

# **Final First Quarter 2013 - Quarterly Groundwater Monitoring Report Inside 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**

**April 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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Naval Facilities Engineering Command, Hawaii  
400 Marshall Road  
JBPHH, HI 96860-3139**

Prepared by:

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354 Uluniu Street, Suite 304  
Kailua, HI 96734**

Prepared under:

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

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**FINAL**  
**FIRST QUARTER 2013 - QUARTERLY GROUNDWATER MONITORING REPORT**  
**INSIDE 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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## ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
%	percent
bgs	below ground surface
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
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
pH	hydrogen activity
RHSF	Red Hill Bulk Fuel Storage Facility
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
TEC	The Environmental Company, Inc.
TPH	Total Petroleum Hydrocarbons
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 Compound
WP	Work Plan

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## EXECUTIVE SUMMARY

This quarterly groundwater monitoring report presents the results of the first quarter 2013 groundwater sampling conducted on January 28 to 29 and February 4, 2013, at 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 January 28 to 29 and February 4, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01). A summary of the analytical results is provided below.

- **RHMW01** – Total Petroleum Hydrocarbons as diesel [TPH-d] (79 micrograms per liter [ $\mu\text{g/L}$ ]), Total Petroleum Hydrocarbons as gasoline [TPH-g] (13  $\mu\text{g/L}$ ), naphthalene (0.10  $\mu\text{g/L}$ ), and dissolved lead (0.846  $\mu\text{g/L}$ ) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH Environmental Action Levels [EALs].
- **RHMW02** – TPH-d (1,700  $\mu\text{g/L}$ ), TPH-g (660  $\mu\text{g/L}$ ), acenaphthene (0.57  $\mu\text{g/L}$ ), fluorene (0.3  $\mu\text{g/L}$ ), 1-methylnaphthalene (47  $\mu\text{g/L}$ ), 2-methylnaphthalene (35  $\mu\text{g/L}$ ), naphthalene (110  $\mu\text{g/L}$ ), ethylbenzene (0.21  $\mu\text{g/L}$ ), and xylenes (0.65  $\mu\text{g/L}$ ) were detected. TPH-d, TPH-g, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination.
- **RHMW03** – TPH-d (59  $\mu\text{g/L}$ ), 1-methylnaphthalene (0.10  $\mu\text{g/L}$ ), 2-methylnaphthalene (0.069  $\mu\text{g/L}$ ), and naphthalene (0.32  $\mu\text{g/L}$ ) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW05** – TPH-d (62  $\mu\text{g/L}$ ) and naphthalene (0.075  $\mu\text{g/L}$ ) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW2254-01** – TPH-g (22  $\mu\text{g/L}$ ), naphthalene (0.052  $\mu\text{g/L}$ ), and total lead (0.242  $\mu\text{g/L}$ ) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

Since the wells were last sampled (October 2012), groundwater contaminant concentrations in four wells (RHMW01, RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected. Only the groundwater samples from RHMW02 showed concentrations of Contaminants of Potential Concern [COPCs] exceeding the DOH EALs. TPH-d concentrations detected in the sample collected from well RHMW02 are consistent with previous analytical data. 1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations have increased since the last sampling event; however, elevated concentrations have been detected in groundwater samples collected during past sampling events. TPH-g concentrations increased since the last sampling event, and is the highest concentration since routine groundwater sampling was initiated in 2005.

With the exception of TPH-g, concentrations of COPCs in well RHMW02 have not changed significantly. The COPCs TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations have been decreasing over the long-term. However, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have increased since April 2012.

Based on the results of the groundwater monitoring, ESI recommends continuing the groundwater monitoring program at the RHSF. If TPH-g concentrations in Well RHMW02 continue to increase, we recommend increasing monitoring frequency to monthly in accordance with the RHSF Groundwater Protection Plan.

## SECTION 1 – INTRODUCTION

This quarterly groundwater monitoring report presents the results of the first quarter 2013 groundwater sampling conducted on January 28 to 29 and February 4, 2013, at the RHSF, JBPHH. 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 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. 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 that 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 the USTs are summarized in Table 1.1.

Five groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01) are located within the RHSF lower access tunnel (Figure 2). Two groundwater monitoring wells (wells HDMW2253-03 and OWDFMW01) are located outside of the RHSF tunnel system. (Monitoring data for the two wells located outside 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. The 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**  
**January 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 SETTING

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 RHSF, 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 25-90% 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 DON Well 2254-01, located in the infiltration gallery within the RHSF. The 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. 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 a depth varying between 100 feet and 200 feet below ground surface [bgs].

In 1998, Earth Tech conducted a Phase II remedial investigation/feasibility study for the Oily Waste Disposal Facility located within the RHSF. The study involved installing well OWDFMW01 (which was originally MW08) (Earth Tech, 1999).

In February 2001, the DON installed groundwater monitoring well RHMW01 to monitor for contamination in the basal aquifer beneath the RHSF. Well RHMW01 was installed approximately 100 feet below grade within the lower access tunnel. The depth to water was measured at 86 feet below grade at the time of the well completion. In February 2001, a groundwater sample was collected from the well. Total Petroleum Hydrocarbons [TPH] and lead were detected in the samples. Lead was detected at a concentration above the DOH EAL (The Environmental Company, Inc. [TEC], 2009; DOH, 2000).

In 2005, the RHSF groundwater monitoring program was initiated. It involved routine groundwater sampling of wells RHMW01 and RHMW2254-01. Samples were collected in February, June, September, and December of 2005. Lead was detected at concentrations above the DOH EAL in samples collected in February and June. The samples collected in February and June were not filtered prior to analysis, whereas the samples collected in September and December were filtered prior to analysis. Since the samples collected in February and June were not filtered prior to analysis, the lead results were not considered appropriate for a risk assessment (TEC, 2008).

Between June and September 2005, TEC installed three groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) within the RHSF (TEC, 2008). Well RHMW04 was installed upgradient of the USTs to provide background geochemistry information for water moving through the basal aquifer beneath the RHSF. Wells RHMW02 and RHMW03 were installed approximately 125 feet below grade within the RHSF lower tunnel and well RHMW04 was installed to a depth of approximately 300 feet bgs outside of the RHSF tunnels. In September 2005, groundwater samples were collected from the three newly installed groundwater monitoring wells (wells RHMW02, RHMW03, and RHMW04) along with the two existing wells (wells RHMW01 and RHMW2254-01). The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, trichloroethylene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2006, TEC installed dedicated sampling pumps in the five wells (wells RHWM01, RHWM02, RHMW03, RHWM04, and RHMW2254-01). In July and December of 2006, groundwater



samples were collected from the five wells. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d and naphthalene were detected at concentrations above the DOH EALs.
- **RHMW02** – TPH-g, TPH-d, and naphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2007, groundwater samples were collected from the four wells RHMW01, RHMW02, RHMW03, and RHMW2254-01. Samples were collected in March, June, and September of 2007. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In 2008, groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, and RHMW2254-01. Samples were collected in January, April, July, and October of 2008. The COPCs with concentrations exceeding DOH EALs are summarized below. In addition, a groundwater protection plan (TEC, 2008) was prepared.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at concentrations above the DOH EAL.

In April 2009, groundwater monitoring well RHMW05 was installed downgradient of the USTs, within the lower access tunnel between RHMW01 and RHMW2254-01. It was installed to identify the extent of contamination downgradient of the USTs. Well RHMW05 was added to the quarterly groundwater sampling program. In 2009, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in February, May, July, and October of 2009. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d and 1-methylnaphthalene were detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at a concentration above the DOH EAL.
- **RHMW05** – TPH-d was detected at a concentration above the DOH EAL.

In 2010, groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-g, TPH-d, naphthalene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs.
- **RHMW03** – TPH-d was detected at a concentration above the DOH EAL.
- **RHMW05** – TPH-d was detected at a concentration above the DOH EAL.

In 2011, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in January, April, July, and October. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, naphthalene, ideno[1,2,3-cd]pyrene, and 1-methylnaphthalene were detected at concentrations above the DOH EALs.

In 2012, quarterly groundwater samples were collected from wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01. Samples were collected in February, April, July, and November. The COPCs with concentrations exceeding DOH EALs are summarized below.

- **RHMW01** – TPH-d was detected at concentrations above the DOH EAL.
- **RHMW02** – TPH-d, TPH-g, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected at concentrations above the DOH EALs.

### ***1.3.1 Previous Reports***

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

1. Groundwater Sampling Report, First Quarter 2005 (submitted April 2005).
2. Groundwater Sampling Report, Second Quarter 2005 (submitted August 2005).
3. Groundwater Sampling Report, Third Quarter 2005 (submitted November 2005).
4. Groundwater Sampling Report, Fourth Quarter 2005 (submitted February 2006).
5. Groundwater Monitoring Results, July 2006 (submitted September 2006).
6. Groundwater Monitoring Results, December 2006 (submitted January 2007).
7. Groundwater Monitoring Results, March 2007 (submitted May 2007).
8. Groundwater Monitoring Results, June 2007 (submitted August 2007).

9. Groundwater Monitoring Results, September 2007 (submitted October 2007).
10. Groundwater Monitoring Report, January 2008 (submitted March 2008).
11. Groundwater Monitoring Report, April 2008 (submitted May 2008).
12. Groundwater Monitoring Report, July 2008 (submitted October 2008).
13. Groundwater Monitoring Report, October and December 2008 (submitted February 2009).
14. Groundwater Monitoring Report, February 2009 (submitted May 2009).
15. Groundwater Monitoring Report, May 2009 (submitted July 2009).
16. Groundwater Monitoring Report, July 2009 (submitted September 2009).
17. Groundwater Monitoring Report, October 2009 (submitted December 2009).
18. Groundwater Monitoring Report, January, February, and March 2010 (submitted April 2010).
19. Groundwater Monitoring Report, April 2010 (submitted May 2010).
20. Groundwater Monitoring Report, July 2010 (submitted August 2010).
21. Groundwater Monitoring Report, October 2010 (submitted December 2010).
22. Groundwater Monitoring Report, January 2011 (submitted March 2011).
23. Groundwater Monitoring Report, April 2011 (submitted June 2011).
24. Groundwater Monitoring Report, July 2011 (submitted September 2011).
25. Groundwater Monitoring Report, October 2011 (submitted December 2011).
26. Groundwater Monitoring Report, January-February 2012 (submitted March 2012).
27. Groundwater Monitoring Report, April 2012 (Submitted July 2012).
28. Groundwater Monitoring Report, October 2012 (Submitted in January 2013).

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## **SECTION 2 – GROUNDWATER SAMPLING**

From January 28 to 29 and February 4, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01). The samples were collected in accordance with DOH UST release response requirements (DOH, 2000) and the RHSF Groundwater Protection Plan (TEC, 2008). Prior to purging and sampling, the depth to groundwater and the depth to the bottoms of the wells were measured using a Geotech oil/water interface probe. No measurable product, sheen, or petroleum hydrocarbon odor was detected in any of the wells.

### **2.1 GROUNDWATER SAMPLING**

Prior to collecting groundwater samples, the monitoring wells were purged of water in the well casings. Each well contains a dedicated bladder pump which was used to purge the well and to collect samples. To operate the pump, a portable air compressor with an in-line filter was connected to a QED MP50 MicroPurge Basics Controller box, which was then connected to the pump. The compressor was turned on to power the pump and the controller was used to adjust the pumping rate to less than one liter of water per minute.

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 assess whether the natural characteristics of the aquifer formation water were present within the monitoring wells before collecting the samples. 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. The groundwater monitoring logs are included in Appendix A. In addition, field notes were taken to document the sampling event. The field notes are included in Appendix B.

When the water quality parameters stabilized, groundwater samples were collected from the wells using the bladder pumps. The groundwater samples were collected no more than two hours after purging was completed to decrease groundwater interaction with the monitoring well casing and atmosphere. Prior to collecting the sample, the water level in the monitoring wells was measured and recorded to ensure that water was not drawn down. The groundwater samples were collected at a flow rate of approximately 0.06 to 0.5 liters per minute. Samples collected for dissolved lead analysis were filtered in the field using 0.45 micron filters.

### **2.2 ANALYTICAL RESULTS**

The samples were analyzed for TPH-d using U.S. Environmental Protection Agency [EPA] Method 8015M, TPH-g and Volatile Organic Compounds [VOCs] using EPA Method 8260B, Polycyclic Aromatic Hydrocarbons [PAHs] using EPA Method 8270C SIM, dissolved lead using EPA Method 6020, and total lead using EPA Method 200.8. The sample collected from well

RHMW2254-01 was analyzed for total lead (unfiltered) as DON Well 2254-01 is a drinking water supply well. The analytical results are summarized below and in Table 2.1. A copy of the laboratory report is included in Appendix C.

- **RHMW01** – TPH-d (79 µg/L), TPH-g (13 µg/L), naphthalene (0.10 µg/L) and dissolved lead (0.846 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW02** – TPH-d (1,700 µg/L), TPH-g (660 µg/L), acenaphthene (0.57 µg/L), fluorene (0.30 µg/L), 1-methylnaphthalene (47 µg/L), 2-methylnaphthalene (35 µg/L), naphthalene (110 µg/L), ethylbenzene (0.21 µg/L), and xylenes (0.65 µg/L) were detected. TPH-d, TPH-g, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination.
- **RHMW03** – TPH-d (59 µg/L), 1-methylnaphthalene (0.10 µg/L), 2-methylnaphthalene (0.069 µg/L), and naphthalene (0.32 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW05** – TPH-d (62 µg/L) and naphthalene (0.075 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW2254-01** – TPH-g (22 µg/L), naphthalene (0.052 µg/L), and total lead (0.242 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

### **2.2.1 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 are provided below.

- **RHMW01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations showed a decreasing trend from 1,500 µg/L in February 2005 to 79 µg/L in February 2013.
- **RHMW02** – TPH-d, TPH-g, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations show a decreasing trend from a high average of 5,420 µg/L in October 2008 to concentrations ranging from 1,500-2,200 µg/L during the last several rounds of sampling.

1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene show a decreasing trend over the long-term. However, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have steadily increased since April 2012.

TPH-g concentrations show an increasing trend with a significant increase from 320 µg/L during the last round of sampling to 660 µg/L during this round of sampling.

- **RHMW03** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since October 2010.
- **RHMW05** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.
- **RHMW2254-01** – COPCs detected during this round of quarterly sampling were consistent with historical data. None of the COPCs have been detected at concentrations above the DOH EALs.

Historical groundwater contaminants concentrations above the DOH EALs for both drinking water toxicity and gross contamination are presented in Appendix D.

## 2.3 WASTE DISPOSAL

The purged groundwater and decontamination water generated during sampling of the inside tunnel wells was stored in a 55-gallon drum along with the purged water and decontamination water from the outside tunnel wells. The water was disposed of following receipt of the analytical results for the outside tunnel wells. The drum was stored onsite at Adit 3. On February 26, 2013, the drum of water was picked up by Pacific Commercial Services, LLC, and disposed of at Unitek Solvent Services, Inc. The waste disposal manifest is included in Appendix E.

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TABLE 2.1  
Analytical Results for Groundwater Sampling (January 28 to 29 and February 4, 2013)  
Red Hill Bulk Fuel Storage Facility  
January 2013 Quarterly Monitoring Report

Method	Chemical	DOH EALs		RHMW2254-01 (ES 014)					RHMW01 (ES010)					RHMW02 (ES011)					RHMW03 (ES013)					RHMW05 (ES015)				
		Drinking Water Toxicity	Gross Contamination	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL	Results	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	22	HD,J	56	22	16	79		54	22	16	1,700	HD	56	22	16	59	HD	56	22	16	62	HD	56	22	16
EPA 8260B	TPH-g	100	100	N.D.	U	50	30	13	13	J	50	30	13	660		50	30	13	N.D.		50	30	13	N.D.		50	30	13
	Acenaphthene	370	20	N.D.	U	0.2	0.05	0.021	N.D.	U	0.2	0.05	0.021	0.57		0.2	0.05	0.021	N.D.		0.2	0.05	0.021	N.D.		0.2	0.05	0.021
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.05	0.018
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.05	0.034
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.036	N.D.	U	0.2	0.05	0.036	N.D.	U	0.2	0.05	0.036	N.D.	U	0.2	0.05	0.036	N.D.	U	0.2	0.05	0.036
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	N.D.	U	0.2	0.05	0.023	N.D.	U	0.2	0.05	0.023	N.D.	U	0.2	0.05	0.023	N.D.	U	0.2	0.05	0.023
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.05	0.019
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027
	Fluorene	240	950	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	0.30		0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022
	1-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.05	0.028	N.D.	U	0.2	0.05	0.028	47		5	1.2	0.71	0.10	J	0.2	0.05	0.028	N.D.	U	0.2	0.05	0.028
	2-Methylnaphthalene	24	10	N.D.	U	0.2	0.05	0.026	N.D.	U	0.2	0.05	0.026	35		5	1.2	0.66	0.069	J	0.2	0.05	0.026	N.D.	U	0.2	0.05	0.026
	Naphthalene	17	21	0.052	J	0.2	0.05	0.023	0.10	J	0.2	0.05	0.023	110		5	1.2	0.57	0.32		0.2	0.05	0.023	0.075	J	0.2	0.05	0.023
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.05	0.031
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025
	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.431
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	IJ, ICH, U	20	10	10	N.D.	IJ, ICH, U	20	10	6	N.D.	IJ, ICH, U	20	10	10	N.D.	IJ, ICH, U	20	10	10	N.D.	IJ, ICH, U	20	10	10
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5
	Bromomethane	8.7	50,000	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	N.D.	U	1		

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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 meets the quality objectives for the project. The data quality assessment was performed in accordance with the approved WP/SAP prepared by ESI (ESI, 2012). The field quality control 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, method blanks, and Laboratory Control Samples [LCSs].

### 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 its 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/Laboratory Control Sample Duplicates [LCSDs] 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.

For this monitoring event, all RPDs for MS/MSD and LCS/LCSD pairs were within the acceptance range. The RPDs of primary and field duplicate samples are provided in Table 3.1. All RPDs are less than 20% (below 50% as recommended in the NAVFAC Project Procedures Manual (DON 2007), and therefore, the data precision is considered acceptable.

#### ***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.

All surrogate spike recoveries for analyzed constituents were within acceptable percent recovery limits. The LCS analyzed for acetone was higher than the acceptable percent recovery limit and indicates a high bias. Acetone was not detected in the sample, therefore the high bias does not compromise the sample data accuracy. All other LCS recoveries were within recovery limits. The analyte concentrations (naphthalene, 2-methylnaphthalene and 1-methylnaphthalene) for ES011, the primary sample on which the MS/MSD were performed,

were significantly higher than the added spike concentration which prevented an accurate evaluation of the MS/MSD recovery. All other MS and 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 (ESI, 2012).

Representativeness is also evaluated via compliance with established sample holding time and sample preservation, and through the analysis of blank samples, including method blank and trip blank samples. The sample holding time and sample preservation complied with the EPA guidance. For this sampling event, two trip blanks were collected. TPH-g and VOCs were not detected in the first trip blank. TPH-g and toluene were detected in the second trip blank. TPH-g was detected in the trip blank at a concentration below the limit of detection [LOD]. Toluene was not detected in any of the samples. The groundwater sample data are considered representative of the groundwater quality on site. The quality control results are provided in Table 3.2.

### ***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 analytical laboratory. No data were rejected for this project, and therefore the completeness goal for this project (90%), was successfully met. Successful completion of data acquisition can only be accomplished if both the field and laboratory portions of the project are performed according to the procedures described in the WP/SAP (ESI, 2012).

### ***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.

### ***Sensitivity***

The limits of quantitation [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 and in some cases, dilution was necessary due to the presence of high concentrations of analytes. 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 LOD 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 the three PAHs (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene) due to significantly higher concentrations in the sample (which exceeded DOH EALs) compared to the spiked concentration, which prevents the accurate evaluation of MS/MSD recovery. Since the surrogate recoveries and the recoveries of these three PAHs in the LCS/LCSD are all within recovery criteria, the accuracy is considered acceptable, and the exceedance is attributed to the high concentration in the sample. The data assessment concludes that all data generated during this event are usable for the intended use for project decisions.

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TABLE 3.1  
Quality Control Results for Groundwater Sampling (January 28, 2013)  
Red Hill Bulk Fuel Storage Facility  
January 2013 Quarterly Monitoring Report

Method	Chemical Constituent	DOH EALs		RHMW02 (ES011)					RHMW02 (ES012)					RPD Duplicate (%)	ES Trip (01/29/13)				
		Drinking Water Toxicity	Gross Contamination	Result	Q	LOQ	LOD	DL	Result	Q	LOQ	LOD	DL		Result	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	1,700	HD	56	22	16	1,500	HD	56	22	16	12.5	-	-	-	-	-
EPA 8260B	TPH-g	100	100	660		50	30	13	650		50	30	13	1.53	N.D.	U	50	30	13
EPA 8270C	Acenaphthene	370	20	0.57		0.2	0.05	0.021	0.54		0.2	0.05	0.021	5.41	-	-	-	-	-
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	N.D.	U	0.2	0.05	0.018	NA	-	-	-	-	-
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	N.D.	U	0.2	0.05	0.034	NA	-	-	-	-	-
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	N.D.	U	0.2	0.05	0.024	NA	-	-	-	-	-
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	NA	-	-	-	-	-
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.036	N.D.	U	0.2	0.05	0.036	NA	-	-	-	-	-
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	NA	-	-	-	-	-
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	N.D.	U	0.2	0.05	0.023	NA	-	-	-	-	-
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	N.D.	U	0.2	0.05	0.019	NA	-	-	-	-	-
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	N.D.	U	0.2	0.05	0.027	NA	-	-	-	-	-
	Fluorene	240	950	0.30		0.2	0.05	0.024	0.27		0.2	0.05	0.024	10.53	-	-	-	-	-
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	N.D.	U	0.2	0.05	0.022	NA	-	-	-	-	-
	1-Methylnaphthalene	4.7	10	47		5	1.2	0.71	41		5	1.2	0.71	13.64	-	-	-	-	-
	2-Methylnaphthalene	24	10	35		5	1.2	0.66	31		5	1.2	0.66	12.12	-	-	-	-	-
	Naphthalene	17	21	110		5	1.2	0.57	100		5	1.2	0.57	9.52	-	-	-	-	-
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.031	N.D.	U	0.2	0.05	0.031	NA	-	-	-	-	-
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	N.D.	U	0.2	0.05	0.025	NA	-	-	-	-	-
EPA 8260B	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3	NA	N.D.	U	5	0.5	0.3
	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38	NA	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28	NA	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.431	NA	N.D.	U	1	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64	NA	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5	NA	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2	NA	N.D.	U	10	5	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36	NA	N.D.	U	1	0.5	0.36
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46	NA	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42	NA	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43	NA	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	IJ, ICH, U	20	10	10	N.D.	IJ, ICH, U	20	10	10	NA	N.D.	IJ, ICH, U	20	10	10
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14	NA	N.D.	U	1	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21	NA	N.D.	U	5	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5	NA	N.D.	U	10	1	0.5
	Bromomethane	8.7	50,000	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9	NA	N.D.	U	20	5	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23	NA	N.D.	U	1	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17	NA	N.D.	U	5	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3	NA	N.D.	U	10	5	2.3
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46	NA	N.D.	U	5	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U	10	5	1.8	N.D.	U	10	5	1.8	NA	N.D.	U	10	5	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48	NA	N.D.	U	1	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25	NA	N.D.	U	1	0.5	0.25
	Ethylbenzene	700	30	0.21	J	1	0.5	0.14	0.24	J	1	0.5	0.14	13.33	N.D.	U	1	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32	NA	N.D.	U	1	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U	10	5.0	2.21	N.D.	U	10	5.0	2.21	NA	N.D.	U	10	5.0	2.21
	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	0.5	0.31	N.D.	U	1	0.5	0.31	NA	N.D.	U	1	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64	NA	N.D.	U	5	1.0	0.64
	Styrene	100	10	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17	NA	N.D.	U	1	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4	NA	N.D.	U	1	0.5	0.4
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41	NA	N.D.	U	1	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5	0.5	0.387	N.D.	U	5	0.5	0.387	NA	N.D.	U	5	0.5	0.39
	Toluene	1,000	40	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24	NA	N.D.	U	1	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37	NA	N.D.	U	1	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1	0.5	0.368	N.D.	U	1	0.5	0.368	NA	N.D.	U	1	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3	NA	N.D.	U	1	0.5	0.3
	Xylenes	10,000	20	0.65	J	10	1	0.23	0.69	J	10	1	0.23	5.97	N.D.	U	10	1	0.23
EPA 6020	Lead	15	50,000	N.D.	U	1	0.2	0.0898	0.171	J	1	0.2	0.0898	0	-	-	-	-	-

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

- Not Analyzed

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

ICH Initial calibration verification recovery above method control limit for this analyte.

IJ Calibration verification recovery above method control limit for this analyte.

J Analyte was detected at a concentration below the LOQ and above the DL. Reported value is estimated.

LOD Limit of Detection

LOQ

NA

N.D.

Q

TPH-g

TPH-d

U

Limit of Quantitation

Both results for duplicate pair were non-detect, no RPD calculations

Not Detected

Qualifiers

Total Petroleum Hydrocarbons as gasoline

Total Petroleum Hydrocarbons as diesel

Undetected at DL and is reported as less than the LOD.

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TABLE 3.2  
Quality Control Results for Groundwater Sampling (February 4, 2013)  
Red Hill Bulk Fuel Storage Facility  
January 2013 Quarterly Monitoring Report

Method	Chemical Constituent	DOH EALs		RHMW01 (ES010)					ES Trip (02/04/13)				
		Drinking Water Toxicity	Gross Contamination	Result	Q	LOQ	LOD	DL	Result	Q	LOQ	LOD	DL
EPA 8015B	TPH-d	190	100	79		54	22	16	-	-	-	-	-
EPA 8260B	TPH-g	100	100	13	J	50	30	13	18	J	50	30	13
EPA 8270C	Acenaphthene	370	20	N.D.	U	0.2	0.05	0.021	-	-	-	-	-
	Acenaphthylene	240	2,000	N.D.	U	0.2	0.05	0.018	-	-	-	-	-
	Anthracene	1,800	22	N.D.	U	0.2	0.05	0.034	-	-	-	-	-
	Benzo[a]anthracene	0.092	4.7	N.D.	U	0.2	0.05	0.024	-	-	-	-	-
	Benzo[g,h,i]perylene	1,500	0.13	N.D.	U	0.2	0.05	0.022	-	-	-	-	-
	Benzo[a]pyrene	0.2	0.81	N.D.	U	0.2	0.05	0.036	-	-	-	-	-
	Benzo[b]fluoranthene	0.092	0.75	N.D.	U	0.2	0.05	0.025	-	-	-	-	-
	Benzo[k]fluoranthene	0.92	0.4	N.D.	U	0.2	0.05	0.023	-	-	-	-	-
	Chrysene	9.2	1	N.D.	U	0.2	0.05	0.019	-	-	-	-	-
	Dibenzo[a,h]anthracene	0.0092	0.52	N.D.	U	0.2	0.05	0.027	-	-	-	-	-
	Fluoranthene	1,500	130	N.D.	U	0.2	0.05	0.027	-	-	-	-	-
	Fluorene	240	950	N.D.	U	0.2	0.05	0.024	-	-	-	-	-
	Indeno[1,2,3-cd]pyrene	0.092	0.095	N.D.	U	0.2	0.05	0.022	-	-	-	-	-
	1-Methylnaphthalene	4.7	10	N.D.	U	0.2	0.05	0.028	-	-	-	-	-
	2-Methylnaphthalene	24	10	N.D.	U	0.2	0.05	0.026	-	-	-	-	-
	Naphthalene	17	21	0.10	J	0.2	0.05	0.023	-	-	-	-	-
	Phenanthrene	240	410	N.D.	U	0.2	0.05	0.031	-	-	-	-	-
	Pyrene	180	68	N.D.	U	0.2	0.05	0.025	-	-	-	-	-
	1,1,1-Trichloroethane	200	970	N.D.	U	5	0.5	0.3	N.D.	U	5	0.5	0.3
EPA 8260B	1,1,2-Trichloroethane	5	50,000	N.D.	U	1	0.5	0.38	N.D.	U	1	0.5	0.38
	1,1-Dichloroethane	2.4	50,000	N.D.	U	5	0.5	0.28	N.D.	U	5	0.5	0.28
	1,1-Dichloroethylene	7	1,500	N.D.	U	1	0.5	0.431	N.D.	U	1	0.5	0.43
	1,2,3-Trichloropropane	0.6	50,000	N.D.	U	5	1	0.64	N.D.	U	5	1	0.64
	1,2,4-Trichlorobenzene	70	3,000	N.D.	U	5	1	0.5	N.D.	U	5	1	0.5
	1,2-Dibromo-3- chloropropane	0.04	10	N.D.	U	10	5	1.2	N.D.	U	10	5	1.2
	1,2-Dibromoethane	0.04	50,000	N.D.	U	1	0.5	0.36	N.D.	U	1	0.5	0.36
	1,2-Dichlorobenzene	600	10	N.D.	U	1	0.5	0.46	N.D.	U	1	0.5	0.46
	1,2-Dichloroethane	0.15	7,000	N.D.	U	1	0.5	0.24	N.D.	U	1	0.5	0.24
	1,2-Dichloropropane	5	10	N.D.	U	5	0.5	0.42	N.D.	U	5	0.5	0.42
	1,3-Dichlorobenzene	180	5	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	1,3-Dichloropropene (total of cis/trans)	0.43	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	1,4-Dichlorobenzene	75	5	N.D.	U	1	0.5	0.43	N.D.	U	1	0.5	0.43
	Acetone	22,000	20,000	N.D.	IJ, ICH, U	20	10	6	N.D.	IJ, ICH, U	20	10	10
	Benzene	5	170	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14
	Bromodichloromethane	0.12	50,000	N.D.	U	5	0.5	0.21	N.D.	U	5	0.5	0.21
	Bromoform	80	510	N.D.	U	10	1	0.5	N.D.	U	10	1	0.5
	Bromomethane	8.7	50,000	N.D.	U	20	5	3.9	N.D.	U	20	5	3.9
	Carbon Tetrachloride	5	520	N.D.	U	1	0.5	0.23	N.D.	U	1	0.5	0.23
	Chlorobenzene	100	50	N.D.	U	5	0.5	0.17	N.D.	U	5	0.5	0.17
	Chloroethane	21,000	16	N.D.	U	10	5	2.3	N.D.	U	10	5	2.3
	Chloroform	70	2,400	N.D.	U	5	0.5	0.46	N.D.	U	5	0.5	0.46
	Chloromethane	1.8	50,000	N.D.	U	10	5	1.8	N.D.	U	10	5	1.8
	cis-1,2-Dichloroethylene	70	50,000	N.D.	U	1	0.5	0.48	N.D.	U	1	0.5	0.48
	Dibromochloromethane	0.16	50,000	N.D.	U	1	0.5	0.25	N.D.	U	1	0.5	0.25
	Ethylbenzene	700	30	N.D.	U	1	0.5	0.14	N.D.	U	1	0.5	0.14
	Hexachlorobutadiene	0.86	6	N.D.	U	1	0.5	0.32	N.D.	U	1	0.5	0.32
	Methyl ethyl ketone (2-Butanone)	7,100	8,400	N.D.	U	10	5.0	2.21	N.D.	U	10	5.0	2.21
	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
	Methyl tert-butyl Ether	12	5	N.D.	U	1	0.5	0.31	N.D.	U	1	0.5	0.31
	Methylene chloride	4.8	9,100	N.D.	U	5	1.0	0.64	N.D.	U	5	1.0	0.64
	Styrene	100	10	N.D.	U	1	0.5	0.17	N.D.	U	1	0.5	0.17
	Tetrachloroethane, 1,1,1,2-	0.52	50,000	N.D.	U	1	0.5	0.4	N.D.	U	1	0.5	0.4
	Tetrachloroethane, 1,1,2,2-	0.067	500	N.D.	U	1	0.5	0.41	N.D.	U	1	0.5	0.41
	Tetrachloroethylene	5	170	N.D.	U	5	0.5	0.387	N.D.	U	5	0.5	0.39
	Toluene	1,000	40	N.D.	U	1	0.5	0.24	2.8		1	0.5	0.24
	trans-1,2- Dichloroethylene	100	260	N.D.	U	1	0.5	0.37	N.D.	U	1	0.5	0.37
	Trichloroethylene	5	310	N.D.	U	1	0.5	0.368	N.D.	U	1	0.5	0.37
	Vinyl chloride	2	3,400	N.D.	U	1	0.5	0.3	N.D.	U	1	0.5	0.3
	Xylenes	10,000	20	N.D.	U	10	1	0.23	N.D.	U	10	1	0.23
EPA 6020	Lead	15	50,000	0.846	J	1	0.2	0.0898	-	-	-	-	-

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

- Not Analyzed  
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  
ICH Initial calibration verification recovery above method control limit for this analyte.  
IJ Calibration verification recovery above method control limit for this analyte.  
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 4 – SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

From January 28 to 29 and February 4, 2013, ESI personnel collected groundwater samples from five monitoring wells at the RHSF (wells RHMW01, RHMW02, RHMW03, RHMW05, and RHMW2254-01).

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. A summary of the analytical results is provided below.

- **RHMW01** – TPH-d (79 µg/L), TPH-g (13 µg/L), naphthalene (0.10 µg/L), and dissolved lead (0.846 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW02** – TPH-d (1,700 µg/L), TPH-g (660 µg/L), acenaphthene (0.57 µg/L), fluorene (0.30 µg/L), 1-methylnaphthalene (47 µg/L), 2-methylnaphthalene (35 µg/L), naphthalene (110 µg/L), ethylbenzene (0.21 µg/L), and xylenes (0.65 µg/L) were detected. TPH-d, TPH-g, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination.
- **RHMW03** – TPH-d (59 µg/L), 1-methylnaphthalene (0.10 µg/L), 2-methylnaphthalene (0.069 µg/L), and naphthalene (0.32 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW05** – TPH-d (62 µg/L) and naphthalene (0.075 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.
- **RHMW2254-01** – TPH-g (22 µg/L), naphthalene (0.052 µg/L), and total lead (0.242 µg/L) were detected. None of the chemical constituents analyzed for were detected at concentrations above the DOH EALs.

### ***Groundwater Contaminant Trends***

- **RHMW01** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EAL for both drinking water toxicity and gross contamination. TPH-d concentrations showed a decreasing trend from 1,500 µg/L in February 2005 to 79 µg/L in February 2013.
- **RHMW02** – COPCs TPH-d, TPH-g, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have historically been detected at concentrations above the DOH EALs. TPH-d concentrations show a decreasing trend from a high average of 5,420 µg/L in October 2008 to concentrations ranging from 1,500-2,200 µg/L during the last several rounds of sampling.

1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene show a decreasing trend over the long-term. However, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene have steadily increased since April 2012.

TPH-g concentrations show an increasing trend with a significant increase from 320 µg/L during the last round of sampling to 660 µg/L during this round of sampling.

- **RHMW03** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since October 2010.
- **RHMW05** – COPCs detected during this round of quarterly sampling were consistent with historical data. TPH-d has historically been detected at concentrations above the DOH EALs for both drinking water toxicity and gross contamination; however, it has not been detected at concentrations above the DOH EALs since January 2010.
- **RHMW2254-01** – COPCs detected during this round of quarterly sampling were consistent with historical data. None of the COPCs have been detected at concentrations above the DOH EALs.

### ***Conclusions and Recommendations***

Since the wells were last sampled (October 2012), groundwater contaminant concentrations in four wells (RHMW01, RHMW03, RHMW05, and RHMW2254-01) remained at low concentrations and did not change significantly, or were not detected. Only the groundwater samples from RHMW02 showed concentrations of COPCs exceeding the DOH EALs. TPH-d concentrations detected in the sample collected from well RHMW02 are consistent with previous analytical data. 1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations have increased since the last sampling event; however, elevated concentrations have been detected in groundwater samples collected during past sampling events. TPH-g concentrations increased since the last sampling event, and is the highest concentration since routine groundwater sampling was initiated in 2005.

With the exception of TPH-g, concentrations of COPCs in well RHMW02 have not changed significantly. TPH-d, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations have been decreasing over the long-term. However, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations have increased since April 2012.

Based on the results of the groundwater monitoring, ESI recommends continuing the groundwater monitoring program at the RHSF. If TPH-g concentrations in Well RHMW02 continue to increase, we recommend increasing monitoring frequency to monthly in accordance with the RHSF Groundwater Protection Plan.

## **SECTION 5 – FUTURE WORK**

### ***GROUNDWATER SAMPLING***

Future work includes the second quarter 2013 groundwater monitoring which is scheduled for April 2013. It is anticipated that the quarterly groundwater monitoring status report will be submitted in May 2013.

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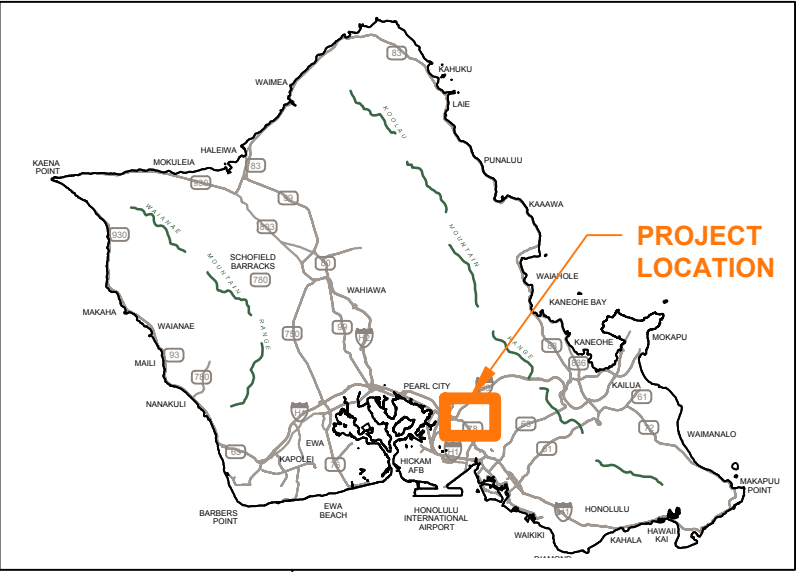
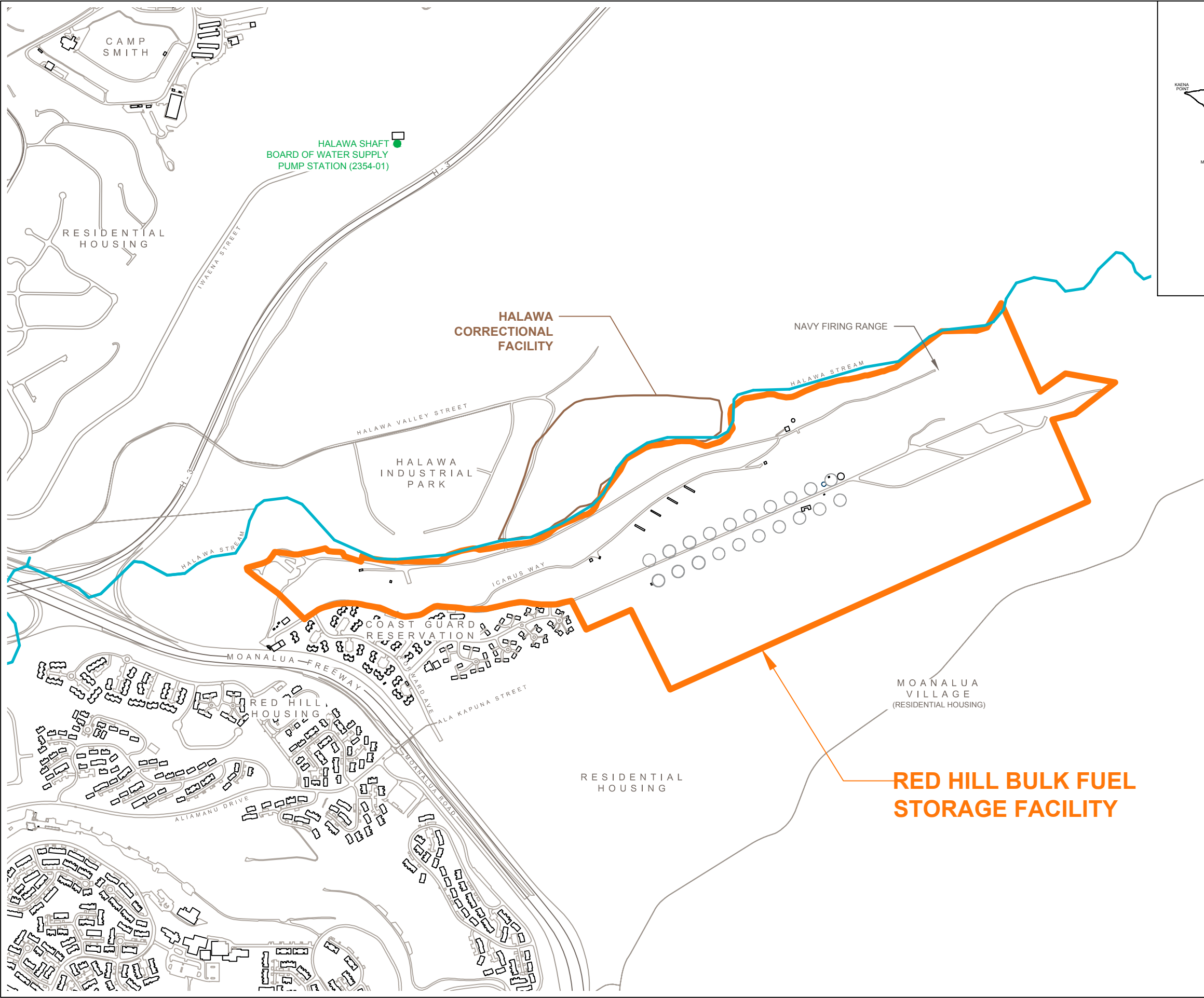
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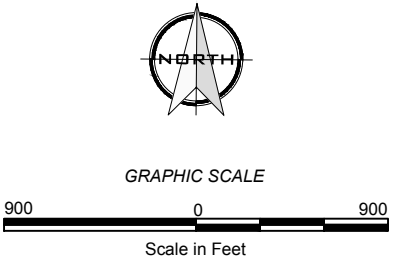


## FIGURES

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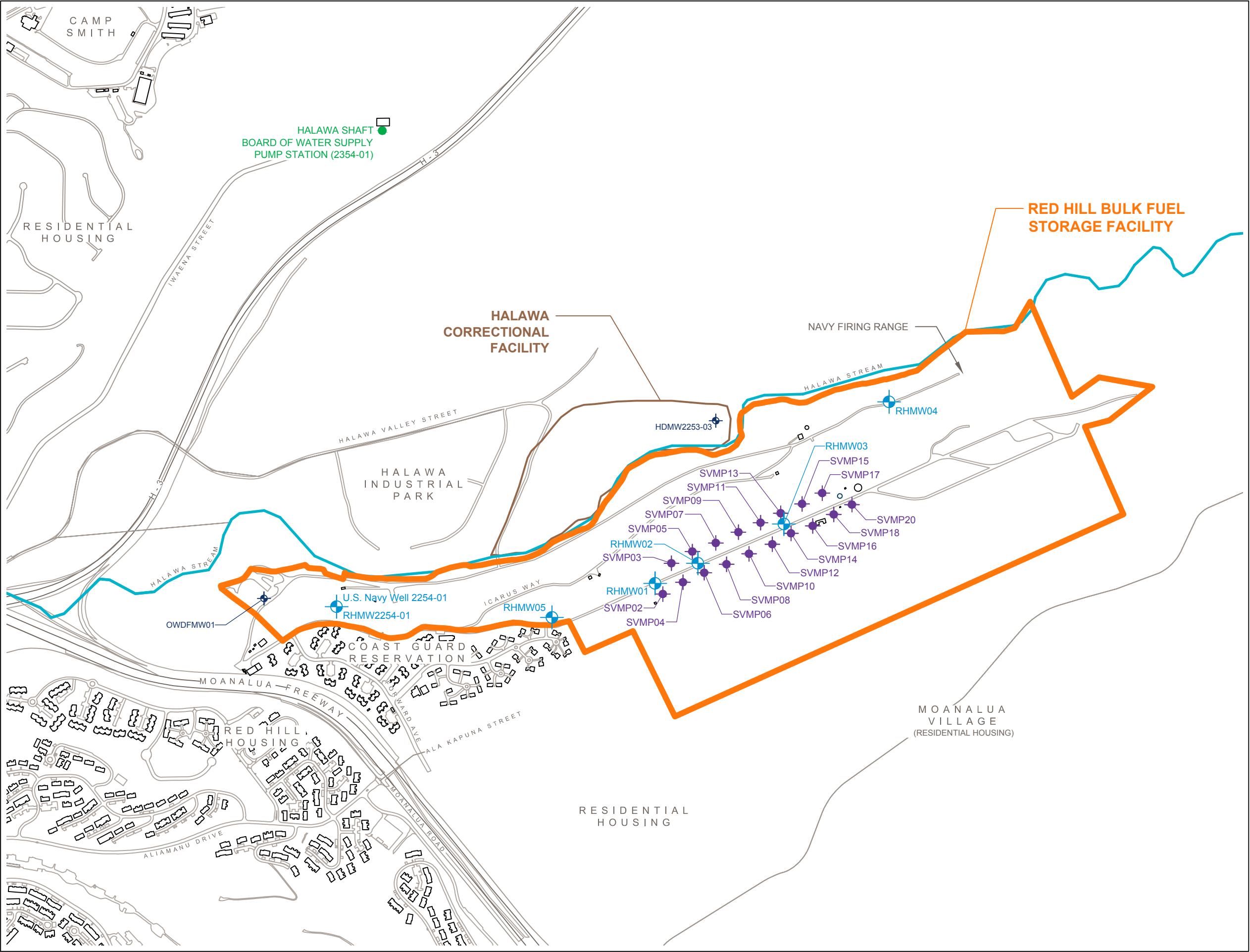


NOTES
The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.
SOURCES
Pearl Harbor Base Map
Navy GIS files



**FIGURE 1**  
**SITE LOCATION**  
GROUNDWATER MONITORING  
RED HILL BULK FUEL STORAGE FACILITY  
NAVAL SUPPLY SYSTEM COMMAND (NAVSUP)  
FLEET LOGISTICS CENTER  
JBPHH, OAHU, HAWAII

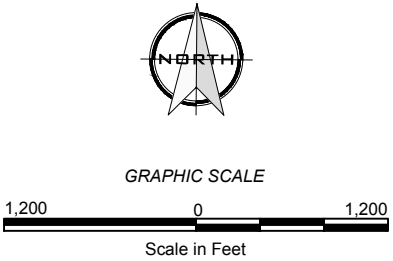
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LEGEND	
	RED HILL BULK FUEL STORAGE FACILITY
	HALAWA CORRECTIONAL FACILITY
	HALAWA STREAM
	BUILDING
	ROAD
	ABOVEGROUND STORAGE TANK
	WATER TANK
	SOIL VAPOR MONITORING POINT
	GROUNDWATER MONITORING WELL LOCATED INSIDE TUNNEL
	GROUNDWATER MONITORING 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



**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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Water Level After Purging: 84.04 ft      Pumping Rate: 0.06 L/min



## Groundwater Sampling Log

Well ID: RHMW02 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 86.75 ft Date: 1/28/2013 Time: 1040

Total Depth of Well: 94.35 ft Personnel Involved: Justin Lam, Branden Ibara

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: 5.0 L Method of Removal: Bladder Pump

Water Level After Purging: 86.25 Pumping Rate: 0.416 L/min

### Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1050	0.0 L	7.17	0.664	5.49	25.13	0.32	-6.1
1052	1.0 L	7.10	0.667	2.37	24.61	0.33	-5.9
1055	2.0 L	7.07	0.662	1.93	24.41	0.32	-2.5
1057	3.0 L	7.05	0.660	1.81	24.40	0.32	-1.9
1100	4.0 L	7.04	0.660	1.80	24.37	0.32	-1.7
1102	5.0 L	7.02	0.660	1.76	24.31	0.32	-1.6

Sample Withdrawal Method: Bladder Pump

### Appearance of Sample:

Color: Clear  
Turbidity: Low  
Sediment: None  
Other:

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

Number and Types of Sample Containers: 22 - VOAs, 8 - 1L amber jar, 5 - 500ml HDPE bottle

Sample Identification Numbers: ES011 [1110], ES011 MS/MSD [1110], ES012 (Dup) [1000]

Decontamination Procedures: Triple Rinsed

Notes:

Sampled by: Justin Lam, Branden Ibara

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 1/31/2013 Time: 10:30

Capacity of Casing (Gallons/Linear Feet)  
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Water Level After Purging: 102.98 ft      Pumping Rate: 0.40 L/min



## Groundwater Sampling Log

Well ID: RHMW05 Location: Red Hill Bulk Fuel Storage Facility Project No.: 112066

Initial Water Level: 83.61 ft Date: 1/29/2013 Time: 1015

Total Depth of Well: - Personnel Involved: Justin Lam, Branden Ibara

Length of Saturated Zone: - Weather Conditions: -

Volume of Water to be Removed: - Method of Removal: Bladder Pump

Water Level After Purging: 83.61 Pumping Rate: 0.5 L/min

### Well Purge Data:

Time	Volume Removed	pH	Conductivity (mS/cm)	DO (mg/l)	Temperature	Salinity	Redox (ORP) (mV)
1025	0.0 L	7.58	1.131	7.06	22.53	0.59	-28.8
1027	1.0 L	7.51	1.122	6.94	22.37	0.59	-26.9
1029	2.0 L	7.47	1.117	6.90	22.30	0.59	-25.4
1031	3.0 L	7.47	1.116	6.83	22.28	0.59	-25.7
1033	4.0 L	7.45	1.116	6.81	22.33	0.55	-27.0

Sample Withdrawal Method: Bladder Pump

### Appearance of Sample:

Color: Clear  
Turbidity: Low  
Sediment: None  
Other:

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

Number and Types of Sample Containers: 6 - VOAs, 3 - 1L amber jar, 1 - 500ml HDPE bottle

Sample Identification Numbers: ES015 [1045]

Decontamination Procedures: Triple Rinsed

Notes:

Sampled by: Justin Lam, Branden Ibara

Sampled Delivered to: Calscience Environmental Lab Transporters: FedEx

Date: 1/31/2013 Time: 10:30

Capacity of Casing (Gallons/Linear Feet)  
2"-0.16 • 4"-0.65 • 8"-2.61 • 10"-4.08 • 12"-5.87



Water Level After Purging: 82.78 ft      Pumping Rate: 0.36 L/min

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## **APPENDIX B**

### **Field Notes**

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Location Red Hill

Date 1/28/13

Project / Client 112066 NAVFAC

Purpose: gw sampling

Personnel: JL, BI

~~735~~: ESI outside.750: safety meeting.805: ESI enter through adit #5.830: gauge RHMW01840: turn on compressor and control box, begin pumping.850: compressor shut off, no water being pumped out.855: compressor will not stay on.930: compressor started and stayed on. well not pumping.935: pull pump out. test pump.1000: put pump back in well. ~~test~~ attempt to pump again, not pumping.1005: compressor will not start.1030: move to RHMW02.1040: gauge RHMW02

PTW: 86.75

1050: begin pumping well. RHMW02

Location Red Hill

Date 1/28/13

Project / Client 112066 NAVFAC

1210: finish sampling RHMW02  
move to RHMW031215 RHMW03

PTW: 102.98

PTB: 110.12

1218: begin purging RHMW031220: no water purging.1241: water purging again1305: finish RHMW031310: walk back to RHMW01.1320: set up equipment at ~~RHMW01~~ <sup>RHMW01</sup>

1 compressor will not stay on.

The outlet by tank 1/2

not usable. So had to

connect to extension cords.

There was not enough voltage

to operate the compressor.

Compressor worked fine at

two other wells today.

1445: leave RHMW01.1500: ESI exit tunnels.



Location Red HillDate 1/28/13Project / Client 112066 NAVFAC1300: clear up for day.1315: drop off drum at adit 3.1325: ESI leave Red Hill.

1/28/13

A

Location Red HillDate 1/29/13Project / Client 112066 NAVFACpurpose: gw sampling  
personnel: JL, BI730: ESI onsite740: safety meeting.750: ESI enter adit #5.  
elevator not working.752: JL called RC about the  
situation800: check adit #3.adit #3 is clear. will  
enter lower tunnels through  
adit #3.830: JL, BI bring equipment through  
adit #3.830: wait for pump house to be opened.835: pump house opened.910: gauged RHMW2254-01

DTW: 82.78

PTB: —

920: begin purging RHMW2254-01935: collect sample.1000: leave ~~Red Hill~~ <sup>1/29/13</sup> pump station.



1015: gauge PTHW05  
DTW: ~~86.70~~ 83.61  
no depth to bottom, IP  
could not get past 86.70 ft

1045: sample well.

1100: clean up around PTHW05  
move to PTHW01.

1100: gauge well. PTHW01

1115: attempt to purge well.

1145: water in tubing but not  
coming out of tubing

1215: water still not coming out  
check bladder pump. get  
pump back in well.

1245: stop attempt to purge well.  
no water coming out of tubing  
not enough time to sample the  
well. Pack up equipment  
change time: 15s exhaust: 5s

1255: leave through adit #5

1310: leave exit tunnels at adit #5

1330: clean up equipment

1330: leave Red Hill to meet  
Domos at FedEx. 1/29/13

Purpose: gw sampling  
Personnel: BT, JL

715: EST at adit #3

730: gauge OWDFAW01  
DTW: 120.55  
DTB: 145.10

740: begin hand bailing the well.

810: begin sampling well.

830: finish sampling well.  
clean up and pack samples.

915: leave Red Hill wait for  
DLNR at Halawa Correctional  
Facility.

930: DLNR at HCF.

938: go to HDMW 2253-03.  
DLNR

950: gauge well.

955: DTW: 208.15

1058: DLNR finish w/ their work.

1105: EST begin purging well

1135: finish purging, begin sampling  
HDMW 2253-03.



Location Red Hill

Date 1/31/13

Project / Client 112066 NAVFAC

1159 SVMP OZ needs to be resampled. the tube on the PIIID was loose and pulling in outside air from the bag. <sup>apartment</sup> Red tags were high due to maintenance work being done at tank 05. (+900 ppbv)

1210 resample SVMP OZ

shallow	542	535	551	555
mid	919	922	885	931
deep	936	973	966	990

1225 ESI leave tunnels.1245 ESI exit adit 3.

1/31/13

R

Location Red Hill

Date 2/4/13

Project / Client 112066 NAVFAC

purpose: gw sampling  
personnel: JL, BI

800: ESI get to R+SF  
elevator still not working at adit 5.

815: ESI unpack equipment at adit 3.

Safety meeting.

820: ESI enter adit 3.

845: gauge R+MWOI  
DTW: 84.04

900: begin <sup>at 2/4/13</sup> ~~gauge~~ pumping from well.

1000: begin sampling R+MWOI.

1215: finish sampling R+MWOI  
leave tunnels through adit 3.

1235: exit tunnels.1245: leave R+SF

2/4/13

R

## **APPENDIX C**

### **Laboratory Reports**

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# CALSCIENCE

## WORK ORDER NUMBER: 13-01-1776

*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

*Richard Villafania*

Approved for release on 02/7/2013 by:  
Richard Villafania  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



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Work Order Number: 13-01-1776

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-1 Client ID: ES011 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 11:10**

**EPA 6020 ICP/MS Metals Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	<0.200	U	0.0898	0.200	1.00	1	01/31/13 00:00	02/01/13 17:44	130131L04D

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

**13-01-1776-2 Client ID: ES012 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 10:00**

**EPA 6020 ICP/MS Metals Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	0.171	J	0.0898	0.200	1.00	1	01/31/13 00:00	02/01/13 17:47	130131L04D

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

**13-01-1776-3 Client ID: ES013 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 13:00**

**EPA 6020 ICP/MS Metals Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	<0.200	U	0.0898	0.200	1.00	1	01/31/13 00:00	02/01/13 17:50	130131L04D

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

**13-01-1776-6 Client ID: ES015 Matrix: Aqueous Units: ug/L Sampled: 01/29/13 10:45**

**EPA 6020 ICP/MS Metals Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	<0.200	U	0.0898	0.200	1.00	1	01/31/13 00:00	02/01/13 17:56	130131L04D

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

**099-14-497-14 Client ID: Method Blank Matrix: Aqueous Units: ug/L Sampled: 02/04/13 13:45**

**EPA 6020 ICP/MS Metals Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	<0.200	U	0.0898	0.200	1.00	1	01/31/13 00:00	02/01/13 17:05	130131L04D

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

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-1 Client ID: ES011 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 11:10**

**EPA 8015B (M) TPH Diesel Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	1700	HD	16	22	56	1.11	02/01/13 00:00	02/05/13 15:48	130201B03

Surr: n-Octacosane (51-141%) 97% 02/01/13 00:00 02/05/13 15:48 130201B03

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

**13-01-1776-2 Client ID: ES012 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 10:00**

**EPA 8015B (M) TPH Diesel Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	1500	HD	16	22	56	1.11	02/01/13 00:00	02/05/13 16:06	130201B03

Surr: n-Octacosane (51-141%) 87% 02/01/13 00:00 02/05/13 16:06 130201B03

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

**13-01-1776-3 Client ID: ES013 Matrix: Aqueous Units: ug/L Sampled: 01/28/13 13:00**

**EPA 8015B (M) TPH Diesel Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	59	HD	15	20	50	1	02/01/13 00:00	02/05/13 16:23	130201B03

Surr: n-Octacosane (51-141%) 89% 02/01/13 00:00 02/05/13 16:23 130201B03

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

**13-01-1776-4 Client ID: ES014 Matrix: Aqueous Units: ug/L Sampled: 01/29/13 09:35**

**EPA 8015B (M) TPH Diesel Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	22	HD,J	15	20	50	1	02/01/13 00:00	02/05/13 16:42	130201B03

Surr: n-Octacosane (51-141%) 92% 02/01/13 00:00 02/05/13 16:42 130201B03

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

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-6**      **Client ID: ES015**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 10:45**

**EPA 8015B (M) TPH Diesel**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	62	HD	15	20	50	1	02/01/13 00:00	02/05/13 17:00	130201B03
Surr: n-Octacosane (51-141%)	112%						02/01/13 00:00	02/05/13 17:00	130201B03

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

**099-15-516-27**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/05/13 17:23**

**EPA 8015B (M) TPH Diesel**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	<20	U	15	20	50	1	02/01/13 00:00	02/05/13 14:20	130201B03
Surr: n-Octacosane (51-141%)	93%						02/01/13 00:00	02/05/13 14:20	130201B03

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-1**      **Client ID: ES011**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 11:10**

**EPA 8270C SIM PAHs      Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	110		0.57	1.2	5.0	25	01/31/13 00:00	02/05/13 13:37	130131L06
2-Methylnaphthalene	35		0.66	1.2	5.0	25	01/31/13 00:00	02/05/13 13:37	130131L06
1-Methylnaphthalene	47		0.71	1.2	5.0	25	01/31/13 00:00	02/05/13 13:37	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Acenaphthene	0.57		0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Fluorene	0.30		0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 18:26	130131L06
Surr: Nitrobenzene-d5 (28-139%)	100%						01/31/13 00:00	02/04/13 18:26	130131L06
Surr: 2-Fluorobiphenyl (33-144%)	105%						01/31/13 00:00	02/04/13 18:26	130131L06
Surr: p-Terphenyl-d14 (23-160%)	115%						01/31/13 00:00	02/04/13 18:26	130131L06

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-2**      **Client ID: ES012**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 10:00**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	100		0.57	1.2	5.0	25	01/31/13 00:00	02/05/13 14:03	130131L06
2-Methylnaphthalene	31		0.66	1.2	5.0	25	01/31/13 00:00	02/05/13 14:03	130131L06
1-Methylnaphthalene	41		0.71	1.2	5.0	25	01/31/13 00:00	02/05/13 14:03	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Acenaphthene	0.54		0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Fluorene	0.27		0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 18:53	130131L06

Surr: Nitrobenzene-d5 (28-139%)      92%      01/31/13 00:00 02/04/13 18:53 130131L06  
Surr: 2-Fluorobiphenyl (33-144%)      87%      01/31/13 00:00 02/04/13 18:53 130131L06  
Surr: p-Terphenyl-d14 (23-160%)      101%      01/31/13 00:00 02/04/13 18:53 130131L06

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-3**      **Client ID: ES013**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 13:00**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	0.32		0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
2-Methylnaphthalene	0.069	J	0.026	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
1-Methylnaphthalene	0.10	J	0.028	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Fluorene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 19:19	130131L06
Surr: Nitrobenzene-d5 (28-139%)	112%						01/31/13 00:00	02/04/13 19:19	130131L06
Surr: 2-Fluorobiphenyl (33-144%)	99%						01/31/13 00:00	02/04/13 19:19	130131L06
Surr: p-Terphenyl-d14 (23-160%)	116%						01/31/13 00:00	02/04/13 19:19	130131L06

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

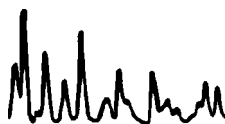
**ANALYTICAL REPORT**

**13-01-1776-4**      **Client ID: ES014**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 09:35**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	0.052	J	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
2-Methylnaphthalene	<0.050	U	0.026	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
1-Methylnaphthalene	<0.050	U	0.028	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Fluorene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 19:45	130131L06
Surr: Nitrobenzene-d5 (28-139%)	109%						01/31/13 00:00	02/04/13 19:45	130131L06
Surr: 2-Fluorobiphenyl (33-144%)	92%						01/31/13 00:00	02/04/13 19:45	130131L06
Surr: p-Terphenyl-d14 (23-160%)	110%						01/31/13 00:00	02/04/13 19:45	130131L06

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





Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-6**      **Client ID: ES015**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 10:45**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	0.075	J	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
2-Methylnaphthalene	<0.050	U	0.026	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
1-Methylnaphthalene	<0.050	U	0.028	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Fluorene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 20:11	130131L06

Surr: Nitrobenzene-d5 (28-139%)      110%      01/31/13 00:00      02/04/13 20:11      130131L06  
Surr: 2-Fluorobiphenyl (33-144%)      97%      01/31/13 00:00      02/04/13 20:11      130131L06  
Surr: p-Terphenyl-d14 (23-160%)      111%      01/31/13 00:00      02/04/13 20:11      130131L06

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





Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-15-148  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

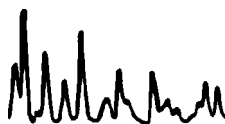
**099-15-148-7**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 17:55**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
2-Methylnaphthalene	<0.050	U	0.026	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
1-Methylnaphthalene	<0.050	U	0.028	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Fluorene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Anthracene	<0.050	U	0.034	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Pyrene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Chrysene	<0.050	U	0.019	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	01/31/13 00:00	02/04/13 17:08	130131L06

Surr: Nitrobenzene-d5 (28-139%)      109%      01/31/13 00:00      02/04/13 17:08      130131L06  
Surr: 2-Fluorobiphenyl (33-144%)      99%      01/31/13 00:00      02/04/13 17:08      130131L06  
Surr: p-Terphenyl-d14 (23-160%)      111%      01/31/13 00:00      02/04/13 17:08      130131L06

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-1**      **Client ID: ES011**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 11:10**

**GC/MS GRO/EPA 8260B Volatile Organics      Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ, ICH, U	10	10	20	1	01/31/13 00:00	01/31/13 18:14	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 18:14	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Ethylbenzene	0.21	J	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-1**      **Client ID: ES011**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 11:10**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 18:14	130131L01
o-Xylene	0.65	J	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 18:14	130131L01
Gasoline Range Organics	660		13	30	50	1	01/31/13 00:00	01/31/13 18:14	130131L01
Surr: Dibromofluoromethane (80-126%)	99%						01/31/13 00:00	01/31/13 18:14	130131L01
Surr: 1,2-Dichloroethane-d4 (80-134%)	101%						01/31/13 00:00	01/31/13 18:14	130131L01
Surr: Toluene-d8 (80-120%)	100%						01/31/13 00:00	01/31/13 18:14	130131L01
Surr: Toluene-d8-TPPH (88-112%)	101%						01/31/13 00:00	01/31/13 18:14	130131L01
Surr: 1,4-Bromofluorobenzene (80-120%)	101%						01/31/13 00:00	01/31/13 18:14	130131L01

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

Return to Contents

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-2**      **Client ID: ES012**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 10:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ,ICH,U	10	10	20	1	01/31/13 00:00	01/31/13 18:41	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 18:41	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Ethylbenzene	0.24	J	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-2**      **Client ID: ES012**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 10:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 18:41	130131L01
o-Xylene	0.69	J	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 18:41	130131L01
Gasoline Range Organics	650		13	30	50	1	01/31/13 00:00	01/31/13 18:41	130131L01
<i>Surr: Dibromofluoromethane (80-126%)</i>							01/31/13 00:00	01/31/13 18:41	130131L01
<i>Surr: 1,2-Dichloroethane-d4 (80-134%)</i>							01/31/13 00:00	01/31/13 18:41	130131L01
<i>Surr: Toluene-d8 (80-120%)</i>							01/31/13 00:00	01/31/13 18:41	130131L01
<i>Surr: Toluene-d8-TPPH (88-112%)</i>							01/31/13 00:00	01/31/13 18:41	130131L01
<i>Surr: 1,4-Bromofluorobenzene (80-120%)</i>							01/31/13 00:00	01/31/13 18:41	130131L01

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

Return to Contents

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-3**      **Client ID: ES013**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 13:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ, ICH, U	10	10	20	1	01/31/13 00:00	01/31/13 20:53	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 20:53	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-3**      **Client ID: ES013**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/28/13 13:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 20:53	130131L01
o-Xylene	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 20:53	130131L01
Gasoline Range Organics	<30	U	13	30	50	1	01/31/13 00:00	01/31/13 20:53	130131L01
Surr: Dibromofluoromethane (80-126%)	92%						01/31/13 00:00	01/31/13 20:53	130131L01
Surr: 1,2-Dichloroethane-d4 (80-134%)	90%						01/31/13 00:00	01/31/13 20:53	130131L01
Surr: Toluene-d8 (80-120%)	97%						01/31/13 00:00	01/31/13 20:53	130131L01
Surr: Toluene-d8-TPPH (88-112%)	98%						01/31/13 00:00	01/31/13 20:53	130131L01
Surr: 1,4-Bromofluorobenzene (80-120%)	95%						01/31/13 00:00	01/31/13 20:53	130131L01

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-4**      **Client ID: ES014**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 09:35**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ,ICH,U	10	10	20	1	01/31/13 00:00	01/31/13 21:19	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 21:19	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01





Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-4**      **Client ID: ES014**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 09:35**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 21:19	130131L01
o-Xylene	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 21:19	130131L01
Gasoline Range Organics	<30	U	13	30	50	1	01/31/13 00:00	01/31/13 21:19	130131L01
Surr: Dibromofluoromethane (80-126%)							01/31/13 00:00	01/31/13 21:19	130131L01
Surr: 1,2-Dichloroethane-d4 (80-134%)							01/31/13 00:00	01/31/13 21:19	130131L01
Surr: Toluene-d8 (80-120%)							01/31/13 00:00	01/31/13 21:19	130131L01
Surr: Toluene-d8-TPPH (88-112%)							01/31/13 00:00	01/31/13 21:19	130131L01
Surr: 1,4-Bromofluorobenzene (80-120%)							01/31/13 00:00	01/31/13 21:19	130131L01

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-6**      **Client ID: ES015**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 10:45**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ, ICH, U	10	10	20	1	01/31/13 00:00	01/31/13 21:46	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 21:46	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-6**      **Client ID: ES015**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 10:45**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 21:46	130131L01
o-Xylene	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 21:46	130131L01
Gasoline Range Organics	<30	U	13	30	50	1	01/31/13 00:00	01/31/13 21:46	130131L01
<i>Surr: Dibromofluoromethane (80-126%)</i>							01/31/13 00:00	01/31/13 21:46	130131L01
<i>Surr: 1,2-Dichloroethane-d4 (80-134%)</i>							01/31/13 00:00	01/31/13 21:46	130131L01
<i>Surr: Toluene-d8 (80-120%)</i>							01/31/13 00:00	01/31/13 21:46	130131L01
<i>Surr: Toluene-d8-TPPH (88-112%)</i>							01/31/13 00:00	01/31/13 21:46	130131L01
<i>Surr: 1,4-Bromofluorobenzene (80-120%)</i>							01/31/13 00:00	01/31/13 21:46	130131L01

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-7**      **Client ID: ESTRIP**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 07:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ, ICH, U	10	10	20	1	01/31/13 00:00	01/31/13 20:26	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 20:26	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-01-1776  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**13-01-1776-7**      **Client ID: ESTRIP**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/29/13 07:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 20:26	130131L01
o-Xylene	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 20:26	130131L01
Gasoline Range Organics	<30	U	13	30	50	1	01/31/13 00:00	01/31/13 20:26	130131L01
Surr: Dibromofluoromethane (80-126%)	92%						01/31/13 00:00	01/31/13 20:26	130131L01
Surr: 1,2-Dichloroethane-d4 (80-134%)	90%						01/31/13 00:00	01/31/13 20:26	130131L01
Surr: Toluene-d8 (80-120%)	98%						01/31/13 00:00	01/31/13 20:26	130131L01
Surr: Toluene-d8-TPPH (88-112%)	99%						01/31/13 00:00	01/31/13 20:26	130131L01
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						01/31/13 00:00	01/31/13 20:26	130131L01

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-13-057  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**099-13-057-3**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/31/13 15:23**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	U	10	10	20	1	01/31/13 00:00	01/31/13 13:56	130131L01
Benzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Bromoform	<2.0	U	0.50	2.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
Bromomethane	<5.0	U	3.9	5.0	20	1	01/31/13 00:00	01/31/13 13:56	130131L01
2-Butanone	<5.0	U	2.2	5.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Chloroethane	<5.0	U	2.3	5.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
Chloroform	<0.50	U	0.46	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Chloromethane	<2.0	U	1.8	2.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
Styrene	<0.50	U	0.17	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Toluene	<0.50	U	0.24	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-13-057  
Project Name: Red Hill LTM 112066  
Received: 01/31/13 10:30

**ANALYTICAL REPORT**

**099-13-057-3**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 01/31/13 15:23**

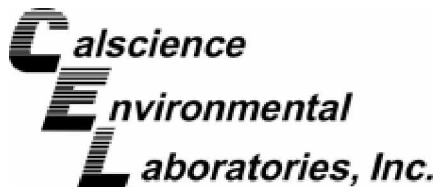
**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
p/m-Xylene	<1.0	U	0.30	1.0	10	1	01/31/13 00:00	01/31/13 13:56	130131L01
o-Xylene	<0.50	U	0.23	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	01/31/13 00:00	01/31/13 13:56	130131L01
Gasoline Range Organics	<30	U	13	30	50	1	01/31/13 00:00	01/31/13 13:56	130131L01
Surr: Dibromofluoromethane (80-126%)	94%						01/31/13 00:00	01/31/13 13:56	130131L01
Surr: 1,2-Dichloroethane-d4 (80-134%)	94%						01/31/13 00:00	01/31/13 13:56	130131L01
Surr: Toluene-d8 (80-120%)	98%						01/31/13 00:00	01/31/13 13:56	130131L01
Surr: Toluene-d8-TPPH (88-112%)	99%						01/31/13 00:00	01/31/13 13:56	130131L01
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						01/31/13 00:00	01/31/13 13:56	130131L01

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

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## Quality Control - Spike/Spike Duplicate



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

Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 3020A Total  
Method: EPA 6020

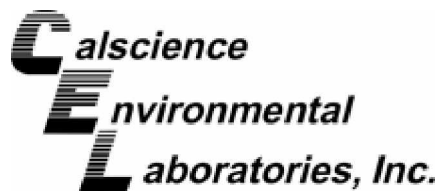
Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES011	Aqueous	ICP/MS 03	01/31/13	02/01/13	130131S04

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>MS CONC</u>	<u>MS %REC</u>	<u>MSD CONC</u>	<u>MSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	ND	100.0	107.8	108	108.9	109	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - PDS / PDSD



Environmental Science International, Inc.  
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Kailua, HI 96734-2500

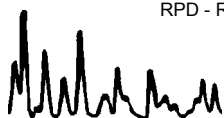
Date Received 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 3020A Total  
Method: EPA 6020

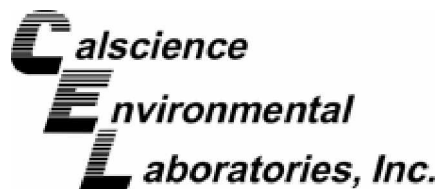
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
ES011	Aqueous	ICP/MS 03	01/31/13	02/01/13	130131S04

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>PDS CONC</u>	<u>PDS %REC</u>	<u>PDSD CONC</u>	<u>PDSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	ND	100.0	110.5	110	106.6	107	75-125	4	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



Environmental Science International, Inc.  
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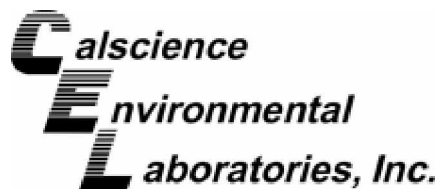
Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 3510C  
Method: EPA 8015B (M)

Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES011	Aqueous	GC 45	02/01/13	02/05/13	130201S03

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>MS CONC</u>	<u>MS %REC</u>	<u>MSD CONC</u>	<u>MSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Diesel	1743	4000	6954	130	6987	131	55-133	0	0-30	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



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

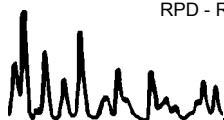
Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 3510C  
Method: EPA 8270C SIM PAHs

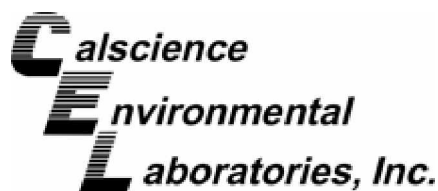
Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES011	Aqueous	GC/MS AAA	01/31/13	02/04/13	130131S06

Parameter	SAMPLE CONC	SPIKE ADDED	MS CONC	MS %REC	MSD CONC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Naphthalene	112.6	2.000	99.16	0	91.10	0	21-133	8	0-25	3
2-Methylnaphthalene	34.80	2.000	28.89	0	36.36	78	21-140	23	0-25	3
1-Methylnaphthalene	47.36	2.000	43.09	0	47.01	0	20-140	9	0-25	3
Acenaphthylene	ND	2.000	2.216	111	2.119	106	33-145	4	0-25	
Acenaphthene	0.5740	2.000	2.772	110	2.648	104	49-121	5	0-25	
Fluorene	0.3020	2.000	2.608	115	2.528	111	59-121	3	0-25	
Phenanthrene	ND	2.000	2.251	113	2.159	108	54-120	4	0-25	
Anthracene	ND	2.000	1.980	99	1.908	95	27-133	4	0-25	
Fluoranthene	ND	2.000	2.363	118	2.281	114	26-137	4	0-25	
Pyrene	ND	2.000	2.559	128	2.483	124	18-168	3	0-25	
Benzo (a) Anthracene	ND	2.000	2.792	140	2.699	135	33-143	3	0-25	
Chrysene	ND	2.000	2.471	124	2.379	119	17-168	4	0-25	
Benzo (k) Fluoranthene	ND	2.000	2.765	138	2.651	133	24-159	4	0-25	
Benzo (b) Fluoranthene	ND	2.000	2.833	142	2.718	136	24-159	4	0-25	
Benzo (a) Pyrene	ND	2.000	2.551	128	2.458	123	17-163	4	0-25	
Indeno (1,2,3-c,d) Pyrene	ND	2.000	2.446	122	2.261	113	10-171	8	0-25	
Dibenz (a,h) Anthracene	ND	2.000	2.436	122	2.270	114	10-219	7	0-25	
Benzo (g,h,i) Perylene	ND	2.000	2.366	118	2.234	112	10-227	6	0-25	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



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

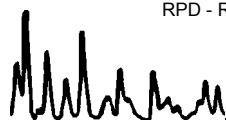
Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

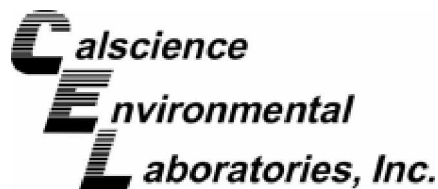
Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES011	Aqueous	GC/MS OO	01/31/13	01/31/13	130131S02

Parameter	SAMPLE CONC	SPIKE ADDED	MS CONC	MS %REC	MSD CONC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	67.63	135	67.64	135	40-140	0	0-20	
Benzene	ND	50.00	45.23	90	46.65	93	80-120	3	0-20	
Bromodichloromethane	ND	50.00	47.31	95	48.71	97	75-120	3	0-20	
Bromoform	ND	50.00	51.06	102	52.59	105	70-130	3	0-20	
Bromomethane	ND	50.00	45.84	92	43.80	88	30-145	5	0-20	
2-Butanone	ND	50.00	57.44	115	56.05	112	30-150	2	0-20	
Carbon Tetrachloride	ND	50.00	44.65	89	46.02	92	65-140	3	0-20	
Chlorobenzene	ND	50.00	47.39	95	49.16	98	80-120	4	0-20	
Chloroethane	ND	50.00	46.36	93	49.15	98	60-135	6	0-20	
Chloroform	ND	50.00	46.67	93	46.68	93	65-135	0	0-20	
Chloromethane	ND	50.00	35.93	72	38.59	77	40-125	7	0-20	
Dibromochloromethane	ND	50.00	47.73	95	49.63	99	60-135	4	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	51.00	102	52.76	106	50-130	3	0-20	
1,2-Dibromoethane	ND	50.00	50.43	101	52.56	105	80-120	4	0-20	
1,2-Dichlorobenzene	ND	50.00	49.52	99	50.52	101	70-120	2	0-20	
1,3-Dichlorobenzene	ND	50.00	49.70	99	51.16	102	75-125	3	0-20	
1,4-Dichlorobenzene	ND	50.00	48.47	97	49.89	100	75-125	3	0-20	
1,1-Dichloroethane	ND	50.00	44.39	89	46.11	92	70-135	4	0-20	
1,2-Dichloroethane	ND	50.00	44.70	89	45.58	91	70-130	2	0-20	
1,1-Dichloroethene	ND	50.00	38.42	77	39.19	78	70-130	2	0-20	
c-1,2-Dichloroethene	ND	50.00	48.39	97	50.20	100	70-125	4	0-20	
t-1,2-Dichloroethene	ND	50.00	46.40	93	49.53	99	60-140	7	0-20	
1,2-Dichloropropane	ND	50.00	48.26	97	49.55	99	75-125	3	0-20	
c-1,3-Dichloropropene	ND	50.00	51.85	104	52.56	105	70-130	1	0-20	
t-1,3-Dichloropropene	ND	50.00	45.96	92	47.60	95	55-140	4	0-20	
Ethylbenzene	ND	50.00	50.02	100	51.89	104	75-125	4	0-20	
Methylene Chloride	ND	50.00	45.28	91	45.70	91	55-140	1	0-20	
4-Methyl-2-Pentanone	ND	50.00	51.85	104	52.40	105	60-135	1	0-20	
Styrene	ND	50.00	52.60	105	53.65	107	65-135	2	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	48.98	98	50.68	101	80-130	3	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	49.26	99	50.14	100	65-130	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



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

Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

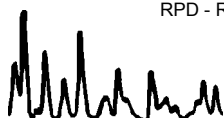
Project Red Hill LTM 112066

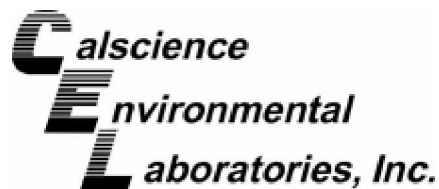
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES011	Aqueous	GC/MS OO	01/31/13	01/31/13	130131S02

Parameter	SAMPLE CONC	SPIKE ADDED	MS CONC	MS %REC	MSD CONC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrachloroethene	ND	50.00	42.53	85	44.47	89	45-150	4	0-20	
Toluene	ND	50.00	47.88	96	49.31	99	75-120	3	0-20	
1,2,4-Trichlorobenzene	ND	50.00	55.17	110	55.71	111	65-135	1	0-20	
1,1,1-Trichloroethane	ND	50.00	46.50	93	47.80	96	65-130	3	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	48.87	98	50.33	101	50-140	3	0-20	
1,1,2-Trichloroethane	ND	50.00	47.53	95	48.66	97	75-125	2	0-20	
Trichloroethene	ND	50.00	46.48	93	48.16	96	70-125	4	0-20	
1,2,3-Trichloropropane	ND	50.00	47.77	96	49.44	99	75-125	3	0-20	
Vinyl Chloride	ND	50.00	41.48	83	42.28	85	50-145	2	0-20	
p/m-Xylene	ND	100.0	100.4	100	103.5	103	75-130	3	0-20	
o-Xylene	ND	50.00	52.96	106	54.97	110	80-120	4	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	51.50	103	53.66	107	65-125	4	0-20	

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RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

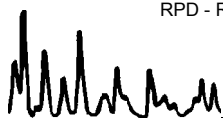
Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: EPA 3020A Total  
Method: EPA 6020

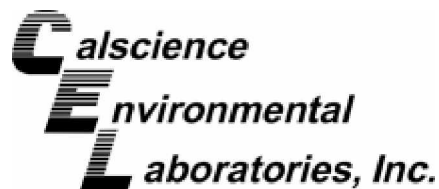
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-497-14	Aqueous	ICP/MS 03	01/31/13	02/01/13	130131L04D

Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	100.0	101.2	101	100.2	100	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: EPA 3510C  
Method: EPA 8015B (M)

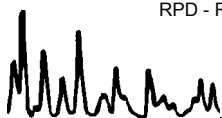
Project: Red Hill LTM 112066

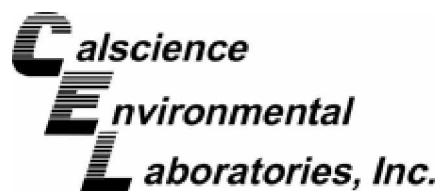
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-516-27	Aqueous	GC 45	02/01/13	02/05/13	130201B03

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	4000	3316	83	3508	88	60-132	6	0-11	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: EPA 3510C  
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number					
099-15-148-7	Aqueous	GC/MS AAA	01/31/13	02/04/13	130131L06					
Parameter	<u>SPIKE</u> <u>ADDED</u>	<u>LCS</u> <u>CONC</u>	<u>LCS</u> <u>%REC</u>	<u>LCSD</u> <u>CONC</u>	<u>LCSD</u> <u>%REC</u>	<u>%REC CL</u>	<u>ME CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Naphthalene	2.000	1.993	100	1.986	99	21-133	2-152	0	0-25	
2-Methylnaphthalene	2.000	2.149	107	2.110	105	21-140	1-160	2	0-25	
1-Methylnaphthalene	2.000	2.126	106	2.146	107	20-140	0-160	1	0-25	
Acenaphthylene	2.000	2.024	101	2.025	101	33-145	14-164	0	0-25	
Acenaphthene	2.000	2.014	101	1.997	100	55-121	44-132	1	0-25	
Fluorene	2.000	2.153	108	2.136	107	59-121	49-131	1	0-25	
Phenanthrene	2.000	2.195	110	2.183	109	54-120	43-131	1	0-25	
Anthracene	2.000	1.991	100	1.993	100	27-133	9-151	0	0-25	
Fluoranthene	2.000	2.176	109	2.155	108	26-137	8-156	1	0-25	
Pyrene	2.000	2.448	122	2.441	122	45-129	31-143	0	0-25	
Benzo (a) Anthracene	2.000	2.608	130	2.593	130	33-143	15-161	1	0-25	
Chrysene	2.000	2.354	118	2.336	117	17-168	0-193	1	0-25	
Benzo (k) Fluoranthene	2.000	2.579	129	2.537	127	24-159	2-182	2	0-25	
Benzo (b) Fluoranthene	2.000	2.617	131	2.621	131	24-159	2-182	0	0-25	
Benzo (a) Pyrene	2.000	2.387	119	2.385	119	17-163	0-187	0	0-25	
Indeno (1,2,3-c,d) Pyrene	2.000	2.290	114	2.286	114	25-175	0-200	0	0-25	
Dibenz (a,h) Anthracene	2.000	2.233	112	2.219	111	25-175	0-200	1	0-25	
Benzo (g,h,i) Perylene	2.000	2.197	110	2.202	110	25-157	3-179	0	0-25	

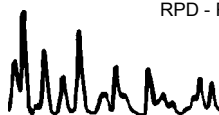
Total number of LCS compounds : 18

Total number of ME compounds : 0

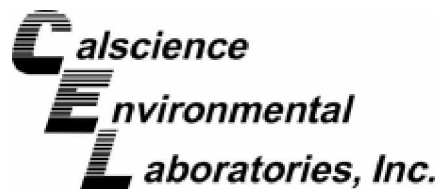
Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit







## Quality Control - LCS/LCS Duplicate



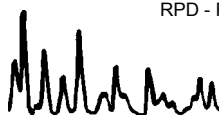
Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500

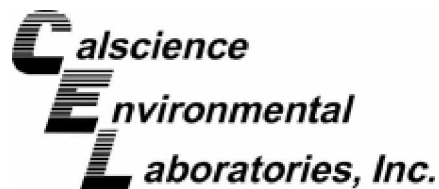
Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed		LCS/LCSD Batch Number			
099-13-057-3	Aqueous	GC/MS OO	01/31/13		01/31/13		130131L01			
Parameter	<u>SPIKE</u> <u>ADDED</u>	<u>LCS</u> <u>CONC</u>	<u>LCS</u> <u>%REC</u>	<u>LCSD</u> <u>CONC</u>	<u>LCSD</u> <u>%REC</u>	<u>%REC CL</u>	<u>ME CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Acetone	50.00	52.31	105	62.75	125	40-140	23-157	18	0-20	
Benzene	50.00	44.55	89	45.58	91	80-120	73-127	2	0-20	
Bromodichloromethane	50.00	47.54	95	47.86	96	75-120	68-128	1	0-20	
Bromoform	50.00	51.69	103	53.34	107	70-130	60-140	3	0-20	
Bromomethane	50.00	41.29	83	40.29	81	30-145	11-164	2	0-20	
2-Butanone	50.00	48.50	97	56.75	114	30-150	10-170	16	0-20	
Carbon Tetrachloride	50.00	44.78	90	46.53	93	65-140	52-152	4	0-20	
Chlorobenzene	50.00	46.71	93	47.56	95	80-120	73-127	2	0-20	
Chloroethane	50.00	49.66	99	47.78	96	60-135	48-148	4	0-20	
Chloroform	50.00	44.88	90	46.66	93	65-135	53-147	4	0-20	
Chloromethane	50.00	40.61	81	39.04	78	40-125	26-139	4	0-20	
Dibromochloromethane	50.00	47.93	96	49.19	98	60-135	48-148	3	0-20	
1,2-Dibromo-3-Chloropropane	50.00	45.54	91	48.62	97	50-130	37-143	7	0-20	
1,2-Dibromoethane	50.00	47.98	96	50.15	100	80-120	73-127	4	0-20	
1,2-Dichlorobenzene	50.00	47.67	95	48.93	98	70-120	62-128	3	0-20	
1,3-Dichlorobenzene	50.00	47.79	96	48.42	97	75-125	67-133	1	0-20	
1,4-Dichlorobenzene	50.00	47.19	94	47.76	96	75-125	67-133	1	0-20	
1,1-Dichloroethane	50.00	44.70	89	45.46	91	70-135	59-146	2	0-20	
1,2-Dichloroethane	50.00	44.28	89	45.22	90	70-130	60-140	2	0-20	
1,1-Dichloroethene	50.00	39.77	80	39.10	78	70-130	60-140	2	0-20	
c-1,2-Dichloroethene	50.00	46.56	93	48.83	98	70-125	61-134	5	0-20	
t-1,2-Dichloroethene	50.00	46.32	93	47.69	95	60-140	47-153	3	0-20	
1,2-Dichloropropane	50.00	47.10	94	48.12	96	75-125	67-133	2	0-20	
c-1,3-Dichloropropene	50.00	50.05	100	51.62	103	70-130	60-140	3	0-20	
t-1,3-Dichloropropene	50.00	45.21	90	46.04	92	55-140	41-154	2	0-20	
Ethylbenzene	50.00	49.55	99	50.32	101	75-125	67-133	2	0-20	
Methylene Chloride	50.00	44.65	89	45.35	91	55-140	41-154	2	0-20	
4-Methyl-2-Pentanone	50.00	44.97	90	50.81	102	60-135	48-148	12	0-20	
Styrene	50.00	50.84	102	51.70	103	65-135	53-147	2	0-20	
1,1,1,2-Tetrachloroethane	50.00	47.72	95	49.13	98	80-130	72-138	3	0-20	
1,1,2,2-Tetrachloroethane	50.00	45.82	92	47.71	95	65-130	54-141	4	0-20	
Tetrachloroethene	50.00	41.66	83	45.35	91	45-150	28-168	8	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed		LCS/LCSD Batch Number			
099-13-057-3	Aqueous	GC/MS OO	01/31/13		01/31/13		130131L01			
Parameter	<u>SPIKE</u> <u>ADDED</u>	<u>LCS</u> <u>CONC</u>	<u>LCS</u> <u>%REC</u>	<u>LCSD</u> <u>CONC</u>	<u>LCSD</u> <u>%REC</u>	<u>%REC CL</u>	<u>ME CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Toluene	50.00	46.28	93	48.13	96	75-120	68-128	4	0-20	
1,2,4-Trichlorobenzene	50.00	51.14	102	51.90	104	65-135	53-147	1	0-20	
1,1,1-Trichloroethane	50.00	46.15	92	47.27	95	65-130	54-141	2	0-20	
Hexachloro-1,3-Butadiene	50.00	47.89	96	47.38	95	50-140	35-155	1	0-20	
1,1,2-Trichloroethane	50.00	45.96	92	48.54	97	75-125	67-133	5	0-20	
Trichloroethene	50.00	45.52	91	47.11	94	70-125	61-134	3	0-20	
1,2,3-Trichloropropane	50.00	43.71	87	46.10	92	75-125	67-133	5	0-20	
Vinyl Chloride	50.00	42.24	84	40.47	81	50-145	34-161	4	0-20	
p/m-Xylene	100.0	99.06	99	100.6	101	75-130	66-139	2	0-20	
o-Xylene	50.00	51.54	103	51.79	104	80-120	73-127	0	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	47.61	95	49.86	100	65-125	55-135	5	0-20	
Gasoline Range Organics	1000	1114	111	1122	112	80-120	73-127	1	0-20	

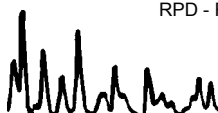
Total number of LCS compounds : 44

Total number of ME compounds : 0

Total number of ME compounds allowed : 2

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



WORK ORDER #: 13-01-1776

Lab Sample Number	Client Sample ID	Method	Extraction	Date/Time Analyzed	Chemist ID	Instrument	Analytical Location
1-K	ES011	EPA 6020	EPA 3020A T	02/1/2013 17:44	598	ICP/MS 03	1
1-S	ES011	EPA 8270C SIM PA	EPA 3510C	02/4/2013 18:26	449	GC/MS AA	1
1-S	ES011	EPA 8270C SIM PA	EPA 3510C	02/5/2013 13:37	449	GC/MS AA	1
1-L	ES011	EPA 8015B (M)	EPA 3510C	02/5/2013 15:48	628	GC 45	1
1-A	ES011	GC/MS / EPA 8260	EPA 5030C	01/31/2013 18:14	486	GC/MS OO	2
2-G	ES012	EPA 6020	EPA 3020A T	02/1/2013 17:47	598	ICP/MS 03	1
2-J	ES012	EPA 8270C SIM PA	EPA 3510C	02/4/2013 18:53	449	GC/MS AA	1
2-J	ES012	EPA 8270C SIM PA	EPA 3510C	02/5/2013 14:03	449	GC/MS AA	1
2-H	ES012	EPA 8015B (M)	EPA 3510C	02/5/2013 16:06	628	GC 45	1
2-A	ES012	GC/MS / EPA 8260	EPA 5030C	01/31/2013 18:41	486	GC/MS OO	2
3-G	ES013	EPA 6020	EPA 3020A T	02/1/2013 17:50	598	ICP/MS 03	1
3-J	ES013	EPA 8270C SIM PA	EPA 3510C	02/4/2013 19:19	449	GC/MS AA	1
3-H	ES013	EPA 8015B (M)	EPA 3510C	02/5/2013 16:23	628	GC 45	1
3-A	ES013	GC/MS / EPA 8260	EPA 5030C	01/31/2013 20:53	486	GC/MS OO	2
4-H	ES014	EPA 8270C SIM PA	EPA 3510C	02/4/2013 19:45	449	GC/MS AA	1
4-G	ES014	EPA 8015B (M)	EPA 3510C	02/5/2013 16:42	628	GC 45	1
4-A	ES014	GC/MS / EPA 8260	EPA 5030C	01/31/2013 21:19	486	GC/MS OO	2
5-A	ES014UF	EPA 200.8	N/A	02/1/2013 17:53	598	ICP/MS 03	1
6-G	ES015	EPA 6020	EPA 3020A T	02/1/2013 17:56	598	ICP/MS 03	1
6-J	ES015	EPA 8270C SIM PA	EPA 3510C	02/4/2013 20:11	449	GC/MS AA	1
6-H	ES015	EPA 8015B (M)	EPA 3510C	02/5/2013 17:00	628	GC 45	1
6-A	ES015	GC/MS / EPA 8260	EPA 5030C	01/31/2013 21:46	486	GC/MS OO	2
7-A	ESTRIP	GC/MS / EPA 8260	EPA 5030C	01/31/2013 20:26	486	GC/MS OO	2

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Location	Description
1	7440 Lincoln Way, Garden Grove, CA 92841
2	7445 Lampson Avenue, Garden Grove, CA 92841

## Glossary of Terms and Qualifiers

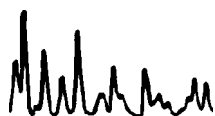


Work Order Number: 13-01-1776

Qualifier	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 matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
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.
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 calibrtn. verif. recov. above method CL for this analyte.
ICJ	Initial calibrtn. verif. recov. below method CL for this analyte.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL 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.

MPN - Most Probable Number



**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](mailto:sales@calscience.com) or call us.

## CHAIN OF CUSTODY RECORD

Date 1/29/13  
Page 1 of 1

WO # / LAB USE ONLY

**13-01-1776**

[illegible]



ORIGIN ID:HNLA

SHIP DATE: 29JAN13  
ACTWGT: 47.9 LB  
CAD: /POS1322  
DIMS: 24x13x14 IN  
BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**  
**CALSCIENCE ENVIRON**  
**7440 LINCOLN WAY**

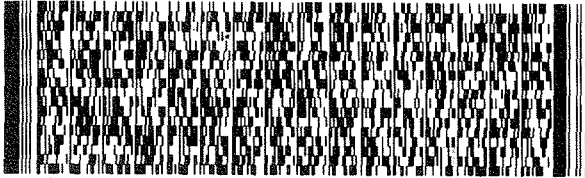
**GARDEN GROVE CA 92841**

(714) 895-5494

REF:

INU:

DEPT:



**FedEx**  
Express



2 of 2

**THU - 31 JAN A1**

**\*\* 2DAY \*\***

MPS# 7955 5016 6622

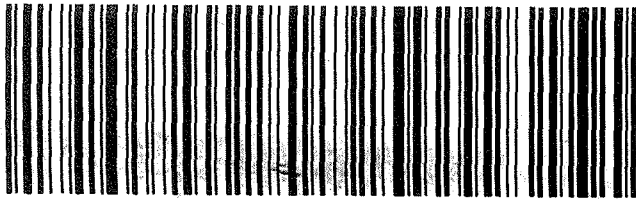
Mstr# 8704 7942 2226

0215

**VZ APVA**

**92841**

**CA-US SNA**



ORIGIN ID:HNLA

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SHIP DATE: 29JAN13  
ACTWGT: 80.2 LB  
CAD: /POS1322  
DIMS: 28x15x17 IN

BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**  
**CALSCIENCE ENVIRON**  
**7440 LINCOLN WAY**

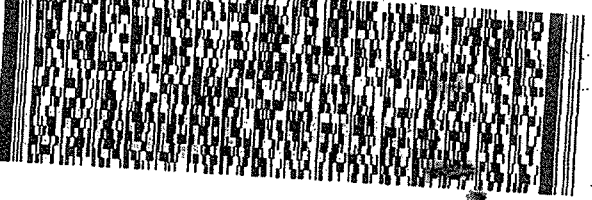
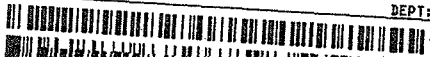
**GARDEN GROVE CA 92841**

(714) 895-5494

REF:

INU:

DEPT:



**FedEx**  
Express



1 of 2

TRK# 8704 7942 2226

## MASTER ##

**VZ APVA**

**THU - 31 JAN A1**

**\*\* 2DAY \*\***

**92841**

**CA-US SN**



Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

☐

Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Signature

Signature

☐

Dry Ice

Dry Ice, 9, UN 1845

☐ Cargo Aircraft Only

Obtain Recip. Acct. No.

Obtain Recip. Acct. No.

☐ Credit Card

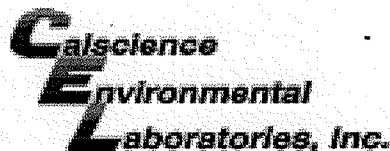
☐ Cash/Check

Credit Card Auth.

See FedEx Service Guide for details.

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WORK ORDER #: 13-01-1776

**SAMPLE RECEIPT FORM**

Cooler 1 of 2

CLIENT: ESIDATE: 01/31/13**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)Temperature 1.9 °C - 0.2 °C (CF) = 1.7 °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 ☐ FilterInitial: JS**CUSTODY SEALS INTACT:**☒ Cooler ☐ \_\_\_\_\_ ☐ No (Not Intact) ☐ Not Present ☐ N/AInitial: JS☒ Sample ☐ \_\_\_\_\_ ☐ No (Not Intact) ☒ Not PresentInitial: JS**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (\_\_\_\_) ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_Water: ☒ VOA ☒ VOA<sub>h</sub> ☐ VOA<sub>na2</sub> ☐ 125AGB ☐ 125AGB<sub>h</sub> ☐ 125AGB<sub>p</sub> ☒ 1AGB ☐ 1AGB<sub>na2</sub> ☐ 1AGB<sub>s</sub>☒ 500AGB ☒ 500AGJ ☐ 500AGJ<sub>s</sub> ☐ 250AGB ☐ 250CGB ☐ 250CGB<sub>s</sub> ☐ 1PB ☐ 1PB<sub>na</sub> ☐ 500PB☐ 250PB ☒ 250PB<sub>na</sub> ☐ 125PB ☐ 125PB<sub>znna</sub> ☐ 100PJ ☐ 100PJ<sub>na2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_Air: ☐ Tedlar® ☐ Canister Other: ☐ \_\_\_\_\_ Trip Blank Lot#: 12/2/08 Labeled/Checked by: JSContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: JSPreservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure znna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: JS

WORK ORDER #: 13-01-1776

**SAMPLE RECEIPT FORM**Cooler 2 of 2CLIENT: ESTDATE: 01/31/13**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)Temperature 1.5 °C - 0.2 °C (CF) = 1.3 °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 ☐ FilterInitial: PS**CUSTODY SEALS INTACT:**☒ Cooler ☐ \_\_\_\_\_ ☐ No (Not Intact) ☐ Not Present ☐ N/AInitial: PS☒ Sample ☐ \_\_\_\_\_ ☐ No (Not Intact) ☐ Not PresentInitial: AP**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (\_\_\_\_) ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_Water: ☒ VOA ☐ VOA<sub>h</sub> ☐ VOA<sub>na2</sub> ☐ 125AGB ☐ 125AGB<sub>h</sub> ☐ 125AGB<sub>p</sub> ☒ 1AGB ☐ 1AGB<sub>na2</sub> ☐ 1AGB<sub>s</sub>☐ 500AGB ☒ 500AGJ ☐ 500AGJ<sub>s</sub> ☐ 250AGB ☐ 250CGB ☐ 250CGB<sub>s</sub> ☐ 1PB ☐ 1PB<sub>na</sub> ☐ 500PB☐ 250PB ☒ 250PB<sub>na</sub> ☐ 125PB ☐ 125PB<sub>znna</sub> ☐ 100PJ ☐ 100PJ<sub>na2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_Air: ☐ Tedlar® ☐ Canister Other: ☐ \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: APContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: PSPreservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure znna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: PS





# CALSCIENCE

## WORK ORDER NUMBER: 13-01-1776

*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

*Richard Villafania*

Approved for release on 02/7/2013 by:  
 Richard Villafania  
 Project Manager

ResultLink ▶

Email your PM ▶



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Client Project Name: Red Hill LTM 112066

Work Order Number: 13-01-1776

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

Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: N/A  
Method: EPA 200.8

Project: Red Hill LTM 112066

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>ES014UF</b>	<b>13-01-1776-5-A</b>	<b>01/29/13 09:35</b>	<b>Aqueous</b>	<b>ICP/MS 03</b>	<b>01/31/13</b>	<b>02/01/13 17:53</b>	<b>130131L02</b>

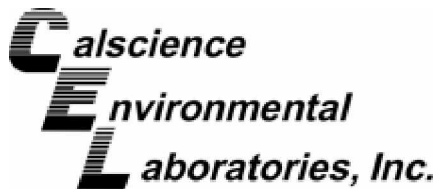
Comment(s): -Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Lead	0.242	1.00	0.0898	1	J	ug/L

<b>Method Blank</b>	<b>099-10-008-2,180</b>	<b>N/A</b>	<b>Aqueous</b>	<b>ICP/MS 03</b>	<b>01/31/13</b>	<b>01/31/13 14:47</b>	<b>130131L02</b>
---------------------	-------------------------	------------	----------------	------------------	-----------------	-----------------------	------------------

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.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>
Lead	<0.0898	1.00	0.0898	1	U	ug/L



Quality Control - Spike/Spike Duplicate



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

Date Received: 01/31/13  
Work Order No: 13-01-1776  
Preparation: N/A  
Method: EPA 200.8

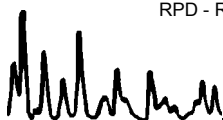
Project Red Hill LTM 112066

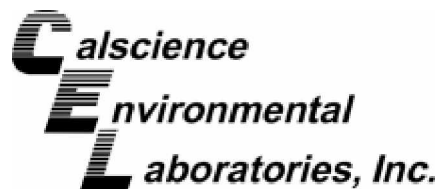
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-01-1769-4	Aqueous	ICP/MS 03	01/31/13	01/31/13	130131S02

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>MS CONC</u>	<u>MS %REC</u>	<u>MSD CONC</u>	<u>MSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	ND	100.0	105.6	106	107.0	107	80-120	1	0-20	

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RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-01-1776  
Preparation: N/A  
Method: EPA 200.8

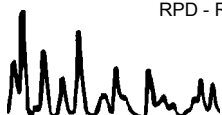
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-10-008-2,180	Aqueous	ICP/MS 03	01/31/13	01/31/13	130131L02

Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	100.0	93.43	93	97.54	98	80-120	4	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit



WORK ORDER #: 13-01-1776

Lab Sample Number	Client Sample ID	Method	Extraction	Date/Time Analyzed	Chemist ID	Instrument	Analytical Location
1-K	ES011	EPA 6020	EPA 3020A T	02/1/2013 17:44	598	ICP/MS 03	1
1-S	ES011	EPA 8270C SIM PA	EPA 3510C	02/4/2013 18:26	449	GC/MS AA	1
1-S	ES011	EPA 8270C SIM PA	EPA 3510C	02/5/2013 13:37	449	GC/MS AA	1
1-L	ES011	EPA 8015B (M)	EPA 3510C	02/5/2013 15:48	628	GC 45	1
1-A	ES011	GC/MS / EPA 8260	EPA 5030C	01/31/2013 18:14	486	GC/MS OO	2
2-G	ES012	EPA 6020	EPA 3020A T	02/1/2013 17:47	598	ICP/MS 03	1
2-J	ES012	EPA 8270C SIM PA	EPA 3510C	02/4/2013 18:53	449	GC/MS AA	1
2-J	ES012	EPA 8270C SIM PA	EPA 3510C	02/5/2013 14:03	449	GC/MS AA	1
2-H	ES012	EPA 8015B (M)	EPA 3510C	02/5/2013 16:06	628	GC 45	1
2-A	ES012	GC/MS / EPA 8260	EPA 5030C	01/31/2013 18:41	486	GC/MS OO	2
3-G	ES013	EPA 6020	EPA 3020A T	02/1/2013 17:50	598	ICP/MS 03	1
3-J	ES013	EPA 8270C SIM PA	EPA 3510C	02/4/2013 19:19	449	GC/MS AA	1
3-H	ES013	EPA 8015B (M)	EPA 3510C	02/5/2013 16:23	628	GC 45	1
3-A	ES013	GC/MS / EPA 8260	EPA 5030C	01/31/2013 20:53	486	GC/MS OO	2
4-H	ES014	EPA 8270C SIM PA	EPA 3510C	02/4/2013 19:45	449	GC/MS AA	1
4-G	ES014	EPA 8015B (M)	EPA 3510C	02/5/2013 16:42	628	GC 45	1
4-A	ES014	GC/MS / EPA 8260	EPA 5030C	01/31/2013 21:19	486	GC/MS OO	2
5-A	ES014UF	EPA 200.8	N/A	02/1/2013 17:53	598	ICP/MS 03	1
6-G	ES015	EPA 6020	EPA 3020A T	02/1/2013 17:56	598	ICP/MS 03	1
6-J	ES015	EPA 8270C SIM PA	EPA 3510C	02/4/2013 20:11	449	GC/MS AA	1
6-H	ES015	EPA 8015B (M)	EPA 3510C	02/5/2013 17:00	628	GC 45	1
6-A	ES015	GC/MS / EPA 8260	EPA 5030C	01/31/2013 21:46	486	GC/MS OO	2
7-A	ESTRIP	GC/MS / EPA 8260	EPA 5030C	01/31/2013 20:26	486	GC/MS OO	2

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Location	Description
1	7440 Lincoln Way, Garden Grove, CA 92841
2	7445 Lampson Avenue, Garden Grove, CA 92841

## Glossary of Terms and Qualifiers




Work Order Number: 13-01-1776

<u>Qualifier</u>	<u>Definition</u>
*	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 matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
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.
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 calibrtn. verif. recov. above method CL for this analyte.
ICJ	Initial calibrtn. verif. recov. below method CL for this analyte.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL 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.

MPN - Most Probable Number





**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](mailto:sales@calscience.com) or call us.

## CHAIN OF CUSTODY RECORD

Date 1/29/13  
Page 1 of 1

WO # / LAB USE ONLY

**13-01-1776**

[illegible]

DISTRIBUTION: White with final report, Green and Yellow to Client. *FORN*  
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

[Return to Contents](#)



ORIGIN ID:HNLA

SHIP DATE: 29JAN13  
ACTWGT: 47.9 LB  
CAD: /POS1322  
DIMS: 24x13x14 IN  
BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**  
**CALSCIENCE ENVIRON**  
**7440 LINCOLN WAY**

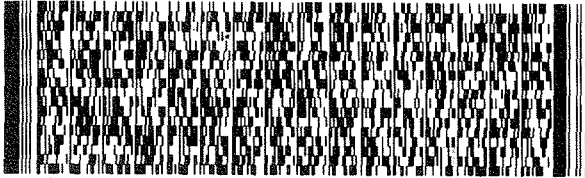
**GARDEN GROVE CA 92841**

(714) 895-5494

REF:

INU:

DEPT:



**FedEx**  
Express



2 of 2

**THU - 31 JAN A1**

**\*\* 2DAY \*\***

MPS# 7955 5016 6622

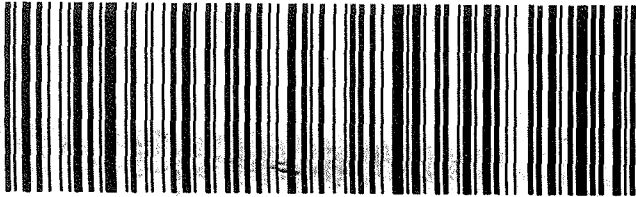
Mstr# 8704 7942 2226

0215

**VZ APVA**

**92841**

**CA-US SNA**



ORIGIN ID:HNLA

Page 9 of 11  
SHIP DATE: 29JAN13  
ACTWGT: 80.2 LB  
CAD: /POS1322  
DIMS: 28x15x17 IN  
BILL RECIPIENT

UNITED STATES US

TO **SAMPLE CONTROL**  
**CALSCIENCE ENVIRON**  
**7440 LINCOLN WAY**

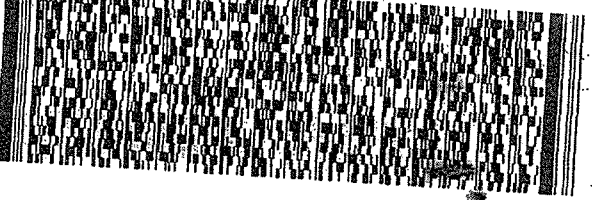
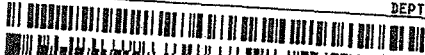
**GARDEN GROVE CA 92841**

(714) 895-5494

REF:

INU:

DEPT:



**FedEx**  
Express



1 of 2

TRK# 8704 7942 2226

## MASTER ##

**VZ APVA**

**THU - 31 JAN**

**\*\* 2DAY \*\***

**92841**

**CA-US SN**



Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.



Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Signature?

Signature



Dry Ice

Dry Ice, 9, UN 1845

Cargo Aircraft Only

Obtain Recip. Acct. No. below.

Card Party



Credit Card

Obtain Recip. Acct. No.



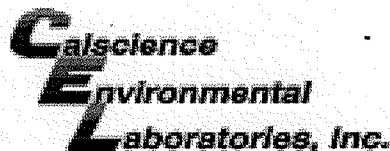
Cash/Check

Credit Card Auth.

See FedEx Service Guide for details.

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WORK ORDER #: 13-01-1776

**SAMPLE RECEIPT FORM**

Cooler 1 of 2

CLIENT: ESIDATE: 01/31/13**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)Temperature 1.9 °C - 0.2 °C (CF) = 1.7 °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 ☐ FilterInitial: JS**CUSTODY SEALS INTACT:**☒ Cooler☐ \_\_\_\_\_☐ No (Not Intact)☐ Not Present☐ N/AInitial: JS☒ Sample☐ \_\_\_\_\_☐ No (Not Intact)☒ Not PresentInitial: JS**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. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours... ☐☐☒Proper preservation noted on COC or sample container..... ☒☐☐☒ Unpreserved vials received for Volatiles analysisVolatile analysis container(s) free of headspace..... ☒☐☐Tedlar bag(s) free of condensation..... ☐☐☒**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (\_\_\_\_) ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_Water: ☒ VOA ☒ VOA<sub>h</sub> ☐ VOA<sub>na2</sub> ☐ 125AGB ☐ 125AGB<sub>h</sub> ☐ 125AGB<sub>p</sub> ☒ 1AGB ☐ 1AGB<sub>na2</sub> ☐ 1AGB<sub>s</sub>☒ 500AGB ☒ 500AGJ ☐ 500AGJ<sub>s</sub> ☐ 250AGB ☐ 250CGB ☐ 250CGB<sub>s</sub> ☐ 1PB ☐ 1PB<sub>na</sub> ☐ 500PB☐ 250PB ☒ 250PB<sub>na</sub> ☐ 125PB ☐ 125PB<sub>znna</sub> ☐ 100PJ ☐ 100PJ<sub>na2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_Air: ☐ Tedlar® ☐ Canister Other: ☐ \_\_\_\_\_ Trip Blank Lot#: 12/2/08 Labeled/Checked by: JSContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: JSPreservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure znna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: JS

WORK ORDER #: 13-01-1776

**SAMPLE RECEIPT FORM**Cooler 2 of 2CLIENT: ESTDATE: 01/31/13**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)Temperature 1.5 °C - 0.2 °C (CF) = 1.3 °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 ☐ FilterInitial: PS**CUSTODY SEALS INTACT:**☒ Cooler ☐ \_\_\_\_\_ ☐ No (Not Intact) ☐ Not Present ☐ N/AInitial: PS☒ Sample ☐ \_\_\_\_\_ ☐ No (Not Intact) ☐ Not PresentInitial: AP**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> No analysis requested. <input type="checkbox"/> Not relinquished. <input type="checkbox"/> No date/time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers and sufficient volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (\_\_\_\_) ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_Water: ☒ VOA ☐ VOA<sub>h</sub> ☐ VOA<sub>na2</sub> ☐ 125AGB ☐ 125AGB<sub>h</sub> ☐ 125AGB<sub>p</sub> ☒ 1AGB ☐ 1AGB<sub>na2</sub> ☐ 1AGB<sub>s</sub>☐ 500AGB ☒ 500AGJ ☐ 500AGJ<sub>s</sub> ☐ 250AGB ☐ 250CGB ☐ 250CGB<sub>s</sub> ☐ 1PB ☐ 1PB<sub>na</sub> ☐ 500PB☐ 250PB ☒ 250PB<sub>na</sub> ☐ 125PB ☐ 125PB<sub>znna</sub> ☐ 100PJ ☐ 100PJ<sub>na2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_Air: ☐ Tedlar® ☐ Canister Other: ☐ \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: APContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: PSPreservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure znna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: PS





# CALSCIENCE

## WORK ORDER NUMBER: 13-02-0277

*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 02/14/2013 by:  
Richard Villafania  
Project Manager

ResultLink ▶

Email your PM ▶



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Work Order Number: 13-02-0277

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

### ANALYTICAL REPORT

**13-02-0277-1**      **Client ID: ES010**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 10:45**

**EPA 6020 ICP/MS Metals**      **Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	0.846	J	0.0898	0.200	1.00	1	02/07/13 00:00	02/07/13 20:49	130207L04D

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

**099-14-497-17**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/08/13 13:01**

**EPA 6020 ICP/MS Metals**      **Extraction: EPA 3020A Total**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Lead	<0.200	U	0.0898	0.200	1.00	1	02/07/13 00:00	02/07/13 20:08	130207L04D

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

Return to Contents

Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**13-02-0277-1**      **Client ID: ES010**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 10:45**

**EPA 8015B (M) TPH Diesel**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	79		16	22	54	1.09	02/08/13 00:00	02/08/13 21:34	130208B07

Surr: n-Octacosane (51-141%)      73%      02/08/13 00:00      02/08/13 21:34      130208B07

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

**099-15-516-28**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/11/13 11:36**

**EPA 8015B (M) TPH Diesel**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
TPH as Diesel	<20	U	15	20	50	1	02/08/13 00:00	02/08/13 20:08	130208B07

Surr: n-Octacosane (51-141%)      75%      02/08/13 00:00      02/08/13 20:08      130208B07

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

Return to Contents



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

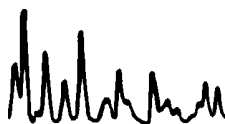
**ANALYTICAL REPORT**

**13-02-0277-1**      **Client ID: ES010**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 10:45**

**EPA 8270C SIM PAHs      Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	0.10	J	0.023	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
2-Methylnaphthalene	<0.050	U	0.026	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
1-Methylnaphthalene	<0.050	U	0.028	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Fluorene	<0.050	U	0.024	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Anthracene	<0.050	U	0.034	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Pyrene	<0.050	U	0.025	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Chrysene	<0.050	U	0.019	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	02/07/13 00:00	02/08/13 18:06	130207L02
Surr: Nitrobenzene-d5 (28-139%)	106%						02/07/13 00:00	02/08/13 18:06	130207L02
Surr: 2-Fluorobiphenyl (33-144%)	97%						02/07/13 00:00	02/08/13 18:06	130207L02
Surr: p-Terphenyl-d14 (23-160%)	108%						02/07/13 00:00	02/08/13 18:06	130207L02

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-15-148  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**099-15-148-9**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/08/13 17:37**

**EPA 8270C SIM PAHs**      **Extraction: EPA 3510C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Naphthalene	<0.050	U	0.023	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
2-Methylnaphthalene	<0.050	U	0.026	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
1-Methylnaphthalene	<0.050	U	0.028	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Acenaphthylene	<0.050	U	0.018	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Acenaphthene	<0.050	U	0.021	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Fluorene	<0.050	U	0.024	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Phenanthrene	<0.050	U	0.031	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Anthracene	<0.050	U	0.034	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Fluoranthene	<0.050	U	0.027	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Pyrene	<0.050	U	0.025	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Benzo (a) Anthracene	<0.050	U	0.024	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Chrysene	<0.050	U	0.019	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Benzo (k) Fluoranthene	<0.050	U	0.023	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Benzo (b) Fluoranthene	<0.050	U	0.025	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Benzo (a) Pyrene	<0.050	U	0.036	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Indeno (1,2,3-c,d) Pyrene	<0.050	U	0.022	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Dibenz (a,h) Anthracene	<0.050	U	0.027	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Benzo (g,h,i) Perylene	<0.050	U	0.022	0.050	0.20	1	02/07/13 00:00	02/08/13 16:48	130207L02
Surr: Nitrobenzene-d5 (28-139%)	105%						02/07/13 00:00	02/08/13 16:48	130207L02
Surr: 2-Fluorobiphenyl (33-144%)	93%						02/07/13 00:00	02/08/13 16:48	130207L02
Surr: p-Terphenyl-d14 (23-160%)	109%						02/07/13 00:00	02/08/13 16:48	130207L02

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



Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**13-02-0277-1**      **Client ID: ES010**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 10:45**

**GC/MS GRO/EPA 8260B Volatile Organics      Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ, ICH, U	6.0	10	20	1	02/06/13 00:00	02/07/13 02:11	130206L03
Benzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Bromoform	<2.0	U	0.50	2.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
Bromomethane	<5.0	U	3.9	5.0	20	1	02/06/13 00:00	02/07/13 02:11	130206L03
2-Butanone	<5.0	U	2.2	5.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Chloroethane	<5.0	U	2.3	5.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
Chloroform	<0.50	U	0.46	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Chloromethane	<2.0	U	1.8	2.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
Styrene	<0.50	U	0.17	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Toluene	<0.50	U	0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**13-02-0277-1**      **Client ID: ES010**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 10:45**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
p/m-Xylene	<1.0	U	0.30	1.0	10	1	02/06/13 00:00	02/07/13 02:11	130206L03
o-Xylene	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	02/06/13 00:00	02/07/13 02:11	130206L03
Gasoline Range Organics	13	J	13	30	50	1	02/06/13 00:00	02/07/13 02:11	130206L03
<i>Surr: Dibromofluoromethane (80-126%)</i>							02/06/13 00:00	02/07/13 02:11	130206L03
<i>Surr: 1,2-Dichloroethane-d4 (80-134%)</i>							02/06/13 00:00	02/07/13 02:11	130206L03
<i>Surr: Toluene-d8 (80-120%)</i>							02/06/13 00:00	02/07/13 02:11	130206L03
<i>Surr: Toluene-d8-TPPH (88-112%)</i>							02/06/13 00:00	02/07/13 02:11	130206L03
<i>Surr: 1,4-Bromofluorobenzene (80-120%)</i>							02/06/13 00:00	02/07/13 02:11	130206L03

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**13-02-0277-2**      **Client ID: ES Trip**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 07:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	IJ,ICH,U	6.0	10	20	1	02/06/13 00:00	02/07/13 01:44	130206L03
Benzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Bromoform	<2.0	U	0.50	2.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
Bromomethane	<5.0	U	3.9	5.0	20	1	02/06/13 00:00	02/07/13 01:44	130206L03
2-Butanone	<5.0	U	2.2	5.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Chloroethane	<5.0	U	2.3	5.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
Chloroform	<0.50	U	0.46	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Chloromethane	<2.0	U	1.8	2.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
Styrene	<0.50	U	0.17	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Toluene	2.8		0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 13-02-0277  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**13-02-0277-2**      **Client ID: ES Trip**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/04/13 07:00**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
p/m-Xylene	<1.0	U	0.30	1.0	10	1	02/06/13 00:00	02/07/13 01:44	130206L03
o-Xylene	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	02/06/13 00:00	02/07/13 01:44	130206L03
Gasoline Range Organics	18	J	13	30	50	1	02/06/13 00:00	02/07/13 01:44	130206L03
Surr: Dibromofluoromethane (80-126%)	92%						02/06/13 00:00	02/07/13 01:44	130206L03
Surr: 1,2-Dichloroethane-d4 (80-134%)	100%						02/06/13 00:00	02/07/13 01:44	130206L03
Surr: Toluene-d8 (80-120%)	99%						02/06/13 00:00	02/07/13 01:44	130206L03
Surr: Toluene-d8-TPPH (88-112%)	99%						02/06/13 00:00	02/07/13 01:44	130206L03
Surr: 1,4-Bromofluorobenzene (80-120%)	97%						02/06/13 00:00	02/07/13 01:44	130206L03

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

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-13-057  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**099-13-057-7**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/07/13 09:57**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
Acetone	<10	U	6.0	10	20	1	02/06/13 00:00	02/07/13 01:18	130206L03
Benzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Bromodichloromethane	<0.50	U	0.21	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Bromoform	<2.0	U	0.50	2.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
Bromomethane	<5.0	U	3.9	5.0	20	1	02/06/13 00:00	02/07/13 01:18	130206L03
2-Butanone	<5.0	U	2.2	5.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
Carbon Tetrachloride	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Chlorobenzene	<0.50	U	0.17	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Chloroethane	<5.0	U	2.3	5.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
Chloroform	<0.50	U	0.46	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Chloromethane	<2.0	U	1.8	2.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
Dibromochloromethane	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2-Dibromo-3-Chloropropane	<2.0	U	1.2	2.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2-Dibromoethane	<0.50	U	0.36	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2-Dichlorobenzene	<0.50	U	0.46	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,3-Dichlorobenzene	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,4-Dichlorobenzene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1-Dichloroethane	<0.50	U	0.28	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2-Dichloroethane	<0.50	U	0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1-Dichloroethene	<0.50	U	0.43	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
c-1,2-Dichloroethene	<0.50	U	0.48	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
t-1,2-Dichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2-Dichloropropane	<0.50	U	0.42	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
c-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
t-1,3-Dichloropropene	<0.50	U	0.25	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Ethylbenzene	<0.50	U	0.14	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Methylene Chloride	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
4-Methyl-2-Pentanone	<5.0	U	4.4	5.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
Styrene	<0.50	U	0.17	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1,1,2-Tetrachloroethane	<0.50	U	0.40	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1,2,2-Tetrachloroethane	<0.50	U	0.41	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Tetrachloroethene	<0.50	U	0.39	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Toluene	<0.50	U	0.24	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,2,4-Trichlorobenzene	<0.50	U	0.50	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1,1-Trichloroethane	<0.50	U	0.30	0.50	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Hexachloro-1,3-Butadiene	<0.50	U	0.32	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
1,1,2-Trichloroethane	<0.50	U	0.38	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Trichloroethene	<0.50	U	0.37	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03

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Client: Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500  
Attn: Robert Chong

Work Order: 099-13-057  
Project Name: Red Hill LTM 112066  
Received: 02/06/13 10:00

**ANALYTICAL REPORT**

**099-13-057-7**      **Client ID: Method Blank**      **Matrix: Aqueous**      **Units: ug/L**      **Sampled: 02/07/13 09:57**

**GC/MS GRO/EPA 8260B Volatile Organics**      **Extraction: EPA 5030C**

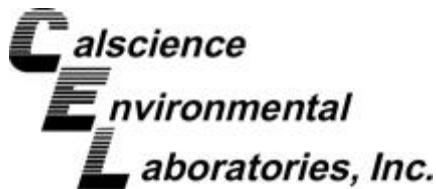
Analyte	Result	Qual.	DL	LOD	LOQ	Dilution Factor	Preparation Date/Time	Analysis Date/Time	Batch
1,2,3-Trichloropropane	<2.0	U	0.64	2.0	5.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Vinyl Chloride	<0.50	U	0.30	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
p/m-Xylene	<1.0	U	0.30	1.0	10	1	02/06/13 00:00	02/07/13 01:18	130206L03
o-Xylene	<0.50	U	0.23	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Methyl-t-Butyl Ether (MTBE)	<0.50	U	0.31	0.50	1.0	1	02/06/13 00:00	02/07/13 01:18	130206L03
Gasoline Range Organics	<30	U	13	30	50	1	02/06/13 00:00	02/07/13 01:18	130206L03
<hr/>									
Surr: Dibromofluoromethane (80-126%)	94%						02/06/13 00:00	02/07/13 01:18	130206L03
Surr: 1,2-Dichloroethane-d4 (80-134%)	100%						02/06/13 00:00	02/07/13 01:18	130206L03
Surr: Toluene-d8 (80-120%)	98%						02/06/13 00:00	02/07/13 01:18	130206L03
Surr: Toluene-d8-TPPH (88-112%)	100%						02/06/13 00:00	02/07/13 01:18	130206L03
Surr: 1,4-Bromofluorobenzene (80-120%)	96%						02/06/13 00:00	02/07/13 01:18	130206L03

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

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## Quality Control - Spike/Spike Duplicate



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

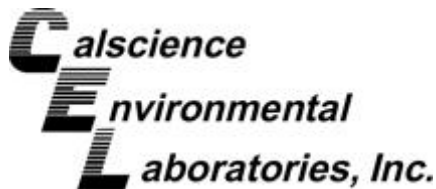
Date Received: 02/06/13  
Work Order No: 13-02-0277  
Preparation: EPA 3005A Filt.  
Method: EPA 6020

Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
13-02-0282-1	Aqueous	ICP/MS 03	02/07/13	02/07/13	130207S04

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>MS CONC</u>	<u>MS %REC</u>	<u>MSD CONC</u>	<u>MSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	45.37	100.0	149.3	104	150.3	105	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



# Quality Control - PDS / PDSD



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

Date Received 02/06/13  
Work Order No: 13-02-0277  
Preparation: EPA 3005A Filt.  
Method: EPA 6020

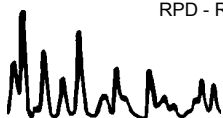
Project: Red Hill LTM 112066

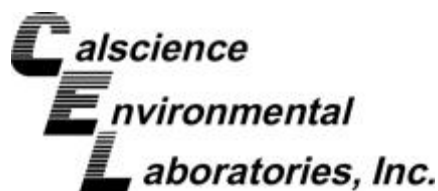
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
13-02-0282-1	Aqueous	ICP/MS 03	02/07/13	02/07/13	130207S04

Parameter	<u>SAMPLE CONC</u>	<u>SPIKE ADDED</u>	<u>PDS CONC</u>	<u>PDS %REC</u>	<u>PDSD CONC</u>	<u>PDSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	45.37	100.0	145.1	100	145.5	100	75-125	0	0-20	

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RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



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

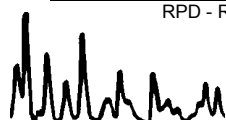
Date Received: 02/06/13  
Work Order No: 13-02-0277  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

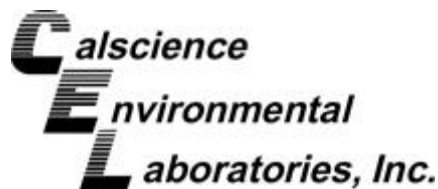
Project Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES010	Aqueous	GC/MS OO	02/06/13	02/07/13	130206S02

Parameter	SAMPLE CONC	SPIKE ADDED	MS CONC	MS %REC	MSD CONC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acetone	ND	50.00	100.6	201	124.9	250	40-140	22	0-20	3,4
Benzene	ND	50.00	45.76	92	45.66	91	80-120	0	0-20	
Bromodichloromethane	ND	50.00	48.15	96	49.85	100	75-120	3	0-20	
Bromoform	ND	50.00	49.26	99	52.03	104	70-130	5	0-20	
Bromomethane	ND	50.00	47.97	96	44.09	88	30-145	8	0-20	
2-Butanone	ND	50.00	56.15	112	53.22	106	30-150	5	0-20	
Carbon Tetrachloride	ND	50.00	44.34	89	45.63	91	65-140	3	0-20	
Chlorobenzene	ND	50.00	47.96	96	47.84	96	80-120	0	0-20	
Chloroethane	ND	50.00	54.22	108	54.75	109	60-135	1	0-20	
Chloroform	ND	50.00	46.63	93	48.11	96	65-135	3	0-20	
Chloromethane	ND	50.00	42.28	85	45.26	91	40-125	7	0-20	
Dibromochloromethane	ND	50.00	48.36	97	49.17	98	60-135	2	0-20	
1,2-Dibromo-3-Chloropropane	ND	50.00	45.21	90	46.56	93	50-130	3	0-20	
1,2-Dibromoethane	ND	50.00	50.28	101	50.92	102	80-120	1	0-20	
1,2-Dichlorobenzene	ND	50.00	49.25	98	48.33	97	70-120	2	0-20	
1,3-Dichlorobenzene	ND	50.00	48.13	96	46.67	93	75-125	3	0-20	
1,4-Dichlorobenzene	ND	50.00	47.10	94	46.01	92	75-125	2	0-20	
1,1-Dichloroethane	ND	50.00	49.06	98	50.72	101	70-135	3	0-20	
1,2-Dichloroethane	ND	50.00	50.13	100	51.85	104	70-130	3	0-20	
1,1-Dichloroethene	ND	50.00	45.61	91	45.84	92	70-130	1	0-20	
c-1,2-Dichloroethene	ND	50.00	47.81	96	49.23	98	70-125	3	0-20	
t-1,2-Dichloroethene	ND	50.00	46.36	93	47.64	95	60-140	3	0-20	
1,2-Dichloropropane	ND	50.00	53.61	107	54.45	109	75-125	2	0-20	
c-1,3-Dichloropropene	ND	50.00	49.44	99	50.43	101	70-130	2	0-20	
t-1,3-Dichloropropene	ND	50.00	43.32	87	44.04	88	55-140	2	0-20	
Ethylbenzene	ND	50.00	49.93	100	48.73	97	75-125	2	0-20	
Methylene Chloride	ND	50.00	45.08	90	46.33	93	55-140	3	0-20	
4-Methyl-2-Pentanone	ND	50.00	57.59	115	60.82	122	60-135	5	0-20	
Styrene	ND	50.00	52.22	104	51.69	103	65-135	1	0-20	
1,1,1,2-Tetrachloroethane	ND	50.00	50.22	100	49.95	100	80-130	1	0-20	
1,1,2,2-Tetrachloroethane	ND	50.00	45.49	91	46.73	93	65-130	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



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

Date Received: 02/06/13  
Work Order No: 13-02-0277  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

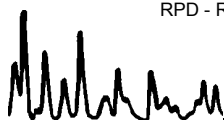
Project Red Hill LTM 112066

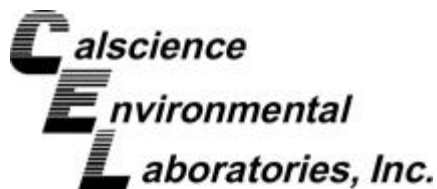
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
ES010	Aqueous	GC/MS OO	02/06/13	02/07/13	130206S02

Parameter	SAMPLE CONC	SPIKE ADDED	MS CONC	MS %REC	MSD CONC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrachloroethene	ND	50.00	59.54	119	58.08	116	45-150	2	0-20	
Toluene	ND	50.00	47.81	96	48.09	96	75-120	1	0-20	
1,2,4-Trichlorobenzene	ND	50.00	46.96	94	45.48	91	65-135	3	0-20	
1,1,1-Trichloroethane	ND	50.00	45.70	91	46.67	93	65-130	2	0-20	
Hexachloro-1,3-Butadiene	ND	50.00	44.97	90	43.65	87	50-140	3	0-20	
1,1,2-Trichloroethane	ND	50.00	47.57	95	48.39	97	75-125	2	0-20	
Trichloroethene	ND	50.00	47.69	95	47.25	94	70-125	1	0-20	
1,2,3-Trichloropropane	ND	50.00	46.76	94	49.55	99	75-125	6	0-20	
Vinyl Chloride	ND	50.00	48.88	98	51.05	102	50-145	4	0-20	
p/m-Xylene	ND	100.0	100.5	100	98.32	98	75-130	2	0-20	
o-Xylene	ND	50.00	52.04	104	51.18	102	80-120	2	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	50.00	49.32	99	51.80	104	65-125	5	0-20	

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RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

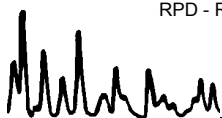
Date Received: N/A  
Work Order No: 13-02-0277  
Preparation: EPA 3020A Total  
Method: EPA 6020

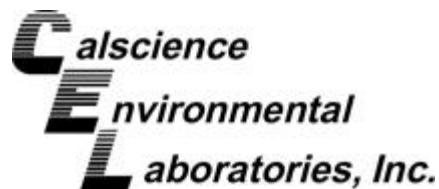
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-497-17	Aqueous	ICP/MS 03	02/07/13	02/07/13	130207L04D

Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Lead	100.0	100.2	100	101.6	102	80-120	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

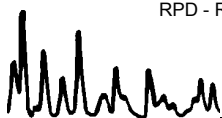
Date Received: N/A  
Work Order No: 13-02-0277  
Preparation: EPA 3510C  
Method: EPA 8015B (M)

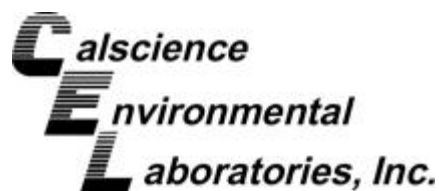
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-516-28	Aqueous	GC 45	02/08/13	02/08/13	130208B07

Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Diesel	4000	3030	76	3102	78	60-132	2	0-11	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-02-0277  
Preparation: EPA 3510C  
Method: EPA 8270C SIM PAHs

Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number					
099-15-148-9	Aqueous	GC/MS AAA	02/07/13	02/08/13	130207L02					
Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>ME CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Naphthalene	2.000	1.976	99	1.969	98	21-133	2-152	0	0-25	
2-Methylnaphthalene	2.000	2.126	106	2.129	106	21-140	1-160	0	0-25	
1-Methylnaphthalene	2.000	2.121	106	2.108	105	20-140	0-160	1	0-25	
Acenaphthylene	2.000	1.975	99	1.973	99	33-145	14-164	0	0-25	
Acenaphthene	2.000	1.972	99	1.997	100	55-121	44-132	1	0-25	
Fluorene	2.000	2.140	107	2.155	108	59-121	49-131	1	0-25	
Phenanthrene	2.000	2.177	109	2.162	108	54-120	43-131	1	0-25	
Anthracene	2.000	1.933	97	1.934	97	27-133	9-151	0	0-25	
Fluoranthene	2.000	2.148	107	2.137	107	26-137	8-156	1	0-25	
Pyrene	2.000	2.421	121	2.401	120	45-129	31-143	1	0-25	
Benzo (a) Anthracene	2.000	2.601	130	2.583	129	33-143	15-161	1	0-25	
Chrysene	2.000	2.339	117	2.334	117	17-168	0-193	0	0-25	
Benzo (k) Fluoranthene	2.000	2.628	131	2.649	132	24-159	2-182	1	0-25	
Benzo (b) Fluoranthene	2.000	2.620	131	2.693	135	24-159	2-182	3	0-25	
Benzo (a) Pyrene	2.000	2.434	122	2.418	121	17-163	0-187	1	0-25	
Indeno (1,2,3-c,d) Pyrene	2.000	2.394	120	2.370	119	25-175	0-200	1	0-25	
Dibenz (a,h) Anthracene	2.000	2.331	117	2.321	116	25-175	0-200	0	0-25	
Benzo (g,h,i) Perylene	2.000	2.275	114	2.265	113	25-157	3-179	0	0-25	

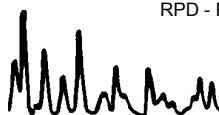
Total number of LCS compounds : 18

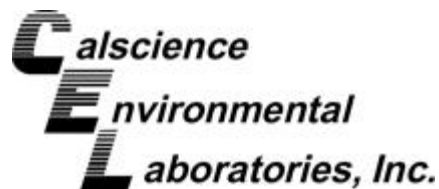
Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



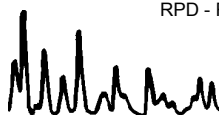
Environmental Science International, Inc.  
354 Uluniu Street, Suite 304  
Kailua, HI 96734-2500

Date Received: N/A  
Work Order No: 13-02-0277  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

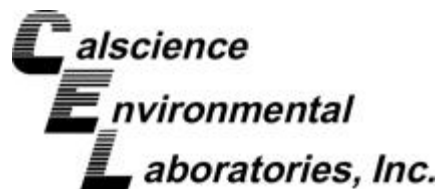
Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed		LCS/LCSD Batch Number			
099-13-057-7	Aqueous	GC/MS OO	02/06/13		02/07/13		130206L03			
Parameter	<u>SPIKE ADDED</u>	<u>LCS CONC</u>	<u>LCS %REC</u>	<u>LCSD CONC</u>	<u>LCSD %REC</u>	<u>%REC CL</u>	<u>ME_CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Acetone	50.00	82.38	165	83.92	168	40-140	23-157	2	0-20	X
Benzene	50.00	47.26	95	48.16	96	80-120	73-127	2	0-20	
Bromodichloromethane	50.00	50.31	101	51.00	102	75-120	68-128	1	0-20	
Bromoform	50.00	51.68	103	54.39	109	70-130	60-140	5	0-20	
Bromomethane	50.00	46.07	92	45.08	90	30-145	11-164	2	0-20	
2-Butanone	50.00	49.45	99	50.39	101	30-150	10-170	2	0-20	
Carbon Tetrachloride	50.00	46.34	93	45.73	91	65-140	52-152	1	0-20	
Chlorobenzene	50.00	49.32	99	50.30	101	80-120	73-127	2	0-20	
Chloroethane	50.00	55.75	112	56.30	113	60-135	48-148	1	0-20	
Chloroform	50.00	48.86	98	48.34	97	65-135	53-147	1	0-20	
Chloromethane	50.00	46.23	92	45.91	92	40-125	26-139	1	0-20	
Dibromochloromethane	50.00	49.92	100	51.72	103	60-135	48-148	4	0-20	
1,2-Dibromo-3-Chloropropane	50.00	46.14	92	48.12	96	50-130	37-143	4	0-20	
1,2-Dibromoethane	50.00	53.90	108	53.48	107	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	50.00	49.52	99	51.72	103	70-120	62-128	4	0-20	
1,3-Dichlorobenzene	50.00	47.94	96	49.88	100	75-125	67-133	4	0-20	
1,4-Dichlorobenzene	50.00	47.49	95	49.32	99	75-125	67-133	4	0-20	
1,1-Dichloroethane	50.00	51.83	104	51.59	103	70-135	59-146	0	0-20	
1,2-Dichloroethane	50.00	52.05	104	53.09	106	70-130	60-140	2	0-20	
1,1-Dichloroethene	50.00	47.62	95	46.57	93	70-130	60-140	2	0-20	
c-1,2-Dichloroethene	50.00	50.38	101	49.45	99	70-125	61-134	2	0-20	
t-1,2-Dichloroethene	50.00	48.00	96	47.66	95	60-140	47-153	1	0-20	
1,2-Dichloropropane	50.00	56.64	113	57.49	115	75-125	67-133	1	0-20	
c-1,3-Dichloropropene	50.00	52.77	106	53.61	107	70-130	60-140	2	0-20	
t-1,3-Dichloropropene	50.00	46.58	93	47.94	96	55-140	41-154	3	0-20	
Ethylbenzene	50.00	51.16	102	52.31	105	75-125	67-133	2	0-20	
Methylene Chloride	50.00	47.11	94	47.03	94	55-140	41-154	0	0-20	
4-Methyl-2-Pentanone	50.00	62.36	125	63.65	127	60-135	48-148	2	0-20	
Styrene	50.00	53.86	108	54.73	109	65-135	53-147	2	0-20	
1,1,1,2-Tetrachloroethane	50.00	51.10	102	52.58	105	80-130	72-138	3	0-20	
1,1,2,2-Tetrachloroethane	50.00	48.25	96	50.54	101	65-130	54-141	5	0-20	
Tetrachloroethene	50.00	44.92	90	46.11	92	45-150	28-168	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit







## Quality Control - LCS/LCS Duplicate



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

Date Received: N/A  
Work Order No: 13-02-0277  
Preparation: EPA 5030C  
Method: GC/MS / EPA 8260B

Project: Red Hill LTM 112066

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed		LCS/LCSD Batch Number			
099-13-057-7	Aqueous	GC/MS OO	02/06/13		02/07/13		130206L03			
Parameter	<u>SPIKE</u> <u>ADDED</u>	<u>LCS</u> <u>CONC</u>	<u>LCS</u> <u>%REC</u>	<u>LCSD</u> <u>CONC</u>	<u>LCSD</u> <u>%REC</u>	<u>%REC CL</u>	<u>ME CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Toluene	50.00	50.17	100	50.72	101	75-120	68-128	1	0-20	
1,2,4-Trichlorobenzene	50.00	49.31	99	50.38	101	65-135	53-147	2	0-20	
1,1,1-Trichloroethane	50.00	48.33	97	47.39	95	65-130	54-141	2	0-20	
Hexachloro-1,3-Butadiene	50.00	46.28	93	47.15	94	50-140	35-155	2	0-20	
1,1,2-Trichloroethane	50.00	50.80	102	52.81	106	75-125	67-133	4	0-20	
Trichloroethene	50.00	47.83	96	49.29	99	70-125	61-134	3	0-20	
1,2,3-Trichloropropane	50.00	51.40	103	51.35	103	75-125	67-133	0	0-20	
Vinyl Chloride	50.00	51.47	103	51.55	103	50-145	34-161	0	0-20	
p/m-Xylene	100.0	102.3	102	104.2	104	75-130	66-139	2	0-20	
o-Xylene	50.00	53.68	107	54.54	109	80-120	73-127	2	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	52.87	106	53.08	106	65-125	55-135	0	0-20	
Gasoline Range Organics	1000	1064	106	1088	109	80-120	73-127	2	0-20	

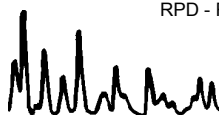
Total number of LCS compounds : 44

Total number of ME compounds : 0

Total number of ME compounds allowed : 2

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



WORK ORDER #: 13-02-0277

<i>Lab Sample Number</i>	<i>Client Sample ID</i>	<i>Method</i>	<i>Extraction</i>	<i>Date/Time Analyzed</i>	<i>Chemist ID</i>	<i>Instrument</i>	<i>Analytical Location</i>
1-G	ES010	EPA 6020	EPA 3020A T	02/7/2013 20:49	598	ICP/MS 03	1
1-I	ES010	EPA 8270C SIM PA	EPA 3510C	02/8/2013 18:06	449	GC/MS AA	1
1-H	ES010	EPA 8015B (M)	EPA 3510C	02/8/2013 21:34	682	GC 45	1
1-A	ES010	GC/MS / EPA 8260	EPA 5030C	02/7/2013 2:11	486	GC/MS OO	2
2-A	ES Trip	GC/MS / EPA 8260	EPA 5030C	02/7/2013 1:44	486	GC/MS OO	2

<i>Location</i>	<i>Description</i>
1	7440 Lincoln Way, Garden Grove, CA 92841
2	7445 Lampson Avenue, Garden Grove, CA 92841

## Glossary of Terms and Qualifiers

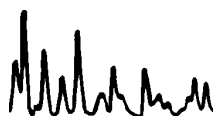


Work Order Number: 13-02-0277

<u>Qualifier</u>	<u>Definition</u>
*	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 matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
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.
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 calibrtn. verif. recov. above method CL for this analyte.
ICJ	Initial calibrtn. verif. recov. below method CL for this analyte.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL 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.

MPN - Most Probable Number





0277

ORIGIN ID: HNLA (714) 895-5494  
 CALSCIENCE ENVIRONMENTAL LAB  
 7440 LINCOLN WAY  
 GARDEN GROVE, CA 928411427  
 UNITED STATES US

SHIP DATE: 04FEB13  
 ACTWGT: 35.0 LB  
 CAD: /POS1400  
 DIMS: 19x13x11 IN  
 BILL SENDER

Per  
 #332013 02/04 5166/9H-24-20R

TO

**CALSCIENCE ENVIRONMENTAL LAB**  
**7440 LINCOLN WAY**

**GARDEN GROVE CA 92841**

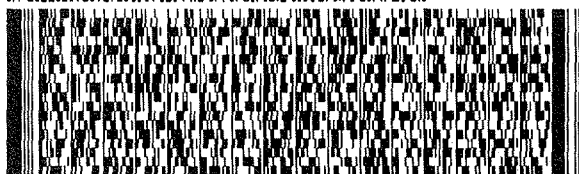
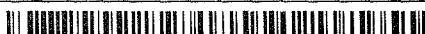
(714) 895-5474

REF:

INU:

PO:

DEPT:



**FedEx**  
 Express



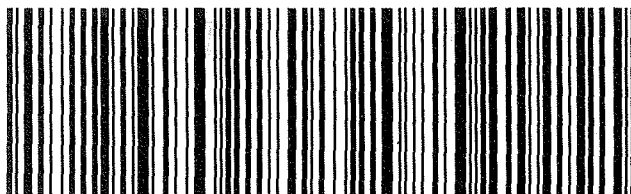
J13101212190126

TRK# 8704 7942 2215  
 0215

WED - 06 FEB A1  
 \*\* 2DAY \*\*

**VZ APVA**

92841  
 CA-US SNA



Return to Contents

WORK ORDER #: 13-02-0277

**SAMPLE RECEIPT FORM**Cooler 1 of 1CLIENT: ESIDATE: 02/06/13**TEMPERATURE:** Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)Temperature 2.9 °C - 0.2 °C (CF) = 2.7 °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 ☐ FilterInitial: PS**CUSTODY SEALS INTACT:**☒ Cooler☐ \_\_\_\_\_☐ No (Not Intact)☐ Not Present☐ N/AInitial: PS☒ Sample☐ \_\_\_\_\_☐ No (Not Intact)☒ Not PresentInitial: HH**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. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours... ☐☐☒Proper preservation noted on COC or sample container..... ☒☐☐☒ Unpreserved vials received for Volatiles analysisVolatile analysis container(s) free of headspace..... ☒☐☐Tedlar bag(s) free of condensation..... ☐☐☒**CONTAINER TYPE:**Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (\_\_\_\_) ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_Water: ☒ VOA <sup>6</sup> ☒ VOA<sup>3</sup>h ☐ VOAna<sub>2</sub> ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☒ 1AGB <sup>2</sup> ☐ 1AGBna<sub>2</sub> ☐ 1AGBs☐ 500AGB ☒ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 1PBna ☐ 500PB☐ 250PB ☒ 250PBnw ☐ 125PB ☐ 125PBznna ☐ 100PJ ☐ 100PJna<sub>2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_Air: ☐ Tedlar® ☐ Canister Other: ☐ \_\_\_\_\_ Trip Blank Lot#: N/A Labeled/Checked by: HHContainer: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: PSPreservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> u: Ultra-pure znna: ZnAc<sub>2</sub>+NaOH f: Filtered Scanned by: PS

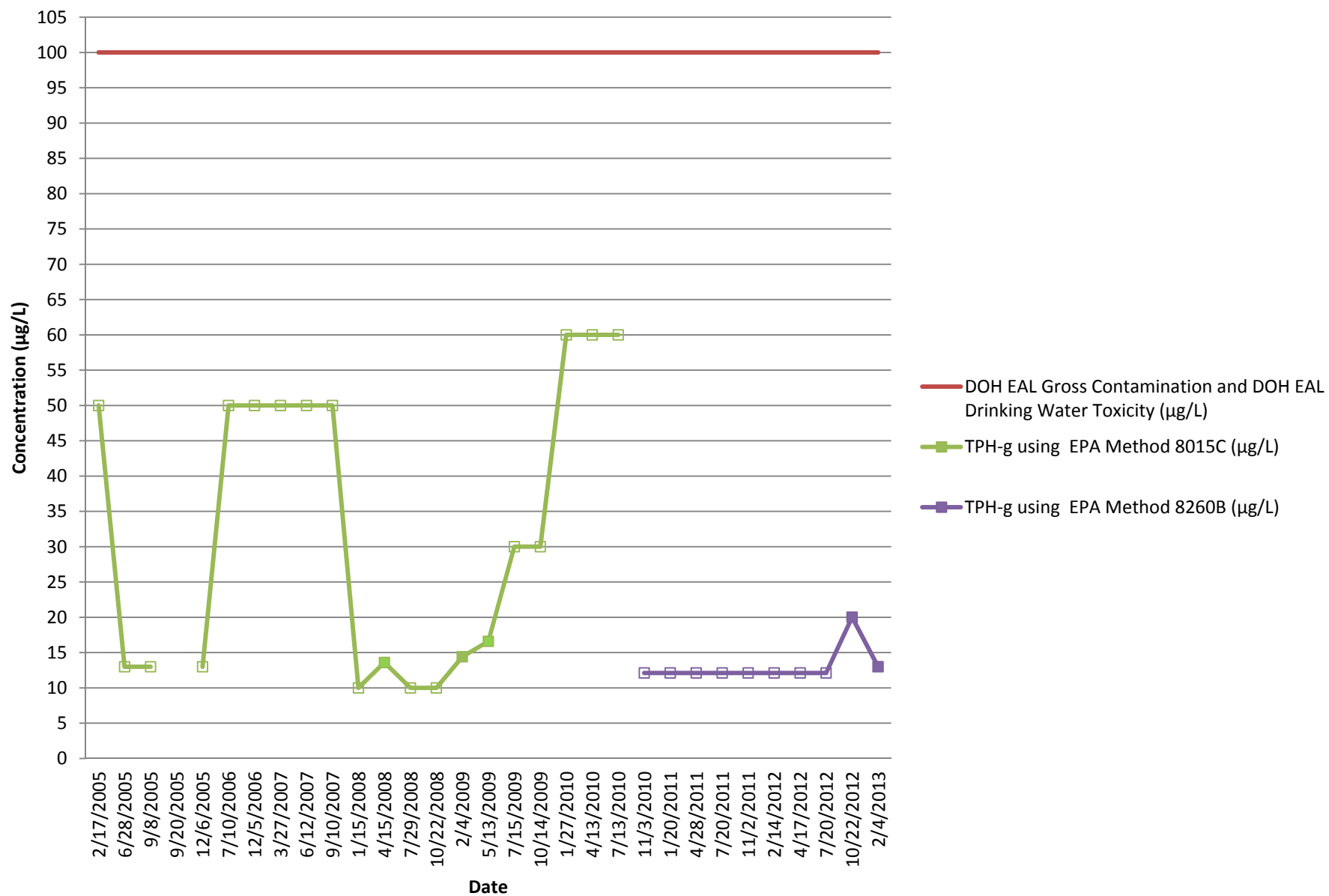
## **APPENDIX D**

### **Historical Groundwater Exceedance Trends**

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## TPH-g Concentrations for RHMW01

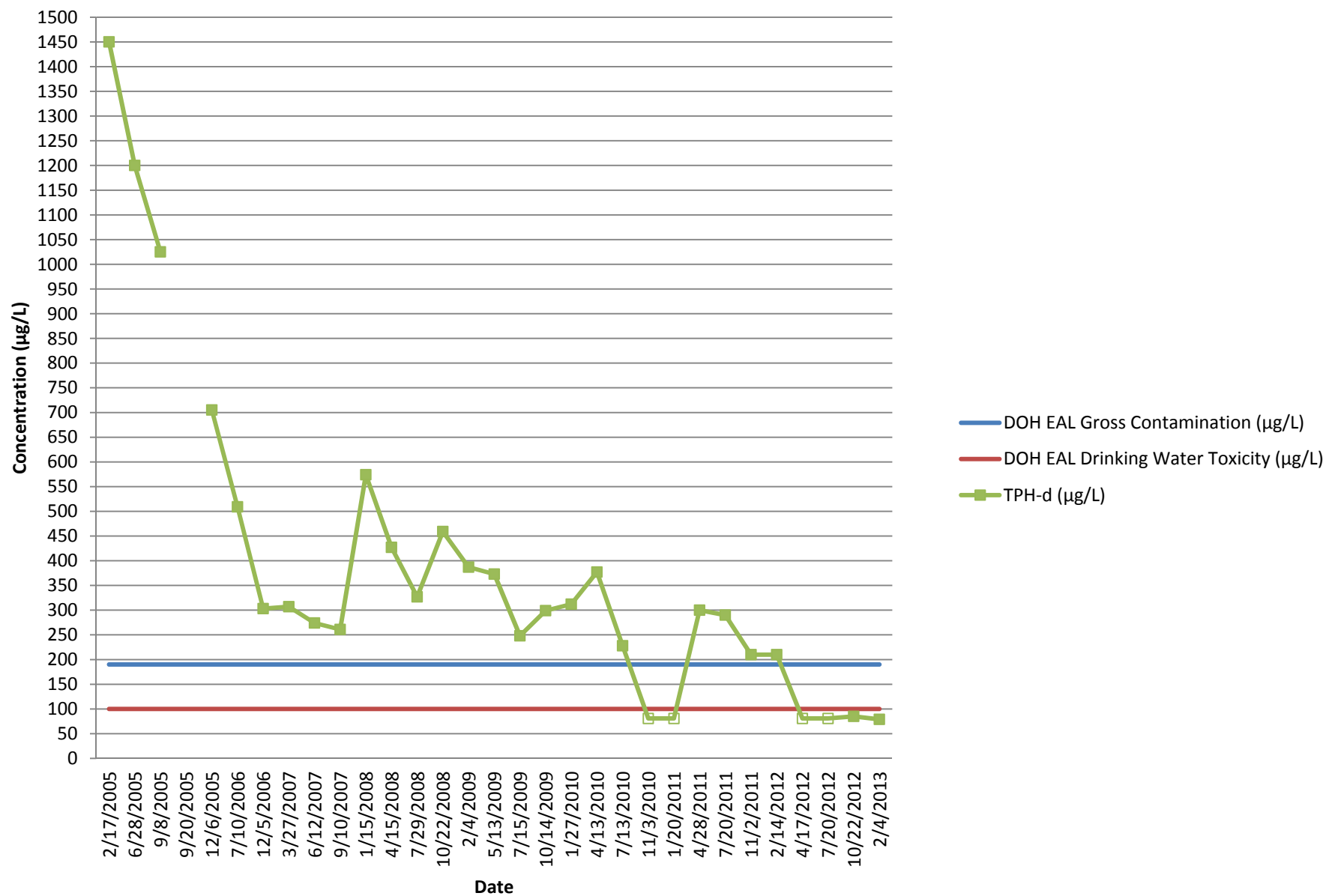


Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.

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

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## TPH-d Concentrations for RHMW01

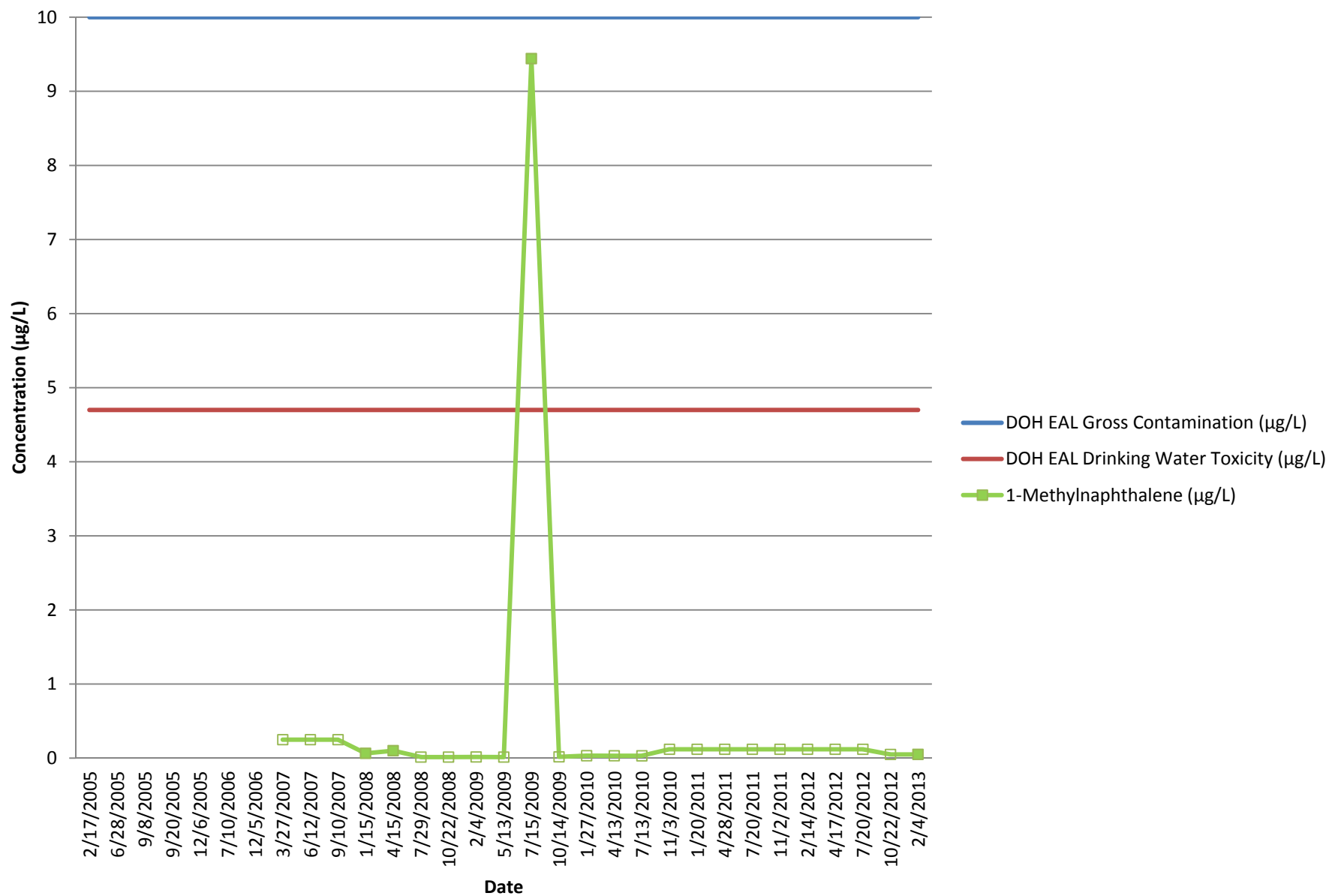


Data points for 2/17/2005 through 9/8/2005 and 12/6/2005 are the average of the primary and duplicate samples.

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

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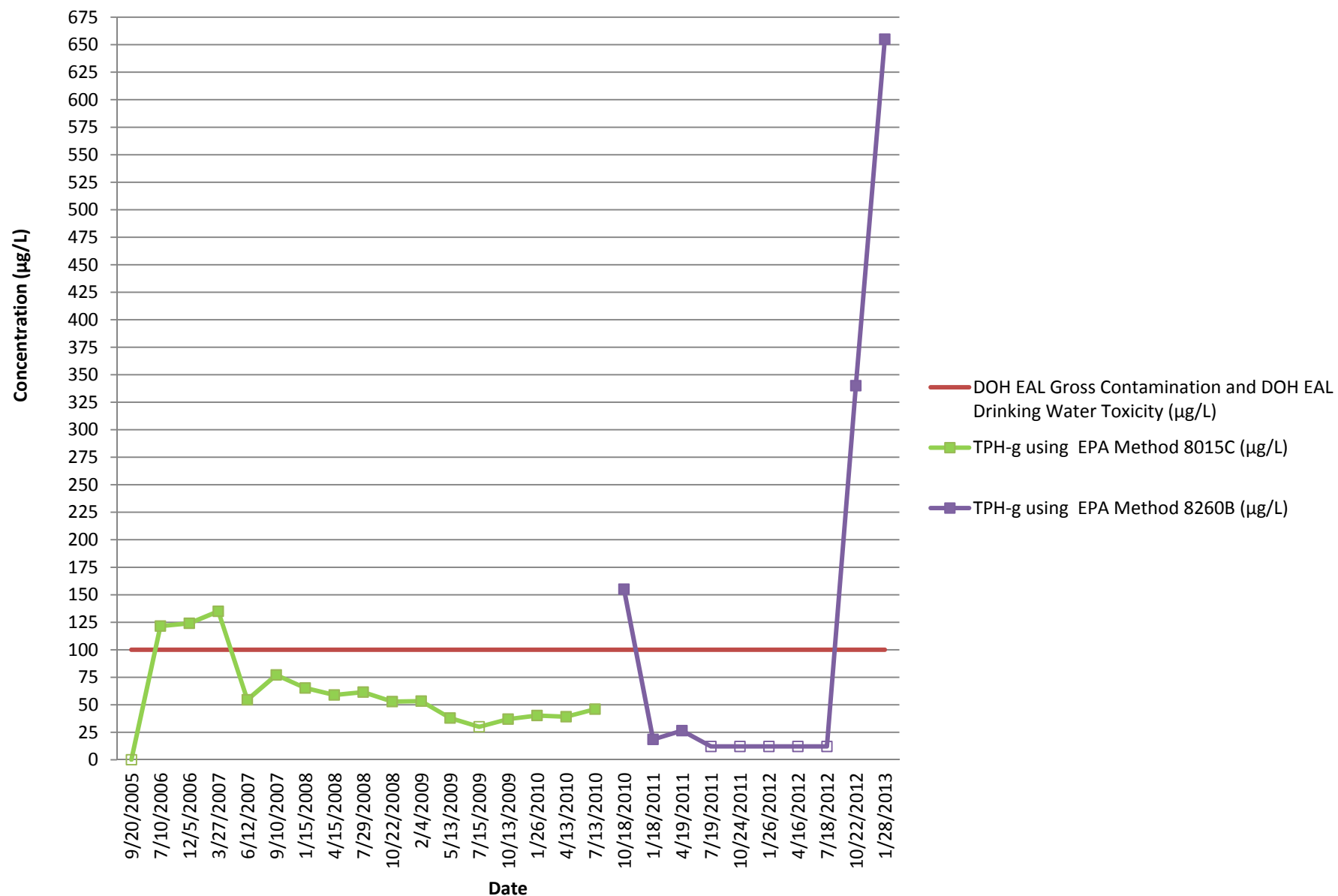
## 1-Methylnaphthalene Concentrations for RHMW01



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

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## TPH-g Concentrations for RHMW02



Data points for 9/20/2005 through 1/28/2013 are the average of the primary and duplicate samples.

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

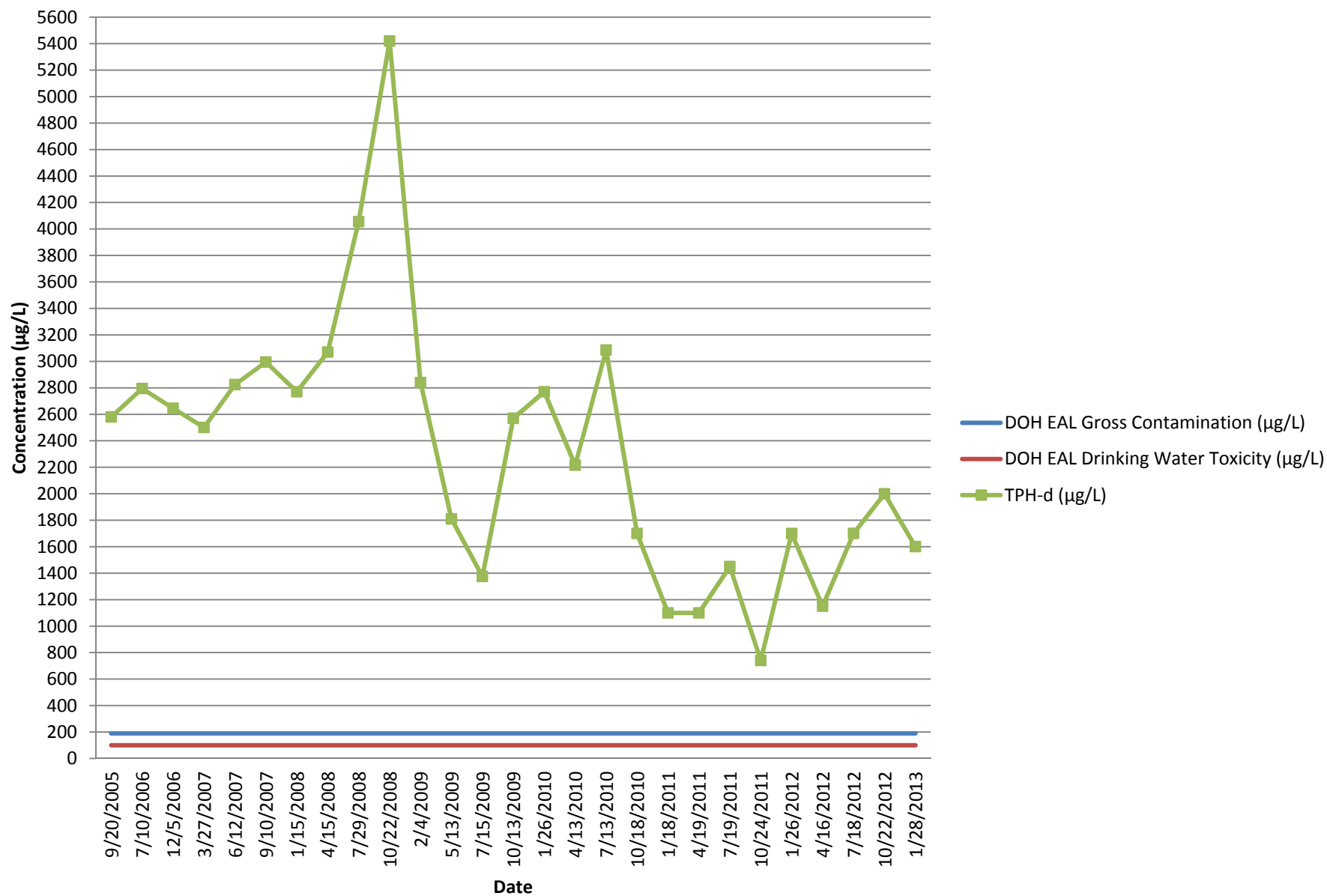
Primary sample results are shown for 1/26/2012 and 7/18/2012; all other concentrations are the average of the primary and duplicate sample results.

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

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## TPH-d Concentrations for RHMW02

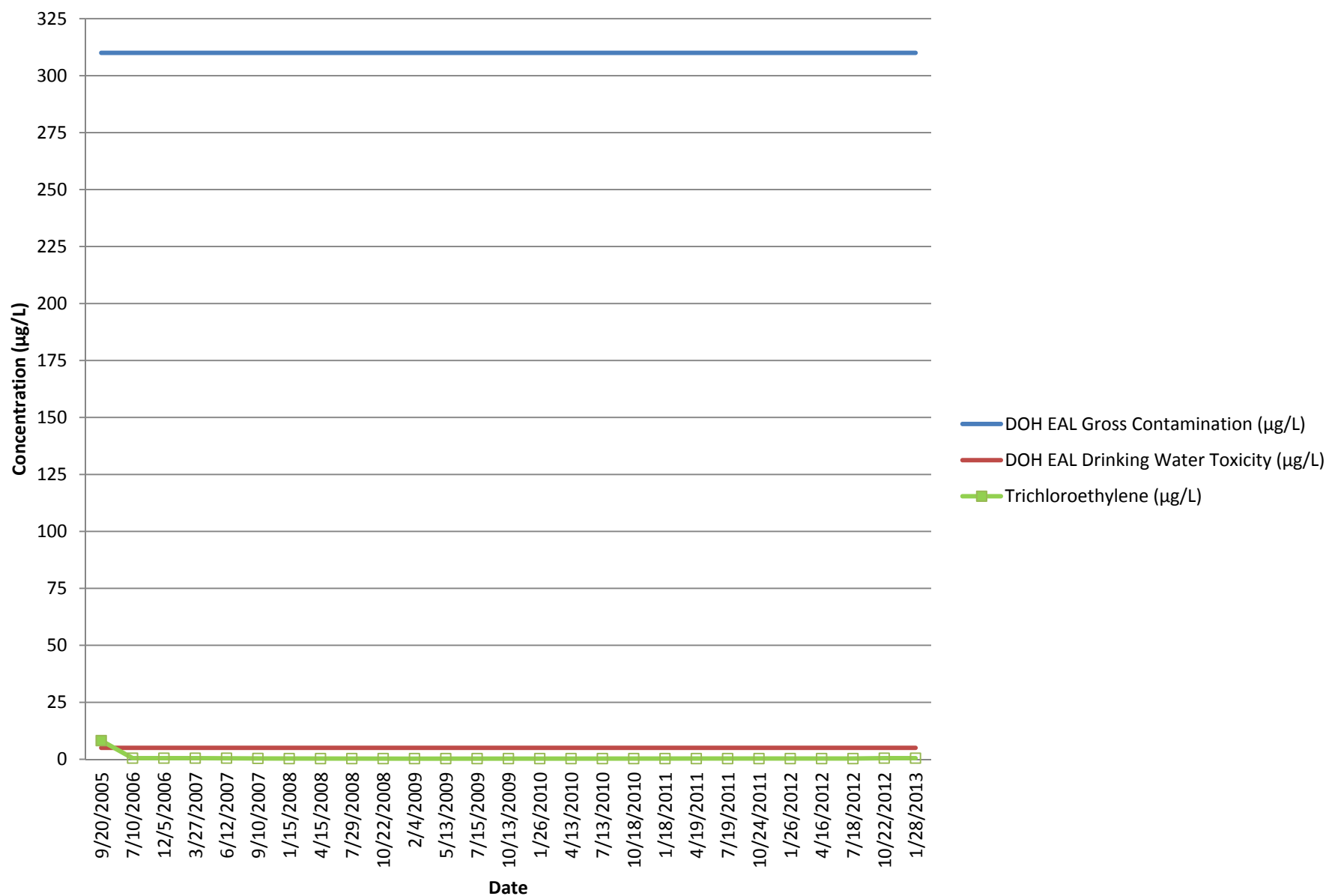


Data points for 9/20/2005 through 1/28/2013 are the average of the primary and duplicate samples.

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

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## Trichloroethylene Concentrations for RHMW02

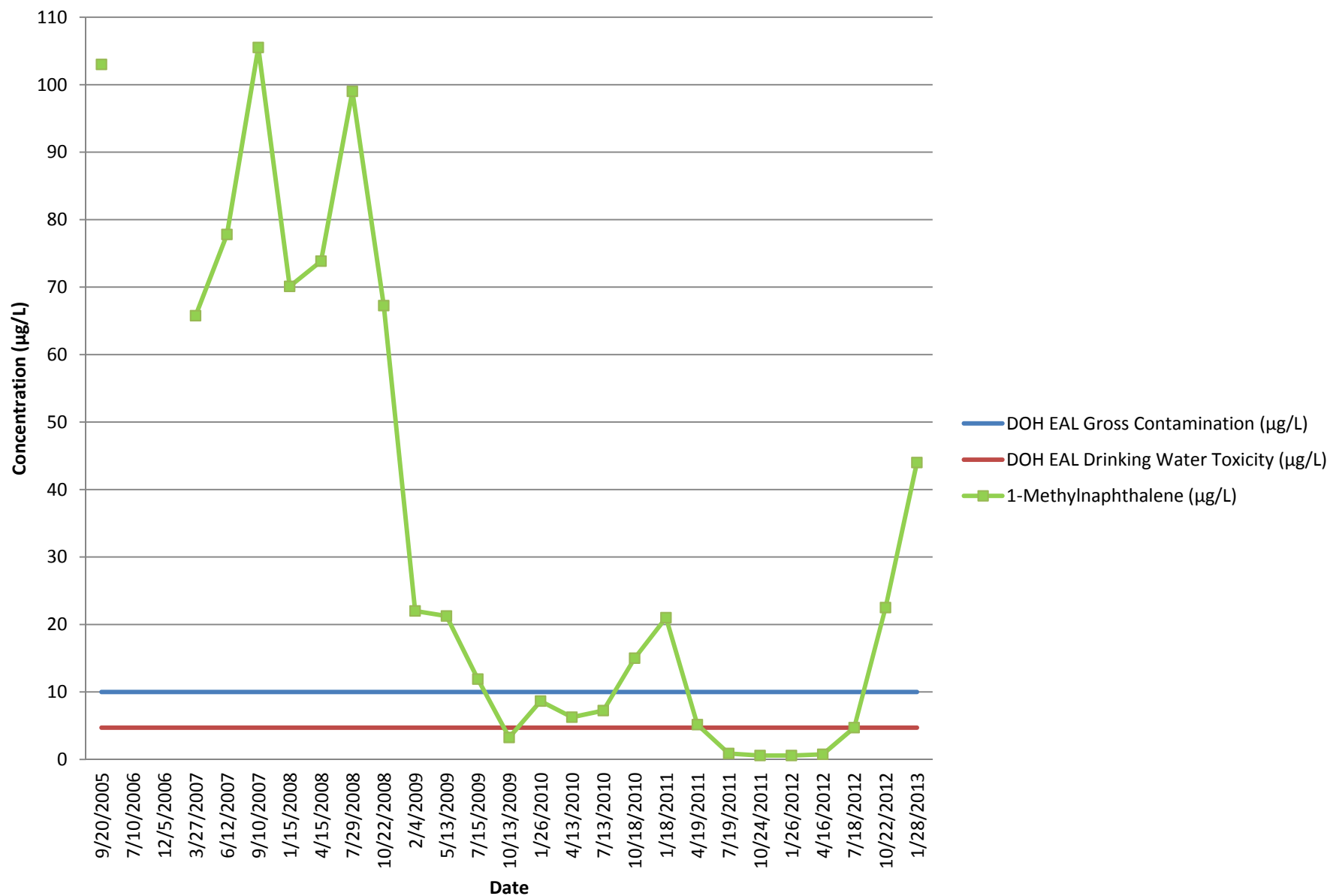


Data points for 9/20/2005 through 1/28/2013 are the average of the primary and duplicate samples.

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

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## 1-Methylnaphthalene Concentrations for RHMW02

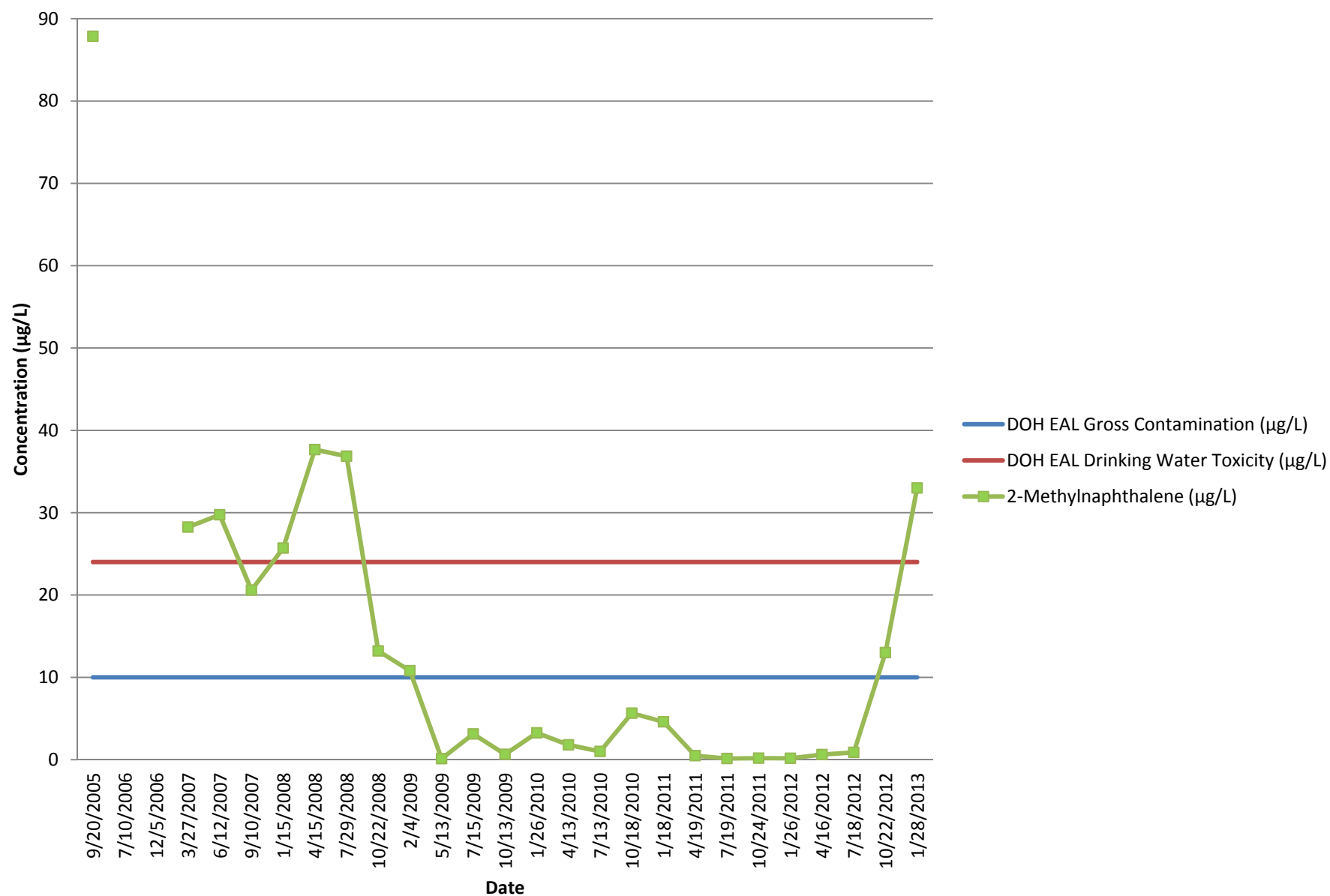


Data points for 9/20/2005 and 3/27/2007 through 1/28/2013 are the average of the primary and duplicate samples.

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

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## 2-Methylnaphthalene Concentrations for RHMW02



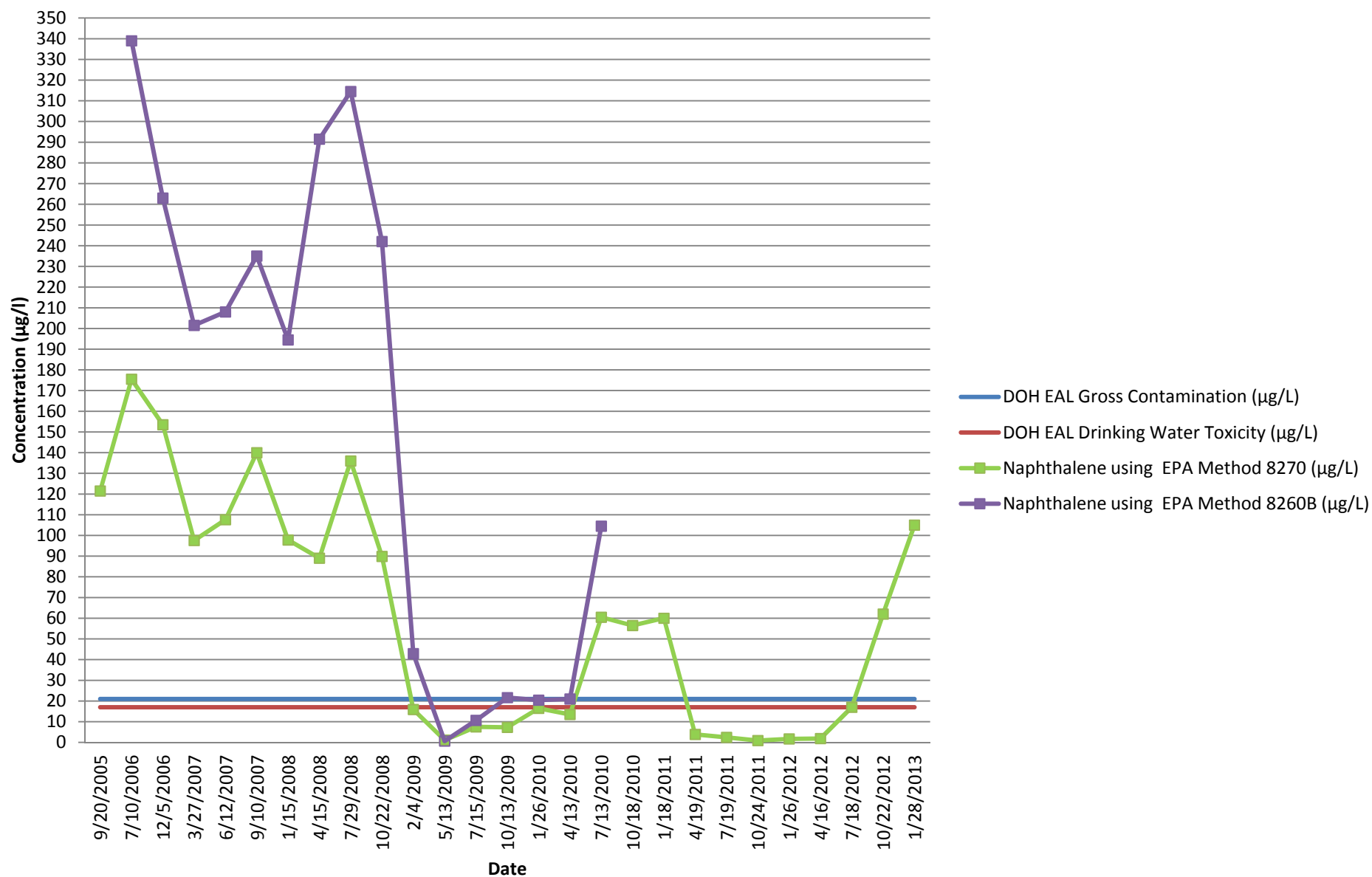
Data points for 9/20/2005 and 3/27/2007 through 1/28/2013 are the average of the primary and duplicate samples.

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

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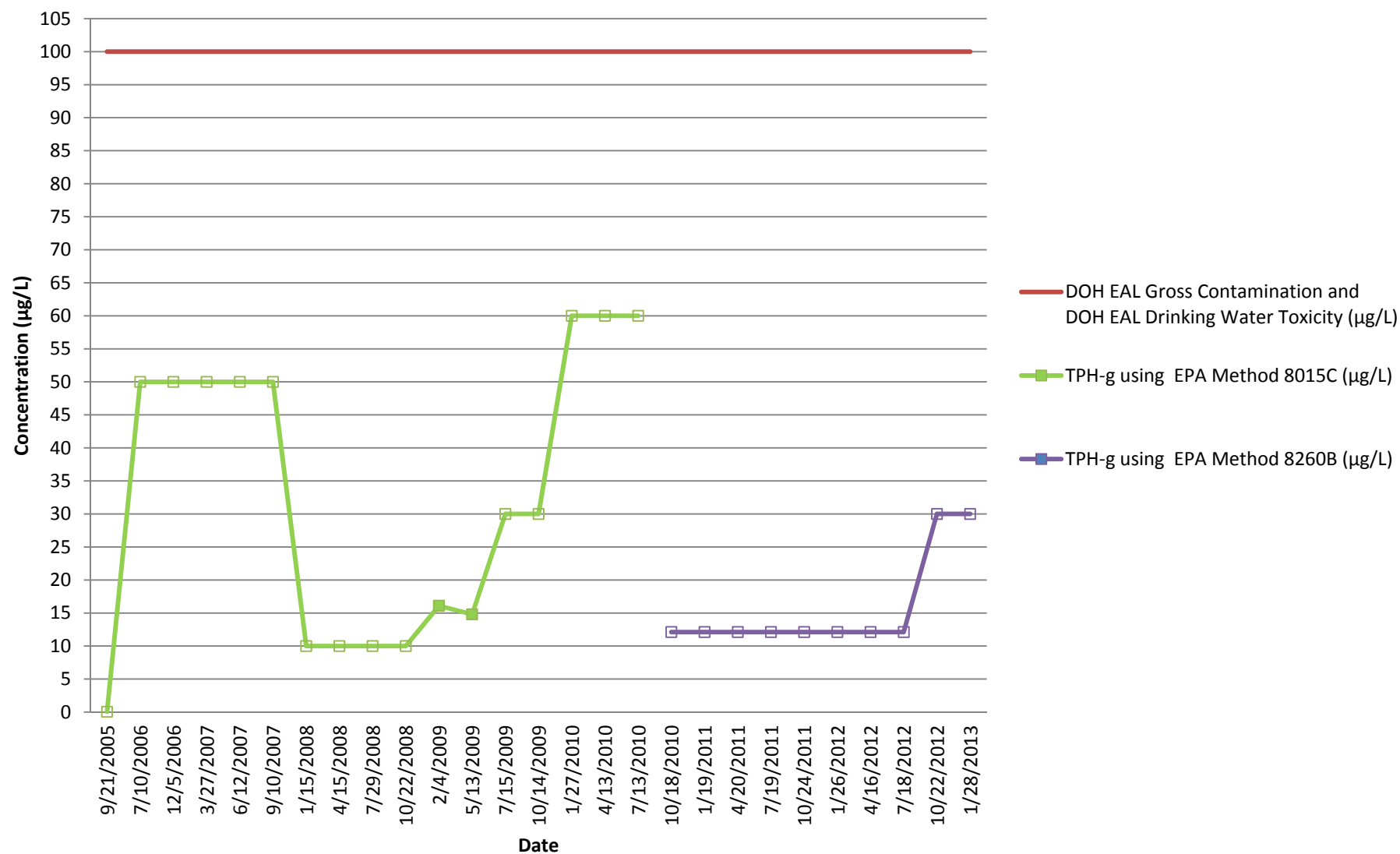
## Naphthalene Concentrations for RHMW02



Primary sample results are shown for 1/26/2012 and 7/18/2012; all other concentrations are the average of the primary and duplicate sample results. Unfilled boxes indicate non-detections. Method detection limits are shown.

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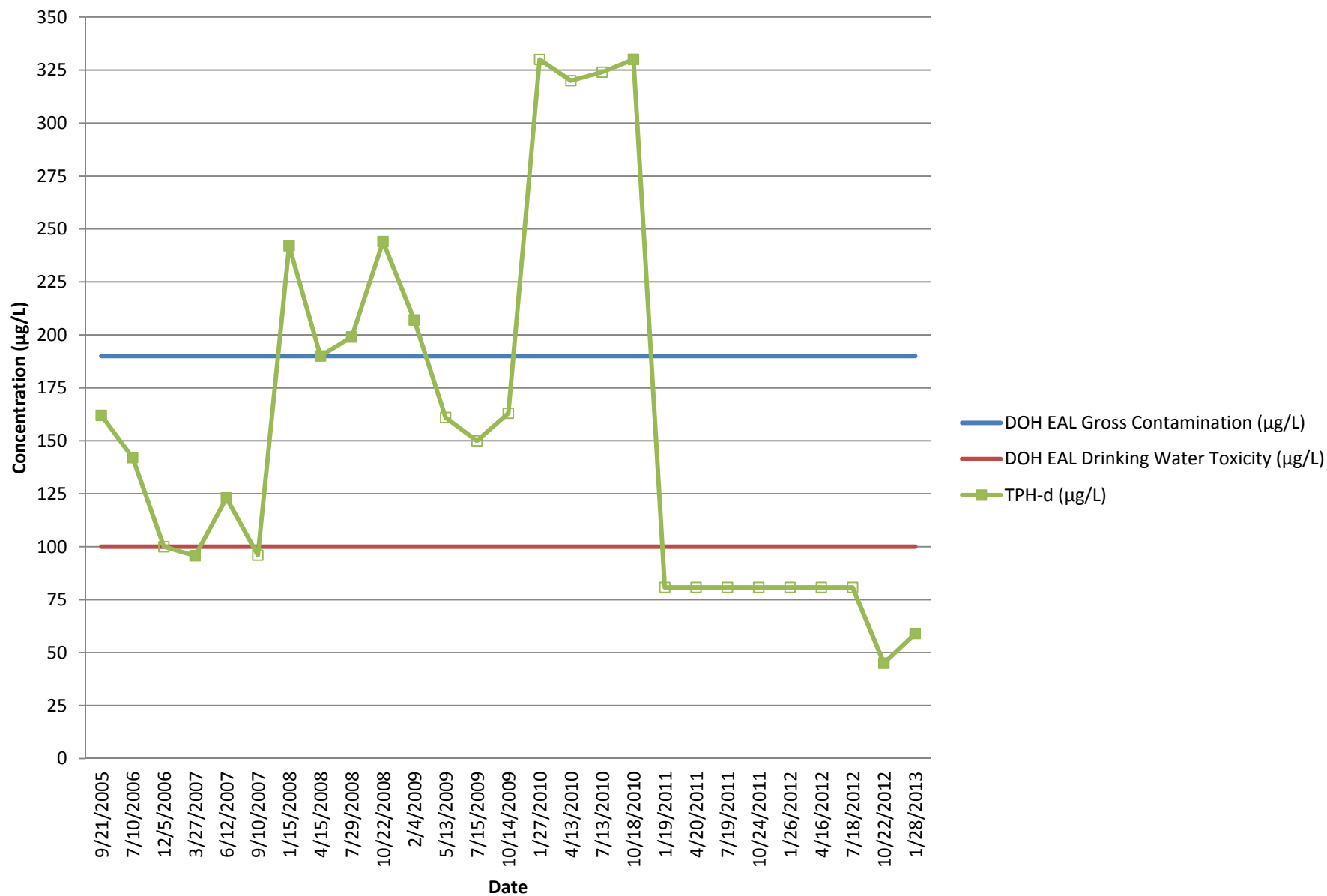
## TPH-g Concentrations for RHMW03



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

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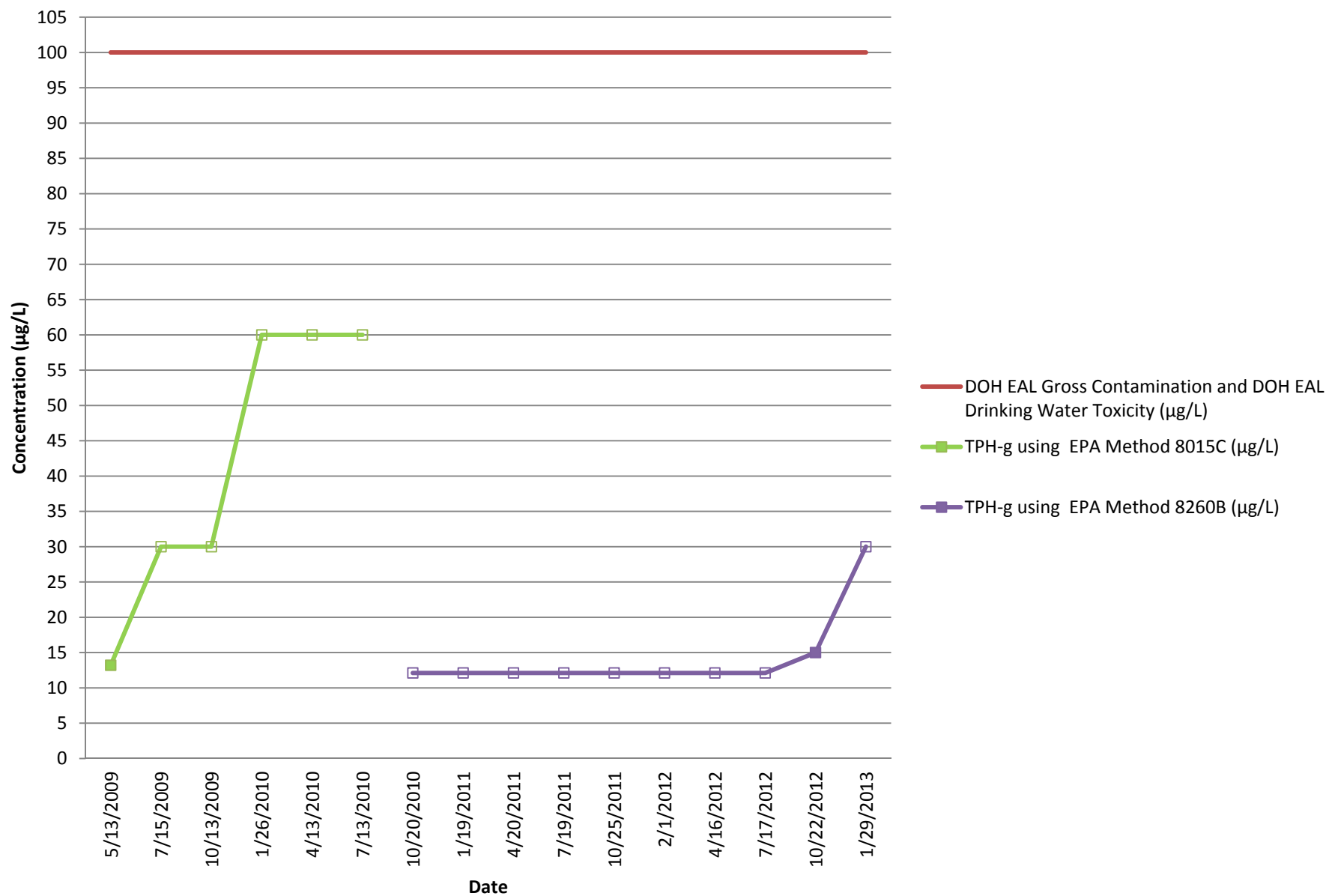
## TPH-d Concentrations for RHMW03



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

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## TPH-g Concentrations for RHMW05



Data point for 7/17/2012 is the average of the primary and duplicate samples.

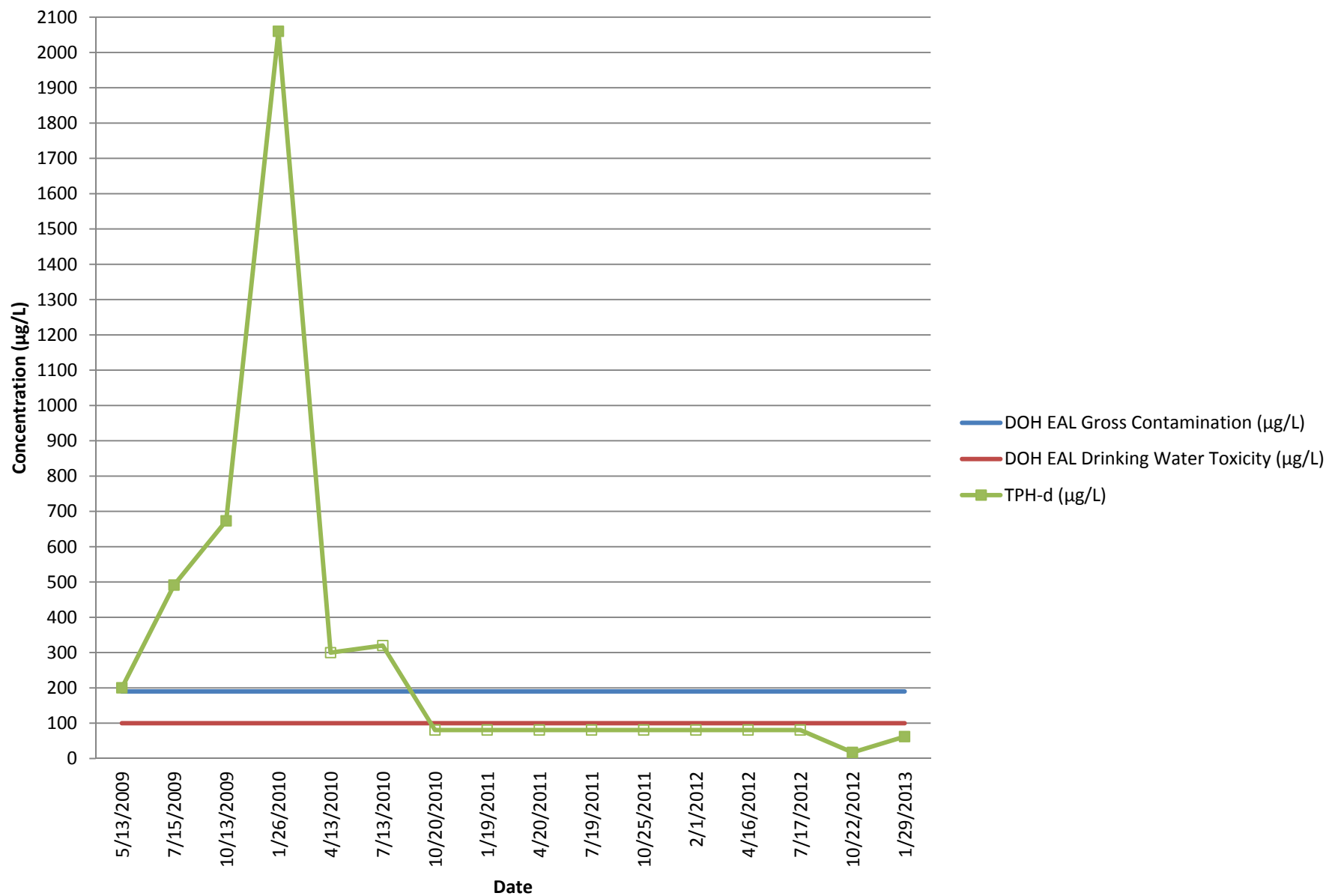
Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/23/2012 sampling event.

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## TPH-d Concentrations for RHMW05

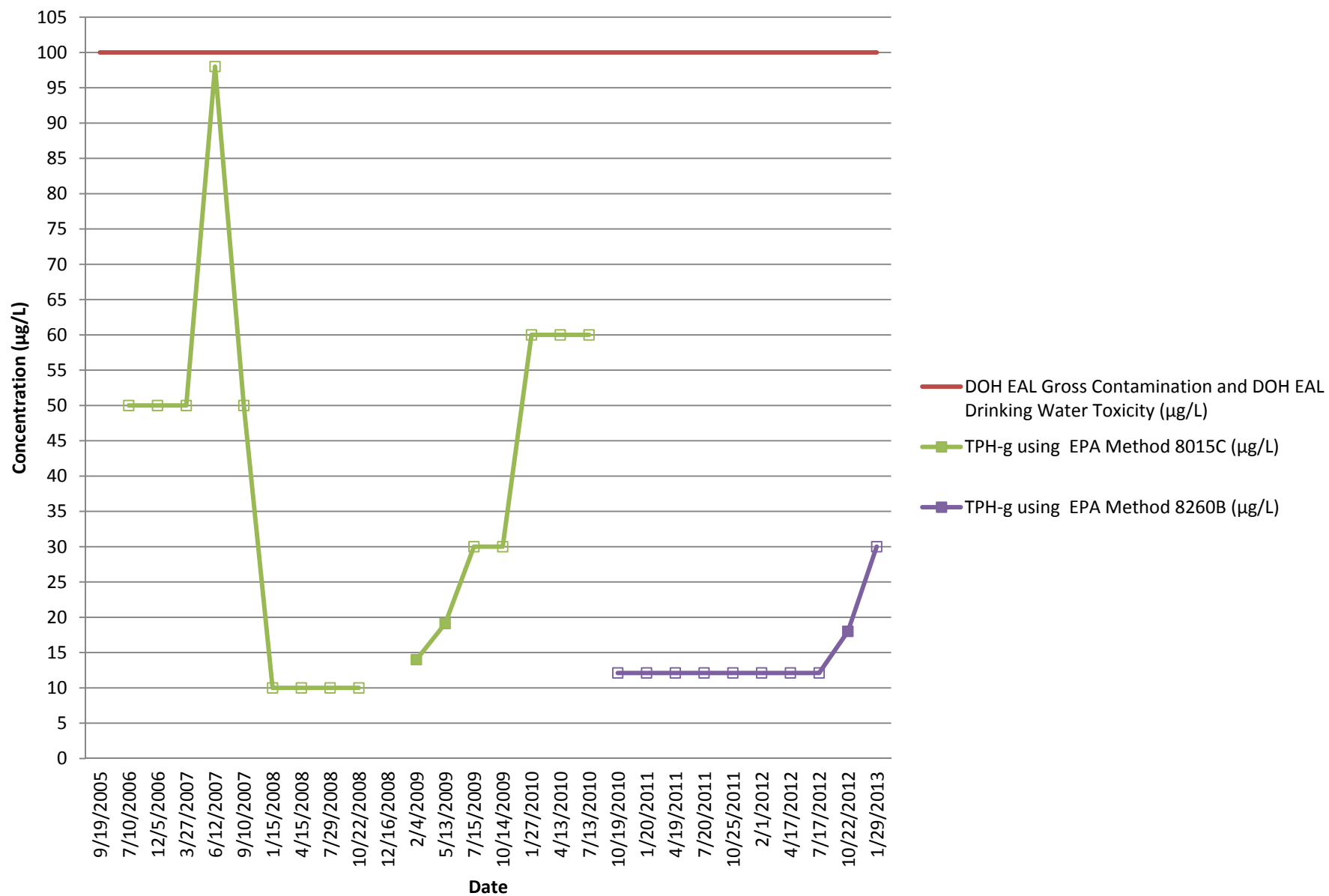


Data point for 7/17/2012 is the average of the primary and duplicate samples.

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

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## TPH-g Concentrations for RHMW2254-01

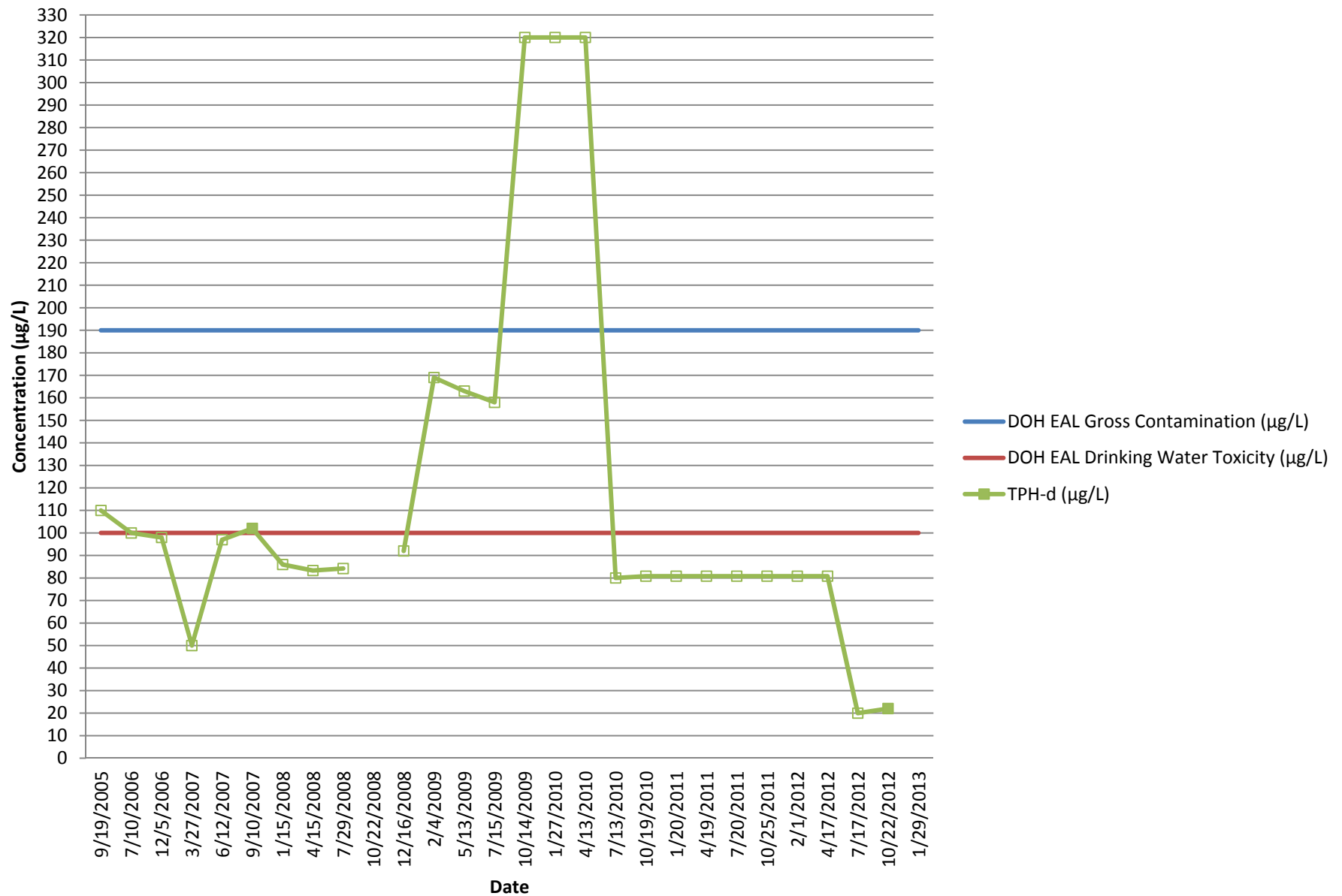


Unfilled boxes indicate non-detections. Method detection limits are shown.

Possible laboratory contamination for 10/23/2012 sampling event.

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## TPH-d Concentrations for RHMW2254-01



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

Laboratory data rejected for 1/15/2008 sampling event.

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## **APPENDIX E**

### **Waste Disposal Manifest**

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GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number HIR 000 050 401	2. Page 1 of 1	3. Emergency Response Phone 808-206-9989	4. Waste Tracking Number 000019546	
5. Generator's Name and Mailing Address COMNAVREG HAWAII, C/O NAVFAC HAWAII, CODE PRJ42 400 MARSHALL ROAD, ATTN: ESTRELITA HIGA JBPBH, HI 96860-3139 808-471-4216			Generator's Site Address (if different than mailing address) HIC8553-02 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 H I R 0 0 0 0 9 7 8 2 4			
7. Transporter 2 Company Name UNITEK SOLVENT SERVICES, INC.-OAHU 808-682-8284			U.S. EPA ID Number H I D 9 8 2 4 4 3 7 1 5			
8. Designated Facility Name and Site Address UNITEK SOLVENT SERVICES, INC. 91-125 KAOMI LOOP KAPOLEI, HI 96707 808-682-8284			U.S. EPA ID Number H I D 9 8 2 4 4 3 7 1 5			
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.	
		No.	Type			
1. MATERIAL NOT REGULATED BY DOT (WELL PURGE AND DECONTAMINATION WATER)		001	DM	00025	G	NON-RCRA
2.						
3.						
4. HQ <300 ppm PH=7						
13. Special Handling Instructions and Additional Information 2008 9b1: TOTAL HALOGEN: < 400pp HQ 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/Offor's Printed/Typed Name Estrelita Higa			Signature Estrelita Higa		Month Day Year 02 26 13	
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:						
16. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name JAMES W WATILONI			Signature James W Watiloni		Month Day Year 02 26 13	
Transporter 2 Printed/Typed Name Claude Agad			Signature Claude Agad		Month Day Year 03 05 13	
17. Discrepancy						
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> 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						
HQ test given to uniter by STE CONSOLIDATED MAXIFEST Nwimg						
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a						
Printed/Typed Name P. ACCHAMBR			Signature P. Acchambr		Month Day Year 03 06 2013	

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