14	NA	N.D.	U	1.0	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1.0	0.5	0.32	N.D.	U	1.0	0.5	0.32	NA	N.D.	U	1.0	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U	10	5.0	2.2	N.D.	U	10	5.0	2.2	NA	N.D.	U	10	5.0	2.2
	Methyl isobutyl ketone (4-Methyl-2-Pentanone)	2,000	1300	N.D.	U	10	5.0	4.4	N.D.	U	10	5.0	4.4	NA	N.D.	U	10	5.0	4.4
	Methyl tert-butyl Ether	12	5	N.D.	U	1.0	0.5	0.31	N.D.	U	1.0	0.5	0.31	NA	N.D.	U	1.0	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5.0	1.0	0.64	N.D.	U	5.0	1.0	0.64	NA	N.D.	U	5.0	1.0	0.64
	Styrene	100	10	N.D.	U	1.0	0.5	0.17	N.D.	U	1.0	0.5	0.17	NA	N.D.	U	1.0	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1.0	0.5	0.40	N.D.	U	1.0	0.5	0.40	NA	N.D.	U	1.0	0.5	0.40
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	UJ	1.0	0.5	0.41	N.D.	UJ	1.0	0.5	0.41	NA	N.D.	UJ	1.0	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5.0	0.5	0.39	N.D.	U	5.0	0.5	0.39	NA	N.D.	U	5.0	0.5	0.39
	Toluene	1,000	40	N.D.	U	1.0	0.5	0.24	N.D.	U	1.0	0.5	0.24	NA	N.D.	U	1.0	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37	NA	N.D.	U	1.0	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1.0	0.5	0.37	N.D.	U	1.0	0.5	0.37	NA	N.D.	U	1.0	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1.0	0.5	0.30	N.D.	U	1.0	0.5	0.30	NA	N.D.	U	1.0	0.5	0.30
	Xylenes	10,000	20	N.D.	U	11	1.5	0.23	N.D.	U	11	1.5	0.23	NA	N.D.	U	11	1.5	0.23
EPA 6020	Dissolved Lead	15	50,000	N.D.	U	1.0	0.2	0.0898	N.D.	U	1	0.2	0.0898	NA	-	-	-	-	-

The data are in micrograms per liter (µg/L). Shaded values exceeded the DOH EALs.

DOH EALs DOH Tier 1 Environmental Action Levels for groundwater where groundwater is a current drinking water source and surface water is greater than 150 meters from the site (DOH, Fall 2011).
DL Detection Limit or Method Detection Limit (MDL)
EPA Environmental Protection Agency
HD The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
J Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
LOD Limit of Detection
LOQ Limit of Quantitation
NA Both results for duplicate pair were non-detect, no RPD calculations
N.D. Not Detected
Q Qualifiers
TPH-g Total Petroleum Hydrocarbons as gasoline
TPH-d Total Petroleum Hydrocarbons as diesel
U Undetected at DL and is reported as less than the LOD.

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SECTION 4 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This quarterly monitoring report presents the results of groundwater sampling conducted on July 24, 2013, at the RHSF, JBPHH, Hawaii. The RHSF is located in Halawa Heights on the Island of Oahu. The DOH Facility ID number for the RHSF is 9-102271. The DOH Release ID numbers are 990051, 010011, and 020028.

The groundwater sampling was conducted as part of the long-term groundwater and soil vapor monitoring at the RHSF, under NAVFAC Contract Number N62742-12-D-1853. The sampling was conducted in accordance with the approved WP/SAP prepared by ESI.

On July 24, 2013, ESI personnel collected groundwater samples from two monitoring wells (wells HDMW2253-03 and OWDFMW01). A summary of the analytical results is provided below.

- **HDMW2253-03** – Naphthalene (0.03 µg/L) was detected. The COPC was not detected at a concentration above the DOH EALs.

- **OWDFMW01** – TPH-d (470 and 340 µg/L), acetone (88 and 83 µg/L), naphthalene (0.081 and 0.12 µg/L), and benzene (0.42 and 0.44 µg/L) were detected in both the primary and duplicate samples. TPH-d (470 and 340 µg/L) was detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination in both samples.

Groundwater Contaminant Trends

Historical groundwater contaminant concentration trends of COPCs that exceeded the DOH EALs are presented in Appendix D. A summary of groundwater contaminant trends is provided below.

- **HDMW2253-03** – TPH-d was not detected during this round of quarterly sampling. TPH-d concentrations last exceeded the DOH EALs for both drinking water toxicity and gross contamination in January 2013 (600 µg/L). Naphthalene was detected but remained at a low concentration, below the DOH EALs and consistent with historical results.

- **OWDFMW01** – With the exception of TPH-d, groundwater contaminant concentrations remained at low concentrations and did not change significantly, or were not detected. TPH-d concentrations detected during this round of sampling were above the DOH EALs for both drinking water toxicity and gross contamination, but decreased significantly from the last event, and were the lowest they have been since July 2012.

Conclusions and Recommendations

Since the wells were last sampled (April 2013), with the exception of TPH-d, groundwater contaminant concentrations remained at low concentrations and did not change significantly,

or were not detected. TPH-d concentrations decreased in wells HDMW2253-03 and OWDFMW01. The TPH-d concentration in HDMW2253-03 was 45 µg/L in April 2013, but was not detected during this round of sampling. TPH-d concentrations in well OWDFMW01 decreased from 1,900 µg/L at the last round of sampling to 470 µg/L during this round.

Based on the results of the assessment, continued groundwater monitoring at the RHSF is recommended. If the TPH-d concentrations significantly increase, the monitoring frequency should be increased to monthly, even though the two outside wells are not included in the RHSF Groundwater Protection Plan.

SECTION 5 – FUTURE WORK

GROUNDWATER SAMPLING

Future work includes the fourth quarter 2013 groundwater monitoring which is scheduled for October 2013. It is anticipated that the quarterly groundwater monitoring status report will be submitted in November 2013.

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SECTION 6 – REFERENCES

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TEC, 2010b, Quarterly Groundwater Monitoring Report – Outside (Non-Tunnel) Wells, Prepared for Navy Region Hawaii, Pearl Harbor, Hawaii, May 2010.

FIGURES

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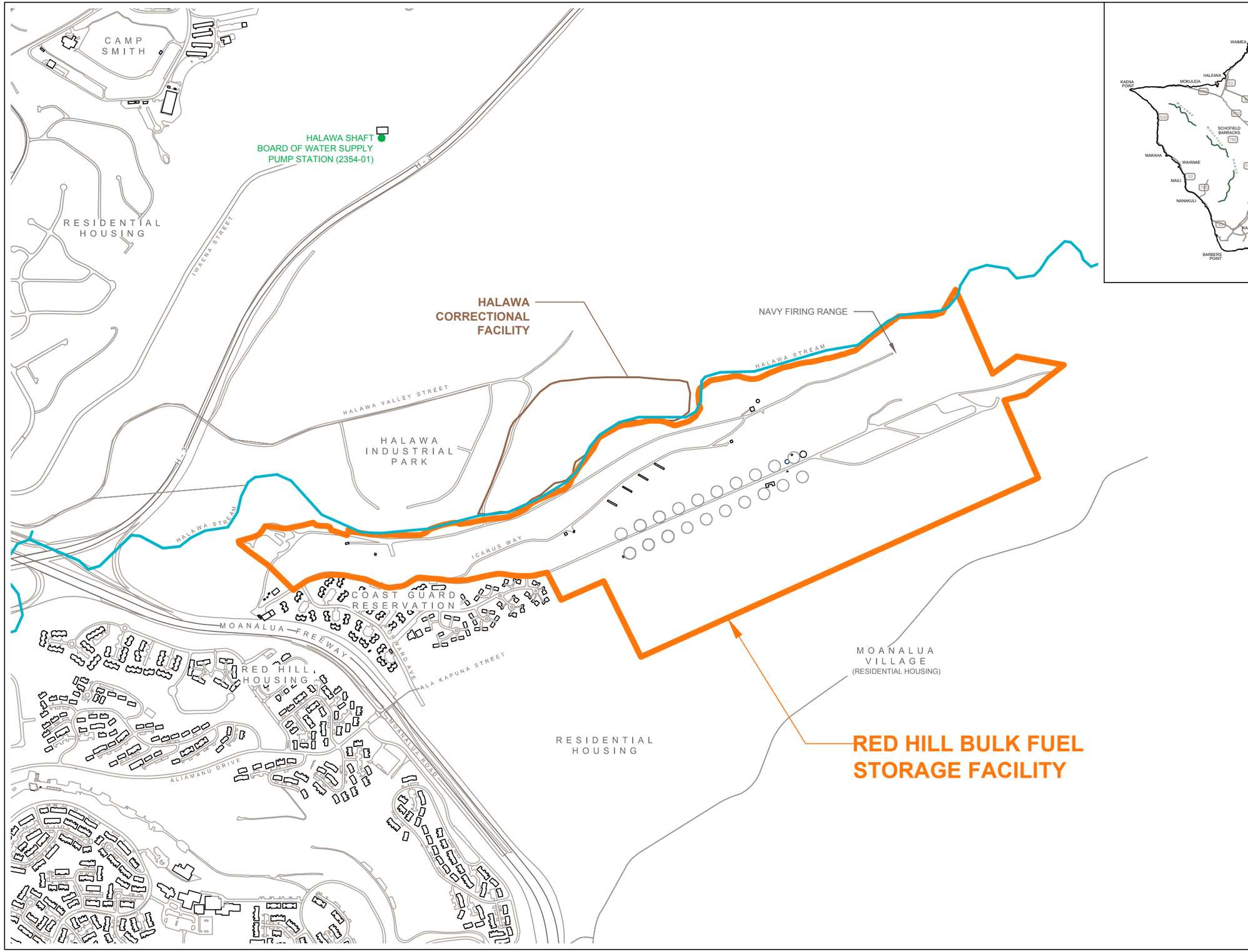

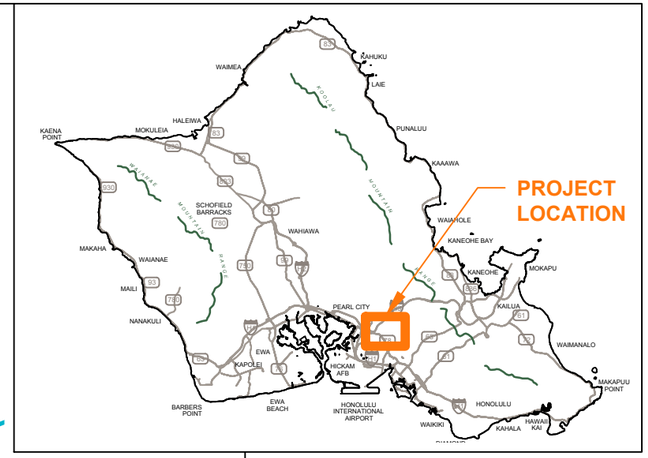

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map

Navy GIS files

NORTH

GRAPHIC SCALE

900 0 900

Scale in Feet

FIGURE 1

SITE LOCATION

GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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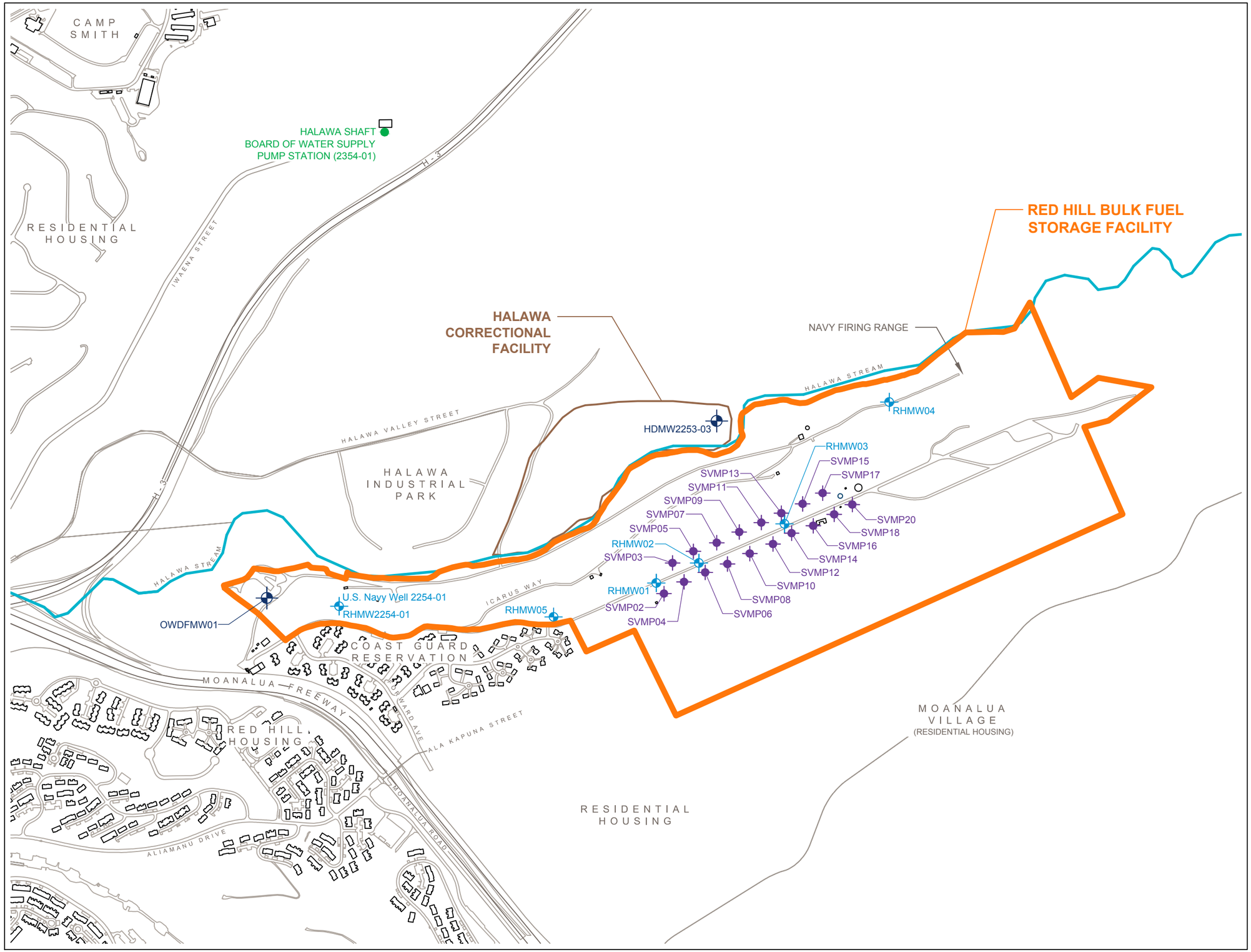

LEGEND

- RED HILL BULK FUEL STORAGE FACILITY
- HALAWA CORRECTIONAL FACILITY
- HALAWA STREAM
- BUILDING
- ROAD
- ABOVEGROUND STORAGE TANK
- WATER TANK
- SOIL VAPOR MONITORING POINT
- GROUNDWATER MONITORING WELL LOCATED INSIDE TUNNEL
- GROUNDWATER MONITORING WELL LOCATED OUTSIDE TUNNEL
- BOARD OF WATER SUPPLY PUMP STATION

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map

Navy GIS files

NORTH

GRAPHIC SCALE

1,200 0 1,200

Scale in Feet

FIGURE 2

SITE LAYOUT

GROUNDWATER MONITORING
RED HILL BULK FUEL STORAGE FACILITY
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)
FLEET LOGISTICS CENTER
JBPHH, OAHU, HAWAII

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APPENDIX A

Groundwater Sampling Logs

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Groundwater Sampling Log

Well ID: OWDFMW01 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 120.72 ft Date: 7/24/2013 Time: 713

Total Depth of Well: 145.10 ft Personnel Involved: Branden Ibara, Tina Alder

Length of Saturated Zone: - Weather Conditions: Sunny

Volume of Water to be Removed: 5.0 L Method of Removal: Disposable Hand Bailer

Water Level After Purging: 120.76 ft Pumping Rate: 0.29 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
720	0.0 L	11.01	2.748	1.75	23.47	-	-127.2
728	2.0 L	10.59	2.724	1.70	23.60	-	-142.2
731	3.0 L	10.52	2.751	1.98	23.60	-	-137.4
734	4.0 L	10.50	2.765	1.41	23.60	-	-138.6
737	5.0 L	10.49	2.765	1.40	23.60	-	-136.4

Sample Withdrawal Method: Disposable Hand Bailer

Appearance of Sample:

Color: Clear

Turbidity: Low

Sediment: Low

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 16 - 40ml VOAs, 6 - 1L amber jar, 4 - 500ml amber jar, 4 - 500ml HDPE

Sample Identification Numbers: ES034 [0815], ES034 MS/MSD [0815]; ES035 [0900]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter

Sampled by: Branden Ibara, Tina Alder

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/24/2013 Time: 1100

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

Groundwater Sampling Log

Well ID: HDMW2253-03 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: - Date: 7/24/2013 Time: 913

Total Depth of Well: 1575 ft Personnel Involved: Branden Ibara, Tina Alder

Length of Saturated Zone: - Weather Conditions: Sunny

Volume of Water to be Removed: - Method of Removal: Disposable Hand Bailer

Water Level After Purging: - Pumping Rate: 0.11 L/min

Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
916	0.0 L	9.14	0.498	3.33	23.33	-	-145.8
926	1.0 L	7.19	0.437	3.02	22.61	-	-101.5
930	2.0 L	6.88	0.432	2.62	22.38	-	-90.2
936	3.0 L	6.94	0.425	2.90	22.40	-	-117.8
941	4.0 L	6.77	0.426	1.96	22.41	-	-103.2

Sample Withdrawal Method: Disposable Hand Bailer

Appearance of Sample:

Color: Tan

Turbidity: Low

Sediment: None

Other: None

Laboratory Analysis Parameters and Preservatives: TPH-d - 8015; TPH-g, VOCs - 8260; PAHs - 8270c sim; lead - 6020

Number and Types of Sample Containers: 6 - 40ml VOAs, 2 - 1L amber jar, 1 - 500ml amber jar, 1 - 250ml HDPE

Sample Identification Numbers: ES036 [0930]

Decontamination Procedures: Triple Rinsed

Notes: YSI did not have salinity parameter

Sampled by: Branden Ibara, Tina Alder

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 7/24/2013 Time: 1100

Capacity of Casing (Gallons/Linear Feet)

2"-0.16• 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87

APPENDIX B

Field Notes

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84

Location RHSF Date 7/23/13

Project / Client NAVFAC

1045	Collected ESO33 from RHMW05
1120	Exited Tunnel
1145	Dropped off IDW
1310	Arrived at FedEx

[redacted]

85

Location RHSF Date 7/24/13

Project / Client NAVFAC

Task: GW Sampling
Personnel: BI, TA

0710 On-site, Health & Safety Meeting
Gauge OWDFMW01
DTW: 120.72 PID: 0.0
DTB: 145.10
Collected ESO34, ESO34MS/MSD
ESO35 from OWDFMW01
Met DLNR at Halawa
Start purge HDMW2253-03
collected ESO36 from HDMW2253-03
Dropped off IDW and backed samples
Left Red Hill for FedEx.
left FedEx
Back at office unloading

7/24/13

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APPENDIX C

Laboratory Reports

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Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-07-1752

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Environmental Science International, Inc.

Client Project Name: Red Hill LTM 112066

Attention: Robert Chong
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Approved for release on 08/02/2013 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: Red Hill LTM 112066
Work Order Number: 13-07-1752

Calscience Environmental Laboratories, Inc.

Work Order Narrative

Work Order: 13-07-1752 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain of Custody (COC) on 07/26/13. They were assigned to Work Order 13-07-1752.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Additional Comments:

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8015B (M)
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 034	**13-07-1752-2-H**	**07/24/13 08:15**	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 04:45**	**130730B09**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as DRO is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	470	15	21	52	1.04	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	90	51-141	

ES 035	**13-07-1752-3-H**	**07/24/13 09:00**	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 05:02**	**130730B09**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as DRO is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	340	15	21	52	1.04	HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	94	51-141	

ES 036	**13-07-1752-4-H**	**07/24/13 09:30**	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 05:20**	**130730B09**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- TPH as DRO is quantified in the carbon range C10-C28.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	<21	15	21	52	1.04	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	75	51-141	

Method Blank	**099-15-516-53**	**N/A**	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 01:36**	**130730B09**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
TPH as Diesel	<20	15	20	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	104	51-141	

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3020A Total
Method: EPA 6020
Units: ug/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 034	**13-07-1752-2-G**	**07/24/13 08:15**	**Aqueous**	**ICP/MS 04**	**07/31/13**	**07/31/13 17:51**	**130731L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 035	**13-07-1752-3-G**	**07/24/13 09:00**	**Aqueous**	**ICP/MS 04**	**07/31/13**	**07/31/13 17:55**	**130731L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 036	**13-07-1752-4-G**	**07/24/13 09:30**	**Aqueous**	**ICP/MS 04**	**07/31/13**	**07/31/13 17:59**	**130731L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-497-42**	**N/A**	**Aqueous**	**ICP/MS 04**	**07/31/13**	**07/31/13 17:23**	**130731L02D**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Lead	<0.200	0.0898	0.200	1.00	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 034	**13-07-1752-2-I**	**07/24/13 08:15**	**Aqueous**	**GC/MS AAA**	**07/29/13**	**08/01/13 13:55**	**130729L12**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	0.081	0.023	0.050	0.20	0.995	J
2-Methylnaphthalene	<0.050	0.026	0.050	0.20	0.995	U
1-Methylnaphthalene	<0.050	0.028	0.050	0.20	0.995	U
Acenaphthylene	<0.050	0.018	0.050	0.20	0.995	U
Acenaphthene	<0.050	0.021	0.050	0.20	0.995	U
Fluorene	<0.050	0.024	0.050	0.20	0.995	U
Phenanthrene	<0.050	0.030	0.050	0.20	0.995	U
Anthracene	<0.050	0.034	0.050	0.20	0.995	U
Fluoranthene	<0.050	0.027	0.050	0.20	0.995	U
Pyrene	<0.050	0.025	0.050	0.20	0.995	U
Benzo (a) Anthracene	<0.050	0.024	0.050	0.20	0.995	U
Chrysene	<0.050	0.019	0.050	0.20	0.995	U
Benzo (k) Fluoranthene	<0.050	0.023	0.050	0.20	0.995	U
Benzo (b) Fluoranthene	<0.050	0.025	0.050	0.20	0.995	U
Benzo (a) Pyrene	<0.050	0.036	0.050	0.20	0.995	U
Indeno (1,2,3-c,d) Pyrene	<0.050	0.022	0.050	0.20	0.995	U
Dibenz (a,h) Anthracene	<0.050	0.027	0.050	0.20	0.995	U
Benzo (g,h,i) Perylene	<0.050	0.022	0.050	0.20	0.995	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	64	28-139	
2-Fluorobiphenyl	63	33-144	
p-Terphenyl-d14	76	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 035	**13-07-1752-3-I**	**07/24/13 09:00**	**Aqueous**	**GC/MS AAA**	**07/29/13**	**08/01/13 14:21**	**130729L12**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	0.12	0.022	0.048	0.19	0.965	J
2-Methylnaphthalene	<0.048	0.026	0.048	0.19	0.965	U
1-Methylnaphthalene	<0.048	0.027	0.048	0.19	0.965	U
Acenaphthylene	<0.048	0.017	0.048	0.19	0.965	U
Acenaphthene	<0.048	0.020	0.048	0.19	0.965	U
Fluorene	<0.048	0.024	0.048	0.19	0.965	U
Phenanthrene	<0.048	0.029	0.048	0.19	0.965	U
Anthracene	<0.048	0.033	0.048	0.19	0.965	U
Fluoranthene	<0.048	0.026	0.048	0.19	0.965	U
Pyrene	<0.048	0.024	0.048	0.19	0.965	U
Benzo (a) Anthracene	<0.048	0.023	0.048	0.19	0.965	U
Chrysene	<0.048	0.018	0.048	0.19	0.965	U
Benzo (k) Fluoranthene	<0.048	0.023	0.048	0.19	0.965	U
Benzo (b) Fluoranthene	<0.048	0.024	0.048	0.19	0.965	U
Benzo (a) Pyrene	<0.048	0.035	0.048	0.19	0.965	U
Indeno (1,2,3-c,d) Pyrene	<0.048	0.021	0.048	0.19	0.965	U
Dibenz (a,h) Anthracene	<0.048	0.026	0.048	0.19	0.965	U
Benzo (g,h,i) Perylene	<0.048	0.021	0.048	0.19	0.965	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	75	28-139	
2-Fluorobiphenyl	70	33-144	
p-Terphenyl-d14	80	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 036	**13-07-1752-4-I**	**07/24/13 09:30**	**Aqueous**	**GC/MS AAA**	**07/29/13**	**08/01/13 14:47**	**130729L12**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	0.030	0.022	0.047	0.19	0.945	J
2-Methylnaphthalene	<0.047	0.025	0.047	0.19	0.945	U
1-Methylnaphthalene	<0.047	0.027	0.047	0.19	0.945	U
Acenaphthylene	<0.047	0.017	0.047	0.19	0.945	U
Acenaphthene	<0.047	0.020	0.047	0.19	0.945	U
Fluorene	<0.047	0.023	0.047	0.19	0.945	U
Phenanthrene	<0.047	0.029	0.047	0.19	0.945	U
Anthracene	<0.047	0.032	0.047	0.19	0.945	U
Fluoranthene	<0.047	0.026	0.047	0.19	0.945	U
Pyrene	<0.047	0.023	0.047	0.19	0.945	U
Benzo (a) Anthracene	<0.047	0.022	0.047	0.19	0.945	U
Chrysene	<0.047	0.018	0.047	0.19	0.945	U
Benzo (k) Fluoranthene	<0.047	0.022	0.047	0.19	0.945	U
Benzo (b) Fluoranthene	<0.047	0.024	0.047	0.19	0.945	U
Benzo (a) Pyrene	<0.047	0.034	0.047	0.19	0.945	U
Indeno (1,2,3-c,d) Pyrene	<0.047	0.021	0.047	0.19	0.945	U
Dibenz (a,h) Anthracene	<0.047	0.025	0.047	0.19	0.945	U
Benzo (g,h,i) Perylene	<0.047	0.021	0.047	0.19	0.945	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	68	28-139	
2-Fluorobiphenyl	66	33-144	
p-Terphenyl-d14	72	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-148-17**	**N/A**	**Aqueous**	**GC/MS AAA**	**07/29/13**	**08/01/13 13:28**	**130729L12**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Naphthalene	<0.051	0.023	0.051	0.20	1.02	U
2-Methylnaphthalene	<0.051	0.027	0.051	0.20	1.02	U
1-Methylnaphthalene	<0.051	0.029	0.051	0.20	1.02	U
Acenaphthylene	<0.051	0.018	0.051	0.20	1.02	U
Acenaphthene	<0.051	0.021	0.051	0.20	1.02	U
Fluorene	<0.051	0.025	0.051	0.20	1.02	U
Phenanthrene	<0.051	0.031	0.051	0.20	1.02	U
Anthracene	<0.051	0.035	0.051	0.20	1.02	U
Fluoranthene	<0.051	0.028	0.051	0.20	1.02	U
Pyrene	<0.051	0.025	0.051	0.20	1.02	U
Benzo (a) Anthracene	<0.051	0.024	0.051	0.20	1.02	U
Chrysene	<0.051	0.019	0.051	0.20	1.02	U
Benzo (k) Fluoranthene	<0.051	0.024	0.051	0.20	1.02	U
Benzo (b) Fluoranthene	<0.051	0.025	0.051	0.20	1.02	U
Benzo (a) Pyrene	<0.051	0.037	0.051	0.20	1.02	U
Indeno (1,2,3-c,d) Pyrene	<0.051	0.022	0.051	0.20	1.02	U
Dibenz (a,h) Anthracene	<0.051	0.027	0.051	0.20	1.02	U
Benzo (g,h,i) Perylene	<0.051	0.022	0.051	0.20	1.02	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Nitrobenzene-d5	74	28-139	
2-Fluorobiphenyl	70	33-144	
p-Terphenyl-d14	80	23-160	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES Trip	**13-07-1752-1-A**	**07/24/13 07:00**	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/31/13 01:23**	**130730L02**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received:	07/26/13
Work Order:	13-07-1752
Preparation:	EPA 5030C
Method:	GC/MS / EPA 8260B
Units:	ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	<30	13	30	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	94	80-126	
1,2-Dichloroethane-d4	90	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	95	88-112	
1,4-Bromofluorobenzene	92	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 034	**13-07-1752-2-A**	**07/24/13 08:15**	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/31/13 01:51**	**130730L02**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	88	6.0	10	20	1	
Benzene	0.42	0.14	0.50	1.0	1	J
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.		Date Received:	07/26/13
354 Uluniu Street, Suite 304		Work Order:	13-07-1752
Kailua, HI 96734-2500		Preparation:	EPA 5030C
		Method:	GC/MS / EPA 8260B
		Units:	ug/L
Project: Red Hill LTM 112066			Page 4 of 10

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	<30	13	30	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	93	80-126	
1,2-Dichloroethane-d4	90	80-134	
Toluene-d8	98	80-120	
Toluene-d8-TPPH	94	88-112	
1,4-Bromofluorobenzene	92	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 035	**13-07-1752-3-A**	**07/24/13 09:00**	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/31/13 02:18**	**130730L02**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	83	6.0	10	20	1	
Benzene	0.44	0.14	0.50	1.0	1	J
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received:	07/26/13
Work Order:	13-07-1752
Preparation:	EPA 5030C
Method:	GC/MS / EPA 8260B
Units:	ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	<30	13	30	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	93	80-126	
1,2-Dichloroethane-d4	93	80-134	
Toluene-d8	101	80-120	
Toluene-d8-TPPH	97	88-112	
1,4-Bromofluorobenzene	92	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
ES 036	**13-07-1752-4-A**	**07/24/13 09:30**	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/31/13 02:46**	**130730L02**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	<30	13	30	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	97	80-126	
1,2-Dichloroethane-d4	95	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	96	88-112	
1,4-Bromofluorobenzene	89	80-120	

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
Units: ug/L

Project: Red Hill LTM 112066

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-13-057-26**	**N/A**	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/30/13 20:20**	**130730L02**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
Acetone	<10	6.0	10	20	1	U
Benzene	<0.50	0.14	0.50	1.0	1	U
Bromodichloromethane	<0.50	0.21	0.50	5.0	1	U
Bromoform	<1.0	0.50	1.0	10	1	U
Bromomethane	<5.0	3.9	5.0	20	1	U
2-Butanone	<5.0	2.2	5.0	10	1	U
Carbon Tetrachloride	<0.50	0.23	0.50	1.0	1	U
Chlorobenzene	<0.50	0.17	0.50	5.0	1	U
Chloroethane	<5.0	2.3	5.0	10	1	U
Chloroform	<0.50	0.46	0.50	5.0	1	U
Chloromethane	<2.0	1.8	2.0	10	1	U
Dibromochloromethane	<0.50	0.25	0.50	1.0	1	U
1,2-Dibromo-3-Chloropropane	<2.0	1.2	2.0	10	1	U
1,2-Dibromoethane	<0.50	0.36	0.50	1.0	1	U
1,2-Dichlorobenzene	<0.50	0.46	0.50	1.0	1	U
1,3-Dichlorobenzene	<0.50	0.40	0.50	1.0	1	U
1,4-Dichlorobenzene	<0.50	0.43	0.50	1.0	1	U
1,1-Dichloroethane	<0.50	0.28	0.50	5.0	1	U
1,2-Dichloroethane	<0.50	0.24	0.50	1.0	1	U
1,1-Dichloroethene	<0.50	0.43	0.50	1.0	1	U
c-1,2-Dichloroethene	<0.50	0.48	0.50	1.0	1	U
t-1,2-Dichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2-Dichloropropane	<0.50	0.42	0.50	5.0	1	U
c-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
t-1,3-Dichloropropene	<0.50	0.25	0.50	1.0	1	U
Ethylbenzene	<0.50	0.14	0.50	1.0	1	U
Methylene Chloride	<1.0	0.64	1.0	5.0	1	U
4-Methyl-2-Pentanone	<5.0	4.4	5.0	10	1	U
Styrene	<0.50	0.17	0.50	1.0	1	U
1,1,1,2-Tetrachloroethane	<0.50	0.40	0.50	1.0	1	U
1,1,2,2-Tetrachloroethane	<0.50	0.41	0.50	1.0	1	U
Tetrachloroethene	<0.50	0.39	0.50	5.0	1	U
Toluene	<0.50	0.24	0.50	1.0	1	U
1,2,4-Trichlorobenzene	<1.0	0.50	1.0	5.0	1	U
1,1,1-Trichloroethane	<0.50	0.30	0.50	5.0	1	U
Hexachloro-1,3-Butadiene	<0.50	0.32	0.50	1.0	1	U

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Calscience Environmental Laboratories, Inc.

Analytical Report

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Date Received:	07/26/13
Work Order:	13-07-1752
Preparation:	EPA 5030C
Method:	GC/MS / EPA 8260B
Units:	ug/L

Project: Red Hill LTM 112066

Parameter	Result	DL	LOD	LOQ	DF	Qualifiers
1,1,2-Trichloroethane	<0.50	0.38	0.50	1.0	1	U
Trichloroethene	<0.50	0.37	0.50	1.0	1	U
1,2,3-Trichloropropane	<1.0	0.64	1.0	5.0	1	U
Vinyl Chloride	<0.50	0.30	0.50	1.0	1	U
p/m-Xylene	<1.0	0.30	1.0	10	1	U
o-Xylene	<0.50	0.23	0.50	1.0	1	U
Methyl-t-Butyl Ether (MTBE)	<0.50	0.31	0.50	1.0	1	U
Gasoline Range Organics	<30	13	30	50	1	U

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	91	80-126	
1,2-Dichloroethane-d4	88	80-134	
Toluene-d8	99	80-120	
Toluene-d8-TPPH	95	88-112	
1,4-Bromofluorobenzene	92	80-120	

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.		Date Received:	07/26/13
354 Uluniu Street, Suite 304		Work Order:	13-07-1752
Kailua, HI 96734-2500		Preparation:	EPA 3510C
		Method:	EPA 8015B (M)
Project: Red Hill LTM 112066			Page 1 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES 034	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 03:01**	**130730S09**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	471.1	4000	4828	109	5043	114	55-133	4	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.		Date Received:	07/26/13
354 Uluniu Street, Suite 304		Work Order:	13-07-1752
Kailua, HI 96734-2500		Preparation:	EPA 3020A Total
		Method:	EPA 6020
Project: Red Hill LTM 112066			Page 2 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES 034	**Aqueous**	**ICP/MS 04**	**07/31/13**	**07/31/13 17:35**	**130731S02**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Lead	ND	100.0	109.5	109	108.1	108	80-120	1	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
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Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES 034	**Aqueous**	**GC/MS AAA**	**07/29/13**	**08/01/13 15:40**	**130729S12**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	ND	2.000	1.278	64	1.624	81	21-133	24	0-25	
2-Methylnaphthalene	ND	2.000	1.155	58	1.466	73	21-140	24	0-25	
1-Methylnaphthalene	ND	2.000	1.060	53	1.341	67	20-140	23	0-25	
Acenaphthylene	ND	2.000	1.241	62	1.584	79	33-145	24	0-25	
Acenaphthene	ND	2.000	1.242	62	1.585	79	49-121	24	0-25	
Fluorene	ND	2.000	1.298	65	1.680	84	59-121	26	0-25	4
Phenanthrene	ND	2.000	1.170	59	1.514	76	54-120	26	0-25	4
Anthracene	ND	2.000	1.049	52	1.276	64	27-133	20	0-25	
Fluoranthene	ND	2.000	1.165	58	1.475	74	26-137	24	0-25	
Pyrene	ND	2.000	1.264	63	1.622	81	18-168	25	0-25	
Benzo (a) Anthracene	ND	2.000	1.265	63	1.595	80	33-143	23	0-25	
Chrysene	ND	2.000	1.170	58	1.483	74	17-168	24	0-25	
Benzo (k) Fluoranthene	ND	2.000	1.229	61	1.632	82	24-159	28	0-25	4
Benzo (b) Fluoranthene	ND	2.000	1.307	65	1.684	84	24-159	25	0-25	
Benzo (a) Pyrene	ND	2.000	1.409	70	1.775	89	17-163	23	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	1.284	64	1.634	82	10-171	24	0-25	
Dibenz (a,h) Anthracene	ND	2.000	1.107	55	1.436	72	10-219	26	0-25	4
Benzo (g,h,i) Perylene	ND	2.000	1.031	52	1.317	66	10-227	24	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B
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Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES 034	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/31/13 03:14**	**130730S02**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	88.36	50.00	187.2	198	175.6	174	40-140	6	0-20	3
Benzene	ND	50.00	51.07	102	47.44	95	80-120	7	0-20	
Bromodichloromethane	ND	50.00	47.19	94	44.76	90	75-120	5	0-20	
Bromoform	ND	50.00	48.19	96	47.65	95	70-130	1	0-20	
Bromomethane	ND	50.00	57.13	114	61.77	124	30-145	8	0-20	
2-Butanone	ND	50.00	60.97	122	56.91	114	30-150	7	0-20	
Carbon Tetrachloride	ND	50.00	48.95	98	45.61	91	65-140	7	0-20	
Chlorobenzene	ND	50.00	46.87	94	44.75	90	80-120	5	0-20	
Chloroethane	ND	50.00	53.30	107	49.55	99	60-135	7	0-20	
Chloroform	ND	50.00	50.43	101	46.58	93	65-135	8	0-20	
Chloromethane	ND	50.00	53.58	107	51.68	103	40-125	4	0-20	
Dibromochloromethane	ND	50.00	50.19	100	47.90	96	60-135	5	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	41.20	82	39.96	80	50-130	3	0-20	
1,2-Dibromoethane	ND	50.00	49.71	99	47.17	94	80-120	5	0-20	
1,2-Dichlorobenzene	ND	50.00	46.00	92	43.73	87	70-120	5	0-20	
1,3-Dichlorobenzene	ND	50.00	44.88	90	43.00	86	75-125	4	0-20	
1,4-Dichlorobenzene	ND	50.00	47.92	96	45.42	91	75-125	5	0-20	
1,1-Dichloroethane	ND	50.00	49.60	99	45.79	92	70-135	8	0-20	
1,2-Dichloroethane	ND	50.00	51.51	103	47.45	95	70-130	8	0-20	
1,1-Dichloroethene	ND	50.00	50.43	101	46.92	94	70-130	7	0-20	
c-1,2-Dichloroethene	ND	50.00	49.99	100	46.94	94	70-125	6	0-20	
t-1,2-Dichloroethene	ND	50.00	51.68	103	48.30	97	60-140	7	0-20	
1,2-Dichloropropane	ND	50.00	50.71	101	46.84	94	75-125	8	0-20	
c-1,3-Dichloropropene	ND	50.00	51.55	103	48.81	98	70-130	5	0-20	
t-1,3-Dichloropropene	ND	50.00	40.48	81	38.87	78	55-140	4	0-20	
Ethylbenzene	ND	50.00	49.08	98	46.93	94	75-125	4	0-20	
Methylene Chloride	ND	50.00	55.24	110	50.33	101	55-140	9	0-20	
4-Methyl-2-Pentanone	ND	50.00	47.02	94	46.11	92	60-135	2	0-20	
Styrene	ND	50.00	52.51	105	49.15	98	65-135	7	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	51.35	103	49.31	99	80-130	4	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	0.3585	1	0.6950	1	65-130	64	0-20	3,4
Tetrachloroethene	ND	50.00	76.45	153	72.20	144	45-150	6	0-20	3
Toluene	ND	50.00	49.38	99	45.89	92	75-120	7	0-20	
1,2,4-Trichlorobenzene	ND	50.00	48.19	96	45.86	92	65-135	5	0-20	
1,1,1-Trichloroethane	ND	50.00	48.01	96	44.87	90	65-130	7	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	47.45	95	44.96	90	50-140	5	0-20	
1,1,2-Trichloroethane	ND	50.00	50.27	101	47.95	96	75-125	5	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Environmental Science International, Inc.	Date Received:	07/26/13
354 Uluniu Street, Suite 304	Work Order:	13-07-1752
Kailua, HI 96734-2500	Preparation:	EPA 5030C
	Method:	GC/MS / EPA 8260B
Project: Red Hill LTM 112066		Page 5 of 5

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Trichloroethene	ND	50.00	87.33	175	80.84	162	70-125	8	0-20	3
1,2,3-Trichloropropane	ND	50.00	50.03	100	48.01	96	75-125	4	0-20	
Vinyl Chloride	ND	50.00	50.64	101	47.81	96	50-145	6	0-20	
p/m-Xylene	ND	100.0	98.53	99	93.79	94	75-130	5	0-20	
o-Xylene	ND	50.00	48.14	96	45.54	91	80-120	6	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	42.97	86	41.53	83	65-125	3	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - PDS/PDSD

Environmental Science International, Inc.		Date Received:	07/26/13
354 Uluniu Street, Suite 304		Work Order:	13-07-1752
Kailua, HI 96734-2500		Preparation:	EPA 3020A Total
		Method:	EPA 6020
Project: Red Hill LTM 112066			Page 1 of 1

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
ES 034	**Aqueous**	**ICP/MS 04**	**07/31/13 00:00**	**07/31/13 17:43**	**130731S02**

Parameter	Sample Conc.	Spike Added	PDS Conc.	PDS %Rec.	%Rec. CL	Qualifiers
Lead	ND	100.0	106.1	106	75-125	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.	Date Received: 07/26/13
354 Uluniu Street, Suite 304	Work Order: 13-07-1752
Kailua, HI 96734-2500	Preparation: EPA 3510C
	Method: EPA 8015B (M)
Project: Red Hill LTM 112066	Page 1 of 5

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-516-53	**Aqueous**	**GC 45**	**07/30/13**	**07/31/13 01:52**	**130730B09**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	4000	4379	109	4127	103	60-132	6	0-11	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

Environmental Science International, Inc.	Date Received:	07/26/13
354 Uluniu Street, Suite 304	Work Order:	13-07-1752
Kailua, HI 96734-2500	Preparation:	EPA 3020A Total
	Method:	EPA 6020
Project: Red Hill LTM 112066		Page 2 of 5

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-14-497-42	**Aqueous**	**ICP/MS 04**	**07/31/13 17:31**	**130731L02D**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Lead	100.0	94.32	94	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 3510C
Method: EPA 8270C SIM PAHs
Page 3 of 5

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	LCS Batch Number
099-15-148-17	**Aqueous**	**GC/MS AAA**	**08/01/13 15:14**	**130729L12**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Naphthalene	2.000	1.682	84	21-133	
2-Methylnaphthalene	2.000	1.748	87	21-140	
1-Methylnaphthalene	2.000	1.625	81	20-140	
Acenaphthylene	2.000	1.684	84	33-145	
Acenaphthene	2.000	1.736	87	55-121	
Fluorene	2.000	1.883	94	59-121	
Phenanthrene	2.000	1.878	94	54-120	
Anthracene	2.000	1.617	81	27-133	
Fluoranthene	2.000	1.900	95	26-137	
Pyrene	2.000	2.068	103	45-129	
Benzo (a) Anthracene	2.000	2.080	104	33-143	
Chrysene	2.000	1.998	100	17-168	
Benzo (k) Fluoranthene	2.000	2.317	116	24-159	
Benzo (b) Fluoranthene	2.000	2.263	113	24-159	
Benzo (a) Pyrene	2.000	2.295	115	17-163	
Indeno (1,2,3-c,d) Pyrene	2.000	2.148	107	25-175	
Dibenz (a,h) Anthracene	2.000	1.832	92	25-175	
Benzo (g,h,i) Perylene	2.000	1.723	86	25-157	

Total number of LCS compounds: 18
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-057-26	**Aqueous**	**GC/MS LL**	**07/30/13**	**07/30/13 18:56**	**130730L02**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acetone	50.00	75.72	151	N/A	N/A	40-140	N/A	0-20	
Benzene	50.00	53.87	108	N/A	N/A	80-120	N/A	0-20	
Bromodichloromethane	50.00	50.21	100	N/A	N/A	75-120	N/A	0-20	
Bromoform	50.00	58.22	116	N/A	N/A	70-130	N/A	0-20	
Bromomethane	50.00	58.56	117	N/A	N/A	30-145	N/A	0-20	
2-Butanone	50.00	59.63	119	N/A	N/A	30-150	N/A	0-20	
Carbon Tetrachloride	50.00	50.51	101	N/A	N/A	65-140	N/A	0-20	
Chlorobenzene	50.00	50.85	102	N/A	N/A	80-120	N/A	0-20	
Chloroethane	50.00	51.79	104	N/A	N/A	60-135	N/A	0-20	
Chloroform	50.00	49.70	99	N/A	N/A	65-135	N/A	0-20	
Chloromethane	50.00	51.81	104	N/A	N/A	40-125	N/A	0-20	
Dibromochloromethane	50.00	54.93	110	N/A	N/A	60-135	N/A	0-20	
1,2-Dibromo-3-Chloropropane	50.00	48.78	98	N/A	N/A	50-130	N/A	0-20	
1,2-Dibromoethane	50.00	54.27	109	N/A	N/A	80-120	N/A	0-20	
1,2-Dichlorobenzene	50.00	50.66	101	N/A	N/A	70-120	N/A	0-20	
1,3-Dichlorobenzene	50.00	51.06	102	N/A	N/A	75-125	N/A	0-20	
1,4-Dichlorobenzene	50.00	53.41	107	N/A	N/A	75-125	N/A	0-20	
1,1-Dichloroethane	50.00	50.23	100	N/A	N/A	70-135	N/A	0-20	
1,2-Dichloroethane	50.00	49.86	100	N/A	N/A	70-130	N/A	0-20	
1,1-Dichloroethene	50.00	49.81	100	N/A	N/A	70-130	N/A	0-20	
c-1,2-Dichloroethene	50.00	52.16	104	N/A	N/A	70-125	N/A	0-20	
t-1,2-Dichloroethene	50.00	53.49	107	N/A	N/A	60-140	N/A	0-20	
1,2-Dichloropropane	50.00	53.34	107	N/A	N/A	75-125	N/A	0-20	
c-1,3-Dichloropropene	50.00	59.86	120	N/A	N/A	70-130	N/A	0-20	
t-1,3-Dichloropropene	50.00	46.32	93	N/A	N/A	55-140	N/A	0-20	
Ethylbenzene	50.00	54.54	109	N/A	N/A	75-125	N/A	0-20	
Methylene Chloride	50.00	54.06	108	N/A	N/A	55-140	N/A	0-20	
4-Methyl-2-Pentanone	50.00	54.61	109	N/A	N/A	60-135	N/A	0-20	
Styrene	50.00	55.76	112	N/A	N/A	65-135	N/A	0-20	
1,1,1,2-Tetrachloroethane	50.00	53.71	107	N/A	N/A	80-130	N/A	0-20	
1,1,2,2-Tetrachloroethane	50.00	54.37	109	N/A	N/A	65-130	N/A	0-20	
Tetrachloroethene	50.00	53.54	107	N/A	N/A	45-150	N/A	0-20	
Toluene	50.00	52.86	106	N/A	N/A	75-120	N/A	0-20	
1,2,4-Trichlorobenzene	50.00	57.01	114	N/A	N/A	65-135	N/A	0-20	
1,1,1-Trichloroethane	50.00	48.94	98	N/A	N/A	65-130	N/A	0-20	
Hexachloro-1,3-Butadiene	50.00	54.06	108	N/A	N/A	50-140	N/A	0-20	
1,1,2-Trichloroethane	50.00	53.95	108	N/A	N/A	75-125	N/A	0-20	

RPD: Relative Percent Difference. CL: Control Limits

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Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCSD

Environmental Science International, Inc.
354 Uluniu Street, Suite 304
Kailua, HI 96734-2500

Project: Red Hill LTM 112066

Date Received: 07/26/13
Work Order: 13-07-1752
Preparation: EPA 5030C
Method: GC/MS / EPA 8260B

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Trichloroethene	50.00	52.76	106	N/A	N/A	70-125	N/A	0-20	
1,2,3-Trichloropropane	50.00	51.92	104	N/A	N/A	75-125	N/A	0-20	
Vinyl Chloride	50.00	50.66	101	N/A	N/A	50-145	N/A	0-20	
p/m-Xylene	100.0	106.1	106	N/A	N/A	75-130	N/A	0-20	
o-Xylene	50.00	51.18	102	N/A	N/A	80-120	N/A	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.32	95	N/A	N/A	65-125	N/A	0-20	
Gasoline Range Organics	1000	1013	101	939.9	94	80-120	8	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Calscience Environmental Laboratories, Inc.

Sample Analysis Summary Report

Work Order: 13-07-1752

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6020	EPA 3020A Total	598	ICP/MS 04	1
EPA 8015B (M)	EPA 3510C	682	GC 45	1
EPA 8270C SIM PAHs	EPA 3510C	773	GC/MS AAA	1
GC/MS / EPA 8260B	EPA 5030C	670	GC/MS LL	2

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order: 13-07-1752 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
DL	The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
ICH	Initial calibration verification recovery is above the control limit for this analyte.
ICJ	Initial calibration verification recovery is below the control limit for this analyte.
IH	Calibration verification recovery is above the control limit for this analyte.
IJ	Calibration verification recovery is below the control limit for this analyte.
J	Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.
LOD	The Limit of Detection (LOD) is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at 99% confidence level.
LOQ	The Limit of Quantitation (LOQ) is the lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
U	Undetected at Detection Limit (DL) and is reported as less than the Limit of Detection (LOD).
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Calscience Environmental Laboratories, Inc.

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
Other CA office locations: Concord and San Luis Obispo
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY
13-07-1752

Date
Page 1 of 1

LABORATORY CLIENT: Environmental Science International
ADDRESS: 354 Uluniu St. #304
CITY: Kailua STATE: Hi ZIP: 96734
TEL: 808-261-0740 E-MAIL: RCHONG@ESCIENCEI.com; DFEITER@ESCIENCEI.com

CLIENT PROJECT NAME / NUMBER: Red Hill LTM 112066
PROJECT CONTACT: Robert Chong
P.O. NO.:
SAMPLER(S): (PRINT) BI/JL

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

☐ COELT EDF GLOBAL ID LOG CODE

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH(g) ~~GCFID~~ 8260	TPH(d) ~~DRO~~ 8015B	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ~~8270~~ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	Lead 6020			
1	ES Trip	7/24/13	0700	Water	3		X		X					X												
2	ES034	7/24/13	0815	Water	10	X	X	X	X	X				X							X			X			
2	ES034 MS/MSD	7/24/13	0815	Water	10	X	X	X	X	X				X							X			X			
3	ES035	7/24/13	0900	Water	10	X	X	X	X	X				X							X			X			
4	ES036	7/24/13	0930	Water	10	X	X	X	X	X				X							X			X			

Relinquished by: (Signature) Brandon Ibarra 7/24/13 1100	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 7/26/13	Time: 1020
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

11/01/12 Revision

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FedEx Express US Airbill

8531 6209 1700

0200

Form ID No. 1752

FedEx Retrieval Copy

1 From

Date 7/24/13 Sender's FedEx Account Number

Sender's Name Branden Ibara Phone 808 261-0740

Company Environmental Science International

Address 354 Uluniu St. #304

Dept./Floor/Suite/Room

City Kailua State Hi ZIP 96734

2 Your Internal Billing Reference

3 To

Recipient's Name Sample Control Phone 714 895-5494

Company Calscience Laboratories

Recipient's Address 7440 Lincoln Way

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Garden Grove State Ca ZIP 92841

4a Express Package Service — Packages up to 150 lbs. * To most locations

1 ☐ FedEx Priority Overnight* Next business morning*

5 ☐ FedEx Standard Overnight Next business afternoon*

6 ☐ FedEx First Overnight Earliest next business morning delivery to select locations*

3 ☒ FedEx 2Day Second business day*

20 ☐ FedEx Express Saver Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs. ** To most locations

7 ☐ FedEx 1Day Freight** Next business day**

8 ☐ FedEx 2Day Freight Second business day**

83 ☐ FedEx 3Day Freight Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

6 ☐ FedEx Envelope*

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3 ☐ FedEx Box

4 ☐ FedEx Tube

1 ☒ Other

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1 ☐ HOLD Weekday at FedEx Location Not available for FedEx First Overnight

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Does this shipment contain dangerous goods? One box must be checked.

☐ No 4 ☐ Yes As per attached Shipper's Declaration ☐ Yes Shipper's Declaration not required 6 ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. ☐ Cargo Aircraft Only

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1 ☐ Sender Acct. No. in Section 1 will be billed. 2 ☒ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

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8531 6209 1700

ORIGIN ID:HNLA

UNITED STATES US

SHIP DATE: 24JUL13
ACTWGT: 43.9 LB
CAD: /POS1400
DIMS: 22x13x12 IN

BILL RECIPIENT

TO SAMPLE CONTROL
CALSCIENCE
7440 LINCOLN WAY

GARDEN GROVE CA 92841

(714) 895-5494 REF:

INV:
PO: DEPT:

FedEx Express

J13113021201 26

2 of 2

MPS# 0681 7958 0141 6730

Mstr# 8531 6209 1700 0200

VZ APVA

FRI - 26 JUL AA
** 2DAY **

92841
CA-US SNA

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-07-1752

SAMPLE RECEIPT FORM

Cooler 1 of 2

CLIENT: Env. Science DATE: 07/26/13

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.3 °C - 0.2 °C (CF) = 2.1 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Initial: AP

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Initial: AP

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: 7/26

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH/Res. Cl/Diss. Sulfide/Diss. Oxygen received within 15-min holding time	☐	☐	☐
Proper preservation noted on COC or sample container	☑	☐	☐
☑ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☑	☐	☐
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☑6VOA ☑3VOAh ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑2 1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** AH

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** WC

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:**$Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:**

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-07-1752

SAMPLE RECEIPT FORM

Cooler 2 of 2

CLIENT: Env. Science DATE: 07/26/13

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 3.2 °C - 0.2 °C (CF) = 3.0 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Initial: AP

CUSTODY SEALS INTACT:

☑ Cooler	☐ _____	☐ No (Not Intact)	☐ Not Present	☐ N/A	Initial: AP
☐ Sample	☐ _____	☐ No (Not Intact)	☑ Not Present		Initial: AP

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH/Res. Cl/Diss. Sulfide/Diss. Oxygen received within 15-min holding time..	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☑1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☑500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☑250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** AH

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** WR

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:** $Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** WR

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APPENDIX D

Historical Groundwater Exceedance Trends

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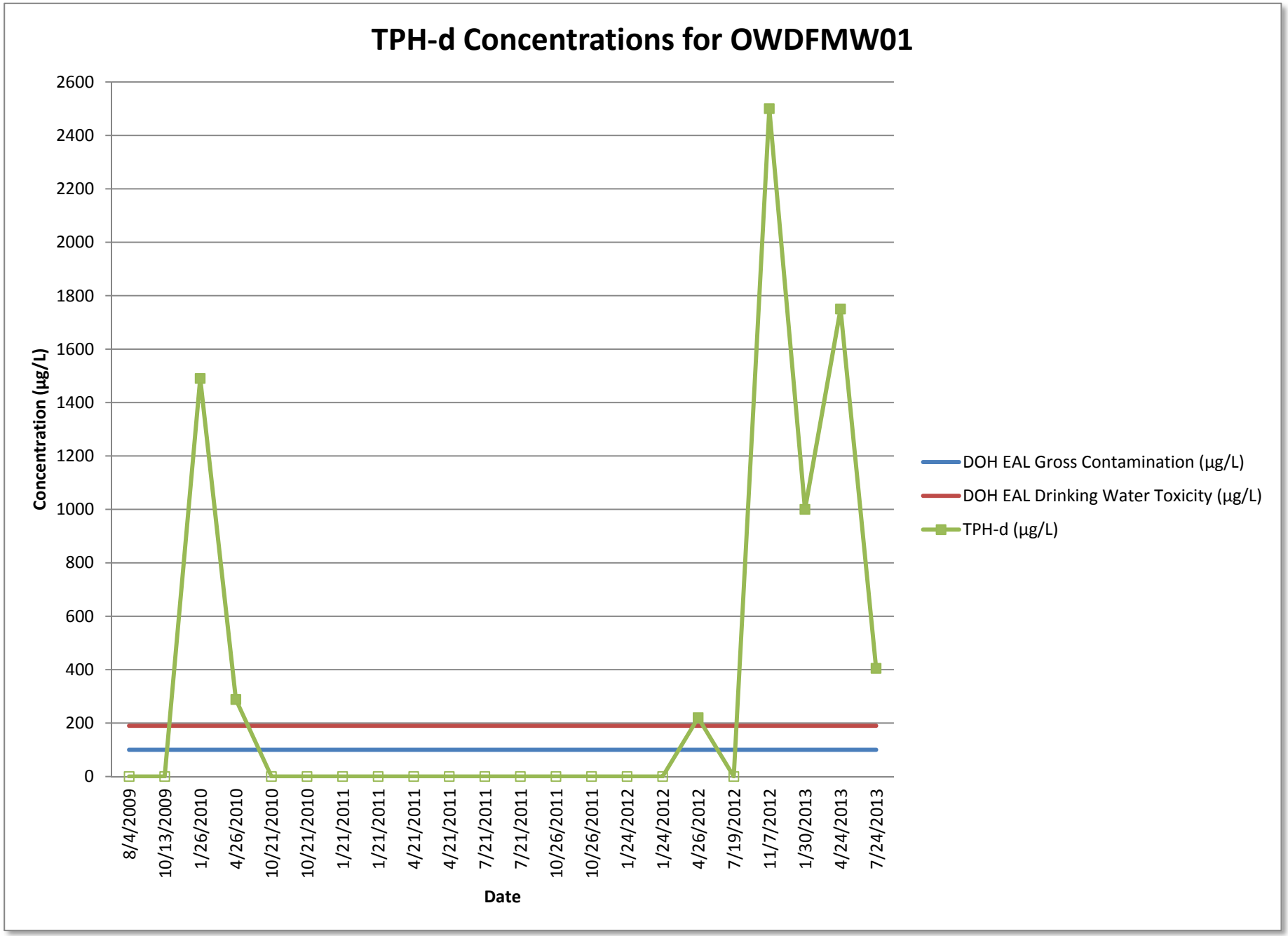

Data points for 10/21/2010 through 1/24/2012 and 11/07/2012 through 7/24/2013 are the average of the primary and duplicate samples.
Unfilled boxes indicate non-detections. Method detection limits are shown.

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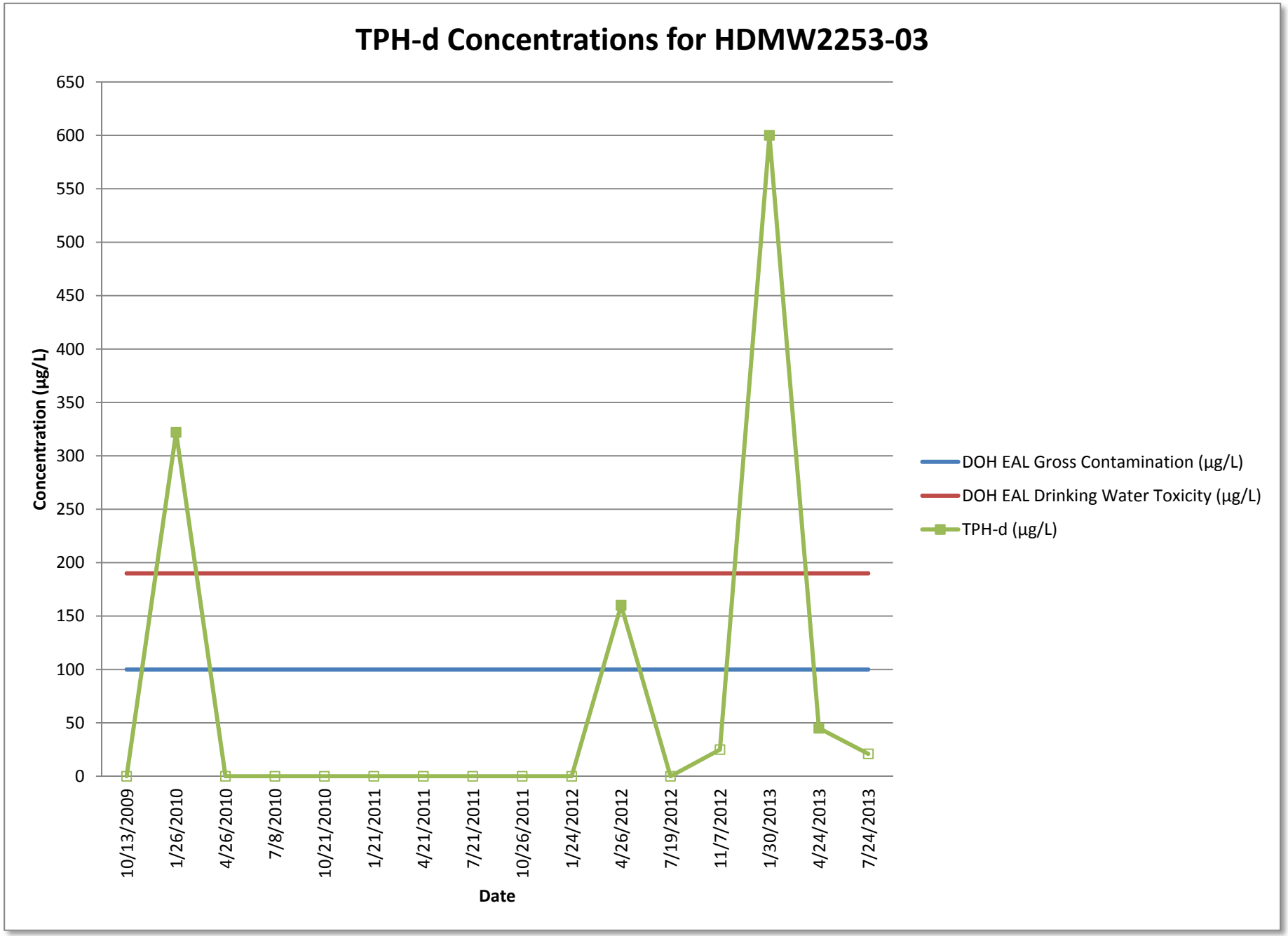

Unfilled boxes indicate non-detections. Method detection limits are shown.

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APPENDIX E

Waste Disposal Manifest

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NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
HIR 000 050 401	1	808-206-9989	000019559

GENERATOR

5. Generator's Name and Mailing Address
COMNAVREG HAWAII, C/O NAVFAC HAWAII, CODE PRJ42
400 MARSHALL ROAD, ATTN: ESTRELITA HIGA
JBPHH, HI 96860-3139
Generator's Phone: 808-471-4216

Generator's Site Address (if different than mailing address)
HIC8553-04
RED HILL BULK FUEL STORAGE FACILITY
AIEA, HI 96701

6. Transporter 1 Company Name: PACIFIC COMMERCIAL SERVICES, LLC. 808-545-4599 — U.S. EPA ID Number: HIR000097824

7. Transporter 2 Company Name: UNITEK SOLVENT SERVICES, INC.-OAHU 808-682-8284 — U.S. EPA ID Number: HID982443715

8. Designated Facility Name and Site Address
UNITEK SOLVENT SERVICES, INC.
91-125 KAOMI LOOP
KAPOLEI, HI 96707
Facility's Phone: ~~808-682-8284~~
U.S. EPA ID Number: HID982443715

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	MATERIAL NOT REGULATED BY DOT (WELL PURGE AND DECONTAMINATION WATER)	001	DM	00020	G	NON-RCRA
2.						
3.						
4.	<400 PPM PH=6					

13. Special Handling Instructions and Additional Information
9b1: NR (<400 PPM) 2008 9b1: TOTAL HALOGEN:

GENERATOR'S CERTIFICATION: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME (WHERE APPLICABLE) AND ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE GOVERNMENT REGULATIONS. I FURTHER CERTIFY THAT IF THIS IS USED OIL IT IS SUBJECT TO REGULATION UNDER 40 CFR PART 279; THAT IT DOES NOT CONTAIN PCBS GREATER THAN OR EQUAL TO 2 PPM; AND THAT IT HAS NOT BEEN CONTAMINATED WITH CARBURATOR CLEANERS, ~~BRAKE SPRAY, FREON, HALOGENATED SOLVENTS, OR OTHER HAZARDOUS MATERIALS AND/OR HAZARDOUS WASTES.~~

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Estrelita Higa — Signature: Estrelita Higa — Month: 08 Day: 23 Year: 13

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: ALAN O. MILLARE — Signature: Alan O. Millare — Month: 8 Day: 23 Year: 13

Transporter 2 Printed/Typed Name: Silinga Lemafa — Signature: — Month: 8 Day: 28 Year: 13

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month Day Year

PCB test provided SEE CONSOLIDATED MANIFEST Mwingy

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: R. ALTHAUSEN — Signature: — Month: 08 Day: 30 Year: 2013

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