

TRIP REPORT

Lone Pine Inc. Oil Spill Near Walden, Jackson County, Colorado

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS) was tasked by the Environmental Protection Agency (EPA), under Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050, Technical Direction Document (TDD) No. 1204-09, to provide technical support to the EPA Region 8 On-Scene Coordinator (OSC) in conjunction with an Emergency Response (ER) to a release from the Lone Pine Inc. (aka Lone Pine Gas Inc.) (“Lone Pine”) tank battery and treatment facility (“the facility”), located approximately 11 miles west of Walden, Colorado. The release apparently occurred in December 2011 but was not reported to the National Response Center.

Specifically, START was tasked to assist the OSC with a thorough assessment and documentation of oil impacts to Spring Gulch Creek and Hell Creek from a point immediately below the facility discharge point to the downstream extent of impacts (“the site”). Assessment activities were conducted from April 25 through 27, 2012 and included:

- visual assessment of the extent and degree of contamination;
- semi-quantitative analysis of hydrocarbon concentrations in stream sediments using immunoassay analytical testing;
- collection of sediment samples for laboratory analysis;
- collection of a water sample from Spring Gulch Creek at a location where livestock appear to regularly access the creek for drinking water;
- collection of an effluent sample from the facility discharge;
- photo documentation and global positioning system (GPS) surveying of impacted areas and sampling locations; and
- GPS surveying of monitoring wells installed at the site.

START field activities followed the site-specific draft Sampling and Analysis Plan (UOS 2012a), the site-specific Health and Safety Plan (UOS 2012b), applicable UOS Technical Standard Operating Procedures (TSOPs) (UOS 2005), and the Emergency Response Program Generic Quality Assurance Project Plan (QAPP) (UOS 1999).

Site activities were documented in the site-specific logbook, included as Appendix A. Appendix B contains the site photo log, and Appendix C contains a table of effluent parameters and discharge limits from the facilities discharge permit. Laboratory analytical results and chains of custody are supplied in Appendix D.

In summary, the assessment activities identified oil contamination with Spring Gulch Creek, and then Hell Creek, to a point at least 4 stream miles downstream of the facility. Detailed visual assessment of creek sediments indicated that impacts were far more reaching than initially indicated. It is possible that contamination observed in sediment may be related to prior releases from the facility, such as that which occurred in 2006 (UOS 2006).

2.0 BACKGROUND AND SITE HISTORY

The Lone Pine facility is located approximately 11 miles (14.5 road miles) west of Walden, Colorado in Jackson County (Figure 1) and consists of a treatment works for the adjacent Lone Pine oil field (Photo 1). The principal products from the field include crude petroleum and natural gas. After oil and formation water is withdrawn from the field wells, initial oil/water separation occurs in vertical tanks. Process wastewater is removed from the vertical tanks and sent to a series of six settling ponds for treatment. Treatment consists of further oil/water physical separation utilizing oil booms (Photo 2), followed by alternating splash aeration and solids settling (CDPHE 2010). After treatment, water is discharged through a weir into a gully (Photo 3), and then travels approximately 370 feet to the northwest before draining into Spring Gulch Creek (Figure 1) (Photo 4), part of the headwaters of the North Platte River. The North Platte River is located approximately 8.5 river miles downstream of the facility.

The facility discharge is regulated under the Colorado Discharge Permit System permit number COG-600000 for “Industrial Minimum Discharge” (CDPHE 2010). Lone Pine is authorized to discharge under this permit via permit certification number COG-600464. This permit was scheduled to expire on July 31, 2006, but both the permit and certification have been administratively extended by the Colorado Water Quality Control Division (CDPHE 2010). A table of effluent parameters and discharge limits from the permit is included in Appendix C.

On or around December 15, 2011, operations at the facility resulted in a discharge of oil to the treatment ponds and then into Spring Gulch Creek. According to Colorado Oil and Gas Commission (COGC) field inspection reports, free petroleum product was noted downstream from the facility on December 20,

2011. On January 3, 2012, oil was noted in all facility pits, and removal of contaminated soil from the gully between the discharge and Spring Gulch Creek was underway.

The release was not reported to the EPA's National Response Center. The EPA Emergency Response program became aware of the release after concerned landowners contacted the EPA on April 3, 2012. An initial field assessment conducted by the OSC on April 5, 2012 confirmed impacts to Spring Gulch Creek to at least its confluence with Hell Creek. Impacts included oiled vegetation and staining, particularly at bends and turns in the creek. Oiled rocks were noted, but no hydrocarbon sheen was visible at the time.

The EPA has previously responded to a release from the Lone Pine oil field, which occurred when a break in a 4-inch pipeline owned by Lone Pine Gas released an unknown amount of crude oil and production water into Hell Creek during the winter of 2006-2007 (UOS 2006). EPA oversaw remediation activities at the site, including the placement of sorbent booms, the removal of contaminated soil and snow, and the pressure washing of oiled-stained stream banks. Impacts to Hell Creek were noted as far downstream as County Road 5 (approximately 3.5 miles downstream from the pipeline).

The purpose of this Emergency Response was to assist the OSC with the further detailed assessment of impacts from the spill. Assessment was to be completed to a degree sufficient enough for the potentially responsible party to be able to complete the required removal action prior to spring runoff.

Land use surrounding the facility and the creeks is primarily agricultural. Cattle were observed in the vicinity of Hell Creek and, according to a local land owner, use the creek for drinking water. It is understood that all local residents utilize ground water for drinking purposes. U.S. Fish and Wildlife Service National Wetlands Inventory mapping shows the near-continuous presence of palustrine emergent wetlands from the facility to the North Platte River (USFWS 2012). Evidence of wildlife in Hell Creek below its confluence with Spring Gulch Creek included mink and deer tracks, and an abandoned beaver dam.

Spring Gulch Creek flows generally northeast from the facility for 1.1 miles before merging with Hell Creek (Figure 1). Hell Creek then flows generally east for approximately 0.2 mile to an irrigation diversion (the Sorenson Ditch), then 1 mile to the east to a second diversion (the Hell Creek Ditch) and meanders east for approximately 2.5 miles to a third diversion (the Homestead Ditch). Hell Creek continues east a further 1.9 miles to where it drains into the North Fork of the North Platte River. The North Platte River is approximately 1.8 miles further downstream. The total stream distance between the facility and the North Fork of the North Platte River is 6.7 miles. The total stream distance between the

facility and the North Platte River is approximately 8.5 miles. The total stream length of Hell Creek from its confluence with Spring Gulch Creek to the background sample location on Hell Creek is 1.3 miles.

3.0 SITE ACTIVITIES

START members Jeff Miller (project manager) and Nat Williams (Geographic Information System [GIS]/data manager) met with EPA On-Scene Coordinators (OSC) Kerry Guy and Martin McComb at the EPA Region 8 office on Tuesday, April 24, 2012 to discuss project data needs and logistics. It was decided in the meeting that the following action plan would be followed in the field:

- Day 1 (April 25): mobilize to site; conduct visual assessment and GPS surveying of Spring Gulch Creek and Hell Creek from facility to the downstream extent of contamination (reconnaissance); collect a limited number of samples for total petroleum hydrocarbon (TPH) immunoassay analysis; initiate GIS viewer (by START employees in Denver office);
- Day 2 (April 26): collect laboratory samples from Spring Gulch Creek and Hell Creek; collect water samples from facility discharge and possibly from Spring Gulch Creek upstream and downstream of discharge entry point; update GIS viewer by START office; and
- Day 3 (April 27): collect additional samples and GPS survey data from any data gaps identified from GIS viewer; demobilize from site; deliver samples to laboratory in Denver.

The above action plan was generally followed in the field, although the visual assessment portion was extended due to the greater extent of contamination discovered in the field.

3.1 DAY ONE (Visual Assessment and Immunoassay Testing)

START mobilized to the site on Wednesday, April 25, leaving Denver at 0900 hours and arriving at the facility at approximately noon. START immediately began performing the assessment of Spring Gulch Creek starting from a location approximately 1,000 feet downstream of the point where the facility discharge empties into the creek. START members were approached by Bob Timberman (local land owner) soon after arrival at the site and later by Ray Parker (Lone Pine treatment facility operator). Both parties briefly discussed the site and spill with START, but were informed by START that the OSC would be on site shortly and would be better able to answer any questions they may have. The OSC joined START with the performance of assessment activities at approximately 1500 hours.

The visual assessment technique employed by START involved use of a Sharpshooter shovel to open a deep, narrow hole within low-energy areas of the stream that contained fine-grained sediment (e.g., point bars, cut off channels). If oil was present, disturbing stream sediments in this manner would result in the generation of hydrocarbon sheen (Photos 5, 6). The assessment revealed that all areas of fine-grained sediment occurring within Spring Gulch Creek would generate sheen when disturbed.

Areas of oiled vegetation were readily identifiable by the presence of a dark coating of weathered oil on the surface (Photo 7). A subjective degree of contamination (i.e., light, medium, heavy) was assigned to each area of affected vegetation, and each length of impacted vegetation was surveyed using GPS.

Discrete areas of sediment were not surveyed using GPS, as every area of fine-grained sediment present in the creek bed was found to be contaminated. Photographs of impacted sediment and areas of vegetation were collected at regular intervals to document the degree and extent of contamination. Sediment contamination was documented the entire stream length assessed during the first day of the assessment, from approximately 1,000 feet below the facility to a point within Hell Creek approximately 1.45 miles downstream. Approximately 1,370 linear feet of streamside vegetation along Spring Gulch Creek was found to be coated with weathered oil (Figure 3). At the confluence of Spring Gulch Creek and Hell Creek only lightly-oiled vegetation was noted. Downstream of this point, and impacted vegetation was not documented.

In addition to the visual assessment, seven locations were sampled for semi-quantitative TPH immunoassay analysis. Analysis was performed after the completion of field activities for the day. Analytical results confirmed that sediments visually determined to have “medium” to “heavy” contamination contained elevated concentrations of TPH. All other samples showed low levels of hydrocarbons. The locations sampled and immunoassay results are summarized in Table 1 below:

TABLE 1					
Summary of Immunoassay Sample Locations and Results					
Sample ID	Waterbody	Location Description	Rationale	TPH (mg/kg)	Photo #
LP-IS-01	Spring Gulch Creek	small pocket of fine- to medium-grained sediment within cut bank, with “medium” contamination	determine screening-level concentration of sediment with “medium” contamination	1,664	8
LP-IS-02	Spring Gulch Creek	small pocket of fine-grained sediment, with “heavy” contamination	determine screening-level concentration of sediment with “heavy” contamination	3,305	9
LP-IS-03	Spring Gulch Creek	“dry” wall of cut bank, above possible line of staining	determine presence or absence of contamination	190	10
LP-IS-04	Spring Gulch Creek	“wet” wall of cut bank, below possible line of staining	determine presence or absence of contamination	115	10
LP-IS-05	Spring Gulch Creek	fine-grained bank material approximately 6” (inches) beneath area of heavily oiled vegetation	determine presence or absence of contamination	303	11
LP-IS-06	Hell Creek	gravel bank of what appeared to be “oil-armored” rocks	determine whether dark color of rocks was of petroleum or mineral origin	52	12
LP-IS-07	Hell Creek	very fine-grained sediment, with “medium” contamination	determine screening-level concentration of sediment with “medium” contamination	686	13

mg/kg milligrams per kilogram

START left the field at approximately 1915 hours on the first day of the assessment. START then met with the OSC to plan the following days activities, analyzed the immunoassay samples, and uploaded photographs and GPS survey data to START GIS support in Denver.

3.2 DAY 2 (Visual Assessment and Laboratory Sampling)

On the second day of the field activities, the primary objectives were to:

- Continue visual assessment within Hell Creek in order to identify the downstream extent of contamination;
- Conduct visual assessment of Spring Gulch Creek between the facility outfall and the point at which assessment activities began on Day 1;

- Conduct visual assessment of Hell Creek above its confluence with Spring Gulch Creek;
- Collect sediment samples for laboratory analysis of TPH from both impacted and background locations on both creeks, as well as sediment from both the Sorenson and Hell Creek Ditches; and
- Collect a water sample for laboratory analysis of volatile organic compounds (VOCs), metals, total suspended solids (TSS), and oil and grease from the facility outfall.

After meeting with the OSC to confirm the plan for the day, START began the downstream visual assessment on Hell Creek at a point approximately 2.5 river miles downstream of the facility (sample location LP-SS-001 on Figure 2). Contaminated sediment was again noted within Hell Creek at this location (Photo 14). Sediment within the Hell Creek Ditch (north of and parallel to Hell Creek) and the Sorenson Ditch (south of and parallel to Hell Creek) did not appear to be contaminated.

START collected laboratory TPH samples from sediment within Hell Creek (sample location LP-SS-001 and its replicate LP-SS-021 [Photo 14]) and the two ditches (LP-SS-002 within Hell Creek Ditch [Photo 15] and LP-SS-003 within the Sorenson Ditch [Photo 16]), then proceeded farther downstream approximately 1.7 miles to a point on Hell Creek just upstream of a culvert beneath County Road 5, near the intersection of County Road 5 and County Road 12 West (approximately 4 miles downstream of the facility) (Figure 2). Again, the sediment within Hell Creek produced sheen at this location when disturbed. Laboratory sample LP-SS-004 was collected at this location (Figure 2) (Photo 17).

START then proceeded upstream towards the facility, collecting laboratory samples from Hell Creek (sample locations LP-SS-005, -006, -007, and -009 [Photos 18, 19, 20 and 22]), and then Spring Gulch Creek (sample locations LP-SS-008, -010, -011, -014, -015, -016, -017, and -018 [Photos 21, 23, 24, 26, 27, 28, 29, and 30]) along the way. Two profile soil samples (sample locations LP-SS-011 [0-2" depth] and LP-SS-012 [2-6" depth] [Photo 25]) were also collected from an area of heavily-oiled vegetation along Spring Gulch Creek.

After completing sediment sampling, START documented and surveyed an additional area of impacted vegetation just below the facility (Photo 31). START also documented that water being discharged from the facility into Spring Gulch Creek was discolored and had a slight sheen (Photo 4).

At 1700 hours, START collected surface water sample LP-SW-001 from the facility outfall (Photo 3). Water quality parameters measured at the outfall are provided in Table 2 below:

TABLE 2 Water Quality Parameters from the Lone Pine Treatment Facility (April 26, 2012)		
pH	Temperature (°F / °C)	Conductivity (µS)
7.6	55 / 12.8	1,269

°F/°C degrees Fahrenheit/Celsius
 µS microSiemens

A slight sheen was present on the surface of the water both on the pond and within the weir.

START then prepared a trip blank (LP-SW-002) to be analyzed for VOCs to ensure no contaminants were introduced into samples during transit in the field and to the laboratory.

A total of 19 sediment samples and 1 water sample (not including laboratory QA/QC samples) for laboratory analyses were collected on Day 2. Sampling details are provided in Table 4.

START left the field at approximately 1730 hours on the second day of the assessment. START then met with the OSC to plan the following day’s activities, preserved samples, and uploaded photographs and GPS survey data to START GIS support in Denver.

3.3 DAY 3 (Visual Assessment, Laboratory Sampling, and GPS Surveying)

On the third and final day of the field activities, the primary objectives were to:

- Continue visual assessment within Hell Creek in order to identify the downstream extent of contamination;
- Collect sediment samples for laboratory analysis of TPH from areas identified on the GIS viewer as data gaps, including from a background location on Hell Creek; and
- Collect a water sample for laboratory analysis VOCs, metals, TSS, and oil and grease from a location on Hell Creek used by cattle for drinking water.

After meeting with the OSC to confirm the plan for the day, START began collecting additional sediment samples from Hell Creek above its confluence with Spring Gulch Creek, including location LP-SS-019 (Photo 32) and the background sample location LP-SS-020 (Photo 33). These locations were identified from the GIS viewer as spatial data gaps for sediment sampling.

START then proceeded to the facility area to survey the locations of six ground water monitoring wells that had been recently installed under the direction of the COGC (Photos 34, 35).

From the facility, START continued downstream to the property of Bob Timberman to collect a surface water sample from Hell Creek from a location where cattle access the creek for drinking water (Photo 36). In an effort to mimic conditions when cattle would be present, START agitated the sediments prior to sampling, generating hydrocarbon sheen on the water surface (Photo 37).

START then proceeded further down Hell Creek in order to collect an additional sediment sample from a spatial data gap identified from the GIS viewer. Samples LP-SS-022 and its replicate LP-SS-023 were collected from Hell Creek at a point approximately 0.5 mile southeast of the Bohn Ranch, and 0.5 mile east of the Timberman property line (Figure 2). Heavy sheen was still noted from disturbed sediments at this location (Photo 38).

At approximately 1210 hours, field work at the site concluded with the collection of sediment sample LP-SS-024 at a location on Hell Creek approximately 0.3 river mile upstream of the North Fork of the North Platte River (Photo 39). Sediment from various locations within this area did not appear to be contaminated, generating no sheen when disturbed.

START proceeded to Walden, stocked the sample coolers with additional ice, and left Walden for the laboratory at approximately 1300 hours. START relinquished all samples to the laboratory at 1615 hours. Chains of custody are included within Appendix D.

4.0 SAMPLING METHODS AND ANALYTICAL RESULTS

All immunoassay sediment samples for TPH were analyzed by START during field activities.

All laboratory samples were hand delivered by START on April 27, 2012 to:

Accutest Laboratories
4036 Youngfield Street
Wheat Ridge, Colorado 80033

Each cooler delivered to the laboratory contained a temperature blank. The cooler with the water samples also contained the trip blank identified as LP-SW-002.

Upon completion of TPH analysis at the Wheat Ridge laboratory, a subset of sediment samples was shipped to another Accutest laboratory for further analysis of total organic carbon (TOC) using analytical method SW846 9060M, and semi-volatile organics (SVOC) using analytical method MADEP EPH Revision 1.1:

Accutest Laboratories of New England, Inc.
50 D'Angelo Drive
495 Technology Center West, Bldg. One
Marlborough, Massachusetts 01752

A summary of analytical methods by matrix is given below:

Sediment/soil:

- TPH using EPA Draft Method 9074 (immunoassay) (7 samples),
- TPH using EPA Method 8015B (reported as diesel-range organics [DRO] [C_{10} - C_{28}] and oil-range organics [ORO] [$>C_{28}$ - C_{40}]) (24 samples),
- TOC using EPA method 9060M (3 samples),
- SVOCs using method MADEP EPH Revision 1.1 (reported as C_{11} - C_{22} aromatics, C_9 - C_{18} aliphatics, C_{19} - C_{36} aliphatics, and 17 polyaromatic hydrocarbons (PAHs) (13 samples).

Water:

- VOCs using EPA Method 8260B (two sample, plus one trip blank),
- total and dissolved metals using EPA Method 200.8 (mercury was analyzed using EPA Method 245.1) (two samples),
- oil and grease using EPA Method 1664A (two samples), and
- TSS using Method SM20-2540D (one sample).

Laboratory sediment and water sample locations are described above in Section 3.0 and are shown below in Table 3 and Figure 2. Details on sampling methods and results are provided in the sections below.

4.1 IMMUNOASSAY SEDIMENT SAMPLING

Sediment for screening-level immunoassay testing for TPH using EPA Draft Method 9074 was collected into individual plastic zip top bags using a new disposable certified clean plastic scoop at each location. Immunoassay samples were placed into a cooler with ice, prior to transfer into individual dedicated plastic sample extraction tubes supplied with the test kit. Samples were extracted and analyzed in strict accordance with the manufacturer's recommended methods, which included the preparation and analysis of both a blank and a calibration standard (Dexsil 2009).

4.2 IMMUNOASSAY SEDIMENT SAMPLE RESULTS

Immunoassay sample results are presented above in Table 1, and shown on Figure 2. These screening-level analytical results confirmed that sediments visually determined to have “medium” to “heavy” contamination contained elevated concentrations of TPH (in the range of 686 to 3,305 milligrams per kilogram [mg/kg]). All other samples showed low levels of hydrocarbons (i.e., 52 to 303 mg/kg).

4.3 LABORATORY SEDIMENT SAMPLING

Sediment samples for laboratory TPH analysis using EPA Method 8015B (reported as DRO and ORO), TOC using EPA method 9060M, and SVOC using method MADEP EPH Revision 1.1, were collected by using a new disposable certified clean plastic sampling scoop at each location. Sediment samples were placed into 8-ounce certified clean amber glass jars, wrapped in bubble wrap, and immediately placed in a cooler with wet ice.

4.4 LABORATORY SEDIMENT SAMPLE RESULTS

Laboratory sediment and soil sample locations are presented in Table 3, and analytical results are summarized in Table 4. Sediment sample results from laboratory samples confirmed that concentrations of DRO and ORO were elevated above background concentrations in sediments displaying sheen when disturbed. Background concentrations of TPH (the combined results of DRO and ORO, or C₁₀ through C₄₀) were 54 mg/kg in the sample collected from Hell Creek (LP-SS-020) and 63 mg/kg from the sample collected in Spring Gulch Creek (LP-SS-018). Concentrations of TPH in sediments in Spring Gulch Creek below the facility ranged from 1,532 mg/kg to 40,000 mg/kg. Concentrations of TPH in sediments in Hell Creek above its confluence

with Spring Gulch Creek, but below the background location, ranged from 56 mg/kg to 585 mg/kg. Concentrations of TPH in sediments in Hell Creek below its confluence with Spring Gulch Creek ranged from 109 mg/kg at the most downstream location (LP-SS-024) to 4,040 mg/kg at a point approximately 2.5 river miles downstream of the facility (LP-SS-001).

Sediment samples collected from the two irrigation supply ditches returned elevated TPH results of 266 mg/kg for the Hell Creek Ditch and 721 mg/kg for the Sorenson Ditch.

Results from the two soil profile samples (sample locations LP-SS-012 [0-2" depth] and LP-SS-013 [2-6" depth]) collected from an area of heavily-oiled vegetation along Spring Gulch Creek showed that the oil contamination in this area appeared to be confined to the surficial layer. The TPH results from sample LP-SS-012 were 87,300 mg/kg while the deeper sample was only slightly elevated above background concentrations (103 mg/kg).

TOC analysis was subsequently conducted on a subset of three samples: LP-SS-010, LP-SS-018, and LP-SS-021. Results ranged from 11,500 mg/kg to 106,000 mg/kg, which is within the typical range for freshwater stream sediments.

SVOC analysis was subsequently conducted on a subset of 13 sediment samples. The analytical method chosen provides for the analysis for 17 PAHs and the following hydrocarbon ranges: C₉-C₁₈ aliphatics, C₁₉-C₃₆ aliphatics, and C₁₁-C₂₂ aromatics. Analytical results showed the following range of concentrations: C₉-C₁₈ aliphatics from non-detect (at 13 mg/kg) in both background sample locations (LP-SS-018 and LP-SS-020) to a maximum of 2,850 mg/kg in sample LP-SS-012; C₁₉-C₃₆ aliphatics from non-detect (at 13 mg/kg) in both background sample locations (LP-SS-018 and LP-SS-020) to a maximum of 7,750 mg/kg in sample LP-SS-012; and C₁₁-C₂₂ aromatics from non-detect (at 26 mg/kg) in both background sample locations (LP-SS-018 and LP-SS-020) to a maximum of 4,620 mg/kg in sample LP-SS-012.

Three PAHs were detected at concentrations elevated above background levels: benzo(a)anthracene (from non-detect at 0.51 mg/kg to a maximum concentration of 3.28 mg/kg), phenanthrene (from non-detect at 0.510 mg/kg to a maximum concentration of 3.04 mg/kg), and pyrene (from non-detect at 0.510 mg/kg to a maximum concentration of 3.33 mg/kg).

4.5 WATER SAMPLING

Water sample locations are presented in Table 3, and select analytical results are summarized in Table 5. Two water samples were collected as part of the field activities. Water sample LP-SW-001 was collected from the outfall from the treatment facility (Photo 3), and water sample LP-SW-003 was collected from a location on Hell Creek downstream of its confluence with Spring Gulch Creek. Originally, the purpose of collecting sample LP-SW-001 was to see if concentrations of select analytes, including potentially dissolved copper, were within the permit discharge limits. The purpose of collecting LP-SW-003 was to gather data on water quality of an area that livestock use to access drinking water from Hell Creek. Subsequent to sampling, it was decided that the analytical suite for both water samples should be expanded (if possible, given the finite amount of sample that had been collected) to include analyses that would provide data helpful in assessing the ecotoxicity of the water.

Water samples LP-SW-001 and LP-SW-003 were analyzed for VOCs using EPA Method 8260B, total and dissolved metals using EPA Method 200.8 (mercury was analyzed using EPA Method 245.1), oil and grease using EPA Method 1664A, and TSS using Method SM20-2540D. Water sample LP-SW-002 (trip blank) was analyzed only for VOCs. Samples were collected by immersing certified clean sample containers appropriate to the associated analytical method used (i.e., 1-liter amber glass bottles for TSS and oil and grease, 500-milliliter [mL] high-density polyethylene bottles for metals, and 40-ml amber glass vials for VOCs) directly in the water being sampled.

4.6 WATER SAMPLING RESULTS

Select analytical results are summarized in Table 5. Analytical results for all VOCs were non-detect for both field samples (LP-SW-001 collected from the facility discharge [Photo 3], and LP-SW-003 collected from Hell Creek on the Timberman property [Photos 38 and 39]) as well as the trip blank (LP-SW-002).

Oil and grease results for the two field samples ranged from 9.2 milligrams per liter (mg/L) in LP-SW-001 to 7.3 mg/L in LP-SW-003. Both results are below the facility discharge daily maximum limit of 10 mg/L (Appendix C). The concentration of TSS in the LP-SW-001 sample was 15.0 mg/L, below the facility discharge daily maximum limit of 3,500 mg/L (Appendix C).

The sample LP-SW-003 was not analyzed for TSS as the volume of water collected intended for this analysis was used to run an additional metal analysis instead.

Analytical results from metals analysis showed that the water being discharged from the treatment facility (Photo 3) contained concentrations of total iron (1,440 micrograms per liter [$\mu\text{g/L}$]) elevated above the facility discharge permit limit of 1,000 $\mu\text{g/L}$ (Appendix C). Concentrations of other metals appear to be elevated, including barium, which was elevated above the maximum contaminant limit (MCL) of 2,000 $\mu\text{g/L}$ in both field samples (LP-SW-001: 4,560 $\mu\text{g/L}$; LP-SW-003: 4,350 $\mu\text{g/L}$), and total sodium, which was found to be at a concentration of 373,000 $\mu\text{g/L}$ in LP-SW-001. Background water samples (e.g., on Spring Gulch Creek upstream of the facility) were not collected for comparison.

The analytical results and quality assurance criteria for these samples were not reviewed or validated.

5.0 REFERENCES:

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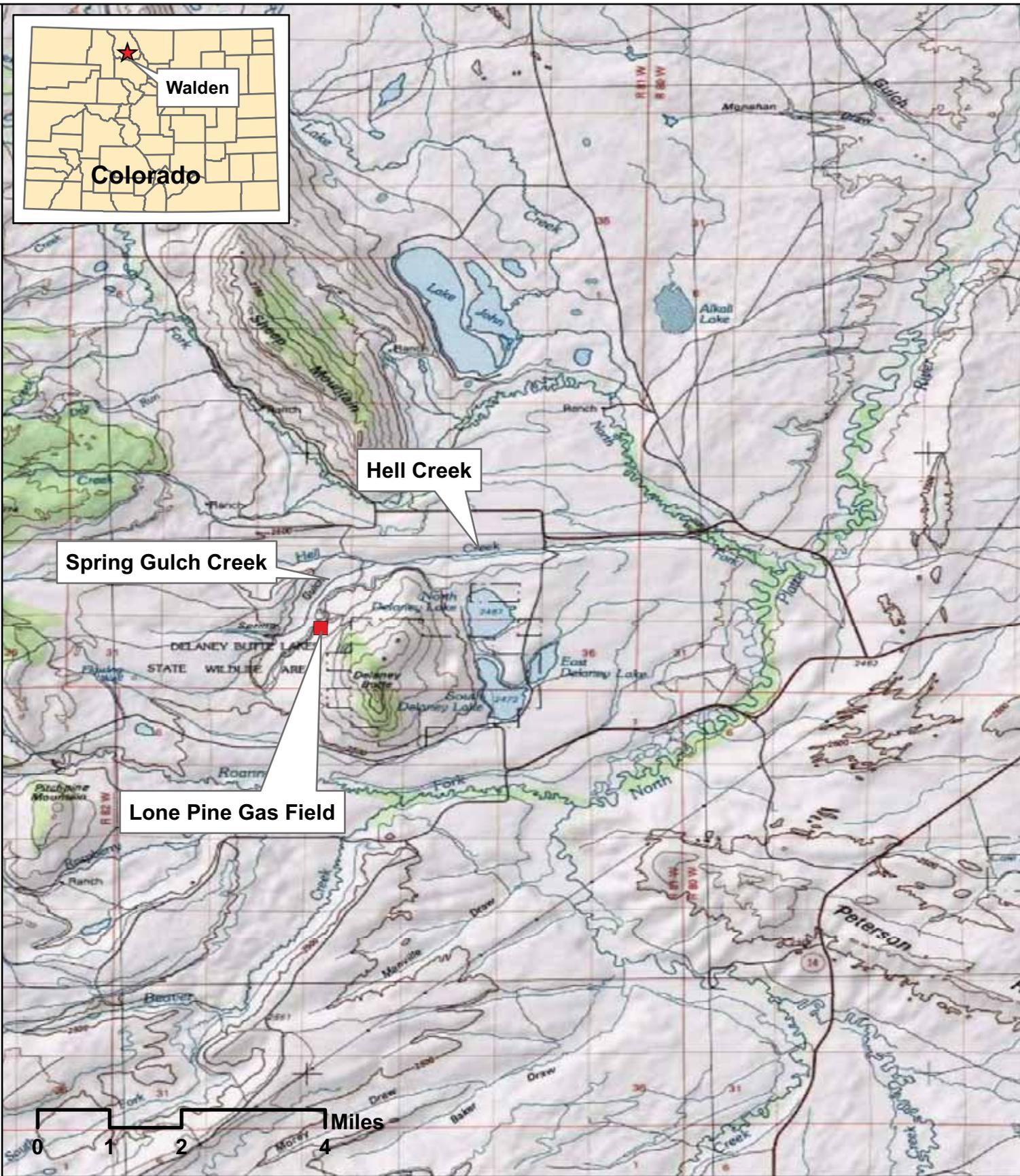
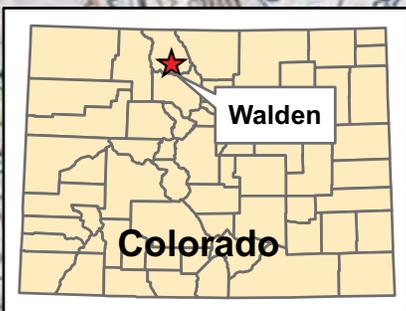
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UOS 2012a. Sampling and Analysis Plan, Lone Pine Gas Inc. Oil Spill, Walden, Jackson County, Colorado. TDD No. 1204-09. April 25, 2012.

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USFWS 2012. U.S. Fish and Wildlife Service, National Wetlands Inventory. Available at: <http://107.20.228.18/Wetlands/WetlandsMapper.html>



Author: Date/Time: Friday, July 06, 2012 7:04:55 AM File: T:\START3\Lone Pine Gas Inc oil spill\GIS\Maps\Fig_1.mxd

Projection System:
GCS WGS 1984

Page Size: 8.5 x 11

1 in = 2 miles



TDD Title: **Lone Pine Gas Inc.
Oil Spill**

Figure: 1

Figure Title: **Site Location Map**

TDD County: Jackson
TDD State: CO

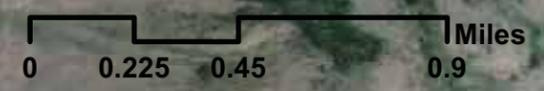
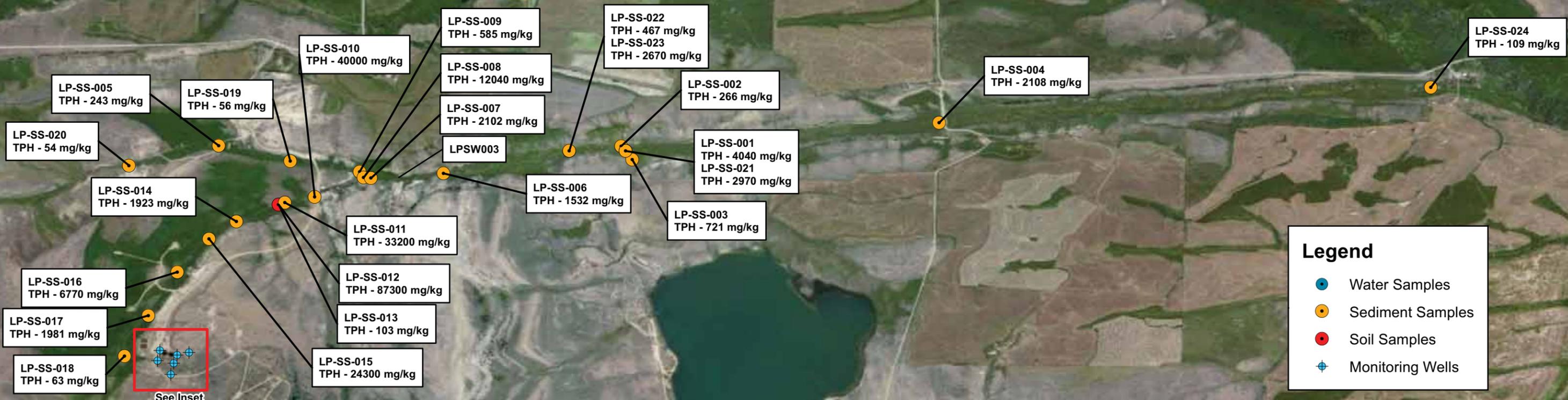
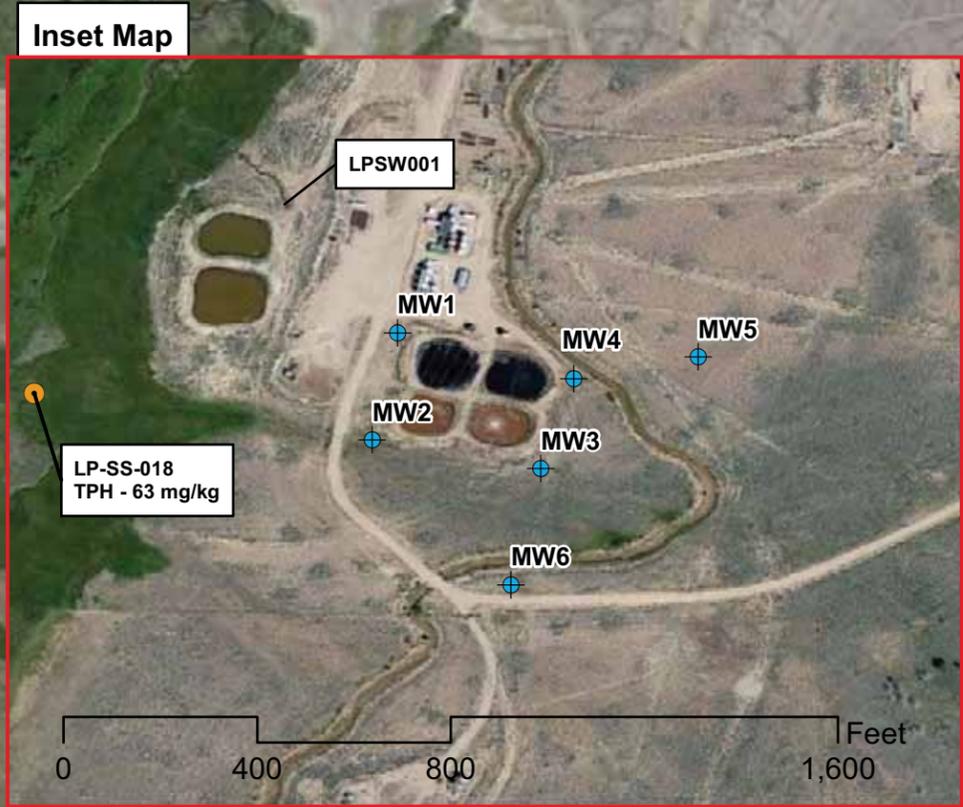
TDD: 1204-09
Date: 07/2012

Sources:
Bing Maps 2011

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GCS WGS 1984

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1 in = 2,083 feet

NORTH

TDD Title: **Lone Pine Gas Inc.
Oil Spill**

Figure: 2

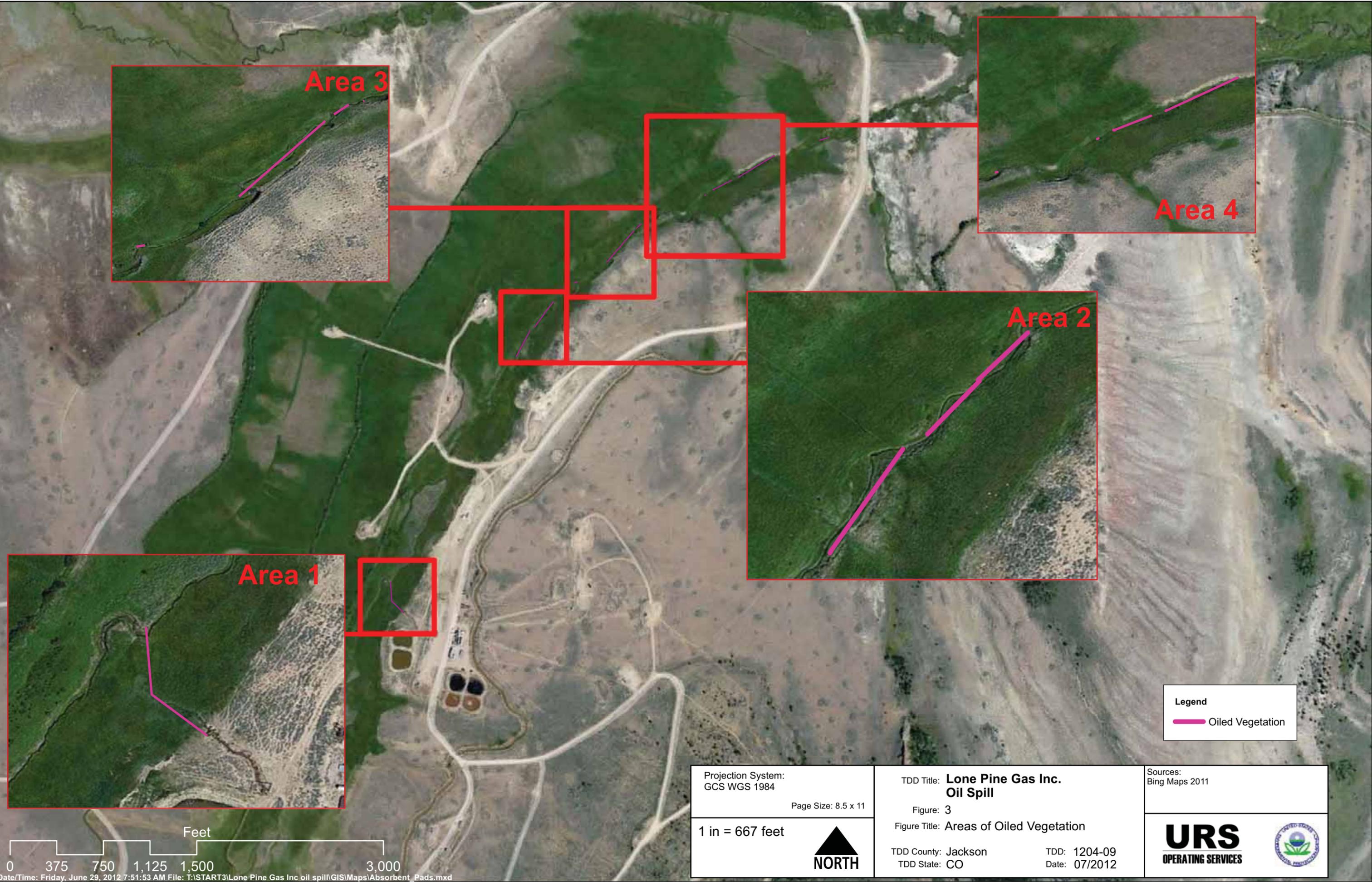
Figure Title: **Sample Location Map**

TDD County: Jackson
TDD State: CO

TDD: 1204-09
Date: 07/2012

Sources:
Bing Maps 2011

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Area 3

Area 4

Area 2

Area 1

Legend

Oiled Vegetation

Projection System:
GCS WGS 1984

Page Size: 8.5 x 11

1 in = 667 feet



TDD Title: **Lone Pine Gas Inc.
Oil Spill**

Figure: 3

Figure Title: Areas of Oiled Vegetation

TDD County: Jackson
TDD State: CO

TDD: 1204-09
Date: 07/2012

Sources:
Bing Maps 2011

URS
OPERATING SERVICES



Feet

0 375 750 1,125 1,500 3,000

TABLE 3
Laboratory Sample Locations and Rationale

Sample Matrix	Sample ID	Location	Rationale
Sediment	LP-SS-001	Hell Creek below Spring Gulch Creek	Document presence/absence of contamination. MS/MSD also collected here to test the precision of laboratory analytical methods.
	LP-SS-002	Hell Creek Ditch	Document presence/absence of contamination.
	LP-SS-003	Sorenson Ditch	Document presence/absence of contamination.
	LP-SS-004	Hell Creek below Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-005	Hell Creek above Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-006	Hell Creek below Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-007	Hell Creek below Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-008	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-009	Hell Creek above Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-010	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-011	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-014	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-015	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-016	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-017	Spring Gulch Creek	Document presence/absence of contamination.
	LP-SS-018	Spring Gulch Creek	Document background concentrations on Spring Gulch Creek.
	LP-SS-019	Hell Creek	Document presence/absence of contamination.
	LP-SS-020	Hell Creek	Document background concentrations on Hell Creek.
LP-SS-022	Hell Creek	Document presence/absence of contamination.	
LP-SS-024	Hell Creek	Document presence/absence of contamination.	

TABLE 3
Laboratory Sample Locations and Rationale

Sample Matrix	Sample ID	Location	Rationale
Soil	LP-SS-012	Spring Gulch Creek, at oil-impacted vegetation (0-2’)	Document degree of contamination.
	LP-SS-013	Spring Gulch Creek, at same location as LP-SS-012 (2-6’)	Document presence/absence of contamination.
Surface Water	LP-SW-001	Outfall/discharge from facility	Document concentrations of various analytes as compared to discharge permit limits.
	LP-SW-003	Hell Creek at Timberman property	Document presence/absence of contamination at a location where livestock access the creek to drink.
QA/QC	LP-SS-021	Hell Creek	Replicate sample of LP-SS-001 collected to document the precision of sample collection procedures and laboratory analyses.
	LP-SS-023	Hell Creek	Replicate sample of LP-SS-022 collected to document the precision of sample collection procedures and laboratory analyses.
	LP-SW-002	Trip Blank (VOC analyses only)	Document potential for contamination via transport.

TABLE 4
Laboratory Sediment and Soil Sample Results (all results in mg/kg)

Sample ID	Sample Depth (inches bgs)	TPH (C ₁₀ -C ₄₀)	TPH-DRO (C ₁₀ -C ₂₈)	TPH-ORO (>C ₂₈ -C ₄₀)	Aromatics (C ₁₁ -C ₂₂)	Aliphatics (C ₉ -C ₁₈)	Aliphatics (C ₁₉ -C ₃₆)	Benzo(a)anthracene	Phenanthrene	Pyrene	TOC
LP-SS-001	2-4	4,040	1,820	2,220	415	257	700	-	-	-	-
LP-SS-002	2-4	266	ND	266	-	-	-	-	-	-	-
LP-SS-003	2-4	721	157	564	-	-	-	-	-	-	-
LP-SS-004	2-4	2,108	938	1,170	288	153	395	-	-	-	-
LP-SS-005	1-4	243	95.9	147	-	-	-	-	-	-	-
LP-SS-006	2-4	1,532	684	848	-	-	-	-	-	-	-
LP-SS-007	2-4	2,102	932	1,170	-	-	-	-	-	-	-
LP-SS-008	2-4	12,040	5,920	6,120	2,400	1,500	4,270	1.68	1.55	1.67	-
LP-SS-009	2-4	585	176	409	53.9	ND	23.2	-	-	-	-
LP-SS-010	2-4	40,000	19,300	20,700	4,700	2,490	6,080	3.02	2.17	3.33	106,000
LP-SS-011	2-4	33,200	17,000	16,200	1,240	802	1,850	0.758	0.748	0.925	-
LP-SS-012	0-2	87,300	46,400	40,900	4,620	2,850	7,750	3.28	3.04	3.20	-
LP-SS-013	2-6	103	ND	103	-	-	-	-	-	-	-
LP-SS-014	2-4	1,923	883	1,040	-	-	-	-	-	-	-
LP-SS-015	2-4	24,300	12,200	12,100	3,730	2,540	6,010	3.14	2.64	2.9	-
LP-SS-016	2-4	6,770	3,490	3,280	1,380	791	1,840	0.814	0.736 J	0.936	-
LP-SS-017	2-4	1,981	941	1,040	-	-	-	-	-	-	-
LP-SS-018	2-4	63.4	ND	63.4	ND	ND	ND	ND	ND	ND	11,500
LP-SS-019	4-8	55.7	ND	55.7	-	-	-	-	-	-	-
LP-SS-020	2-4	54.1	ND	54.1	ND	ND	ND	ND	ND	ND	-

TABLE 4
Laboratory Sediment and Soil Sample Results (all results in mg/kg)

Sample ID	Sample Depth (inches bgs)	TPH (C ₁₀ -C ₄₀)	TPH-DRO (C ₁₀ -C ₂₈)	TPH-ORO (>C ₂₈ -C ₄₀)	Aromatics (C ₁₁ -C ₂₂)	Aliphatics (C ₉ -C ₁₈)	Aliphatics (C ₁₉ -C ₃₆)	Benzo(a)anthracene	Phenanthrene	Pyrene	TOC
LP-SS-021	2-4	2,970	1,370	1,600	411	179	501	ND	ND	ND	18,100
LP-SS-022	2-6	467	142	325	-	-	-	-	-	-	-
LP-SS-023	2-6	2,670	1,410	1,260	220	178	247	ND	ND	ND	-
LP-SS-024	2-6	109	ND	109	-	-	-	-	-	-	-

ND not detected
 - not analyzed

TABLE 5
Selected Water Sample Results (all results in µg/L)

Sample ID	VOCs	Oil and Grease	TSS	Total Iron	Dissolved Copper	Total Manganese	Dissolved Zinc	Total Barium
LP-SW-001	ND	9.2	15.0	1,440	< 4.0	223	59.3	4,560
LP-SW-002	ND	-	-	-	-	-	-	-
LP-SW-003	ND	7.3	-*	16,300	9.2	1,200	139	673

* not analyzed as sample volume collected was used for dissolved metals analysis instead
- not analyzed
ND not detected

APPENDIX A

Project Log Book

"Outdoor writing products...
...for outdoor writing people."



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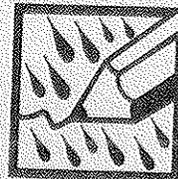
Item No. 391

ISBN: 978-1-932143-22-7

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ALL-WEATHER
JOURNAL

No. 391

Lone Pine Gas Inc. Oil spill
(Margaret Spaulding Tank
Battery Treatment Facility)

~10 miles west of Walden, CO

TDD No. 1204-09

EI No. 36549247

April 20, 2012 FRIDAY

- 1430 Received call from Chuck Baker about oil spill. Told to call Kerry Guy, EPA regarding site visit following week.
- 1500 Called Kerry Guy (KG) and discussed site:
 - oil spill last Dec. (2011), just recently reported.
 - plan on trip to facility near Walden, CO next week to document extent + degree of oil contamination that has occurred to Spring Gulch + Hell Cr.

[Signature]
4/20/12

April 23, 2012 MONDAY

- 0930 Called KG to discuss site. Still on for users. (25th) departure. 2-3 days in field. Sample for TPH-DRD/RD along adjacent creeks. Photo document + GPS to construct views.
- 1070 Met Williams (NW) on board as data manager/GIS person. I began writing Sampling Analysis Plan, NW writing H+S Plan. Amy Gray working on procurement for remainder of day.

[Signature]
4/23/12

4
April 24, 2012 TUESDAY
0815 Meeting at EPA. NW, JM,
KB + Marley McCombs (EPA, MM)
present.

Discussed data needs for

viewer:

- every photo is a point on map
- will delineate areas of concern as lines w/ GPS
- will make every attempt to use Arc Mobile app so as to be able to have viewer ready w/in 24 hours, but as this will involve constructing a custom data dictionary, it might take a while to set up. Will use Terraviva as back up.

Plan for field:

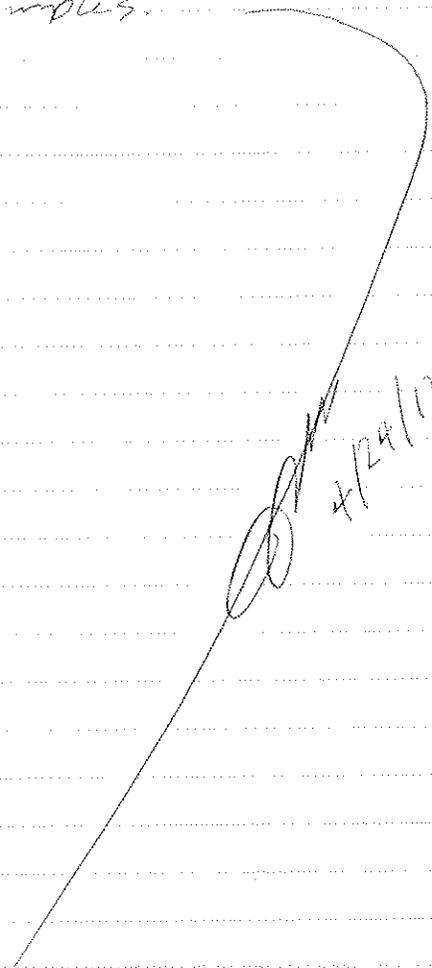
Wednesday: drive to site. Begin recon (GPS locations, collect immunoscreen field screen samples, photos document). Walk affected streams.

Thursday: Go back to worst affected areas + collect definitive level samples.

5
April 24, 12 (cont.)

Thursday: also collect H₂O samples from outfall at Pond 5, upstream + downstream of site on Spring Gulch

Friday: wrap up. Drop off samples.



April 25, 2012 WEDNESDAY

0700 To office. Get vehicle.
Drive to warehouse.

0730 meets NW at warehouse.
Load equip. To office to
get GPS units + other equip.

0900 Leave Denver. Call KB
with update.

1200 Arrive site. Quick
lunch + call to KB. KB
will be on site 2-3 pm.

1230 Trying to get GPS up.

1300 Bob Timberman stops
by (local abbetal landowner).

[Ray Power, Lone Pine
307 760 2247.] Ray told Bob
that Ray had a crew on site
w/ 2 weeks ago who raked the
entire stream length removing
abbetal grass, etc.

1345 Bob Timberman leaves. NW
has GPS working.

Began walking downstream from
road that crosses Spring Gulch
~ 500' downstream of tank battery.

Occasional v. small spots where
~~grass~~ ~~APR 25, 2012~~

April 25, 2012 WEDNESDAY

a sheen can be generated w/
shovel. No large-scale grass
contaminated. Numerous places
where bacteria on surface of
standing water above stream channel
creates a "sheen" but this is not
petroleum. Breaks, rather than
smears.

WEATHER: OVERCAST (THIN), WARM
(mid-60s), breezy with occasional
gusts.

Have walked another ~ 300-400'
down Spring Gulch to bend in stream
to east. small sand bank. Can
create sheen from glob (baseball-
sized) of oily material, as well as
from sand at water line. Area
is about 20' in length. Took two
pics: 100-3395 (glob) w/sheen
100-3396 sand w/sheen

1415 Collected immunoassay TPH
sample 1 from same location
as photo 100-3396.
~~IS~~ LP-IS-01

100-3397 is overview photo,
looking W.

April 25, 2012 (cont) WEDNESDAY

~50' downstream, located
5' long patch of deeper sand,
seems much more heavily
contaminated.

1440 Collected LP-IS-02
from sand described above
photo 100-3398

1445 Ray Power arrives to
discuss issue & spill. Asked
him to speak w/ Kerry Guy
who will be on site.

1455 Kerry Guy on site. Outlined
our observations & approach.
Conveyed my conversations
with BT & RP.

~1500 Photo 100-3399, ^{first} obvious
line of oil-crusted vegetation
E. bank. NW makes GPS
line. Photo 100-3400 as
above, looking south. Continued
line of oil-crusted vegetation
on left (east) side of creek.
Small bit on right end.

~50' further downstream
begins a second intermittent

April 25, 2012 (cont) WEDNESDAY

both-sides area of oil-crusted
veg. light to heavy contam.

Photo 100-3401 from n. middle.

Photo 100-3402 close up of
oil-crusted veg near northern
end of above line.

1535 Collected LP-IS-03

1540 " LP-IS-04

Samples above collected
from exposed bank. 03
from above suspected oil
line, 04 from below.

Photo 100-3403 of above.

Find old open top drum photo 100-
3404. Oil-crusted veg below.

Photo 100-3405 heavy contam.
oil-crusted veg.

1619 Dig profile below ^{collected}
veg. ¹⁶²⁰ Collected LP-IS-05
from ~6" bgs. No obvious
oil contam. No smell of
petrod. Photo 100-3406

Moving further downstream, same

April 25, 2012 (cont.) WEDNESDAY

show, not as much oil-crusted veg. but all low-energy areas can create sheen.

100-3408 Shows steepness of bank w/oiled veg.

100-3409 upstream start of significant length of oil-crusted veg. 60' long bank of ice/snow w/ oil beneath

Photos 100-3410

Anoble - 50' of lightly-med oil-crusted veg. further downstream = Photos 100-3411

Photos 100-3412 & 3413 = more sheen ~ 200' down stream of large culverts under road to Lone Pine still above Hell Cr.

1730 Took short video of creasation of sheen ~ 250' downstream of culvert. →

1740 Two photos of area

April 25, 2012 (cont.) WEDNESDAY

06 confluence of Spring Gulch & Hell Cr. still sheen.

100-3416 & 3417

1750 collected

LS-IS-06 from "oil armored" rocks below Hell Cr./Spring Cr. confluence Photo 100-3418

Photos 100-3419 & 3420 KG creating sheen.

Photos 100-3421 & 3422 KG doing same w/ NW GPS in location

Photo 100-3423 oily foam with sheen on edge, caught on fence line.

Photo 100-3424 KG steady in com access, still sheen

Photo 100-3425 ^{Jim Sorenson?} ~~Talantkin~~

ditch diversion Takes significant portion of flow currently.

April 25, 2012 (cont.) WEDNESDAY

100-3426 Sample location
1828 LP-IS-Ø7 Collected.

Strong green from sediments
pockets entire length of
Bob Timberman property.

100-3427 eastern end of
Bob T.'s property line.

Still strong green.

Decide to call it a day in the
field. Will need to run
immunoassay samples
tonight + upload files into
for viewer.

1915 left field for Walden
1940 To Walden to Chelton
hotel.

2000 Had dinner w/ KG.

2030 Checked in to hotel finally.

2100 Meet w/ KG to discuss tomorrow
plan.

April 25, 2012 (cont.) WEDNESDAY

2130 Begin set up + running of
immunoassay screening samples.
Dried samples significantly
finsb.

2150 Had to run to store to get
9V battery for optical reader.

2220 Prepped reagent blank + cal.
std. vials for calibrating reader.

Results: ppm

Blank	0
cal. standard	1,000
LP-S1-Ø1	1,664
Ø2	3,305
Ø3	190
Ø4	115
Ø5	303
Ø6	52
Ø7	686

2315 Checked emails. Have
received ITR SAMPLING PLAN
from Rebecca Laramie (START
Deputy leader) and more info
on labs.

2330 End of day

 4/25/12

April 26th, 2012

0630 Up and completing labels.

Printed out SAP after
addressing review comments.

0800 Meet with KG to discuss

plan for day, results from
immuno assay testing, etc.

0845 Talked to Amy Green (chemist)
re analyses.

20 - TPH (RO/RAO) = \$1,375

3 - BTEX, O+G, Cu,
Fe, TSS = \$618

\$1,993

April 26th, 2012

Checklist for day:

- 1.) downstream creek (starts ~
diversion #2)
- 2.) fill upstream gap
- 3.) collect ~20 TPH
- 4.) Hell Cr above Spring Gulch (at
road crossing).

1040 Have arrived at pt on
Hell Cr just below where
2nd diversion (to north) occurs.
pathed 3-4 locations on southern
- most diversion: no visible stream.

This diversion is called the Sorenson
Ditch on the topo.

On Hell Cr (middle water body)

Still stream, but faint.

1050 collected LP-SS-001

+MS/MSD

1055 collected LP-SS-021 (amp.)

Photo 100-3428

Over to N-most ditch 2-3 pct

April 26th, 2012

Water No seen. Recent ditch excavation thorough, but thinking spill occurred before active water diversion.

1105 Collected LP-SS- $\phi\phi$ 2
Photo 100-3429

1110 Collected LP-SS- $\phi\phi$ 3
From s-most irrigation ditch/diversion. No seen.

Photo 100-3430

1130 Back to truck. Pack samples.
Drive back to road, to culverts ~2 mi down from Spring Gulch / Hell Cr. confluence.
Still seen in sed. (

1145 Collected LP-SS- $\phi\phi$ 4

1200 To location on Hell Cr upstream of confluence w/ Spring Gulch. Seen present.

1205 Collected LP-SS- $\phi\phi$ 5
From ~10' upgradient of west culvert on Hell Cr.

1250 Collected LP-SS- $\phi\phi$ 6
From ~50' upgrad of Bob Timberman prop. line.

April 26th, 2012

Photo 100-3433

WEATHER: P. to M. CLOUDY, good chance of rain + t-storms, ~70°F

1310 Collected LP-SS- $\phi\phi$ 7 From ~100' downstream from Hell Cr. / Spring G. confluence on Hell Cr.
Photo 100-3434

1320 Collected LP-SS- $\phi\phi$ 8 from Spring Gulch ~50' above confluence with Hell Cr. Photo 100-3435
walked upstream of confluence on Hell Cr. Noted 6" fish ~150' upstream. Water clear, unlike Spring Gulch. Slightly seen in sed. through.

1330 Collected LP-SS- $\phi\phi$ 9
Also noted leech on bottom of stream (Hell Cr.)

1350 Hiked out to truck. Unboxed samples into cooler. Drive farther up spring gulch.

1400 Collected LP-SS- $\phi\phi$ 10

1410 " " $\phi\phi$ 11 from just below snow/ice bank.

April 26th, 2012

walked above snow bank
took profile samp. of oil-crusted
veg.

1425 Collected LP-SS-φ12
0-2"

1430 " " " φ13
2"-6" bgs.

many, many roots. tight
clay matrix.

1455 Collected LP-SS-φ14
Photos 100-3440

1510 " " " φ15
Photos 100-3441

1520 Collected LP-SS-φ16
Photos 100-3442

1550 Collected LP-SS-φ17
Photos 100-3443

walked to outfall discharge with
w/ Spring Gulch. Constant stream
of discolored water with sheen.
Much oil-crusted veg. Photos
100-3444 + 3445

April 26th, 2012

1610 Collected LP-SS-φ18

Photo 100-3446
From upstream of tank
battery on Spring Gulch. AD
Sheen at this or any other of
3 locations pot holed into
sed.

1630 walked last bit of Spring Gulch
just below outfall gully. No
oiled veg.

1700 Collected LP-SW-φφ1
From outfall. Photos 100-3447
NW bump checked pH/cond/T meter
all good.

Temp = 12.8 C

Cond = 1269 us

pH = 7.60

1705 Large + storm moving into
area. Will try to leave
field for day.

Photo 100-3448 is of material
excavated from just below
outfall.

April 26th, 2012

1710 Collected LP-SW-092
trip blank, now that
all samples for day are
in cooler.

1730 To store for more ice.

NOTE ON TRIP BLANK:

JUG of DI water had cap
fall off at some pt.

dunny day.

-1735. Met with KG to discuss
plan for tomorrow:

- leave hotel ~ 07:30
- collect additional samples in
debris gaps.
- more water samples?
- back to hotel for late
check out.
- leave site by 2.

1800 Email photos, shrink video,
logbook, etc. Preserve samples.

1940 To dinner.

2030 Complete labels, pack +
re-ice samples.

2200 Done for day

[Signature] 4/26/12

April 27th, 2012 FRIDAY

0600 Begin chains of custody,
packing equipments.

0725 met w/ KG plan is:

- look at 'good' pockets
of sed. in upper Spring Gulch.
- collect additional samples
on Upper Hell Cr. Csg. by
scrap.]
- water sample on Timberman
property.

0800 Out to site. Boy river
stopped to talk.

0815 Down to large pocket
of sed. pulled up profile for
KG to see. It is ~ 1" 'clean'
sed overlying dark oily sed
with sheen on pebbles. It is ~ 2-3"
thick but hard to tell as is
unconsolidated + shovel disturbs it.

0830 Up to pond S + water still
with sheen at both. Same
for junction of outfall discharge
+ Spring Gulch. To Hell Cr. above comb.

0905 Collected LP-SS-019

0930 " LP-SS-020

April 27th, 2012 FRIDAY

09:45 Drive to factory to GPS

MW's:

Photo 100-3452 = MW 4 NE ponds

100-3453 = MW 3 SE of ponds

100-3454 = MW 6 769 wells?

100-3455 = MW 5

100-3456 = MW 2 SW corner of pond

100-3457 = MW 1 - adj to oiled
wading pond

1015 Drive to Timberman property to
collect SW ^{water} sample.

LP-SW-003

1030 Collected LP-SW-003

1120 Collected LP-SS-022

1125 " LP-SS-023 (dup)

Heavy oil content. 100-3462

1210 Collected LP-SS-024

sed appears clean.

Judy ^{Lewis} ~~Lewis~~ prop.

WEATHER: mid-low 30's

snow from 8 - after 12 noon

then m. cloudy breezy

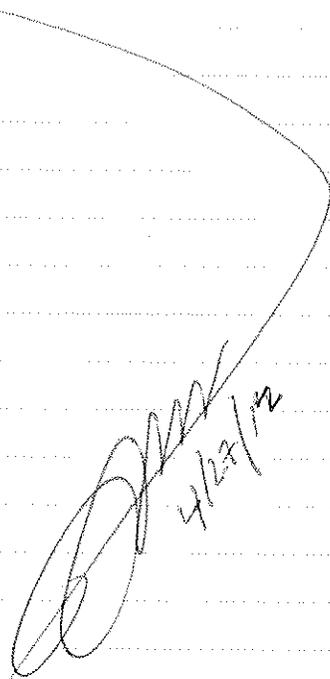
1235 Check out of hotel
preserved samples.

April 27th, 2012 Friday

1310 After buying more ice +
icing samples, grabbed to go
sandwiches and left Walden
for lab in Wheat ridge.

1630 Arrive lab. Release samples.

1700 Back to warehouse. End of
day



APPENDIX B

Photo Log



PHOTO 1
Lone Pine Treatment Facility, looking north.



PHOTO 2
Lone Pine Treatment Facility holding pond, looking north.



PHOTO 3

Jeff Miller (START) collecting LP-SW-001 water sample from weir leaving Pond 5.



PHOTO 4

Nat Williams (START) surveying location of confluence of facility discharge with Spring Gulch Creek. Note discolored water of discharge. Flow is to left. Looking east.



PHOTO 5

Sheen from sediments in Spring Gulch Creek, just above confluence with Hell Creek.



PHOTO 6

Nat Williams (START) and Kerry Guy (EPA) generating sheen in Hell Creek below confluence with Spring Gulch Creek. Looking north.



PHOTO 7
Weathered oil in vegetation along Spring Gulch Creek.



PHOTO 8
Sheen at sediment immunoassay sample location LP-IS-01, Spring Gulch Creek.



PHOTO 9

Sheen at sediment immunoassay sample location LP-IS-02, Spring Gulch Creek.



PHOTO 10

Nat Williams (START) at immunoassay sample locations LP-IS-03 (above) and LP-IS-04 (below) in bank of Spring Gulch Creek. Looking north.



PHOTO 11

Immunoassay soil sample location LP-IS-05 collected from oil-impacted vegetation, on Spring Gulch Creek.



PHOTO 12

Immunoassay sample of 'black armored rocks' on Hell Creek below confluence with Spring Gulch Creek. Sample location LP-IS-06.



PHOTO 13
Immunoassay sediment sample location LP-IS-07 on Hell Creek.



PHOTO 14
Sediment sample locations LP-SS-001 and LP-SS-021 (duplicate), on Hell Creek.



PHOTO 15

Jeff Miller (START) at sediment sample location LP-SS-002, Hell Creek Ditch.



PHOTO 16

Jeff Miller (START) at sediment sample location LP-SS-003, Sorenson Ditch.
Looking west.



PHOTO 17

Jeff Miller (START) collecting sediment sample location LP-SS-004, Hell Creek. Looking east.



PHOTO 18

Jeff Miller (START) collecting sediment sample location LP-SS-005, Hell Creek above confluence with Spring Gulch Creek. Looking west.



PHOTO 19

Jeff Miller (START) collecting sediment sample location LP-SS-006, Hell Creek. Looking north.



PHOTO 20

Jeff Miller (START) collecting sediment sample location LP-SS-007, Hell Creek just below confluence with Spring Gulch Creek. Looking west.



PHOTO 21

Jeff Miller (START) collecting sediment sample location LP-SS-008, Spring Gulch Creek just above confluence with Hell Creek. Looking southwest.



PHOTO 22

Jeff Miller (START) collecting sediment sample location LP-SS-009, Hell Creek just above confluence with Spring Gulch Creek. Looking west.



PHOTO 23

Jeff Miller (START) collecting sediment sample location LP-SS-010, Spring Gulch Creek. Looking north.



PHOTO 24

Jeff Miller (START) collecting sediment sample location LP-SS-011, Spring Gulch Creek. Looking southwest.



PHOTO 25

Stream bank soil sample locations LP-SS-012 and LP-SS-013, Spring Gulch Creek.



PHOTO 26

Jeff Miller (START) collecting sediment sample location LP-SS-014, Spring Gulch Creek. Looking southwest.



PHOTO 27

Jeff Miller (START) collecting sediment sample location LP-SS-015, Spring gulch Creek. Looking southwest.



PHOTO 28

Jeff Miller (START) collecting sediment sample location LP-SS-016, Spring Gulch Creek. Looking west.



PHOTO 29

Jeff Miller (START) collecting sediment sample location LP-SS-017, Hell Creek below confluence with discharge from facility. Looking north.



PHOTO 30

Jeff Miller (START) collecting background sediment sample location LP-SS-018, Spring Gulch Creek upstream of the facility (in background). Looking northeast.



PHOTO 31

Oil-impacted vegetation along discharge flow path just northwest of the facility. Spring Gulch Creek in background. Looking northwest.



PHOTO 32

Jeff Miller (START) collecting sediment sample location LP-SS-019, Hell Creek above confluence with Spring Gulch Creek.



PHOTO 33

Jeff Miller (START) collecting background sediment sample location LP-SS-020 on Hell Creek. Looking north.



PHOTO 34

Nat Williams surveying background monitoring well MW6. Facility in background. Looking north.



PHOTO 35

Nat Williams (START) surveying monitoring well MW1 just west of holding pond. Looking north.



PHOTO 36

Nat Williams (START) stirring up sediment at water sample location LP-SW-003 on Hell Creek, Timberman property cattle access. Looking southeast.



PHOTO 37

Close-up of sample location LP-SW-003 on Hell Creek at Timberman property. Note sheen on water surface.



PHOTO 38

Sheen on water at sediment sample locations LP-SS-022 and LP-SS-023 (duplicate), Hell Creek.



PHOTO 39

Jeff Miller (START) collecting sediment sample location LP-SS-024, Julie Lewis property, Hell Creek above North Fork of the North Platte River.

APPENDIX C

Discharge Permit Effluent Parameters and Discharge Limits

9. Pursuant to Part I.B.2 of the Permit and page one (1) of the Certification, Lone Pine Gas, Inc.'s permitted discharge shall not exceed the effluent limitations specified below:

Effluent Parameter	Discharge Limitation		
	30-Day Average	7-Day Average	Daily Maximum
Flow, gpm	0.42	N/A	Report
Oil & Grease, mg/L	N/A	N/A	10
pH, s.u. (minimum-maximum)	N/A	N/A	6.5-9.0
Total Suspended Solids, mg/L	30	45	N/A
Potentially Dissolved Copper, µg/L	27	N/A	38
Total Recoverable Iron, µg/L	1,000	N/A	Report
Total Recoverable Manganese, µg/L	2,230	N/A	Report
Potentially Dissolved Zinc, µg/L	230	N/A	250
Total Dissolved Solids, mg/L	Report	N/A	3,500
Whole Effluent Toxicity, Chronic*	N/A	N/A	Report

*See pages 1b-1c of the certification for conditions

APPENDIX D

Laboratory Analytical Results and Chains of Custody

Sample Summary

URS Operating Services, Inc.

Job No: D34023

36549247

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D34023-1	04/26/12	10:50 JKM	04/27/12	SO	Soil	LP-SS-001
D34023-1D	04/26/12	10:50 JKM	04/27/12	SO	Soil Dup/MSD	LP-SS-001
D34023-1M	04/26/12	10:50 JKM	04/27/12	SO	Soil Matrix Spike	LP-SS-001
D34023-2	04/26/12	11:05 JKM	04/27/12	SO	Soil	LP-SS-002
D34023-3	04/26/12	11:10 JKM	04/27/12	SO	Soil	LP-SS-003
D34023-4	04/26/12	11:45 JKM	04/27/12	SO	Soil	LP-SS-004
D34023-5	04/26/12	12:05 JKM	04/27/12	SO	Soil	LP-SS-005
D34023-6	04/26/12	12:50 JKM	04/27/12	SO	Soil	LP-SS-006
D34023-7	04/26/12	13:10 JKM	04/27/12	SO	Soil	LP-SS-007
D34023-8	04/26/12	13:20 JKM	04/27/12	SO	Soil	LP-SS-008
D34023-9	04/26/12	13:30 JKM	04/27/12	SO	Soil	LP-SS-009
D34023-10	04/26/12	14:00 JKM	04/27/12	SO	Soil	LP-SS-010
D34023-11	04/26/12	14:10 JKM	04/27/12	SO	Soil	LP-SS-011

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

URS Operating Services, Inc.

Job No: D34023

36549247

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D34023-12	04/26/12	14:25 JKM	04/27/12	SO	Soil	LP-SS-012
D34023-13	04/26/12	14:30 JKM	04/27/12	SO	Soil	LP-SS-013
D34023-14	04/26/12	14:55 JKM	04/27/12	SO	Soil	LP-SS-014
D34023-15	04/26/12	15:10 JKM	04/27/12	SO	Soil	LP-SS-015
D34023-16	04/26/12	15:20 JKM	04/27/12	SO	Soil	LP-SS-016
D34023-17	04/26/12	15:50 JKM	04/27/12	SO	Soil	LP-SS-017
D34023-18	04/26/12	16:10 JKM	04/27/12	SO	Soil	LP-SS-018
D34023-19	04/27/12	09:05 JKM	04/27/12	SO	Soil	LP-SS-019
D34023-19R	04/27/12	09:05 JKM	04/27/12	SO	Soil	LP-SS-019
D34023-20	04/27/12	09:30 JKM	04/27/12	SO	Soil	LP-SS-020
D34023-21	04/26/12	10:55 JKM	04/27/12	SO	Soil	LP-SS-021
D34023-22	04/27/12	11:20 JKM	04/27/12	SO	Soil	LP-SS-022
D34023-23	04/27/12	11:25 JKM	04/27/12	SO	Soil	LP-SS-023

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary (continued)

URS Operating Services, Inc.
36549247

Job No: D34023

Sample Number	Collected			Matrix		Client Sample ID
	Date	Time	By	Received Code	Type	
D34023-24	04/27/12	12:10	JKM	04/27/12	SO Soil	EP-SS-024

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Accutest Laboratories

Report of Analysis

3.1
3

Client Sample ID: LP-SS-001	Date Sampled: 04/26/12
Lab Sample ID: D34023-1	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 65.2
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05573.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	1820	120	77	mg/kg	
	TPH-ORO (> C28-C40)	2220	47	36	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

3.2
3

Client Sample ID: LP-SS-001	Date Sampled: 04/26/12
Lab Sample ID: D34023-1D	Date Received: 04/27/12
Matrix: SO - Soil Dup/MSD	Percent Solids: 65.2
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	65.2		%	1	04/30/12	SWT	SM19 2540B M

RL = Reporting Limit

Report of Analysis

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3

Client Sample ID: LP-SS-001
Lab Sample ID: D34023-1M
Matrix: SO - Soil Matrix Spike
Project: 36549247

Date Sampled: 04/26/12
Date Received: 04/27/12
Percent Solids: 65.2

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	65.2		%	1	04/30/12	SWT	SM19 2540B M

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

3.4
3

Client Sample ID: LP-SS-002	Date Sampled: 04/26/12
Lab Sample ID: D34023-2	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 72.2
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05575.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	110	71	mg/kg	
	TPH-ORO (> C28-C40)	266	44	33	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	74%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.5
3

Client Sample ID: LP-SS-003	Date Sampled: 04/26/12
Lab Sample ID: D34023-3	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 44.8
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05577.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	157	170	110	mg/kg	J
	TPH-ORO (> C28-C40)	564	70	52	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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3.6
3

Client Sample ID:	LP-SS-004	Date Sampled:	04/26/12
Lab Sample ID:	D34023-4	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	62.4
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05579.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	938	130	83	mg/kg	
	TPH-ORO (> C28-C40)	1170	51	38	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.7
3

Client Sample ID:	LP-SS-005	Date Sampled:	04/26/12
Lab Sample ID:	D34023-5	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	60.3
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05581.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	95.9	130	86	mg/kg	J
	TPH-ORO (>C28-C40)	147	53	40	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	82%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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3.8
3

Client Sample ID: LP-SS-006	Date Sampled: 04/26/12
Lab Sample ID: D34023-6	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 72.3
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05583.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	684	110	72	mg/kg	
	TPH-ORO (> C28-C40)	848	44	33	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.9
3

Client Sample ID:	LP-SS-007	Date Sampled:	04/26/12
Lab Sample ID:	D34023-7	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	63.5
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05585.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	932	130	82	mg/kg	
	TPH-ORO (> C28-C40)	1170	50	38	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	76%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

3.10
3

Client Sample ID: LP-SS-008	Date Sampled: 04/26/12
Lab Sample ID: D34023-8	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 51.6
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05587.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	5920	150	100	mg/kg	
	TPH-ORO (> C28-C40)	6120	62	46	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.11
3

Client Sample ID:	LP-SS-009	Date Sampled:	04/26/12
Lab Sample ID:	D34023-9	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	47.8
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05589.D	1	04/30/12	AV	04/30/12	OP5799	GFI414
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	176	170	110	mg/kg	
	TPH-ORO (> C28-C40)	409	66	50	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.12
3

Client Sample ID: LP-SS-010	Date Sampled: 04/26/12
Lab Sample ID: D34023-10	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 41.5
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F105635.D	10	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	19300	1900	1200	mg/kg	
	TPH-ORO (> C28-C40)	20700	770	580	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.13
3

Client Sample ID:	LP-SS-011	Date Sampled:	04/26/12
Lab Sample ID:	D34023-11	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	58.1
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05636.D	10	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	17000	1400	890	mg/kg	
	TPH-ORO (> C28-C40)	16200	550	410	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

3.14
3

Client Sample ID: LP-SS-012	Date Sampled: 04/26/12
Lab Sample ID: D34023-12	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 55.0
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05637.D	10	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	46400	1500	950	mg/kg	
	TPH-ORO (> C28-C40)	40900	580	440	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	81%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.15

3

Client Sample ID:	LP-SS-013	Date Sampled:	04/26/12
Lab Sample ID:	D34023-13	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	71.9
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05638.D	1	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	110	71	mg/kg	
	TPH-ORO (> C28-C40)	103	44	33	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

3.16
3

Client Sample ID: LP-SS-014	Date Sampled: 04/26/12
Lab Sample ID: D34023-14	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 54.1
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05639.D	1	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	883	150	96	mg/kg	
	TPH-ORO (> C28-C40)	1040	59	44	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	79%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.17
3

Client Sample ID:	LP-SS-015	Date Sampled:	04/26/12
Lab Sample ID:	D34023-15	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	52.7
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F105640.D	10	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	12200	1500	980	mg/kg	
	TPH-ORO (> C28-C40)	12100	600	450	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	86%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Page 1 of 1

3.18

3

Client Sample ID:	LP-SS-016	Date Sampled:	04/26/12
Lab Sample ID:	D34023-16	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	58.3
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05641.D	1	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	3490	140	88	mg/kg	
	TPH-ORO (> C28-C40)	3280	54	41	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	75%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.19

3

Client Sample ID:	LP-SS-017	Date Sampled:	04/26/12
Lab Sample ID:	D34023-17	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	66.3
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05643.D	1	05/01/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	941	120	78	mg/kg	
	TPH-ORO (> C28-C40)	1040	48	36	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	74%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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3.20
3

Client Sample ID: LP-SS-018	Date Sampled: 04/26/12
Lab Sample ID: D34023-18	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 68.3
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05644.D	1	05/02/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	120	75	mg/kg	
	TPH-ORO (> C28-C40)	63.4	46	35	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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3

Client Sample ID:	LP-SS-019	Date Sampled:	04/27/12
Lab Sample ID:	D34023-19	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	66.0
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05645.D	1	05/02/12	AV	04/30/12	OP5799	GFI416
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	120	77	mg/kg	
	TPH-ORO (> C28-C40)	55.7	48	36	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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3.22
3

Client Sample ID: LP-SS-019	Date Sampled: 04/27/12
Lab Sample ID: D34023-19R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 66.0
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05659.D	1	05/04/12	AV	05/04/12	OP5830	GFI417
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	120	76	mg/kg	
	TPH-ORO (> C28-C40)	89	48	36	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	71%		43-136%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.24

3

Client Sample ID:	LP-SS-021	Date Sampled:	04/26/12
Lab Sample ID:	D34023-21	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	55.6
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05578.D	1	04/30/12	AV	04/30/12	OP5800	GFI415
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	1370	140	94	mg/kg	
	TPH-ORO (> C28-C40)	1600	58	43	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.25

3

Client Sample ID:	LP-SS-022	Date Sampled:	04/27/12
Lab Sample ID:	D34023-22	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	75.0
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05576.D	1	04/30/12	AV	04/30/12	OP5800	GFI415
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	142	110	69	mg/kg	
	TPH-ORO (> C28-C40)	325	43	32	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.26
3

Client Sample ID: LP-SS-023	Date Sampled: 04/27/12
Lab Sample ID: D34023-23	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 66.7
Method: SW846-8015B SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05580.D	1	04/30/12	AV	04/30/12	OP5800	GFI415
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	1410	120	77	mg/kg	
	TPH-ORO (> C28-C40)	1260	47	35	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	88%		43-136%		

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

3.27
3

Client Sample ID:	LP-SS-024	Date Sampled:	04/27/12
Lab Sample ID:	D34023-24	Date Received:	04/27/12
Matrix:	SO - Soil	Percent Solids:	78.5
Method:	SW846-8015B SW846 3546		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI05582.D	1	04/30/12	AV	04/30/12	OP5800	GFI415
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	100	66	mg/kg	
	TPH-ORO (> C28-C40)	109	41	31	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	88%		43-136%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Sample Summary

URS Operating Services, Inc.

Job No: D34023R

36549247

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D34023-1R	04/26/12	10:50 JKM	04/27/12	SO	Soil	LP-SS-001
D34023-4R	04/26/12	11:45 JKM	04/27/12	SO	Soil	LP-SS-004
D34023-8R	04/26/12	13:20 JKM	04/27/12	SO	Soil	LP-SS-008
D34023-9R	04/26/12	13:30 JKM	04/27/12	SO	Soil	LP-SS-009
D34023-10R	04/26/12	14:00 JKM	04/27/12	SO	Soil	LP-SS-010
D34023-11R	04/26/12	14:10 JKM	04/27/12	SO	Soil	LP-SS-011
D34023-12R	04/26/12	14:25 JKM	04/27/12	SO	Soil	LP-SS-012
D34023-15R	04/26/12	15:10 JKM	04/27/12	SO	Soil	LP-SS-015
D34023-16R	04/26/12	15:20 JKM	04/27/12	SO	Soil	LP-SS-016
D34023-18R	04/26/12	16:10 JKM	04/27/12	SO	Soil	LP-SS-018
D34023-20R	04/27/12	09:30 JKM	04/27/12	SO	Soil	LP-SS-020
D34023-21R	04/26/12	10:55 JKM	04/27/12	SO	Soil	LP-SS-021
D34023-23R	04/27/12	11:25 JKM	04/27/12	SO	Soil	LP-SS-023

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Report of Analysis

3.1
3

Client Sample ID: LP-SS-001	Date Sampled: 04/26/12
Lab Sample ID: D34023-1R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 65.2
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10781.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.3 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	680	540	ug/kg	
208-96-8	Acenaphthylene	ND	680	540	ug/kg	
120-12-7	Anthracene	ND	680	540	ug/kg	
56-55-3	Benzo(a)anthracene	ND	680	540	ug/kg	
50-32-8	Benzo(a)pyrene	ND	680	540	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	680	540	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	680	540	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	680	540	ug/kg	
218-01-9	Chrysene	ND	680	540	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	680	540	ug/kg	
206-44-0	Fluoranthene	ND	680	540	ug/kg	
86-73-7	Fluorene	ND	680	540	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	680	540	ug/kg	
91-57-6	2-Methylnaphthalene	ND	680	540	ug/kg	
91-20-3	Naphthalene	ND	680	540	ug/kg	
85-01-8	Phenanthrene	ND	680	540	ug/kg	
129-00-0	Pyrene	ND	680	540	ug/kg	
	C11-C22 Aromatics (Unadj.)	416000	27000	27000	ug/kg	
	C9-C18 Aliphatics	257000	14000	14000	ug/kg	
	C19-C36 Aliphatics	700000	14000	14000	ug/kg	
	C11-C22 Aromatics	415000	27000	27000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	69%		40-140%
321-60-8	2-Fluorobiphenyl	76%		40-140%
580-13-2	2-Bromonaphthalene	53%		40-140%
3386-33-2	1-Chlorooctadecane	54%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Report of Analysis

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3.2
3

Client Sample ID: LP-SS-004		Date Sampled: 04/26/12
Lab Sample ID: D34023-4R		Date Received: 04/27/12
Matrix: SO - Soil		Percent Solids: 62.4
Method: MADEP EPH REV 1.1 SW846 3546		
Project: 36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10779.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.3 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	710	570	ug/kg	
208-96-8	Acenaphthylene	ND	710	570	ug/kg	
120-12-7	Anthracene	ND	710	570	ug/kg	
56-55-3	Benzo(a)anthracene	ND	710	570	ug/kg	
50-32-8	Benzo(a)pyrene	ND	710	570	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	710	570	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	710	570	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	710	570	ug/kg	
218-01-9	Chrysene	ND	710	570	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	710	570	ug/kg	
206-44-0	Fluoranthene	ND	710	570	ug/kg	
86-73-7	Fluorene	ND	710	570	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	710	570	ug/kg	
91-57-6	2-Methylnaphthalene	ND	710	570	ug/kg	
91-20-3	Naphthalene	ND	710	570	ug/kg	
85-01-8	Phenanthrene	ND	710	570	ug/kg	
129-00-0	Pyrene	ND	710	570	ug/kg	
	C11-C22 Aromatics (Unadj.)	288000	28000	28000	ug/kg	
	C9-C18 Aliphatics	153000	14000	14000	ug/kg	
	C19-C36 Aliphatics	395000	14000	14000	ug/kg	
	C11-C22 Aromatics	288000	28000	28000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	69%		40-140%
321-60-8	2-Fluorobiphenyl	76%		40-140%
580-13-2	2-Bromonaphthalene	60%		40-140%
3386-33-2	1-Chlorooctadecane	50%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
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 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID: LP-SS-008	Date Sampled: 04/26/12
Lab Sample ID: D34023-8R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 51.6
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10794.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.4 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	850	680	ug/kg	
208-96-8	Acenaphthylene	ND	850	680	ug/kg	
120-12-7	Anthracene	ND	850	680	ug/kg	
56-55-3	Benzo(a)anthracene	1680	850	680	ug/kg	
50-32-8	Benzo(a)pyrene	ND	850	680	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	850	680	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	850	680	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	850	680	ug/kg	
218-01-9	Chrysene	ND	850	680	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	850	680	ug/kg	
206-44-0	Fluoranthene	ND	850	680	ug/kg	
86-73-7	Fluorene	ND	850	680	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	850	680	ug/kg	
91-57-6	2-Methylnaphthalene	ND	850	680	ug/kg	
91-20-3	Naphthalene	ND	850	680	ug/kg	
85-01-8	Phenanthrene	1550	850	680	ug/kg	
129-00-0	Pyrene	1670	850	680	ug/kg	
	C11-C22 Aromatics (Unadj.)	2410000	34000	34000	ug/kg	
	C9-C18 Aliphatics	1500000	17000	17000	ug/kg	
	C19-C36 Aliphatics	4270000	17000	17000	ug/kg	
	C11-C22 Aromatics	2400000	34000	34000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	47%		40-140%
321-60-8	2-Fluorobiphenyl	72%		40-140%
580-13-2	2-Bromonaphthalene	53%		40-140%
3386-33-2	1-Chlorooctadecane	61%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID: LP-SS-009	Date Sampled: 04/26/12
Lab Sample ID: D34023-9R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 47.8
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10777.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

	Initial Weight	Final Volume
Run #1	11.6 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	900	720	ug/kg	
208-96-8	Acenaphthylene	ND	900	720	ug/kg	
120-12-7	Anthracene	ND	900	720	ug/kg	
56-55-3	Benzo(a)anthracene	ND	900	720	ug/kg	
50-32-8	Benzo(a)pyrene	ND	900	720	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	900	720	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	900	720	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	900	720	ug/kg	
218-01-9	Chrysene	ND	900	720	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	900	720	ug/kg	
206-44-0	Fluoranthene	ND	900	720	ug/kg	
86-73-7	Fluorene	ND	900	720	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	900	720	ug/kg	
91-57-6	2-Methylnaphthalene	ND	900	720	ug/kg	
91-20-3	Naphthalene	ND	900	720	ug/kg	
85-01-8	Phenanthrene	ND	900	720	ug/kg	
129-00-0	Pyrene	ND	900	720	ug/kg	
	C11-C22 Aromatics (Unadj.)	54200	36000	36000	ug/kg	
	C9-C18 Aliphatics	ND	18000	18000	ug/kg	
	C19-C36 Aliphatics	23200	18000	18000	ug/kg	
	C11-C22 Aromatics	53900	36000	36000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	69%		40-140%
321-60-8	2-Fluorobiphenyl	74%		40-140%
580-13-2	2-Bromonaphthalene	51%		40-140%
3386-33-2	1-Chlorooctadecane	50%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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Report of Analysis

3.5
3

Client Sample ID: LP-SS-010	Date Sampled: 04/26/12
Lab Sample ID: D34023-10R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 41.5
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10790.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.3 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1100	860	ug/kg	
208-96-8	Acenaphthylene	ND	1100	860	ug/kg	
120-12-7	Anthracene	ND	1100	860	ug/kg	
56-55-3	Benzo(a)anthracene	3020	1100	860	ug/kg	
50-32-8	Benzo(a)pyrene	ND	1100	860	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	1100	860	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	1100	860	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	1100	860	ug/kg	
218-01-9	Chrysene	ND	1100	860	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	1100	860	ug/kg	
206-44-0	Fluoranthene	ND	1100	860	ug/kg	
86-73-7	Fluorene	ND	1100	860	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1100	860	ug/kg	
91-57-6	2-Methylnaphthalene	ND	1100	860	ug/kg	
91-20-3	Naphthalene	ND	1100	860	ug/kg	
85-01-8	Phenanthrene	2170	1100	860	ug/kg	
129-00-0	Pyrene	3330	1100	860	ug/kg	
	C11-C22 Aromatics (Unadj.)	4710000	43000	43000	ug/kg	
	C9-C18 Aliphatics	2490000	21000	21000	ug/kg	
	C19-C36 Aliphatics	6080000	21000	21000	ug/kg	
	C11-C22 Aromatics	4700000	43000	43000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	57%		40-140%
321-60-8	2-Fluorobiphenyl	100%		40-140%
580-13-2	2-Bromonaphthalene	71%		40-140%
3386-33-2	1-Chlorooctadecane	61%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

Client Sample ID: LP-SS-010	Date Sampled: 04/26/12
Lab Sample ID: D34023-10R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 41.5
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Total Organic Carbon ^a	106000	4600	mg/kg	1	05/11/12 10:39	AMA	SW 846 9060M

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit

Report of Analysis

3.6
3

Client Sample ID: LP-SS-011	
Lab Sample ID: D34023-11R	Date Sampled: 04/26/12
Matrix: SO - Soil	Date Received: 04/27/12
Method: MADEP EPH REV 1.1 SW846 3546	Percent Solids: 58.1
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10784.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.9 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	720	580	ug/kg	
208-96-8	Acenaphthylene	ND	720	580	ug/kg	
120-12-7	Anthracene	ND	720	580	ug/kg	
56-55-3	Benzo(a)anthracene	758	720	580	ug/kg	
50-32-8	Benzo(a)pyrene	ND	720	580	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	720	580	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	720	580	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	720	580	ug/kg	
218-01-9	Chrysene	ND	720	580	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	720	580	ug/kg	
206-44-0	Fluoranthene	ND	720	580	ug/kg	
86-73-7	Fluorene	ND	720	580	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	720	580	ug/kg	
91-57-6	2-Methylnaphthalene	ND	720	580	ug/kg	
91-20-3	Naphthalene	ND	720	580	ug/kg	
85-01-8	Phenanthrene	748	720	580	ug/kg	
129-00-0	Pyrene	925	720	580	ug/kg	
	C11-C22 Aromatics (Unadj.)	1240000	29000	29000	ug/kg	
	C9-C18 Aliphatics	802000	14000	14000	ug/kg	
	C19-C36 Aliphatics	1850000	14000	14000	ug/kg	
	C11-C22 Aromatics	1240000	29000	29000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	49%		40-140%
321-60-8	2-Fluorobiphenyl	76%		40-140%
580-13-2	2-Bromonaphthalene	61%		40-140%
3386-33-2	1-Chlorooctadecane	54%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Report of Analysis

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3.7
3

Client Sample ID: LP-SS-012		Date Sampled: 04/26/12
Lab Sample ID: D34023-12R		Date Received: 04/27/12
Matrix: SO - Soil		Percent Solids: 55.0
Method: MADEP EPH REV 1.1 SW846 3546		
Project: 36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10797.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	810	650	ug/kg	
208-96-8	Acenaphthylene	ND	810	650	ug/kg	
120-12-7	Anthracene	ND	810	650	ug/kg	
56-55-3	Benzo(a)anthracene	3280	810	650	ug/kg	
50-32-8	Benzo(a)pyrene	ND	810	650	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	810	650	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	810	650	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	810	650	ug/kg	
218-01-9	Chrysene	ND	810	650	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	810	650	ug/kg	
206-44-0	Fluoranthene	ND	810	650	ug/kg	
86-73-7	Fluorene	ND	810	650	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	810	650	ug/kg	
91-57-6	2-Methylnaphthalene	ND	810	650	ug/kg	
91-20-3	Naphthalene	ND	810	650	ug/kg	
85-01-8	Phenanthrene	3040	810	650	ug/kg	
129-00-0	Pyrene	3200	810	650	ug/kg	
	C11-C22 Aromatics (Unadj.)	4630000	32000	32000	ug/kg	
	C9-C18 Aliphatics	2850000	16000	16000	ug/kg	
	C19-C36 Aliphatics	7750000	16000	16000	ug/kg	
	C11-C22 Aromatics	4620000	32000	32000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	57%		40-140%
321-60-8	2-Fluorobiphenyl	79%		40-140%
580-13-2	2-Bromonaphthalene	65%		40-140%
3386-33-2	1-Chlorooctadecane	111%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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Report of Analysis

3.8
3

Client Sample ID: LP-SS-015	Date Sampled: 04/26/12
Lab Sample ID: D34023-15R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 52.7
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10800.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.3 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	840	670	ug/kg	
208-96-8	Acenaphthylene	ND	840	670	ug/kg	
120-12-7	Anthracene	ND	840	670	ug/kg	
56-55-3	Benzo(a)anthracene	3140	840	670	ug/kg	
50-32-8	Benzo(a)pyrene	ND	840	670	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	840	670	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	840	670	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	840	670	ug/kg	
218-01-9	Chrysene	ND	840	670	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	840	670	ug/kg	
206-44-0	Fluoranthene	ND	840	670	ug/kg	
86-73-7	Fluorene	ND	840	670	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	840	670	ug/kg	
91-57-6	2-Methylnaphthalene	ND	840	670	ug/kg	
91-20-3	Naphthalene	ND	840	670	ug/kg	
85-01-8	Phenanthrene	2640	840	670	ug/kg	
129-00-0	Pyrene	2900	840	670	ug/kg	
	C11-C22 Aromatics (Unadj.)	3740000	34000	34000	ug/kg	
	C9-C18 Aliphatics	2540000	17000	17000	ug/kg	
	C19-C36 Aliphatics	6010000	17000	17000	ug/kg	
	C11-C22 Aromatics	3730000	34000	34000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	56%		40-140%
321-60-8	2-Fluorobiphenyl	79%		40-140%
580-13-2	2-Bromonaphthalene	62%		40-140%
3386-33-2	1-Chlorooctadecane	79%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

Client Sample ID: LP-SS-016		Date Sampled: 04/26/12
Lab Sample ID: D34023-16R		Date Received: 04/27/12
Matrix: SO - Soil		Percent Solids: 58.3
Method: MADEP EPH REV 1.1 SW846 3546		
Project: 36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10787.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.3 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	760	610	ug/kg	
208-96-8	Acenaphthylene	ND	760	610	ug/kg	
120-12-7	Anthracene	ND	760	610	ug/kg	
56-55-3	Benzo(a)anthracene	814	760	610	ug/kg	
50-32-8	Benzo(a)pyrene	ND	760	610	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	760	610	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	760	610	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	760	610	ug/kg	
218-01-9	Chrysene	ND	760	610	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	760	610	ug/kg	
206-44-0	Fluoranthene	ND	760	610	ug/kg	
86-73-7	Fluorene	ND	760	610	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	760	610	ug/kg	
91-57-6	2-Methylnaphthalene	ND	760	610	ug/kg	
91-20-3	Naphthalene	ND	760	610	ug/kg	
85-01-8	Phenanthrene	736	760	610	ug/kg	J
129-00-0	Pyrene	936	760	610	ug/kg	
	C11-C22 Aromatics (Unadj.)	1390000	30000	30000	ug/kg	
	C9-C18 Aliphatics	791000	15000	15000	ug/kg	
	C19-C36 Aliphatics	1840000	15000	15000	ug/kg	
	C11-C22 Aromatics	1380000	30000	30000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	56%		40-140%
321-60-8	2-Fluorobiphenyl	81%		40-140%
580-13-2	2-Bromonaphthalene	69%		40-140%
3386-33-2	1-Chlorooctadecane	59%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Report of Analysis

3.10
3

Client Sample ID: LP-SS-018	Date Sampled: 04/26/12
Lab Sample ID: D34023-18R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 68.3
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10769.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	650	520	ug/kg	
208-96-8	Acenaphthylene	ND	650	520	ug/kg	
120-12-7	Anthracene	ND	650	520	ug/kg	
56-55-3	Benzo(a)anthracene	ND	650	520	ug/kg	
50-32-8	Benzo(a)pyrene	ND	650	520	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	650	520	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	650	520	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	650	520	ug/kg	
218-01-9	Chrysene	ND	650	520	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	650	520	ug/kg	
206-44-0	Fluoranthene	ND	650	520	ug/kg	
86-73-7	Fluorene	ND	650	520	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	650	520	ug/kg	
91-57-6	2-Methylnaphthalene	ND	650	520	ug/kg	
91-20-3	Naphthalene	ND	650	520	ug/kg	
85-01-8	Phenanthrene	ND	650	520	ug/kg	
129-00-0	Pyrene	ND	650	520	ug/kg	
	C11-C22 Aromatics (Unadj.)	ND	26000	26000	ug/kg	
	C9-C18 Aliphatics	ND	13000	13000	ug/kg	
	C19-C36 Aliphatics	ND	13000	13000	ug/kg	
	C11-C22 Aromatics	ND	26000	26000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	74%		40-140%
321-60-8	2-Fluorobiphenyl	81%		40-140%
580-13-2	2-Bromonaphthalene	72%		40-140%
3386-33-2	1-Chlorooctadecane	52%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.10
3

Client Sample ID: LP-SS-018	Date Sampled: 04/26/12
Lab Sample ID: D34023-18R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 68.3
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Total Organic Carbon ^a	11500	1400	mg/kg	1	05/11/12 10:28	AMA	SW 846 9060M

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit

Report of Analysis

3.11
3

Client Sample ID: LP-SS-020	Date Sampled: 04/27/12
Lab Sample ID: D34023-20R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 67.4
Method: MADEP EPH REV 1.1 SW846 3546	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10770.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	670	530	ug/kg	
208-96-8	Acenaphthylene	ND	670	530	ug/kg	
120-12-7	Anthracene	ND	670	530	ug/kg	
56-55-3	Benzo(a)anthracene	ND	670	530	ug/kg	
50-32-8	Benzo(a)pyrene	ND	670	530	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	670	530	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	670	530	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	670	530	ug/kg	
218-01-9	Chrysene	ND	670	530	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	670	530	ug/kg	
206-44-0	Fluoranthene	ND	670	530	ug/kg	
86-73-7	Fluorene	ND	670	530	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	670	530	ug/kg	
91-57-6	2-Methylnaphthalene	ND	670	530	ug/kg	
91-20-3	Naphthalene	ND	670	530	ug/kg	
85-01-8	Phenanthrene	ND	670	530	ug/kg	
129-00-0	Pyrene	ND	670	530	ug/kg	
	C11-C22 Aromatics (Unadj.)	ND	27000	27000	ug/kg	
	C9-C18 Aliphatics	ND	13000	13000	ug/kg	
	C19-C36 Aliphatics	ND	13000	13000	ug/kg	
	C11-C22 Aromatics	ND	27000	27000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	79%		40-140%
321-60-8	2-Fluorobiphenyl	85%		40-140%
580-13-2	2-Bromonaphthalene	68%		40-140%
3386-33-2	1-Chlorooctadecane	51%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: LP-SS-021		Date Sampled: 04/26/12
Lab Sample ID: D34023-21R		Date Received: 04/27/12
Matrix: SO - Soil		Percent Solids: 55.6
Method: MADEP EPH REV 1.1 SW846 3546		
Project: 36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10808.D	1	05/12/12	AMA	05/09/12	M:OP28867	M:GBJ412
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.7 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	770	610	ug/kg	
208-96-8	Acenaphthylene	ND	770	610	ug/kg	
120-12-7	Anthracene	ND	770	610	ug/kg	
56-55-3	Benzo(a)anthracene	ND	770	610	ug/kg	
50-32-8	Benzo(a)pyrene	ND	770	610	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	770	610	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	770	610	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	770	610	ug/kg	
218-01-9	Chrysene	ND	770	610	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	770	610	ug/kg	
206-44-0	Fluoranthene	ND	770	610	ug/kg	
86-73-7	Fluorene	ND	770	610	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	770	610	ug/kg	
91-57-6	2-Methylnaphthalene	ND	770	610	ug/kg	
91-20-3	Naphthalene	ND	770	610	ug/kg	
85-01-8	Phenanthrene	ND	770	610	ug/kg	
129-00-0	Pyrene	ND	770	610	ug/kg	
	C11-C22 Aromatics (Unadj.)	411000	31000	31000	ug/kg	
	C9-C18 Aliphatics	179000	15000	15000	ug/kg	
	C19-C36 Aliphatics	501000	15000	15000	ug/kg	
	C11-C22 Aromatics	411000	31000	31000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		40-140%
321-60-8	2-Fluorobiphenyl	81%		40-140%
580-13-2	2-Bromonaphthalene	64%		40-140%
3386-33-2	1-Chlorooctadecane	49%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

3.12

3

Client Sample ID: LP-SS-021	Date Sampled: 04/26/12
Lab Sample ID: D34023-21R	Date Received: 04/27/12
Matrix: SO - Soil	Percent Solids: 55.6
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Total Organic Carbon ^a	18100	1600	mg/kg	1	05/11/12 11:17	AMA	SW 846 9060M

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit

Report of Analysis

3.13
3

Client Sample ID: LP-SS-023		Date Sampled: 04/27/12
Lab Sample ID: D34023-23R		Date Received: 04/27/12
Matrix: SO - Soil		Percent Solids: 66.7
Method: MADEP EPH REV 1.1 SW846 3546		
Project: 36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	BJ10773.D	1	05/11/12	AMA	05/09/12	M:OP28867	M:GBJ411
Run #2							

Run #	Initial Weight	Final Volume
Run #1	11.8 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	630	510	ug/kg	
208-96-8	Acenaphthylene	ND	630	510	ug/kg	
120-12-7	Anthracene	ND	630	510	ug/kg	
56-55-3	Benzo(a)anthracene	ND	630	510	ug/kg	
50-32-8	Benzo(a)pyrene	ND	630	510	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	630	510	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	630	510	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	630	510	ug/kg	
218-01-9	Chrysene	ND	630	510	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	630	510	ug/kg	
206-44-0	Fluoranthene	ND	630	510	ug/kg	
86-73-7	Fluorene	ND	630	510	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	630	510	ug/kg	
91-57-6	2-Methylnaphthalene	ND	630	510	ug/kg	
91-20-3	Naphthalene	ND	630	510	ug/kg	
85-01-8	Phenanthrene	ND	630	510	ug/kg	
129-00-0	Pyrene	ND	630	510	ug/kg	
	C11-C22 Aromatics (Unadj.)	221000	25000	25000	ug/kg	
	C9-C18 Aliphatics	178000	13000	13000	ug/kg	
	C19-C36 Aliphatics	247000	13000	13000	ug/kg	
	C11-C22 Aromatics	220000	25000	25000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	71%		40-140%
321-60-8	2-Fluorobiphenyl	80%		40-140%
580-13-2	2-Bromonaphthalene	71%		40-140%
3386-33-2	1-Chlorooctadecane	49%		40-140%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

D34023 1 of 2

UOS URS Operating Services, Inc. 18 th Street, STE 740 900 Denver, CO 80202 303-291-8200		SHIP TO: Accutest 4036 Youngfield St. Wheatridge, CO 80033 Attn: Ann Doerr		CHAIN OF CUSTODY RECORD			
PROJECT NUMBER / PURCHASE ORDER NUMBER: 36549247		SITE MANAGER / PHONE NUMBER: Jeff Miller 303 291 8212 720 810 0790		Number of Containers TPH ORG - AID		TURNAROUND REQUESTED: 3 day	
SAMPLER'S SIGNATURE: <i>[Signature]</i> Jeff K. Miller						TAG NUMBERS	
SAMPLE ID	DATE	TIME	COMP/GRAB	REMARKS		TAG NUMBERS	
¹ LP-SS-001	4/26/12	1050	Grab	includes ms/msp	2	01	
² LP-SS-002		1105			1	02	
³ LP-SS-003		1110				03	
⁴ LP-SS-004		1145				04	
⁵ LP-SS-005		1205				05	
⁶ LP-SS-006		1250				06	
⁷ LP-SS-007		1310				07	
⁸ LP-SS-008		1320				08	
⁹ LP-SS-009		1330				09	
¹⁰ LP-SS-010		1400				10	
¹¹ LP-SS-011		1410				11	
¹² LP-SS-012		1425		0-2"		12	
¹³ LP-SS-013		1430		2-6"		13	
¹⁴ LP-SS-014		1455				14	
¹⁵ LP-SS-015		1510				15 <i>DR4/27</i>	
RELINQUISHED BY: (Signature) <i>[Signature]</i>		DATE 4/27/12	TIME 1615	RECEIVED BY: (Signature) <i>[Signature]</i>		OTHER INFORMATION: all bottle/jar labels are missing a zero in sample ID COC is correct	
RELINQUISHED BY: (Signature)		DATE	TIME	RECEIVED BY: (Signature)			
RELINQUISHED BY: (Signature)		DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature) <i>[Signature]</i>			
		DATE 4/27/12	TIME 1615	DATE 4/27/12	TIME 1615	AIRBILL NUMBER: LAB REMARKS:	

White - Original to Accompany Samples Yellow - UOS Chemist Pink - UOS Project Manager

HD S-2 DN 7316 N.A.B. *[Signature]* 4/27/12

UOS URS Operating Services, Inc. 777, 1099 18 th Street, STE 700 Denver, CO 80202 303-291-8200		SHIP TO: Accutest 4036 Youngfield St Wheatbridge, CO Attn: Ann Doerr 80033		CHAIN OF CUSTODY RECORD			
PROJECT NUMBER / PURCHASE ORDER NUMBER: 36549247			SITE MANAGER / PHONE NUMBER: Jeff Miller 303 291 8212 720 810 0970			TURNAROUND REQUESTED: 3 day	
SAMPLER'S SIGNATURE: <i>[Signature]</i> Jeff K. Miller							
SAMPLE ID	DATE	TIME	COMP/GRAB	REMARKS	Number of Containers	TAG NUMBERS	
1) LP-SS-016	4/26/12	1520	Grab		TPH DRD-RRD _____	16	
2) LP-SS-017		1550				17	
3) LP-SS-018	↓	1610				18	
4) LP-SS-019	4/27/12	0905				19	
5) LP-SS-020	↓	0930				20	
6) LP-SS-021	4/26/12	1055				21	
7) LP-SS-022	4/27/12	1120				22	
8) LP-SS-023	↓	1125				23	
9) LP-SS-024	↓	1210				24	
10)							
11)						DR4127	
12)							
13)							
14)							
15)							
RELINQUISHED BY: (Signature)		DATE	TIME	RECEIVED BY: (Signature)		OTHER INFORMATION:	
RELINQUISHED BY: (Signature)		DATE	TIME	RECEIVED BY: (Signature)		all bottle/jar labels are missing a zero in sample ID CDL is correct	
RELINQUISHED BY: (Signature)		DATE	TIME	RECEIVED FOR LABORATORY BY: (Signature)		AIRBILL NUMBER:	
<i>[Signature]</i>		4/27/12	1615	<i>[Signature]</i>		LAB REMARKS:	

4.1
4

White - Original to Accompany Samples

Yellow - UOS Chemist

Pink - UOS Project Manager

HD 5.2

DN 7317

N.A.B. *[Signature]*
4/27/12



CHAIN OF CUSTODY

2 pages

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D34023R
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information							Analytical Information											
Name Accutest Mountain States (AMS)			Name Accutest - New England							BMAEPH	TOC				Comments						
Address 4036 Youngfield St.			Address 495 Technology Center West, BLDG C																		
City Wheat Ridge,	State CO	Zip 80033	City Marlborough	State MA	Zip 01752																
Send Report to: Andrew Fluegel			Contact: Sample Management																		
Any questions contact: Renea Jackson			Phone: (508) 481-6200																		
Phone/Fax #: (303) 425-6021; (303) 425-6854																					
Field ID / Point of Collection		Collection		Matrix	# of bottles	Preservation						BMAEPH	TOC				Comments				
	Date	Time	HCL			NaOH	HNO3	H2SO4	None												
D34023R -1R	4/26/12	10:50 AM		Soil	1							X									
-4R		11:45 AM		Soil	1							X									
-8R		1:20 PM		Soil	1							X									
-9R		1:30 PM		Soil	1							X									
-10R		2:00 PM		Soil	1							X	X								
-11R		2:10 PM		Soil	1							X									
-12R		2:25 PM		Soil	1							X									
-15R		3:10 PM		Soil	1							X					2E				
-16R		3:20 PM		Soil	1							X									
-18R		4:10 PM		Soil	1							X	X								
Turnaround Information			Data Deliverable Information							Comments / Remarks											
<input checked="" type="checkbox"/> 3 - 5 Business Day Rush <input type="checkbox"/> Other (Days) <u>Monday 5/14</u> Approved By: _____ 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.			<input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____							Please use Colorado regulations and RLs.											
Sample Custody must be documented below each time samples change possession, including courier delivery.										For Subcontract Laboratory Use Only											
Relinquished by: 1 <u>EDX</u>	Date & Time: <u>5-9-12 8:30</u>	Received By: 1 <u>[Signature]</u>	Date & Time: 1	Seal #:	Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	Preserved where applicable: <input type="checkbox"/>		Temperature °C <u>11</u>		On Ice: <input checked="" type="checkbox"/>											
Relinquished by: 2	Date & Time:	Received By: 2	Date & Time: 2																		
Relinquished by: 3	Date & Time:	Received By: 3	Date & Time: 3																		

5.1 5

D34023R: Chain of Custody
Page 1 of 3
Accutest Labs of New England, Inc.



CHAIN OF CUSTODY

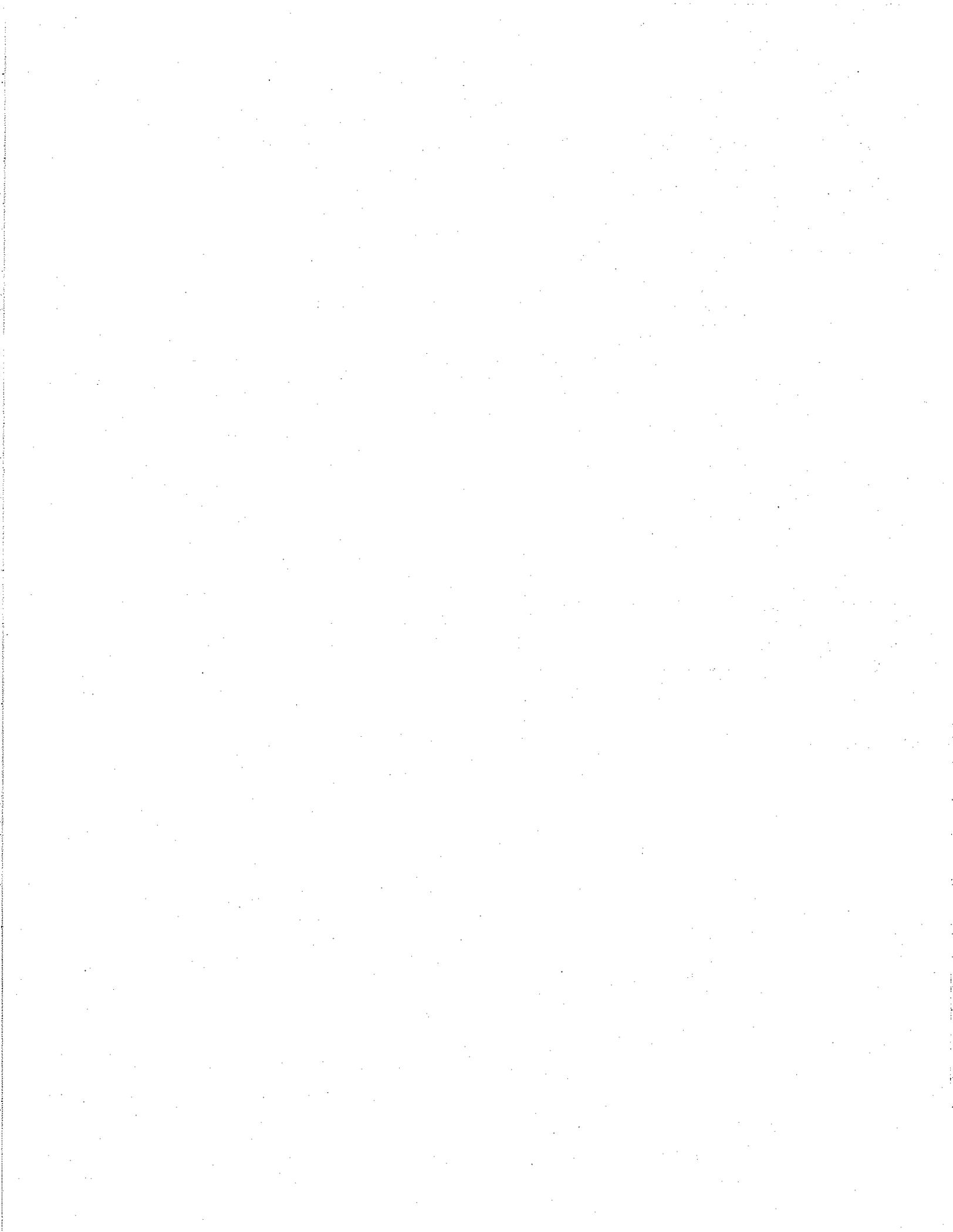
4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D34023R
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information							Analytical Information				Comments
Name			Name							BMAEPH	TOC			
Accutest Mountain States (AMS)			Accutest - New England											
Address			Address											
4036 Youngfield St.			495 Technology Center West, BLDG C											
City	State	Zip	City	State	Zip									
Wheat Ridge,	CO	80033	Marlborough	MA	01752									
Send Report to:			Contact:											
Andrew Fluegel			Sample Management											
Any questions contact:			Phone:											
Renea Jackson			(508) 481-6200											
Phone/Fax #:														
			Collection			Preservation								
Field ID / Point of Collection	Date	Time	Matrix	# of bottles	NPL	NEOH	HNOS	HPSCA	None					
D34023R -20R	4/27/12	9:30 AM	Soil	1						X				
-21R	4/26/12	10:55 AM	Soil	1						X	X			
-23R	4/27/12	11:25 AM	Soil	1						X				
Turnaround Information			Data Deliverable Information							Comments / Remarks				
<input checked="" type="checkbox"/> 3 - 5 Business Day Rush <input type="checkbox"/> Other _____ (Days) <i>Monday 5/14</i>			Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: _____ <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____							Please use Colorado regulations and RLs.				
10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.														
Sample Custody must be documented below each time samples change possession, including courier delivery.										For Subcontract Laboratory Use Only				
Relinquished by:	Date & Time:	Received By:	Date & Time:	Seal #:	Headspace:									
1 <i>FEDX</i>	5-9-12 9:30	<i>[Signature]</i>	1	1	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>									
Relinquished by:	Date & Time:	Received By:	Date & Time:	Preserved where applicable:										
2		2	2	<input type="checkbox"/>										
Relinquished by:	Date & Time:	Received By:	Date & Time:	Temperature °C	On Ice									
3		3	3	6.1	<input checked="" type="checkbox"/>									

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5

D34023R: Chain of Custody
Page 2 of 3





Sample Summary

URS Operating Services, Inc.

Job No: D34022

36549247

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D34022-1	04/26/12	17:00 JKM	04/27/12	AQ	Water	LP-SW-001
D34022-1F	04/26/12	17:00 JKM	04/27/12	AQ	Water Filtered	LP-SW-001
D34022-2	04/26/12	17:10 JKM	04/27/12	AQ	Trip Blank Water	LP-SW-002
D34022-3	04/27/12	10:30 JKM	04/27/12	AQ	Water	LP-SW-003
D34022-3F	04/27/12	10:30 JKM	04/27/12	AQ	Potentially Diss. AQ	LP-SW-003

Report of Analysis

Client Sample ID:	LP-SW-001	Date Sampled:	04/26/12
Lab Sample ID:	D34022-1	Date Received:	04/27/12
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	36549247		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V13349.D	1	04/28/12	BR	n/a	n/a	V6V705
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.27	ug/l	
75-27-4	Bromodichloromethane	ND	2.0	0.38	ug/l	
75-25-2	Bromoform	ND	2.0	0.53	ug/l	
108-90-7	Chlorobenzene	ND	2.0	0.34	ug/l	
75-00-3	Chloroethane	ND	2.0	0.61	ug/l	
67-66-3	Chloroform	ND	2.0	0.38	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	2.0	0.80	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.56	ug/l	
56-23-5	Carbon tetrachloride	ND	2.0	0.27	ug/l	
75-34-3	1,1-Dichloroethane	ND	2.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	2.0	0.46	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.0	0.38	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.38	ug/l	
124-48-1	Dibromochloromethane	ND	2.0	0.53	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.47	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.25	ug/l	
541-73-1	m-Dichlorobenzene	ND	2.0	0.37	ug/l	
95-50-1	o-Dichlorobenzene	ND	2.0	0.32	ug/l	
106-46-7	p-Dichlorobenzene	ND	2.0	0.35	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	0.36	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	3.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.33	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.75	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	10	5.0	ug/l	
74-83-9	Methyl bromide	ND	5.0	2.3	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene chloride	ND	4.0	2.5	ug/l	
78-93-3	Methyl ethyl ketone	ND	10	2.9	ug/l	
100-42-5	Styrene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.34	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: LP-SW-001	Date Sampled: 04/26/12
Lab Sample ID: D34022-1	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Method: SW846 8260B	
Project: 36549247	

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	2.0	0.42	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
79-01-6	Trichloroethylene	ND	2.0	0.41	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.36	ug/l	
108-05-4	Vinyl Acetate	ND	30	15	ug/l	
1330-20-7	Xylene (total)	ND	4.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	100%		67-131%
2037-26-5	Toluene-D8	107%		65-130%
460-00-4	4-Bromofluorobenzene	114%		65-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: LP-SW-001	Date Sampled: 04/26/12
Lab Sample ID: D34022-1	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Project: 36549247	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	105	100	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Antimony	<0.80	0.80	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Arsenic	<1.6	1.6	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Barium	4560	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Beryllium	<0.40	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Cadmium	<0.20	0.20	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Calcium	31500	800	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Chromium	<4.0	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Cobalt	<0.40	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Copper	<4.0	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Iron	1440	80	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Lead	<1.0	1.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Magnesium	10500	200	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Manganese	223	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Mercury	<0.10	0.10	ug/l	1	05/01/12	05/01/12 JB	EPA 245.1 ²	EPA 245.1 ⁶
Nickel	<4.0	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Potassium	12800	400	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Selenium	<0.80	0.80	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁵
Silver	<0.20	0.20	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Sodium	373000	10000	ug/l	20	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Thallium	<0.40	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Vanadium	<2.0	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Zinc	153	20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵

- (1) Instrument QC Batch: MA2378
- (2) Instrument QC Batch: MA2381
- (3) Instrument QC Batch: MA2383
- (4) Instrument QC Batch: MA2388
- (5) Prep QC Batch: MP7377
- (6) Prep QC Batch: MP7381

RL = Reporting Limit

Report of Analysis

3.1
3

Client Sample ID: LP-SW-001	Date Sampled: 04/26/12
Lab Sample ID: D34022-1	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
HEM Oil and Grease	9.2	5.2	mg/l	1	05/01/12	SWT	EPA 1664A
Solids, Total Suspended	15.0	5.0	mg/l	1	05/01/12	JD	SM20 2540D

RL = Reporting Limit

Report of Analysis

3.2
3

Client Sample ID:	LP-SW-001	Date Sampled:	04/26/12
Lab Sample ID:	D34022-1F	Date Received:	04/27/12
Matrix:	AQ - Water Filtered	Percent Solids:	n/a
Project:	36549247		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	< 100	100	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Antimony	< 0.80	0.80	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Arsenic	< 1.6	1.6	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Barium	4350	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Beryllium	< 0.40	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Cadmium	< 0.20	0.20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Calcium	31700	800	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Chromium	< 4.0	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Cobalt	< 0.40	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Copper	< 4.0	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Iron	171	80	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Lead	< 1.0	1.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁶
Magnesium	10300	200	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Manganese	222	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Mercury	< 0.10	0.10	ug/l	1	05/01/12	05/01/12 JB	EPA 245.1 ²	EPA 245.1 ⁷
Nickel	< 4.0	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Potassium	12600	400	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Selenium	< 0.80	0.80	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Silver	< 0.20	0.20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Sodium	372000	10000	ug/l	20	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Thallium	< 0.40	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁶
Vanadium	< 2.0	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Zinc	59.3	20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶

- (1) Instrument QC Batch: MA2378
- (2) Instrument QC Batch: MA2381
- (3) Instrument QC Batch: MA2383
- (4) Instrument QC Batch: MA2386
- (5) Instrument QC Batch: MA2388
- (6) Prep QC Batch: MP7377
- (7) Prep QC Batch: MP7381

RL = Reporting Limit

Report of Analysis

Client Sample ID: LP-SW-002	Date Sampled: 04/26/12
Lab Sample ID: D34022-2	Date Received: 04/27/12
Matrix: AQ - Trip Blank Water	Percent Solids: n/a
Method: SW846 8260B	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V13350.D	1	04/28/12	BR	n/a	n/a	V6V705
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.27	ug/l	
75-27-4	Bromodichloromethane	ND	2.0	0.38	ug/l	
75-25-2	Bromoform	ND	2.0	0.53	ug/l	
108-90-7	Chlorobenzene	ND	2.0	0.34	ug/l	
75-00-3	Chloroethane	ND	2.0	0.61	ug/l	
67-66-3	Chloroform	ND	2.0	0.38	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	2.0	0.80	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.56	ug/l	
56-23-5	Carbon tetrachloride	ND	2.0	0.27	ug/l	
75-34-3	1,1-Dichloroethane	ND	2.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	2.0	0.46	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.0	0.38	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.38	ug/l	
124-48-1	Dibromochloromethane	ND	2.0	0.53	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.47	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.25	ug/l	
541-73-1	m-Dichlorobenzene	ND	2.0	0.37	ug/l	
95-50-1	o-Dichlorobenzene	ND	2.0	0.32	ug/l	
106-46-7	p-Dichlorobenzene	ND	2.0	0.35	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	0.36	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	3.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.33	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.75	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	10	5.0	ug/l	
74-83-9	Methyl bromide	ND	5.0	2.3	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene chloride	ND	4.0	2.5	ug/l	
78-93-3	Methyl ethyl ketone	ND	10	2.9	ug/l	
100-42-5	Styrene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.34	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis



Client Sample ID: LP-SW-002	Date Sampled: 04/26/12
Lab Sample ID: D34022-2	Date Received: 04/27/12
Matrix: AQ - Trip Blank Water	Percent Solids: n/a
Method: SW846 8260B	
Project: 36549247	

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	2.0	0.42	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
79-01-6	Trichloroethylene	ND	2.0	0.41	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.36	ug/l	
108-05-4	Vinyl Acetate	ND	30	15	ug/l	
1330-20-7	Xylene (total)	ND	4.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	98%		67-131%
2037-26-5	Toluene-D8	110%		65-130%
460-00-4	4-Bromofluorobenzene	115%		65-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: LP-SW-003	Date Sampled: 04/27/12
Lab Sample ID: D34022-3	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Method: SW846 8260B	
Project: 36549247	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V13351.D	1	04/28/12	BR	n/a	n/a	V6V705
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	5.0	ug/l	
71-43-2	Benzene	ND	1.0	0.27	ug/l	
75-27-4	Bromodichloromethane	ND	2.0	0.38	ug/l	
75-25-2	Bromoform	ND	2.0	0.53	ug/l	
108-90-7	Chlorobenzene	ND	2.0	0.34	ug/l	
75-00-3	Chloroethane	ND	2.0	0.61	ug/l	
67-66-3	Chloroform	ND	2.0	0.38	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	2.0	0.80	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.56	ug/l	
56-23-5	Carbon tetrachloride	ND	2.0	0.27	ug/l	
75-34-3	1,1-Dichloroethane	ND	2.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	2.0	0.46	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.0	0.38	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.38	ug/l	
124-48-1	Dibromochloromethane	ND	2.0	0.53	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.47	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.25	ug/l	
541-73-1	m-Dichlorobenzene	ND	2.0	0.37	ug/l	
95-50-1	o-Dichlorobenzene	ND	2.0	0.32	ug/l	
106-46-7	p-Dichlorobenzene	ND	2.0	0.35	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	0.36	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	3.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.33	ug/l	
591-78-6	2-Hexanone	ND	2.0	0.75	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	10	5.0	ug/l	
74-83-9	Methyl bromide	ND	5.0	2.3	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene chloride	ND	4.0	2.5	ug/l	
78-93-3	Methyl ethyl ketone	ND	10	2.9	ug/l	
100-42-5	Styrene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.34	ug/l	

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.4
3

Client Sample ID: LP-SW-003
 Lab Sample ID: D34022-3
 Matrix: AQ - Water
 Method: SW846 8260B
 Project: 36549247

Date Sampled: 04/27/12
 Date Received: 04/27/12
 Percent Solids: n/a

VOA HSL List

CAS No.	Compound	Result	RL	MDL	Units	Q
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	2.0	0.42	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
79-01-6	Trichloroethylene	ND	2.0	0.41	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.36	ug/l	
108-05-4	Vinyl Acetate	ND	30	15	ug/l	
1330-20-7	Xylene (total)	ND	4.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	101%		67-131%
2037-26-5	Toluene-D8	109%		65-130%
460-00-4	4-Bromofluorobenzene	116%		65-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: LP-SW-003	Date Sampled: 04/27/12
Lab Sample ID: D34022-3	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Project: 36549247	

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	6410	100	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Antimony	<0.80	0.80	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Arsenic	8.6	1.6	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Barium	673	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Beryllium	0.85	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Cadmium	1.6	0.20	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Calcium	61100	800	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Chromium	7.6	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Cobalt	6.8	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Copper	15.4	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Iron	16300	80	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Lead	10.4	1.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Magnesium	23800	200	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Manganese	1200	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Mercury	<0.10	0.10	ug/l	1	05/01/12	05/01/12 JB	EPA 245.1 ²	EPA 245.1 ⁶
Nickel	16.2	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Potassium	5270	400	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Selenium	<0.80	0.80	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁵
Silver	<0.20	0.20	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Sodium	31200	1000	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵
Thallium	<0.40	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Vanadium	21.1	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁵
Zinc	145	20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁵

- (1) Instrument QC Batch: MA2378
- (2) Instrument QC Batch: MA2381
- (3) Instrument QC Batch: MA2383
- (4) Instrument QC Batch: MA2388
- (5) Prep QC Batch: MP7377
- (6) Prep QC Batch: MP7381

RL = Reporting Limit

Report of Analysis

3.4
3

Client Sample ID: LP-SW-003	Date Sampled: 04/27/12
Lab Sample ID: D34022-3	Date Received: 04/27/12
Matrix: AQ - Water	Percent Solids: n/a
Project: 36549247	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
HEM Oil and Grease	7.3	5.6	mg/l	1	05/01/12	SWT	EPA 1664A

RL = Reporting Limit

Report of Analysis

Client Sample ID: LP-SW-003	Date Sampled: 04/27/12
Lab Sample ID: D34022-3F	Date Received: 04/27/12
Matrix: AQ - Potentially Diss. AQ	Percent Solids: n/a
Project: 36549247	

Potentially Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	1230	100	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Antimony	<0.80	0.80	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Arsenic	7.3	1.6	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Barium	663	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Beryllium	0.89	0.40	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Cadmium	2.6	0.20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Calcium	74200	800	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Chromium	<4.0	4.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Cobalt	7.0	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Copper	9.2	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Iron	13100	80	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Lead	8.7	1.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁶
Magnesium	21100	200	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Manganese	1740	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Mercury	<0.10	0.10	ug/l	1	05/01/12	05/01/12 JB	EPA 245.1 ²	EPA 245.1 ⁷
Nickel	12.5	4.0	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Potassium	4200	400	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Selenium	<0.80	0.80	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Silver	<0.20	0.20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶
Sodium	27500	1000	ug/l	2	04/30/12	05/03/12 GJ	EPA 200.8 ⁵	EPA 200.8 ⁶
Thallium	<0.40	0.40	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ⁴	EPA 200.8 ⁶
Vanadium	17.5	2.0	ug/l	2	04/30/12	05/01/12 GJ	EPA 200.8 ¹	EPA 200.8 ⁶
Zinc	139	20	ug/l	2	04/30/12	05/02/12 GJ	EPA 200.8 ³	EPA 200.8 ⁶

- (1) Instrument QC Batch: MA2378
- (2) Instrument QC Batch: MA2381
- (3) Instrument QC Batch: MA2383
- (4) Instrument QC Batch: MA2386
- (5) Instrument QC Batch: MA2388
- (6) Prep QC Batch: MP7377
- (7) Prep QC Batch: MP7381

RL = Reporting Limit

