

State of Colorado
Oil and Gas Conservation Commission



1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

#7976

FOR OGCC USE ONLY

RECEIVED
8/29/2013

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☒ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☐ Other (describe): _____

OGCC Employee:

☐ Spill ☐ Complaint

☐ Inspection ☐ NOAV

Tracking No: 2229551

OGCC Operator Number: 95620

Name of Operator: Western Operating Company

Address: 518 17th Street, Suite 200

City: Denver State: CO Zip: 80202

Contact Name and Telephone:

Steven James

No: (303) 893-2438

Fax: _____

API Number: 05-075-06203

County: Logan

Facility Name: Arthur Edens #1 Tank Battery

Facility Number: 219347

Well Name: Arthur Edens

Well Number: 1

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SENW Sec 2 T8N R54W 6th PM Latitude: 40.695557 Longitude: -103.38497

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Crude Oil

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Dry land farming

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Rago Loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Industrial water well (Receipt #9043663) 1,190 feet northwest

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

☒ Soils☐ Vegetation☐ Groundwater☐ Surface Water

Extent of Impact:

Surface (see attached documents)

How Determined:

Visual, laboratory analysis

REMEDIAL WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Following the release (Spill Tracking #2229551) Western Operating Company continues to conduct on site remediation.

Describe how source is to be removed:

See attached letter for detail of ongoing remediation.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Any hydrocarbon material exceeding COGCC Table 910-1 Concentration Levels will be removed and disposed of at a licensed disposal facility.



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

OGCC Employee: Axelsson

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Not Applicable

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The tank battery surface will be returned to previous grade as all scraping occurred within secondary containment.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

Sample locations SS-02 and SS-03 require further scraping as laboratory analytical results indicate an exceedance of the Colorado Oil & Gas Conservation Commission (COGCC) Concentration Level for total petroleum hydrocarbons (TPH)-diesel range organics (DRO) at 840 milligrams per kilogram (mg/kg) and 1,300 mg/kg, respectively.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Any hydrocarbon material exceeding the COGCC Table 910-1 Concentration Levels will be removed and disposed of at a licensed disposal facility.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>10/10/12</u>	Date Site Investigation Completed: <u>TBD</u>	Date Remediation Plan Submitted: <u>8/29/2013</u>
Remediation Start Date: <u>10/10/12</u>	Anticipated Completion Date: <u>TBD</u>	Actual Completion Date: <u>TBD</u>

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Steven D. James

Signed: _____

Title: President

Date: 8/29/2013

OGCC Approved: ACE for John Axelsson Title: Supervisor EasternCO Date: 9/16/2013



August 27, 2013

Mr. John Axelson
Northeast Region Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

**RE: Remediation Workplan Update
Western Operating Company
Arthur Edens #1 Tank Battery
Facility #312193
Spill Tracking #2229551
SENW Sec. 2 T8N R54W, 6th Principal Meridian
Logan County, Colorado**

Dear Mr. Axelson:

LT Environmental, Inc. (LTE), at the request of Western Operating Company (WOC), is submitting this Remediation Workplan Update, for the Arthur Edens #1 Tank Battery (Site) located in Logan County, Colorado (Figure 1). The purpose of the workplan is to update the Colorado Oil and Gas Conservation Commission (COGCC) on remediation activities following a release (Spill Tracking #2229551) and satisfy the requirements set forth in a recent inspection summary (Document #667500056).

Background

On July 4, 2012, WOC discovered a release (Spill Tracking #2229551) at the Site. It was determined that 5 barrels (bbls) of oil and 200 bbls of produced water breached secondary containment as a result of the failure of a pump relay switch following a lightning storm.

On July 11, 2012, the COGCC conducted an on-site field inspection (Document #667500033) at the Site. During the field inspection the COGCC observed that oily soil remained within tank battery secondary containment, within the shed housing the triplex pump, and within a low area southwest of the Arthur Edens #1 well head.

On October 10, 2012, LTE personnel were on site to conduct a site investigation following on-site remediation activity. Soil samples SS-01 through SS-09 (Figure 2) were collected along the spill path and where oily soil was observed. Soil samples were submitted to Summit Scientific, Inc. (Summit) of Golden, Colorado, for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons (TPH)-gasoline range organics (GRO) by United States Environmental Protection Agency (EPA) Method 8260B and TPH-diesel range organics (DRO) by EPA Modified Method 8015.



Laboratory analytical results from the site investigation indicated soil samples SS-02, SS-03, and SS-04 exceeded the COGCC Table 910-1 Concentration Level for TPH at 16,045 milligrams per kilogram (mg/kg), 2,000 mg/kg, and 871.4 mg/kg, respectively (Table 1). All other sample locations were in compliance with the COGCC Table 910-1 Concentration Levels. The laboratory analytical reports are attached.

On October 30, 2012, the COGCC conducted an on-site field inspection (Document #667500056) at the Site. The inspection summary required multiple action items be completed to obtain satisfactory conditions at the Site. As a result, LTE is assisting with the following required tasks at the Site:

- Provide confirmation soil sampling and results regarding Spill Tracking #2229551;
- Provide soil disposal documentation;
- Proper labeling of all tanks with contents, capacity, and NFPA diamonds; and
- Removal of buried culvert pipe and confirmation soil sampling.

On October 31, 2012, LTE personnel returned to the Site to assist WOC contractors in excavation activities regarding oily soil at the tank battery and to collect soil samples following the removal of additional non-compliant soil. Soil samples were submitted to Summit for analysis of previous exceedances (TPH-DRO). Additional soil staining was discovered beneath a leaky pipe fitting within tank battery secondary containment. Soil sample SS-10 was collected following the removal of surficial staining and submitted to Summit for analysis of BTEX, TPH-GRO, and TPH-DRO.

Laboratory analytical results indicate soil samples SS-02 and SS-03 continue to exceed the COGCC Table 910-1 Concentration Level for TPH-DRO at 840 mg/kg and 1,300 mg/kg, respectively. Soil samples SS-04 and SS-10 were in compliance with the COGCC Table 910-1 Concentration Levels.

LTE is scheduling to return to the Site to delineate impact in the area of soil samples SS-02 and SS-03. WOC contractors will remove the COGCC non-compliant soil at which time LTE will conduct confirmation soil sampling. Confirmation soil samples will be submitted to Summit for analysis of previous exceedances (TPH-DRO). Following remediation activities, soil analytical data will be summarized and submitted to the COGCC. During the abovementioned excavation activities, WOC will also remove the non-operational culvert at the Site. The culvert, which was mentioned in the recent inspection document (Document #667500033), was not operated by WOC and will be removed and closed properly. After confirmation samples are collected, a closure request will be submitted via a Form 27.



Should you have any questions, please contact Steve James with WOC at (303) 893-2438.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read "Michael Wicker".

Michael Wicker
Staff Geologist

A handwritten signature in black ink, appearing to read "Brian Dodek".

Brian Dodek, P.G.
Client Manager/Senior Geologist

Attachments:

Figure 1 – Site Location Map

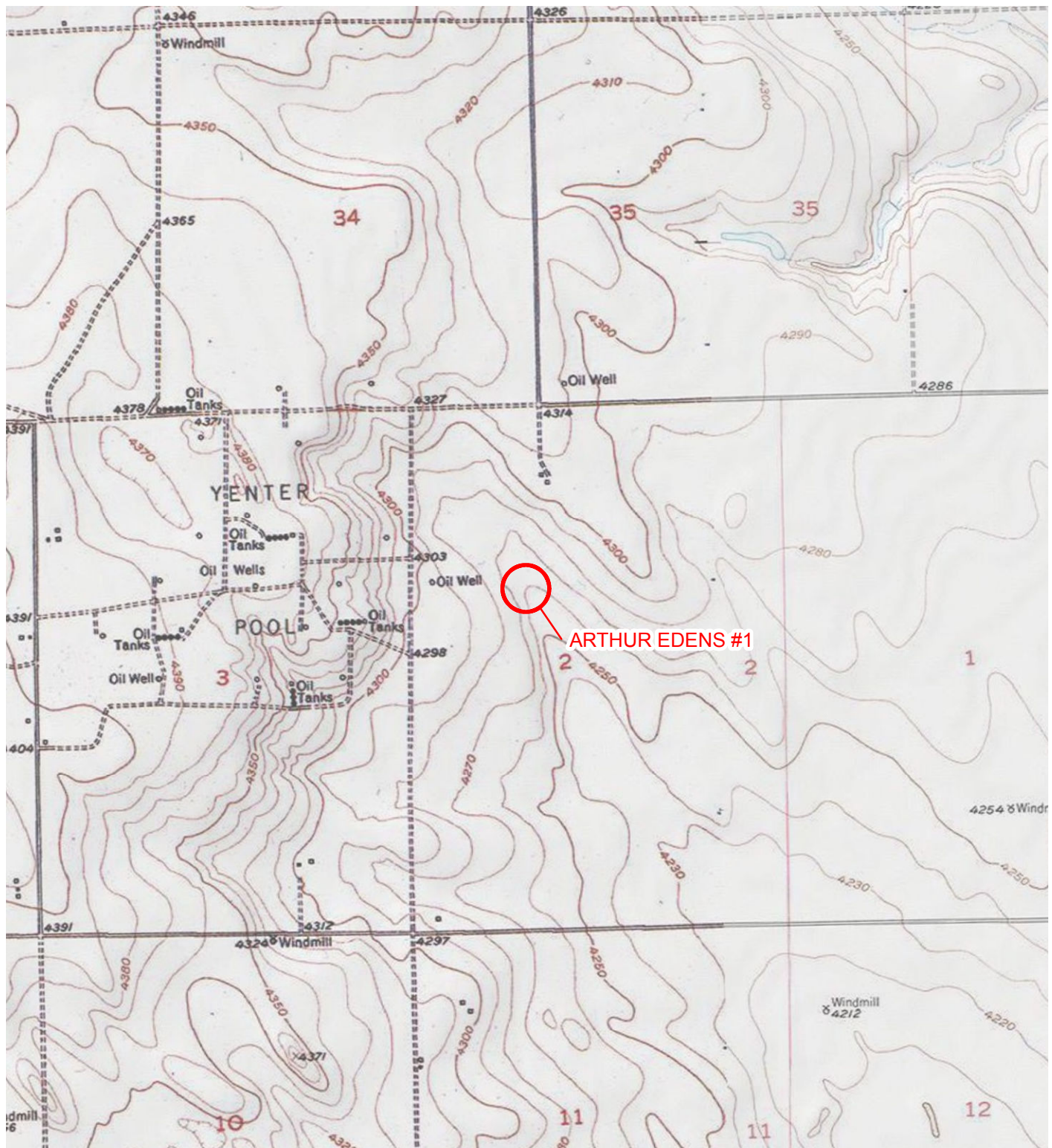
Figure 2 – Site Map

Table 1 – Soil Analytical Results

Attachment – Laboratory Analytical Results

FIGURES





LEGEND

 SITE LOCATION

IMAGE COURTESY OF ESRI/USGS

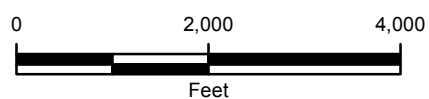


FIGURE 1
SITE LOCATION MAP
ARTHUR EDENS #1
SENW SEC 2-T8N-R54W
LOGAN COUNTY, COLORADO
WESTERN OPERATING COMPANY





IMAGE COURTESY OF ESRI/BING MAPS

LEGEND

- SOIL SAMPLE
- WELL HEAD

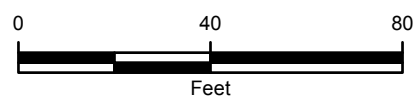


FIGURE 2
SITE MAP
ARTHUR EDENS #1
SENW SEC 2-T8N-R54W
LOGAN COUNTY, COLORADO
WESTERN OPERATING COMPANY



TABLE



TABLE 1
SOIL ANALYTICAL RESULTS
ARTHUR EDENS #1
LOGAN COUNTY, COLORADO
WESTERN OPERATING COMPANY

PARAMETER	COGCC Table 910-1 Concentration Level	UNITS	Sample ID: SS-01	Sample ID: SS-02	Sample ID: SS-02	Sample ID: SS-03	Sample ID: SS-03	Sample ID: SS-04	Sample ID: SS-04
Sample Date			10/10/2012	10/10/2012	10/31/2012	10/10/2012	10/31/2012	10/10/2012	10/31/2012
Benzene	0.17	mg/kg	<0.0050	<0.0050	--	<0.0045	--	<0.0050	--
Toluene	85	mg/kg	<0.0050	<0.0050	--	<0.0045	--	<0.0050	--
Ethylbenzene	100	mg/kg	<0.0050	<0.0050	--	<0.0045	--	<0.0050	--
Total Xylenes	175	mg/kg	<0.0050	0.0065	--	<0.0045	--	<0.0050	--
TPH-GRO		mg/kg	<0.50	45	--	<0.45	--	1.4	--
TPH-DRO		mg/kg	140	16,000	840	2,000	1,300	870	<50
Total TPH	500	mg/kg	140	16,045	840	2,000	1,300	871.4	<50

NOTES:

< - less than the stated laboratory reporting limit

-- - not analyzed

mg/kg - milligrams per kilogram

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

Total TPH - sum of TPH-DRO and TPH-GRO

BOLD - indicates result exceeds the applicable Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 Concentration Level



TABLE 1
SOIL ANALYTICAL RESULTS
ARTHUR EDENS #1
LOGAN COUNTY, COLORADO
WESTERN OPERATING COMPANY

PARAMETER	COGCC Table 910-1 Concentration Level	UNITS	Sample ID: SS-05	Sample ID: SS-06	Sample ID: SS-07	Sample ID: SS-08	Sample ID: SS-09	Sample ID: SS-10
Sample Date			10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/31/2012
Benzene	0.17	mg/kg	<0.0050	<0.0050	<0.0050	<0.0045	<0.0050	<0.0050
Toluene	85	mg/kg	<0.0050	<0.0050	<0.0050	<0.0045	<0.0050	<0.0050
Ethylbenzene	100	mg/kg	<0.0050	<0.0050	<0.0050	<0.0045	<0.0050	0.014
Total Xylenes	175	mg/kg	<0.0050	<0.0050	<0.0050	<0.0045	<0.0050	0.18
TPH-GRO		mg/kg	<0.50	<0.50	<0.50	<0.45	<0.50	11
TPH-DRO		mg/kg	53	<50	110	340	<50	240
Total TPH	500	mg/kg	53	<50.50	110	340	<50.50	251

NOTES:

< - less than the stated laboratory reporting limit

-- - not analyzed

mg/kg - milligrams per kilogram

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

Total TPH - sum of TPH-DRO and TPH-GRO

BOLD - indicates result exceeds the applicable Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 Concentration Level



ATTACHMENT
LABORATORY ANALYTICAL REPORTS



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 15, 2012

Brian Dodek
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: PDC - Edens #1

Enclosed are the results of analyses for samples received by Summit Scientific on 10/10/12 17:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph J. Egry IV". The signature is fluid and cursive, with a small "IV" at the end.

Joseph J Egry IV For Ben Shrewsbury
President / Laboratory Manager



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1

Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-01	R210094-01	Soil	10/10/12 10:40	10/10/12 17:10
SS-02	R210094-02	Soil	10/10/12 10:45	10/10/12 17:10
SS-03	R210094-03	Soil	10/10/12 10:50	10/10/12 17:10
SS-04	R210094-04	Soil	10/10/12 10:55	10/10/12 17:10
SS-05	R210094-05	Soil	10/10/12 11:00	10/10/12 17:10
SS-06	R210094-06	Soil	10/10/12 11:05	10/10/12 17:10
SS-07	R210094-07	Soil	10/10/12 11:10	10/10/12 17:10
SS-08	R210094-08	Soil	10/10/12 11:15	10/10/12 17:10
SS-09	R210094-09	Soil	10/10/12 11:20	10/10/12 17:10

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1

Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Summit Scientific
R2100941

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9510 • 303-277-9531 Fax

Client: LT Environmental, Inc.
Address: 4600 West 60th Avenue
City/State/Zip: Arvada, CO 80003
Phone: (303) 433-9788
Sample Name: M. W. 1/1/11
Project Manager: Brian Dodek
E-Mail: bodek@ltenv.com
Project Name: ~~Edens #1~~
Project Number:

Page 1 of 2

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:				Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	DRO	GBTEX	BTEX	pH / EC		SAR
SS-01	10/10/12	1040	1			X				X							
SS-02		1045	1			X				X							
SS-03		1050	1			X				X							
SS-04		1055	1			X				X							
SS-05		1100	1			X				X							
SS-06		1105	1			X				X							
SS-07		1110	1			X				X							
SS-08		1115	1			X				X							
SS-09		1120	1			X				X							
SS-10		1125	1			X				X							
Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)				Notes:									
10/11/12	10/10/12 1700	10/10/12	1710	Same Day				72 Hours									
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 Hours				Standard									
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	48 Hours				Sample Integrity:									
								Temperature Upon Receipt:									
								Intact: Yes No									

www.SScientific.com

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1

Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Summit Scientific
R2100942

S₂
741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-277-9531 Fax

Page 2 of 2

Client: L.T. Environmental, Inc.
 Project Manager: Brian Dodd
 Address: 4600 West 60th Avenue
 City/State/Zip: Arvada, CO 80003
 E-Mail: bddodd@ltem.com
 Phone: (303) 433-9788
 Fax: (303) 433-1432
 Project Name: Edens #1
 Sample Name: H1000v

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative					Matrix					Analyze For:					Special Instructions
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Alr - Canister Serial #	Other (Specify)	DRO	GBTEX	BTEX	PH / EC	SAR	Table 910.1 metals		
SS-11	10.10.12	1130	1		X				X					X	X				Hold
Relinquished by: <i>[Signature]</i>	Date Time: 10.10.12/1700	Received by: <i>[Signature]</i> Date Time: 10.10.12.17.55										Turn Around Time (Check) <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours					Notes:		
Relinquished by: <i>[Signature]</i>	Date Time:	Received by: <i>[Signature]</i> Date Time:										Sample Integrity: Temperature Upon Receipt: <i>16</i> Intact: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>							
Relinquished by: <i>[Signature]</i>	Date Time:	Received in Lab by: <i>[Signature]</i> Date Time:																	

www.s2scientific.com

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Regel IV



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1

Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-01
R210094-01 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 10/10/12 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	140	50	mg/kg	1	2101108	10/11/12	10/12/12	8015 DRO	

Date Sampled: 10/10/12 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		81.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/10/12 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/10/12 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.1 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		92.0 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.2 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-02
R210094-02 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	16000	50	mg/kg	1	2101108	10/11/12	10/12/12	8015 DRO	

Date Sampled: **10/10/12 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		902 %	30-150		"	"	"	"	S-02

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.0065	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	45	0.50	"	"	"	"	"	"	

Date Sampled: **10/10/12 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		81.7 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.1 %	30-150		"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-03
R210094-03 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	2000	50	mg/kg	1	2101108	10/11/12	10/12/12	8015 DRO	

Date Sampled: **10/10/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		94.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0045	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0045	"	"	"	"	"	"	
Ethylbenzene	ND	0.0045	"	"	"	"	"	"	
Xylenes (total)	ND	0.0045	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.45	"	"	"	"	"	"	

Date Sampled: **10/10/12 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		94.8 %	30-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		95.3 %	30-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		92.9 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-04
R210094-04 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	870	50	mg/kg	1	2101108	10/11/12	10/12/12	8015 DRO	

Date Sampled: **10/10/12 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		81.3 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	1.4	0.50	"	"	"	"	"	"	

Date Sampled: **10/10/12 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.2 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		93.1 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.1 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-05
R210094-05 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	53	45	mg/kg	1	2101108	10/11/12	10/13/12	8015 DRO	

Date Sampled: **10/10/12 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/10/12 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.1 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		95.5 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.8 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-06
R210094-06 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101108	10/11/12	10/13/12	8015 DRO	

Date Sampled: **10/10/12 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		95.3 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/10/12 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		90.6 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		95.0 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.0 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-07
R210094-07 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	110	50	mg/kg	1	2101108	10/11/12	10/13/12	8015 DRO	

Date Sampled: **10/10/12 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		106 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/10/12 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.7 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		95.8 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.1 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-08
R210094-08 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: **10/10/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	340	50	mg/kg	1	2101108	10/11/12	10/13/12	8015 DRO	

Date Sampled: **10/10/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		97.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/10/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0045	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0045	"	"	"	"	"	"	
Ethylbenzene	ND	0.0045	"	"	"	"	"	"	
Xylenes (total)	ND	0.0045	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.45	"	"	"	"	"	"	

Date Sampled: **10/10/12 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.8 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.5 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.2 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

SS-09
R210094-09 (Soil)

Summit Scientific

Total Petroleum Hydrocarbons by 8015

Date Sampled: 10/10/12 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101108	10/11/12	10/13/12	8015 DRO	

Date Sampled: 10/10/12 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.0 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/10/12 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2101107	10/11/12	10/12/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/10/12 11:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.4 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.3 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Total Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2101108 - EPA 3550A

Blank (2101108-BLK1)

Prepared & Analyzed: 10/11/12

C10-C28 (DRO) ND 50 mg/kg

LCS (2101108-BS1)

Prepared & Analyzed: 10/11/12

C10-C28 (DRO) 499 50 mg/kg 501 99.6 73-134

LCS Dup (2101108-BSD1)

Prepared: 10/11/12 Analyzed: 10/12/12

C10-C28 (DRO) 530 50 mg/kg 501 106 73-134 5.92 11

Matrix Spike (2101108-MS1)

Source: R210104-01

Prepared: 10/11/12 Analyzed: 10/12/12

C10-C28 (DRO) 501 50 mg/kg 499 43.5 91.6 50-148

Matrix Spike Dup (2101108-MSD1)

Source: R210104-01

Prepared: 10/11/12 Analyzed: 10/12/12

C10-C28 (DRO) 513 50 mg/kg 501 43.5 93.6 50-148 2.38 13

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2101107 - EPA 5030 Soil MS

Blank (2101107-BLK1)

Prepared: 10/11/12 Analyzed: 10/12/12

Benzene	ND	0.0050	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0352		"	0.0397		88.7	30-150			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0382		"	0.0400		95.4	30-150			

LCS (2101107-BS1)

Prepared: 10/11/12 Analyzed: 10/12/12

Benzene	0.104	0.0050	mg/kg	0.100		104	58-130			
Toluene	0.111	0.0050	"	0.100		111	61-134			
Ethylbenzene	0.116	0.0050	"	0.100		116	74-139			
m,p-Xylene	0.239	0.010	"	0.200		119	73-137			
o-Xylene	0.118	0.0050	"	0.100		118	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0333		"	0.0397		84.0	30-150			
Surrogate: Toluene-d8	0.0389		"	0.0400		97.3	30-150			
Surrogate: 4-Bromofluorobenzene	0.0366		"	0.0400		91.5	30-150			

LCS Dup (2101107-BSD1)

Prepared: 10/11/12 Analyzed: 10/12/12

Benzene	0.103	0.0050	mg/kg	0.100		103	58-130	1.45	13	
Toluene	0.110	0.0050	"	0.100		110	61-134	1.03	16	
Ethylbenzene	0.115	0.0050	"	0.100		115	74-139	0.963	12	
m,p-Xylene	0.237	0.010	"	0.200		118	73-137	0.946	14	
o-Xylene	0.117	0.0050	"	0.100		117	73-141	0.662	12	
Surrogate: 1,2-Dichloroethane-d4	0.0344		"	0.0397		86.7	30-150			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0385		"	0.0400		96.3	30-150			

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1
Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2101107 - EPA 5030 Soil MS

Matrix Spike (2101107-MS1)		Source: R210104-01			Prepared: 10/11/12		Analyzed: 10/12/12		QM-07	
Benzene	ND	0.0050	mg/kg	0.0996	ND		30-131			
Toluene	ND	0.0050	"	0.0996	ND		30-134			
Ethylbenzene	0.0420	0.0050	"	0.0996	ND	42.2	22-153			
m,p-Xylene	0.130	0.010	"	0.199	ND	65.5	10-159			
o-Xylene	0.0486	0.0050	"	0.0996	ND	48.8	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0372		"	0.0395		94.2	30-150			
Surrogate: Toluene-d8	0.0317		"	0.0398		79.5	30-150			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0398		102	30-150			

Matrix Spike Dup (2101107-MSD1)		Source: R210104-01			Prepared: 10/11/12		Analyzed: 10/12/12		QM-07	
Benzene	ND	0.0050	mg/kg	0.0986	ND		30-131		34	
Toluene	ND	0.0050	"	0.0986	ND		30-134		30	
Ethylbenzene	0.0475	0.0050	"	0.0986	ND	48.1	22-153	12.3	24	
m,p-Xylene	0.136	0.010	"	0.197	ND	69.1	10-159	4.29	68	
o-Xylene	0.0492	0.0050	"	0.0986	ND	49.9	31-151	1.32	38	
Surrogate: 1,2-Dichloroethane-d4	0.0375		"	0.0392		95.8	30-150			
Surrogate: Toluene-d8	0.0318		"	0.0394		80.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0397		"	0.0394		101	30-150			

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: PDC - Edens #1

Project Number: 0188-
Project Manager: Brian Dodek

Reported:
10/15/12 14:06

Notes and Definitions

S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 02, 2012

Brian Dodek
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: WOC - Arthur Edens #1

Enclosed are the results of analyses for samples received by Summit Scientific on 11/01/12 09:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph J. Egry IV". The signature is stylized with a large, sweeping "J" and "E".

Joseph J Egry IV
Laboratory Director



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003
Project Manager: Brian Dodek

Reported:
11/02/12 16:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS02	R211005-01	Soil	10/31/12 15:00	11/01/12 09:40
SS10	R211005-02	Soil	10/31/12 15:10	11/01/12 09:40
SS03	R211005-03	Soil	10/31/12 15:30	11/01/12 09:40
SS04	R211005-04	Soil	10/31/12 10:05	11/01/12 09:40

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003

Project Manager: Brian Dodek

Reported:

11/02/12 16:12

Summit Scientific

5

741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 1

Client: LIE

Address: 4400 W. 60th Ave
Project Manager: B. Dodek

City/State/Zip: Arvuda, CO 80003

Phone: (303) 433-9788 Fax:

Sampler Name: M. Wilkov

Journal of Management Inquiry 21(1)

[illegible]

www.s2scientific.com

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Carol Myers IV



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003
Project Manager: Brian Dodek

Reported:
11/02/12 16:12

SS02
R211005-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/31/12 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	840	50	mg/kg	1	2110110	11/01/12	11/02/12	8015 Full Carbon Chain	

Date Sampled: **10/31/12 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		<i>104 %</i>	<i>30-150</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003
Project Manager: Brian Dodek

Reported:
11/02/12 16:12

SS10
R211005-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/31/12 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	240	50	mg/kg	1	2110110	11/01/12	11/02/12	8015 Full Carbon Chain	

Date Sampled: **10/31/12 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/12 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	2110109	11/01/12	11/02/12	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.014	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.18	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	11	0.50	"	"	"	"	"	"	

Date Sampled: **10/31/12 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		121 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		124 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003
Project Manager: Brian Dodek

Reported:
11/02/12 16:12

SS03
R211005-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/31/12 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	1300	50	mg/kg	1	2110110	11/01/12	11/02/12	8015 Full Carbon Chain	

Date Sampled: **10/31/12 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		95.3 %	30-150		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: WOC - Arthur Edens #1

Project Number: 0284-12003
Project Manager: Brian Dodek

Reported:
11/02/12 16:12

SS04
R211005-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/31/12 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2110110	11/01/12	11/02/12	8015 Full Carbon Chain	

Date Sampled: **10/31/12 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.3 %	30-150		"	"	"	"	

Summit Scientific

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Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2110110 - EPA 3550A

Blank (2110110-BLK1)

Prepared & Analyzed: 11/01/12

C10-C28 (DRO) ND 50 mg/kg

LCS (2110110-BS1)

Prepared & Analyzed: 11/01/12

C10-C28 (DRO) 554 50 mg/kg 501 111 73-134

LCS Dup (2110110-BSD1)

Prepared & Analyzed: 11/01/12

C10-C28 (DRO) 535 50 mg/kg 501 107 73-134 3.52 11

Matrix Spike (2110110-MS1)

Source: R211001-01

Prepared & Analyzed: 11/01/12

C10-C28 (DRO) 543 50 mg/kg 493 ND 110 50-148

Matrix Spike Dup (2110110-MSD1)

Source: R211001-01

Prepared & Analyzed: 11/01/12

C10-C28 (DRO) 520 50 mg/kg 481 ND 108 50-148 4.33 13

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2110109 - EPA 5030 Soil MS

Blank (2110109-BLK1)

Prepared & Analyzed: 11/01/12

Benzene	ND	0.0050	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0391		"	0.0397	98.4	30-150				
Surrogate: Toluene-d8	0.0392		"	0.0400	97.9	30-150				
Surrogate: 4-Bromofluorobenzene	0.0375		"	0.0400	93.7	30-150				

LCS (2110109-BS1)

Prepared & Analyzed: 11/01/12

Benzene	0.0678	0.0050	mg/kg	0.100	67.8	58-130				
Toluene	0.0731	0.0050	"	0.100	73.1	61-134				
Ethylbenzene	0.101	0.0050	"	0.100	101	74-139				
m,p-Xylene	0.184	0.010	"	0.200	91.8	73-137				
o-Xylene	0.102	0.0050	"	0.100	102	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0385		"	0.0397	97.0	30-150				
Surrogate: Toluene-d8	0.0396		"	0.0400	99.1	30-150				
Surrogate: 4-Bromofluorobenzene	0.0379		"	0.0400	94.8	30-150				

LCS Dup (2110109-BSD1)

Prepared & Analyzed: 11/01/12

Benzene	0.0713	0.0050	mg/kg	0.100	71.3	58-130	5.00	13		
Toluene	0.0785	0.0050	"	0.100	78.5	61-134	7.08	16		
Ethylbenzene	0.106	0.0050	"	0.100	106	74-139	4.40	12		
m,p-Xylene	0.190	0.010	"	0.200	94.9	73-137	3.39	14		
o-Xylene	0.107	0.0050	"	0.100	107	73-141	5.31	12		
Surrogate: 1,2-Dichloroethane-d4	0.0394		"	0.0397	99.4	30-150				
Surrogate: Toluene-d8	0.0389		"	0.0400	97.4	30-150				
Surrogate: 4-Bromofluorobenzene	0.0380		"	0.0400	95.0	30-150				

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2110109 - EPA 5030 Soil MS

Matrix Spike (2110109-MS1)		Source: R211001-01			Prepared & Analyzed: 11/01/12					
Benzene	0.0700	0.0050	mg/kg	0.100	ND	70.0	30-131			
Toluene	0.0754	0.0050	"	0.100	ND	75.4	30-134			
Ethylbenzene	0.102	0.0050	"	0.100	ND	102	22-153			
m,p-Xylene	0.185	0.010	"	0.200	ND	92.7	10-159			
o-Xylene	0.101	0.0050	"	0.100	ND	101	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0429		"	0.0397		108	30-150			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	30-150			
Surrogate: 4-Bromofluorobenzene	0.0379		"	0.0400		94.6	30-150			

Matrix Spike Dup (2110109-MSD1)		Source: R211001-01			Prepared & Analyzed: 11/01/12					
Benzene	0.0737	0.0050	mg/kg	0.100	ND	73.7	30-131	5.18	34	
Toluene	0.0798	0.0050	"	0.100	ND	79.8	30-134	5.69	30	
Ethylbenzene	0.106	0.0050	"	0.100	ND	106	22-153	3.40	24	
m,p-Xylene	0.190	0.010	"	0.200	ND	95.1	10-159	2.60	68	
o-Xylene	0.104	0.0050	"	0.100	ND	104	31-151	3.07	38	
Surrogate: 1,2-Dichloroethane-d4	0.0444		"	0.0397		112	30-150			
Surrogate: Toluene-d8	0.0401		"	0.0400		100	30-150			
Surrogate: 4-Bromofluorobenzene	0.0370		"	0.0400		92.5	30-150			

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Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

A handwritten signature in black ink, appearing to read 'Daniel A. [unclear]'.