

From: [Randy Miller](#)  
To: [Fischer, Alex](#)  
Cc: [Steven Shute](#)  
Subject: Treater Overflow Pit ID 115241  
Date: Thursday, August 09, 2012 8:43:08 AM  
Attachments: [L95687.pdf](#)

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Alex,

Please find the attached analytical report for the remaining soils in the Treater Overflow Pit Fac ID 115241.

As we expected, contamination remains in the soils around and below the excavation (which extends to 35 feet below ground surface. My recommendations are as follows:

1. Document the precise location of the excavation and backfill with the clean soil from the banks of the pit. Bank material on the North and West sides can be used to get the pit filled in above the ground water level.
2. Remove/recycle the contaminated soil (2000 - 2500 cy) and fill the remainder of the pit with recycled or clean fill as funds allow from Lone Pine Gas.
3. Develop a monitoring/sampling plan for the existing monitoring wells down gradient of the pit area. I would estimate that 99% of the contaminated soil has been removed from the pit and the remainder is not going to present any immediate danger to the ground water or surface water in Spring Gulch. This is evidenced by the monitor well samples collected on 4/17/12 that were well below the COGCC action levels, which was before any of the pit soil was removed (and had been in place for 40 years).

Thank you and let me know your thoughts,

----- Forwarded message -----

From: <[tantalek@acz.com](mailto:tantalek@acz.com)>  
Date: Wed, Aug 8, 2012 at 2:36 PM  
Subject: ACZ Laboratories Project L95687 Final Report and EDD  
To: [pipeline@rof.net](mailto:pipeline@rof.net)  
Cc: [randy@npeng.com](mailto:randy@npeng.com)

Attached is the final report for project 'L95687'.

The report is in Adobe's Portable Document Format (PDF). Adobe Acrobat Reader is available at no charge at:  
<http://www.adobe.com/products/acrobat/readstep2.html>

Please feel free to contact me should you have any questions about your report. For fastest service, please refer to your project number in any correspondence.

Regards,

Tony Antalek  
ACZ Project Manager  
[tantalek@acz.com](mailto:tantalek@acz.com)  
[970-879-6590 ext 107](tel:970-879-6590)  
<http://www.acz.com>

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by ACZ - <http://www.acz.com>

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Randy Miller, President

**North Park Engineering & Consulting, Inc.**

PO Box 395  
Walden, CO 80480

970-218-4974 (cell)  
970-723-3725 (office)  
970-723-8420 (fax)

August 08, 2012

## Report to:

Steve Shute

Lone Pine Gas, Inc.

PO Box 1054

Glenwood Springs, CO 81602

## Bill to:

C/O Warren Associates, Inc.

Lone Pine Gas, Inc.

Roy Warren 4505 S. Broadway

Englewood, CO 80113

cc: Randy Miller

Project ID: LONE PINE GAS

ACZ Project ID: L95687

Steve Shute:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on July 17, 2012. This project has been assigned to ACZ's project number, L95687. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L95687. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after September 08, 2012. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Tony Antalek has reviewed and approved this report.



**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT BOTTOM 35

ACZ Sample ID: **L95687-01**  
Date Sampled: 07/12/12 11:00  
Date Received: 07/17/12  
Sample Matrix: Soil

**Metals Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6020 ICP-MS	1.5			mg/Kg	0.1	0.5	07/25/12 19:44	pmc
Barium, total (3050)	M6010B ICP	71.1			mg/Kg	0.3	2	07/26/12 0:15	aeb
Boron, total (3050)	M6010B ICP		U		mg/Kg	1	5	07/26/12 0:15	aeb
Cadmium, total (3050)	M6010B ICP		U		mg/Kg	0.5	2	07/26/12 0:15	aeb
Calcium, soluble (Sat. Paste)	M6010B ICP	0.17			meq/L	0.01	0.05	07/30/12 13:07	aeb
Chromium, total (3050)	M6010B ICP	5			mg/Kg	1	5	07/26/12 0:15	aeb
Chromium, Trivalent	Calculation (Total - Hexavalent)	5			mg/Kg	1	5	08/08/12 9:39	calc
Copper, total (3050)	M6010B ICP	6		*	mg/Kg	1	5	07/26/12 0:15	aeb
Lead, total (3050)	M6010B ICP	5	B	*	mg/Kg	4	20	07/26/12 0:15	aeb
Magnesium, soluble (Sat. Paste)	M6010B ICP	0.05	B		meq/L	0.02	0.08	07/30/12 13:07	aeb
Mercury by Direct Combustion AA	M7473	7.28	B	*	ng/g	2.09	10.45	08/03/12 15:48	erf
Nickel, total (3050)	M6010B ICP	2	B		mg/Kg	1	5	07/26/12 0:15	aeb
Selenium, total (3050)	M6010B ICP		U		mg/Kg	6	30	07/26/12 0:15	aeb
Silver, total (3050)	M6010B ICP		U		mg/Kg	1	3	07/26/12 0:15	aeb
Sodium Absorption Ratio	Calculation	9.20				0.03	0.15	08/08/12 9:39	calc
Sodium, soluble (Sat. Paste)	M6010B ICP	3.05			meq/L	0.01	0.09	07/30/12 13:07	aeb
Zinc, total (3050)	M6010B ICP	94		*	mg/Kg	1	5	07/26/12 0:15	aeb

**Soil Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	0.318		*	mmhos/cm	0.001	0.01	07/27/12 11:22	mss2
pH, Saturated Paste	USDA No. 60 (21A)	8.5		*	units	0.1	0.1	07/27/12 11:22	mss2
Solids, Percent	CLPSOW390, PART F, D-98	88.8		*	%	0.1	0.5	07/18/12 13:00	cdb

**Soil Preparation**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/18/12 11:30	cdb
Crush and Pulverize	EPA-600/2-78-054 3.1.3							07/25/12 8:00	mss2
Digestion - Alkaline	M3060A							07/30/12 10:00	cra
Digestion - Hot Plate	M3050B ICP-MS							07/25/12 9:59	mss2
Digestion - Hot Plate	M3050B ICP							07/25/12 9:59	mss2
Saturated Paste Extraction	USDA No. 60 (2)							07/26/12 9:45	mss2

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chromium, Hexavalent (3060)	M7196A		U	*	mg/Kg	1.125	4.5	08/01/12 10:43	jad

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT NORTH 24

ACZ Sample ID: **L95687-02**  
Date Sampled: 07/12/12 13:30  
Date Received: 07/17/12  
Sample Matrix: Soil

**Metals Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6020 ICP-MS	5.1			mg/Kg	0.1	0.5	07/25/12 19:46	pmc
Barium, total (3050)	M6010B ICP	221			mg/Kg	0.3	2	07/26/12 0:19	aeb
Boron, total (3050)	M6010B ICP	3	B		mg/Kg	1	5	07/26/12 0:19	aeb
Cadmium, total (3050)	M6010B ICP	0.8	B		mg/Kg	0.5	2	07/26/12 0:19	aeb
Calcium, soluble (Sat. Paste)	M6010B ICP	0.19			meq/L	0.01	0.05	07/30/12 13:13	aeb
Chromium, total (3050)	M6010B ICP	27			mg/Kg	1	5	07/26/12 0:19	aeb
Chromium, Trivalent	Calculation (Total - Hexavalent)	27			mg/Kg	1	5	08/08/12 9:40	calc
Copper, total (3050)	M6010B ICP	20		*	mg/Kg	1	5	07/26/12 0:19	aeb
Lead, total (3050)	M6010B ICP	14	B	*	mg/Kg	4	20	07/26/12 0:19	aeb
Magnesium, soluble (Sat. Paste)	M6010B ICP	0.09			meq/L	0.02	0.08	07/30/12 13:13	aeb
Mercury by Direct Combustion AA	M7473	4.17	B	*	ng/g	2.18	10.9	08/03/12 15:55	erf
Nickel, total (3050)	M6010B ICP	16			mg/Kg	1	5	07/26/12 0:19	aeb
Selenium, total (3050)	M6010B ICP		U		mg/Kg	6	30	07/26/12 0:19	aeb
Silver, total (3050)	M6010B ICP		U	*	mg/Kg	2	5	07/27/12 0:20	aeb
Sodium Absorption Ratio	Calculation	3.23				0.03	0.15	08/08/12 9:40	calc
Sodium, soluble (Sat. Paste)	M6010B ICP	1.21			meq/L	0.01	0.09	07/30/12 13:13	aeb
Zinc, total (3050)	M6010B ICP	69		*	mg/Kg	1	5	07/26/12 0:19	aeb

**Soil Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	0.146		*	mmhos/cm	0.001	0.01	07/27/12 11:37	mss2
pH, Saturated Paste	USDA No. 60 (21A)	7.3		*	units	0.1	0.1	07/27/12 11:37	mss2
Solids, Percent	CLPSOW390, PART F, D-98	86.6		*	%	0.1	0.5	07/18/12 17:00	cdb

**Soil Preparation**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/18/12 14:11	cdb
Crush and Pulverize	EPA-600/2-78-054 3.1.3							07/25/12 8:07	mss2
Digestion - Alkaline	M3060A							07/30/12 14:16	cra
Digestion - Hot Plate	M3050B ICP-MS							07/25/12 10:18	mss2
Digestion - Hot Plate	M3050B ICP							07/25/12 10:18	mss2
Saturated Paste Extraction	USDA No. 60 (2)							07/26/12 9:55	mss2

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chromium, Hexavalent (3060)	M7196A		U	*	mg/Kg	1.15	4.6	08/01/12 11:00	jad

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT WEST 24

ACZ Sample ID: **L95687-03**  
Date Sampled: 07/12/12 13:40  
Date Received: 07/17/12  
Sample Matrix: Soil

**Metals Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6020 ICP-MS	2.4			mg/Kg	0.1	0.5	07/25/12 19:47	pmc
Barium, total (3050)	M6010B ICP	68.8			mg/Kg	0.3	2	07/26/12 0:22	aeb
Boron, total (3050)	M6010B ICP		U		mg/Kg	1	5	07/26/12 0:22	aeb
Cadmium, total (3050)	M6010B ICP		U		mg/Kg	0.5	2	07/26/12 0:22	aeb
Calcium, soluble (Sat. Paste)	M6010B ICP	1.00			meq/L	0.01	0.05	07/30/12 13:16	aeb
Chromium, total (3050)	M6010B ICP	7			mg/Kg	1	5	07/26/12 0:22	aeb
Chromium, Trivalent	Calculation (Total - Hexavalent)	7			mg/Kg	1	5	08/08/12 9:40	calc
Copper, total (3050)	M6010B ICP	8		*	mg/Kg	1	5	07/26/12 0:22	aeb
Lead, total (3050)	M6010B ICP	7	B	*	mg/Kg	4	20	07/26/12 0:22	aeb
Magnesium, soluble (Sat. Paste)	M6010B ICP	0.30			meq/L	0.02	0.08	07/30/12 13:16	aeb
Mercury by Direct Combustion AA	M7473	10.6		*	ng/g	1.72	8.6	08/03/12 16:09	erf
Nickel, total (3050)	M6010B ICP	5	B		mg/Kg	1	5	07/26/12 0:22	aeb
Selenium, total (3050)	M6010B ICP		U		mg/Kg	6	30	07/26/12 0:22	aeb
Silver, total (3050)	M6010B ICP		U		mg/Kg	1	3	07/26/12 0:22	aeb
Sodium Absorption Ratio	Calculation	3.63				0.03	0.15	08/08/12 9:40	calc
Sodium, soluble (Sat. Paste)	M6010B ICP	2.93			meq/L	0.01	0.09	07/30/12 13:16	aeb
Zinc, total (3050)	M6010B ICP	35		*	mg/Kg	1	5	07/26/12 0:22	aeb

**Soil Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	0.377		*	mmhos/cm	0.001	0.01	07/27/12 11:44	mss2
pH, Saturated Paste	USDA No. 60 (21A)	7.8		*	units	0.1	0.1	07/27/12 11:44	mss2
Solids, Percent	CLPSOW390, PART F, D-98	94.4		*	%	0.1	0.5	07/18/12 19:00	cdb

**Soil Preparation**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/18/12 16:52	cdb
Crush and Pulverize	EPA-600/2-78-054 3.1.3							07/25/12 8:15	mss2
Digestion - Alkaline	M3060A							07/30/12 20:40	cra
Digestion - Hot Plate	M3050B ICP							07/25/12 10:38	mss2
Digestion - Hot Plate	M3050B ICP-MS							07/25/12 10:38	mss2
Saturated Paste Extraction	USDA No. 60 (2)							07/26/12 10:00	mss2

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chromium, Hexavalent (3060)	M7196A		U	*	mg/Kg	1.05	4.2	08/01/12 11:25	jad

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT SOUTH 24

ACZ Sample ID: **L95687-04**  
Date Sampled: 07/12/12 13:50  
Date Received: 07/17/12  
Sample Matrix: Soil

**Metals Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6020 ICP-MS	3.7			mg/Kg	0.1	0.5	07/25/12 19:48	pmc
Barium, total (3050)	M6010B ICP	220			mg/Kg	0.3	2	07/26/12 0:25	aeb
Boron, total (3050)	M6010B ICP	3	B		mg/Kg	1	5	07/26/12 0:25	aeb
Cadmium, total (3050)	M6010B ICP	0.5	B		mg/Kg	0.5	2	07/26/12 0:25	aeb
Calcium, soluble (Sat. Paste)	M6010B ICP	0.87			meq/L	0.01	0.05	07/30/12 13:19	aeb
Chromium, total (3050)	M6010B ICP	25			mg/Kg	1	5	07/26/12 0:25	aeb
Chromium, Trivalent	Calculation (Total - Hexavalent)	25			mg/Kg	1	5	08/08/12 9:40	calc
Copper, total (3050)	M6010B ICP	20		*	mg/Kg	1	5	07/26/12 0:25	aeb
Lead, total (3050)	M6010B ICP	14	B	*	mg/Kg	4	20	07/26/12 0:25	aeb
Magnesium, soluble (Sat. Paste)	M6010B ICP	0.29			meq/L	0.02	0.08	07/30/12 13:19	aeb
Mercury by Direct Combustion AA	M7473	23.1		*	ng/g	2.15	10.75	08/03/12 16:23	erf
Nickel, total (3050)	M6010B ICP	14			mg/Kg	1	5	07/26/12 0:25	aeb
Selenium, total (3050)	M6010B ICP		U		mg/Kg	6	30	07/26/12 0:25	aeb
Silver, total (3050)	M6010B ICP		U		mg/Kg	1	3	07/26/12 0:25	aeb
Sodium Absorption Ratio	Calculation	5.24				0.03	0.15	08/08/12 9:40	calc
Sodium, soluble (Sat. Paste)	M6010B ICP	3.99			meq/L	0.01	0.09	07/30/12 13:19	aeb
Zinc, total (3050)	M6010B ICP	113		*	mg/Kg	1	5	07/26/12 0:25	aeb

**Soil Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	0.446		*	mmhos/cm	0.001	0.01	07/27/12 11:51	mss2
pH, Saturated Paste	USDA No. 60 (21A)	7.9		*	units	0.1	0.1	07/27/12 11:51	mss2
Solids, Percent	CLPSOW390, PART F, D-98	83.4		*	%	0.1	0.5	07/18/12 21:00	cdb

**Soil Preparation**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/18/12 19:33	cdb
Crush and Pulverize	EPA-600/2-78-054 3.1.3							07/25/12 8:22	mss2
Digestion - Alkaline	M3060A							07/30/12 22:48	cra
Digestion - Hot Plate	M3050B ICP-MS							07/25/12 10:58	mss2
Digestion - Hot Plate	M3050B ICP							07/25/12 10:58	mss2
Saturated Paste Extraction	USDA No. 60 (2)							07/26/12 10:05	mss2

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chromium, Hexavalent (3060)	M7196A		U	*	mg/Kg	1.2	4.8	08/01/12 11:33	jad

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT EAST 24

ACZ Sample ID: **L95687-05**  
Date Sampled: 07/12/12 14:00  
Date Received: 07/17/12  
Sample Matrix: Soil

**Metals Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total (3050)	M6020 ICP-MS	2.3			mg/Kg	0.1	0.5	07/25/12 19:50	pmc
Barium, total (3050)	M6010B ICP	97.9			mg/Kg	0.3	2	07/26/12 0:28	aeb
Boron, total (3050)	M6010B ICP	1	B		mg/Kg	1	5	07/26/12 0:28	aeb
Cadmium, total (3050)	M6010B ICP		U		mg/Kg	0.5	2	07/26/12 0:28	aeb
Calcium, soluble (Sat. Paste)	M6010B ICP	1.37			meq/L	0.01	0.05	07/30/12 13:22	aeb
Chromium, total (3050)	M6010B ICP	10			mg/Kg	1	5	07/26/12 0:28	aeb
Chromium, Trivalent	Calculation (Total - Hexavalent)	10			mg/Kg	1	5	08/08/12 9:40	calc
Copper, total (3050)	M6010B ICP	9		*	mg/Kg	1	5	07/26/12 0:28	aeb
Lead, total (3050)	M6010B ICP	7	B	*	mg/Kg	4	20	07/26/12 0:28	aeb
Magnesium, soluble (Sat. Paste)	M6010B ICP	0.36			meq/L	0.02	0.08	07/30/12 13:22	aeb
Mercury by Direct Combustion AA	M7473	9.64	B	*	ng/g	1.97	9.85	08/03/12 16:30	erf
Nickel, total (3050)	M6010B ICP	7			mg/Kg	1	5	07/26/12 0:28	aeb
Selenium, total (3050)	M6010B ICP		U		mg/Kg	6	30	07/26/12 0:28	aeb
Silver, total (3050)	M6010B ICP		U		mg/Kg	1	3	07/26/12 0:28	aeb
Sodium Absorption Ratio	Calculation	4.34				0.03	0.15	08/08/12 9:40	calc
Sodium, soluble (Sat. Paste)	M6010B ICP	4.04			meq/L	0.01	0.09	07/30/12 13:22	aeb
Zinc, total (3050)	M6010B ICP	193		*	mg/Kg	1	5	07/26/12 0:28	aeb

**Soil Analysis**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	0.516		*	mmhos/cm	0.001	0.01	07/27/12 11:58	mss2
pH, Saturated Paste	USDA No. 60 (21A)	7.9		*	units	0.1	0.1	07/27/12 11:58	mss2
Solids, Percent	CLPSOW390, PART F, D-98	94.3		*	%	0.1	0.5	07/18/12 23:00	cdb

**Soil Preparation**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972							07/18/12 22:15	cdb
Crush and Pulverize	EPA-600/2-78-054 3.1.3							07/25/12 8:30	mss2
Digestion - Alkaline	M3060A							07/31/12 0:56	cra
Digestion - Hot Plate	M3050B ICP-MS							07/25/12 11:17	mss2
Digestion - Hot Plate	M3050B ICP							07/25/12 11:17	mss2
Saturated Paste Extraction	USDA No. 60 (2)							07/26/12 10:10	mss2

**Wet Chemistry**

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chromium, Hexavalent (3060)	M7196A		U	*	mg/Kg	1.05	4.2	08/01/12 11:58	jad

## Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit, typically 5 times the MDL.
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

## QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

## QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

## ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

## Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
- (5) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 & 20th edition (1998).

## Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>



Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Arsenic, total (3050)**

M6020 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327039</b>													
WG327039ICV	ICV	07/25/12 19:23	MS120710-2	.05		.05224	mg/L	104.5	90	110			
WG327039ICB	ICB	07/25/12 19:24				U	mg/L		-0.0006	0.0006			
L95597-01MS	MS	07/25/12 19:34	MS120517-3	25.025	10.8	33.56	mg/Kg	90.9	75	125			
L95597-01MSD	MSD	07/25/12 19:35	MS120517-3	25.025	10.8	33.75	mg/Kg	91.7	75	125	0.56	20	
WG326962PBS	PBS	07/25/12 19:41				.2	mg/Kg		-0.3	0.3			
WG326962LCSS	LCSS	07/25/12 19:42	PCN39542	94.5		97.8	mg/Kg		77.8	111			
WG326962LCSSD	LCSSD	07/25/12 19:43	PCN39542	94.5		96.5	mg/Kg		77.8	111	1.3	20	
L95688-04DUP	DUP	07/25/12 19:59			6.5	6.34	mg/Kg				2.5	20	

**Barium, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		2.016	mg/L	100.8	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.009	0.009			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-0.9	0.9			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	167		172.2	mg/Kg		140	193			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	167		171.6	mg/Kg		140	193	0.3	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	248	305.02	mg/Kg	112.9	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	248	302.5	mg/Kg	107.9	75	125	0.83	20	

**Boron, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		2.011	mg/L	100.6	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	106		113.5	mg/Kg		80.3	133			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	106		113.3	mg/Kg		80.3	133	0.2	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5505	7	61	mg/Kg	106.8	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5505	7	60.7	mg/Kg	106.2	75	125	0.49	20	

**Cadmium, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		1.983	mg/L	99.2	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.015	0.015			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-1.5	1.5			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	60.5		61.18	mg/Kg		50.3	70.7			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	60.5		61.85	mg/Kg		50.3	70.7	1.1	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	U	45.9	mg/Kg	89.9	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	U	45.34	mg/Kg	88.8	75	125	1.23	20	

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Calcium, soluble (Sat. Paste)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327198</b>													
WG327198ICV	ICV	07/30/12 12:51	II120711-1	100		99.34	mg/L	99.3	90	110			
WG327198ICB	ICB	07/30/12 12:54				U	mg/L		-0.6	0.6			
L95687-01DUP	DUP	07/30/12 13:10			.17	.182	meq/L				6.6	20	

**Chromium, Hexavalent (3060)**

M7196A

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327450</b>													
WG327450ICV	ICV	08/01/12 10:27	WC120504-	.05		.0496	mg/L	99.2	90	110			
WG327450ICB	ICB	08/01/12 10:35				U	mg/L		-0.015	0.015			
L95687-01DUP	DUP	08/01/12 10:51			U	U	mg/Kg				0	20	RA
L95687-02MS1	MS	08/01/12 11:08	SI120718-2	36.814904	U	33	mg/Kg	89.6	75	125			
L95687-02MS2	MS	08/01/12 11:16	SI110616-4	1450.84023	U	2210	mg/Kg	152.3	75	125			MR
L95688-04AS	AS	08/01/12 12:39	WC120409-	.25	U	.125	mg/Kg	50	80	120			M2
WG327266LCSS	LCSS	08/01/12 12:48	PCN39707	218		195	mg/Kg		154	282			
WG327266PBS	PBS	08/01/12 12:56				U	mg/Kg		-3	3			

**Chromium, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		1.957	mg/L	97.9	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	70.4		70.5	mg/Kg		57.6	83.2			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	70.4		70.6	mg/Kg		57.6	83.2	0.1	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	22	72.3	mg/Kg	101.6	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	22	71.5	mg/Kg	100	75	125	1.11	20	

**Conductivity @25C**

SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327172</b>													
L95687-01DUP	DUP	07/27/12 11:30			.318	.324	nmhos/cm				1.9	20	

**Copper, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		2.007	mg/L	100.4	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	79.6		81.8	mg/Kg		66.7	92.4			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	79.6		80.8	mg/Kg		66.7	92.4	1.2	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	24	71.9	mg/Kg	94.9	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	24	71.6	mg/Kg	94.3	75	125	0.42	20	

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Lead, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	4		4.021	mg/L	100.5	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.12	0.12			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-12	12			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	91.8		93.5	mg/Kg		75.5	108			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	91.8		89	mg/Kg		75.5	108	4.9	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	101	15	108.9	mg/Kg	93	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	101	15	110.5	mg/Kg	94.6	75	125	1.46	20	

**Magnesium, soluble (Sat. Paste)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327198</b>													
WG327198ICV	ICV	07/30/12 12:51	II120711-1	100		101.36	mg/L	101.4	90	110			
WG327198ICB	ICB	07/30/12 12:54				U	mg/L		-0.6	0.6			
L95687-01DUP	DUP	07/30/12 13:10			.05	.053	meq/L				6.4	20	

**Mercury by Direct Combustion AA**

M7473

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG324025</b>													
WG324025ICV1	ICV	06/07/12 17:06	HG120605-4	100		101	ng/g	101	90	110			
WG324025ICV2	ICV	06/07/12 17:19	HG120605-5	100		99.9	ng/g	99.9	90	110			
WG324025ICV3	ICV	06/07/12 17:37	HG120605-3	1000		1060	ng/g	106	90	110			
WG324025ICV4	ICV	06/07/12 17:57	HG120605-3	1000		1030	ng/g	103	90	110			
<b>WG327592</b>													
WG327592ICV1	ICV	08/03/12 11:30	HG120720-3	100		96.9	ng/g	96.9	90	110			
WG327592ICV2	ICV	08/03/12 11:49	HG120720-4	100		102	ng/g	102	90	110			
WG327592ICV3	ICV	08/03/12 12:10	HG120720-2	1000		1060	ng/g	106	90	110			
WG327592ICV4	ICV	08/03/12 12:23	HG120720-2	1000		996	ng/g	99.6	90	110			
WG327592PBS	PBS	08/03/12 15:27				U	ng/g		-2	2			
WG327592LCSS	LCSS	08/03/12 15:34	PCN38815	91		92.5	ng/g		80	120			
WG327592LCSSD	LCSSD	08/03/12 15:41	PCN38815	91		93.2	ng/g		80	120	0.8	20	
L95687-02MS	MS	08/03/12 16:02	PCN38815				ng/g	109.9	80	120			
L95687-03DUP	DUP	08/03/12 16:16			10.6	10	ng/g				5.8	20	RA

**Nickel, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2.002		1.969	mg/L	98.4	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	57.6		59.1	mg/Kg		47.7	67.5			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	57.6		58.5	mg/Kg		47.7	67.5	1	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	18	63.8	mg/Kg	90.7	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	18	63.2	mg/Kg	89.5	75	125	0.94	20	

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**pH, Saturated Paste**

USDA No. 60 (21A)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327172</b>													
L95687-01DUP	DUP	07/27/12 11:30			8.5	8.45	units				0.6	20	
WG327172ICV	ICV	07/27/12 13:03	PCN38642	4		3.98	units	99.5	97	103			

**Selenium, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	4		4.127	mg/L	103.2	90	110			
WG327087ICB	ICB	07/25/12 23:54				.082	mg/L		-0.18	0.18			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-18	18			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	86.4		87.9	mg/Kg		69.2	104			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	86.4		91.8	mg/Kg		69.2	104	4.3	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	101	U	95.4	mg/Kg	94.5	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	101	U	95.9	mg/Kg	95	75	125	0.52	20	

**Silver, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	1.003		1.018	mg/L	101.5	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	34.4		34.2	mg/Kg		22.8	46.1			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	34.4		34.1	mg/Kg		22.8	46.1	0.3	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5		42.1	mg/Kg	83.4	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5		41.5	mg/Kg	82.2	75	125	1.44	20	

**WG327093**

WG327093ICV	ICV	07/26/12 23:55	II120430-5	1.003		1.014	mg/L	101.1	90	110			
WG327093ICB	ICB	07/26/12 23:58				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/27/12 0:11				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/27/12 0:14	PCN39542	34.4		34.2	mg/Kg		22.8	46.1			
WG326962LCSSD	LCSSD	07/27/12 0:17	PCN39542	34.4		34.6	mg/Kg		22.8	46.1	1.2	20	
L95688-03MS	MS	07/27/12 0:29	II2XSOIL	50.5	U	44.9	mg/Kg	88.9	75	125			
L95688-03MSD	MSD	07/27/12 0:32	II2XSOIL	50.5	U	44.9	mg/Kg	88.9	75	125	0	20	

**Sodium, soluble (Sat. Paste)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327198</b>													
WG327198ICV	ICV	07/30/12 12:51	II120711-1	100		100.46	mg/L	100.5	90	110			
WG327198ICB	ICB	07/30/12 12:54				U	mg/L		-0.9	0.9			
L95687-01DUP	DUP	07/30/12 13:10			3.05	3.519	meq/L				14.3	20	

**Solids, Percent**

CLPSOW390, PART F, D-98

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG326471</b>													
L95687-01DUP	DUP	07/18/12 15:00			88.8	89.02	%				0.2	20	
WG326471PBS	PBS	07/19/12 9:00				U	%		99.9	100.1			

**Lone Pine Gas, Inc.**

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Zinc, total (3050)**

M6010B ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG327087</b>													
WG327087ICV	ICV	07/25/12 23:51	II120430-5	2		2.002	mg/L	100.1	90	110			
WG327087ICB	ICB	07/25/12 23:54				U	mg/L		-0.03	0.03			
WG326962PBS	PBS	07/26/12 0:06				U	mg/Kg		-3	3			
WG326962LCSS	LCSS	07/26/12 0:09	PCN39542	140		144.5	mg/Kg		115	165			
WG326962LCSSD	LCSSD	07/26/12 0:12	PCN39542	140		141.2	mg/Kg		115	165	2.3	20	
L95688-03MS	MS	07/26/12 0:49	II120717-3	50.5	87	133.2	mg/Kg	97.4	75	125			
L95688-03MSD	MSD	07/26/12 0:52	II120717-3	50.5	87	130.6	mg/Kg	92.3	75	125	1.97	20	

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L95687-01</b>	WG327087	Copper, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
	WG327592	Mercury by Direct Combustion AA	M7473	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG327087	Zinc, total (3050)	M6010B ICP	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
	WG327450	Chromium, Hexavalent (3060)	M7196A	DA	Sample required dilution due to reactivity.
			M7196A	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7196A	MR	Hexavalent Chromium matrix spike recovery was low. Recovery of the associated LCS was acceptable. ORP & pH measurements of the sample selected for spiking indicate the low recovery may be attributed to a reducing sample matrix.
			M7196A	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
<b>L95687-02</b>	WG327087	Copper, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
	WG327592	Mercury by Direct Combustion AA	M7473	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG327093	Silver, total (3050)	M6010B ICP	DB	Sample required dilution due to low bias result.
	WG327087	Zinc, total (3050)	M6010B ICP	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
	WG327450	Chromium, Hexavalent (3060)	M7196A	DA	Sample required dilution due to reactivity.
			M7196A	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7196A	MR	Hexavalent Chromium matrix spike recovery was low. Recovery of the associated LCS was acceptable. ORP & pH measurements of the sample selected for spiking indicate the low recovery may be attributed to a reducing sample matrix.
			M7196A	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L95687-03</b>	WG327087	Copper, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
	WG327592	Mercury by Direct Combustion AA	M7473	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG327087	Zinc, total (3050)	M6010B ICP	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
	WG327450	Chromium, Hexavalent (3060)	M7196A	DA	Sample required dilution due to reactivity.
			M7196A	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7196A	MR	Hexavalent Chromium matrix spike recovery was low. Recovery of the associated LCS was acceptable. ORP & pH measurements of the sample selected for spiking indicate the low recovery may be attributed to a reducing sample matrix.
			M7196A	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
<b>L95687-04</b>	WG327087	Copper, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
	WG327592	Mercury by Direct Combustion AA	M7473	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG327087	Zinc, total (3050)	M6010B ICP	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
	WG327450	Chromium, Hexavalent (3060)	M7196A	DA	Sample required dilution due to reactivity.
			M7196A	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7196A	MR	Hexavalent Chromium matrix spike recovery was low. Recovery of the associated LCS was acceptable. ORP & pH measurements of the sample selected for spiking indicate the low recovery may be attributed to a reducing sample matrix.
			M7196A	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

**Lone Pine Gas, Inc.**

ACZ Project ID: **L95687**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L95687-05</b>	WG327087	Copper, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
		Lead, total (3050)	M6010B ICP	ZG	The ICP Serial Dilution was not used for data validation because the sample concentration was less than 50 times the MDL.
	WG327592	Mercury by Direct Combustion AA	M7473	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG327087	Zinc, total (3050)	M6010B ICP	ZH	Serial Dilution exceeded the acceptance criteria. Matrix interference [physical or chemical] is suspected.
	WG327450	Chromium, Hexavalent (3060)	M7196A	DA	Sample required dilution due to reactivity.
			M7196A	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M7196A	MR	Hexavalent Chromium matrix spike recovery was low. Recovery of the associated LCS was acceptable. ORP & pH measurements of the sample selected for spiking indicate the low recovery may be attributed to a reducing sample matrix.
			M7196A	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).



**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT BOTTOM 35

ACZ Sample ID: **L95687-01**  
 Date Sampled: 07/12/12 11:00  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**BTEX/Gasoline Range Organics (C6-C10)**

Analysis Method: **M8021B/8015D GC/PID/FID**  
 Extract Method: **3580A**

**Workgroup: WG326976**

Analyst: pml  
 Extract Date: 07/25/12 16:50  
 Analysis Date: 07/25/12 16:50

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
Benzene	71-43-2		U	1000	*	ug/Kg	200	1000
Ethylbenzene	100-41-4	2800		1000	*	ug/Kg	200	1000
m p Xylene	1330-20-7	6300		1000	*	ug/Kg	400	2000
o Xylene	95-47-6	1800		1000	*	ug/Kg	200	1000
Toluene	108-88-3		U	1000	*	ug/Kg	200	1000
TVH C6 to C10	TVH	550		1000	*	mg/Kg	50	50
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
Bromofluorobenzene	460-00-4	92.1		1000	*	%	70	130
Bromofluorobenzene (TVH)	460-00-4	90.1		1000	*	%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT BOTTOM 35

ACZ Sample ID: **L95687-01**  
 Date Sampled: 07/12/12 11:00  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**Diesel Range Organics (C10-C28)**

Analysis Method: **M8015D GC/FID**  
 Extract Method: **M3540**

**Workgroup: WG326631**

Analyst: gk  
 Extract Date: 07/19/12 14:03  
 Analysis Date: 07/20/12 13:09

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		7600		1666.67		mg/Kg	200	800
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	132.2		1666.67	*	%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT BOTTOM 35

ACZ Sample ID: **L95687-01**  
 Date Sampled: 07/12/12 11:00  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**Polynuclear Aromatic Hydrocarbons GC/M**

Analysis Method: **M8270C GC/MS**  
 Extract Method: **M3540**

**Workgroup: WG326959**

Analyst: itk  
 Extract Date: 07/23/12 16:48  
 Analysis Date: 07/24/12 21:25

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
2-Methylnaphthalene	91-57-6		U	3333.34	*	ug/Kg	7000	30000
Acenaphthene	83-32-9		U	3333.34	*	ug/Kg	7000	30000
Acenaphthylene	208-96-8		U	3333.34	*	ug/Kg	7000	30000
Anthracene	120-12-7		U	3333.34	*	ug/Kg	7000	30000
Benzo(a)anthracene	56-55-3		U	3333.34	*	ug/Kg	7000	30000
Benzo(a)pyrene	50-32-8		U	3333.34	*	ug/Kg	7000	30000
Benzo(b)fluoranthene	205-99-2		U	3333.34	*	ug/Kg	7000	30000
Benzo(g,h,i)perylene	191-24-2		U	3333.34	*	ug/Kg	7000	30000
Benzo(k)fluoranthene	207-08-9		U	3333.34	*	ug/Kg	7000	30000
Chrysene	218-01-9		U	3333.34	*	ug/Kg	7000	30000
Dibenzo(a,h)anthracene	53-70-3		U	3333.34	*	ug/Kg	7000	30000
Fluoranthene	206-44-0		U	3333.34	*	ug/Kg	7000	30000
Fluorene	86-73-7		U	3333.34	*	ug/Kg	7000	30000
Indeno(1,2,3-cd)pyrene	193-39-5		U	3333.34	*	ug/Kg	7000	30000
Naphthalene	91-20-3		U	3333.34	*	ug/Kg	7000	30000
Phenanthrene	85-01-8	8000	J	3333.34	*	ug/Kg	7000	30000
Pyrene	129-00-0		U	3333.34	*	ug/Kg	7000	30000
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
2-Fluorobiphenyl	321-60-8	117.6		3333.34	*	%	45	105
Nitrobenzene-d5	4165-60-0	96.9		3333.34	*	%	35	100
Terphenyl-d14	1718-51-0	114.4		3333.34	*	%	30	125

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT NORTH 24

ACZ Sample ID: **L95687-02**  
 Date Sampled: 07/12/12 13:30  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**BTEX/Gasoline Range Organics (C6-C10)**

Analysis Method: **M8021B/8015D GC/PID/FID**  
 Extract Method: **3580A**

**Workgroup: WG326976**

Analyst: pml  
 Extract Date: 07/25/12 14:01  
 Analysis Date: 07/25/12 14:01

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
Benzene	71-43-2		U	1000	*	ug/Kg	200	1000
Ethylbenzene	100-41-4	800	J	1000	*	ug/Kg	200	1000
m p Xylene	1330-20-7	1900	J	1000	*	ug/Kg	400	2000
o Xylene	95-47-6	800	J	1000	*	ug/Kg	200	1000
Toluene	108-88-3		U	1000	*	ug/Kg	200	1000
TVH C6 to C10	TVH	220		1000	*	mg/Kg	50	50
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
Bromofluorobenzene	460-00-4	96.6		1000	*	%	70	130
Bromofluorobenzene (TVH)	460-00-4	94.8		1000	*	%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
Sample ID: SLUDGE PIT NORTH 24

ACZ Sample ID: **L95687-02**  
Date Sampled: 07/12/12 13:30  
Date Received: 07/17/12  
Sample Matrix: Soil

**Diesel Range Organics (C10-C28)**

Analysis Method: **M8015D GC/FID**  
Extract Method: **M3540**

**Workgroup: WG326631**

Analyst: gk  
Extract Date: 07/19/12 14:04  
Analysis Date: 07/20/12 13:35

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		1390		333.33		mg/Kg	30	200
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	95.6		333.33		%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT WEST 24

ACZ Sample ID: **L95687-03**  
 Date Sampled: 07/12/12 13:40  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**BTEX/Gasoline Range Organics (C6-C10)**

Analysis Method: **M8021B/8015D GC/PID/FID**  
 Extract Method: **3580A**

**Workgroup: WG326976**

Analyst: pml  
 Extract Date: 07/25/12 17:27  
 Analysis Date: 07/25/12 17:27

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
Benzene	71-43-2		U	625	*	ug/Kg	100	600
Ethylbenzene	100-41-4	400	J	625	*	ug/Kg	100	600
m p Xylene	1330-20-7	600	J	625	*	ug/Kg	300	1000
o Xylene	95-47-6	300	J	625	*	ug/Kg	100	600
Toluene	108-88-3		U	625	*	ug/Kg	100	600
TVH C6 to C10	TVH	90		625	*	mg/Kg	30	30
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
Bromofluorobenzene	460-00-4	101.4		625	*	%	70	130
Bromofluorobenzene (TVH)	460-00-4	98.4		625	*	%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT WEST 24

ACZ Sample ID: **L95687-03**  
 Date Sampled: 07/12/12 13:40  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**Diesel Range Organics (C10-C28)**

Analysis Method: **M8015D GC/FID**  
 Extract Method: **M3540**

**Workgroup: WG326631**

Analyst: gk  
 Extract Date: 07/19/12 14:05  
 Analysis Date: 07/20/12 21:53

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		3500		999.99		mg/Kg	100	500
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	102.6		999.99		%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT SOUTH 24

ACZ Sample ID: **L95687-04**  
 Date Sampled: 07/12/12 13:50  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**BTEX/Gasoline Range Organics (C6-C10)**

Analysis Method: **M8021B/8015D GC/PID/FID**  
 Extract Method: **3580A**

**Workgroup: WG326976**

Analyst: pml  
 Extract Date: 07/25/12 18:03  
 Analysis Date: 07/25/12 18:03

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
Benzene	71-43-2		U	625	*	ug/Kg	100	600
Ethylbenzene	100-41-4	500	J	625	*	ug/Kg	100	600
m p Xylene	1330-20-7	1100		625	*	ug/Kg	300	1000
o Xylene	95-47-6	500	J	625	*	ug/Kg	100	600
Toluene	108-88-3		U	625	*	ug/Kg	100	600
TVH C6 to C10	TVH	130		625	*	mg/Kg	30	30
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
Bromofluorobenzene	460-00-4	102.5		625	*	%	70	130
Bromofluorobenzene (TVH)	460-00-4	98.7		625	*	%	70	130



**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT SOUTH 24

ACZ Sample ID: **L95687-04**  
 Date Sampled: 07/12/12 13:50  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**Diesel Range Organics (C10-C28)**

Analysis Method: **M8015D GC/FID**  
 Extract Method: **M3540**

**Workgroup: WG326631**

Analyst: gk  
 Extract Date: 07/19/12 14:06  
 Analysis Date: 07/20/12 14:28

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		5090		833.33		mg/Kg	80	400
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	126.2		833.33		%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT EAST 24

ACZ Sample ID: **L95687-05**  
 Date Sampled: 07/12/12 14:00  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**BTEX/Gasoline Range Organics (C6-C10)**

Analysis Method: **M8021B/8015D GC/PID/FID**  
 Extract Method: **3580A**

**Workgroup: WG326976**

Analyst: pml  
 Extract Date: 07/25/12 18:40  
 Analysis Date: 07/25/12 18:40

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
Benzene	71-43-2		U	625	*	ug/Kg	100	600
Ethylbenzene	100-41-4	200	J	625	*	ug/Kg	100	600
m p Xylene	1330-20-7		U	625	*	ug/Kg	300	1000
o Xylene	95-47-6	200	J	625	*	ug/Kg	100	600
Toluene	108-88-3		U	625	*	ug/Kg	100	600
TVH C6 to C10	TVH	70		625	*	mg/Kg	30	30
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
Bromofluorobenzene	460-00-4	101.2		625	*	%	70	130
Bromofluorobenzene (TVH)	460-00-4	101		625	*	%	70	130

**Lone Pine Gas, Inc.**

Project ID: LONE PINE GAS  
 Sample ID: SLUDGE PIT EAST 24

ACZ Sample ID: **L95687-05**  
 Date Sampled: 07/12/12 14:00  
 Date Received: 07/17/12  
 Sample Matrix: Soil

**Diesel Range Organics (C10-C28)**

Analysis Method: **M8015D GC/FID**  
 Extract Method: **M3540**

**Workgroup: WG326631**

Analyst: gk  
 Extract Date: 07/19/12 14:07  
 Analysis Date: 07/20/12 22:19

Compound	CAS	Result	QUAL	Dilution	XQ	Units	MDL	PQL
TPH C10 to C28		4700		1666.66		mg/Kg	200	800
Surrogate Recoveries	CAS	% Recovery		Dilution	XQ	Units	LCL	UCL
OTP	84-15-1	131.8		1666.66	*	%	70	130

**Report Header Explanations**

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>LCL</i>	Lower Control Limit
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit, typically 5 times the MDL.
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>UCL</i>	Upper Control Limit
<i>Sample</i>	Value of the Sample of interest

**QC Sample Types**

<i>SURR</i>	Surrogate	<i>LFM</i>	Laboratory Fortified Matrix
<i>INTS</i>	Internal Standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBS</i>	Prep Blank - Soil
<i>LFB</i>	Laboratory Fortified Blank	<i>PBW</i>	Prep Blank - Water

**QC Sample Type Explanations**

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.

**ACZ Qualifiers (Qual)**

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
E	Analyte concentration is estimated due to result exceeding calibration range.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
J	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
L	Target analyte response was below the laboratory defined negative threshold.
M	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.
P	Analyte concentration differs from second detector by more than 40%.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
V	High blank data accepted because sample concentration is 10 times higher than blank concentration.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

**Method References**

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/4-90/020. Methods for the Determination of Organic Compounds in Drinking Water (I), July 1990.
(3)	EPA 600/R-92/129. Methods for the Determination of Organic Compounds in Drinking Water (II), July 1990.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(5)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 & 20th edition (1998).

**Comments**

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<http://www.acz.com/public/extquallist.pdf>

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**BTEX/Gasoline Range Organics (C6-C10)**

M8021B/8015D GC/PID/FID

**WG326976**

AS	Sample ID: L95687-02AS		PCN/SCN: B120622-1-SPIK				Analyzed:		07/25/12 14:38	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
BENZENE	25000	U	25460	ug/Kg	101.8	70	130			
ETHYLBENZENE	25000	800	26890	ug/Kg	104.4	70	130			
M P XYLENE	50000	1900	54040	ug/Kg	104.3	70	130			
O XYLENE	50000	800	51070	ug/Kg	100.5	70	130			
TOLUENE	75000	U	78580	ug/Kg	104.8	70	130			
TVH C6 TO C10	500	220	734	mg/Kg	102.8	70	130			
BROMOFLUOROBENZENE (surr)				%	100.2	70	130			
BROMOFLUOROBENZENE (TVH) (surr)				%	101.3	70	130			

ASD	Sample ID: L95687-02ASD		PCN/SCN: B120622-1-SPIK				Analyzed:		07/25/12 15:16	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
BENZENE	25000	U	25470	ug/Kg	101.9	70	130	0.04	20	
ETHYLBENZENE	25000	800	27170	ug/Kg	105.5	70	130	1.04	20	
M P XYLENE	50000	1900	54870	ug/Kg	105.9	70	130	1.52	20	
O XYLENE	50000	800	52060	ug/Kg	102.5	70	130	1.92	20	
TOLUENE	75000	U	78380	ug/Kg	104.5	70	130	0.25	20	
TVH C6 TO C10	500	220	750	mg/Kg	106.0	70	130	2.16	20	
BROMOFLUOROBENZENE (surr)				%	100.8	70	130			
BROMOFLUOROBENZENE (TVH) (surr)				%	102.6	70	130			

LCSS	Sample ID: WG326976LCSS		PCN/SCN: B120622-1-SPIK				Analyzed:		07/25/12 12:06	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
BENZENE	25		24.04	ug/Kg	96.2	70	130			
ETHYLBENZENE	25		24.91	ug/Kg	99.6	70	130			
M P XYLENE	50		50.87	ug/Kg	101.7	70	130			
O XYLENE	50		48.87	ug/Kg	97.7	70	130			
TOLUENE	75		73.78	ug/Kg	98.4	70	130			
TVH C6 TO C10	.5		.524	mg/Kg	104.8	70	130			
BROMOFLUOROBENZENE (surr)				%	100.1	70	130			
BROMOFLUOROBENZENE (TVH) (surr)				%	99.3	70	130			

LCSSD	Sample ID: WG326976LCSSD		PCN/SCN: B120622-1-SPIK				Analyzed:		07/25/12 12:43	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
BENZENE	25		24.04	ug/Kg	96.2	70	130	0	20	
ETHYLBENZENE	25		25	ug/Kg	100.0	70	130	0.4	20	
M P XYLENE	50		50.88	ug/Kg	101.8	70	130	0	20	
O XYLENE	50		49.02	ug/Kg	98.0	70	130	0.3	20	
TOLUENE	75		74.23	ug/Kg	99.0	70	130	0.6	20	
TVH C6 TO C10	.5		.499	mg/Kg	99.8	70	130	4.9	20	
BROMOFLUOROBENZENE (surr)				%	100.7	70	130			
BROMOFLUOROBENZENE (TVH) (surr)				%	100.9	70	130			

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

PBS		Sample ID: WG326976PBS						Analyzed: 07/25/12 11:28		
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
BENZENE			U	ug/Kg		-1	1			
ETHYLBENZENE			U	ug/Kg		-1	1			
M P XYLENE			.43	ug/Kg		-2	2			
O XYLENE			.28	ug/Kg		-1	1			
TOLUENE			U	ug/Kg		-1	1			
TVH C6 TO C10			U	mg/Kg		-.05	.05			
BROMOFLUOROBENZENE (surr)				%	93.2	70	130			
BROMOFLUOROBENZENE (TVH) (surr)				%	92.4	70	130			

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Diesel Range Organics (C10-C28)**

M8015D GC/FID

**WG326631**

MS	Sample ID: L95688-04MS		PCN/SCN: TPH120529-2-30				Analyzed: 07/20/12 17:31			
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
TPH C10 TO C28	83.3	11	77.1	mg/Kg	79.3	70	130			
OTP (surr)				%	99.0	70	130			

MSD		Sample ID: L95688-04MSD		PCN/SCN: TPH120529-2-30			Analyzed: 07/20/12 17:57			
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
TPH C10 TO C28	83.3	11	74.9	mg/Kg	76.7	70	130	2.89	20	
OTP (surr)				%	97.1	70	130			

LCSS		Sample ID: WG326557LCSS		PCN/SCN: TPH120529-2-30				Analyzed: 07/20/12 11:23		
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
TPH C10 TO C28	83.3		69.7	mg/Kg	83.6	70	130			
OTP (surr)				%	91.0	70	130			

LCSSD	Sample ID: WG326557LCSSD		PCN/SCN: TPH120529-2-30				Analyzed: 07/20/12 11:49			
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
TPH C10 TO C28	83.3		74	mg/Kg	88.8	70	130	6	20	
OTP (surr)				%	93.7	70	130			

PBS		Sample ID: WG326557PBS						Analyzed: 07/20/12 10:57		
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
TPH C10 TO C28			U	mg/Kg		-20	20			
OTP (surr)				%	89.0	70	130			

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

**Polynuclear Aromatic Hydrocarbons GC/MS**

M8270C GC/MS

**WG326959**

MS	Sample ID: L95745-01MS		PCN/SCN: BNA120618-2-6G				Analyzed:		07/24/12 22:27	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
ACENAPHTHENE	8333.3	U	8100	ug/Kg	97.2	45	110			MD
PYRENE	8333.3	U	8000	ug/Kg	96.0	45	125			MD
2,4,6-TRIBROMOPHENOL (surr)				%	89.9	35	125			
2-FLUOROBIPHENYL (surr)				%	94.0	45	105			
2-FLUOROPHENOL (surr)				%	91.9	35	105			
NITROBENZENE-D5 (surr)				%	79.9	35	100			
PHENOL-D6 (surr)				%	93.5	40	100			
TERPHENYL-D14 (surr)				%	87.8	30	125			

MSD	Sample ID: L95745-01MSD		PCN/SCN: BNA120618-2-6G				Analyzed:		07/24/12 22:59	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
ACENAPHTHENE	8333.3	U	6400	ug/Kg	76.8	45	110	23.45	20	MD
PYRENE	8333.3	U	6600	ug/Kg	79.2	45	125	19.18	20	MD
2,4,6-TRIBROMOPHENOL (surr)				%	78.7	35	125			
2-FLUOROBIPHENYL (surr)				%	78.4	45	105			
2-FLUOROPHENOL (surr)				%	75.2	35	105			
NITROBENZENE-D5 (surr)				%	67.5	35	100			
PHENOL-D6 (surr)				%	74.4	40	100			
TERPHENYL-D14 (surr)				%	72.4	30	125			

LCSS	Sample ID: WG326798LCSS		PCN/SCN: BNA120618-2-30				Analyzed:		07/24/12 20:24	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
ACENAPHTHENE	1666.7		1342	ug/Kg	80.5	45	110			
PYRENE	1666.7		1719	ug/Kg	103.1	45	125			
2,4,6-TRIBROMOPHENOL (surr)				%	86.6	35	125			
2-FLUOROBIPHENYL (surr)				%	82.2	45	105			
2-FLUOROPHENOL (surr)				%	81.7	35	105			
NITROBENZENE-D5 (surr)				%	75.5	35	100			
PHENOL-D6 (surr)				%	83.6	40	100			
TERPHENYL-D14 (surr)				%	95.7	30	125			

LCSSD	Sample ID: WG326798LCSSD		PCN/SCN: BNA120618-2-30				Analyzed:		07/24/12 20:55	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
ACENAPHTHENE	1666.7		1509	ug/Kg	90.5	45	110	11.7	20	
PYRENE	1666.7		1820	ug/Kg	109.2	45	125	5.7	20	
2,4,6-TRIBROMOPHENOL (surr)				%	94.7	35	125			
2-FLUOROBIPHENYL (surr)				%	93.6	45	105			
2-FLUOROPHENOL (surr)				%	88.0	35	105			
NITROBENZENE-D5 (surr)				%	83.0	35	100			
PHENOL-D6 (surr)				%	90.5	40	100			
TERPHENYL-D14 (surr)				%	101.1	30	125			



Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

Project ID: LONE PINE GAS

PBS		Sample ID: WG326798PBS					Analyzed:		07/24/12 19:53	
Compound	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
2-METHYLNAPHTHALENE			U	ug/Kg		-300	300			
ACENAPHTHENE			U	ug/Kg		-300	300			
ACENAPHTHYLENE			U	ug/Kg		-300	300			
ANTHRACENE			U	ug/Kg		-300	300			
BENZO(A)ANTHRACENE			U	ug/Kg		-300	300			
BENZO(A)PYRENE			U	ug/Kg		-300	300			
BENZO(B)FLUORANTHENE			U	ug/Kg		-300	300			
BENZO(G,H,I)PERYLENE			U	ug/Kg		-300	300			
BENZO(K)FLUORANTHENE			U	ug/Kg		-300	300			
CHRYSENE			U	ug/Kg		-300	300			
DIBENZO(A,H)ANTHRACENE			U	ug/Kg		-300	300			
FLUORANTHENE			U	ug/Kg		-300	300			
FLUORENE			U	ug/Kg		-300	300			
INDENO(1,2,3-CD)PYRENE			U	ug/Kg		-300	300			
NAPHTHALENE			U	ug/Kg		-300	300			
PHENANTHRENE			U	ug/Kg		-300	300			
PYRENE			U	ug/Kg		-300	300			
2,4,6-TRIBROMOPHENOL (surr)				%	89.4	35	125			
2-FLUOROBIPHENYL (surr)				%	89.3	45	105			
2-FLUOROPHENOL (surr)				%	88.1	35	105			
NITROBENZENE-D5 (surr)				%	80.3	35	100			
PHENOL-D6 (surr)				%	88.8	40	100			
TERPHENYL-D14 (surr)				%	97.6	30	125			

Lone Pine Gas, Inc.

ACZ Project ID: **L95687**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L95687-01</b>	WG326557	*All Compounds*	M3540	D1	Sample required dilution due to matrix.
	WG326798		M3540	D1	Sample required dilution due to matrix.
	WG326976		M8021B/8015D GC/PID/FID	D1	Sample required dilution due to matrix.
	WG326631	OTP	M8015D GC/FID	SA	Surrogate recovery was outside acceptance limits due to matrix interference.
	WG326959	*All Compounds*	M8270C GC/MS	D1	Sample required dilution due to matrix.
			M8270C GC/MS	MD	The spike recovery (and spike duplicate RPD, if applicable) was not used for data validation because the concentration of the sample and/or the spike was less than the reporting limit.
			M8270C GC/MS	S8	The sample required a dilution such that the surrogate recovery calculation does not provide useful information. The recovery for the associated control sample was acceptable.
	WG326557		M3540	D1	Sample required dilution due to matrix.
	WG326798		M3540	D1	Sample required dilution due to matrix.
<b>L95687-02</b>	WG326976	*All Compounds*	M8021B/8015D GC/PID/FID	D1	Sample required dilution due to matrix.
	WG326557		M3540	D1	Sample required dilution due to matrix.
<b>L95687-03</b>	WG326976	*All Compounds*	M8021B/8015D GC/PID/FID	D1	Sample required dilution due to matrix.
		Benzene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
		Toluene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
	WG326557	*All Compounds*	M3540	D1	Sample required dilution due to matrix.
<b>L95687-04</b>	WG326976	*All Compounds*	M8021B/8015D GC/PID/FID	D1	Sample required dilution due to matrix.
		Benzene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
		Toluene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
	WG326557	*All Compounds*	M3540	D1	Sample required dilution due to matrix.
<b>L95687-05</b>	WG326976	*All Compounds*	M8021B/8015D GC/PID/FID	D1	Sample required dilution due to matrix.
		Benzene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
		m p Xylene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
		Toluene	M8021B/8015D GC/PID/FID	ZM	Data is estimated because result is below 200 ug/Kg; ACZ does not have a closed-system purge and trap as described in method 5035.
	WG326631	OTP	M8015D GC/FID	S8	The sample required a dilution such that the surrogate recovery calculation does not provide useful information. The recovery for the associated control sample was acceptable.
	WG326557	*All Compounds*	M3540	D1	Sample required dilution due to matrix.

**Lone Pine Gas, Inc.**

ACZ Project ID: **L95687**

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Conductivity @25C	SM2510B
pH, Saturated Paste	USDA No. 60 (21A)
Solids, Percent	CLPSOW390, PART F, D-98

**Lone Pine Gas, Inc.**  
LONE PINE GAS

ACZ Project ID: L95687  
Date Received: 07/17/2012 09:56  
Received By: ksj  
Date Printed: 7/17/2012

**Receipt Verification**

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2) Is the Chain of Custody or other directive shipping papers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) Does this project require special handling procedures such as CLP protocol?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4) Are any samples NRC licensable material?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5) If samples are received past hold time, proceed with requested short hold time analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) Is the Chain of Custody complete and accurate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) Were any changes made to the Chain of Custody prior to ACZ receiving the samples? A change was made in the ID Line 6 section prior to ACZ custody.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Samples/Containers**

	YES	NO	NA
8) Are all containers intact and with no leaks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9) Are all labels on containers and are they intact and legible?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10) Do the sample labels and Chain of Custody match for Sample ID, Date, and Time? L95687-04 Container B1230233: The sample ID on the container is ''Suldge Pit South 30'' and on the chain of custody it is ''South 24''. The sample ID was entered per the COC.  L95687-04 Container B1230234: The sample ID on the container is ''Sludge Pit South 30'' and on the COC it is ''South 24''. The sample ID was entered per the COC.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11) For preserved bottle types, was the pH checked and within limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12) Is there sufficient sample volume to perform all requested work?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13) Is the custody seal intact on all containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14) Are samples that require zero headspace acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15) Are all sample containers appropriate for analytical requirements? L95687-01 : The gallon ziplock bag was not used for this sample and there may be limited volume to perform all analysis.  L95687-02 : The gallon ziplock bag was not used for this sample and there may be limited volume to perform all analysis.  L95687-03 : The gallon ziplock bag was not used for this sample and there may be limited volume to perform all analysis.  L95687-04 : The gallon ziplock bag was not used for this sample and there may be limited volume to perform all analysis.  L95687-05 : The gallon ziplock bag was not used for this sample and there may be limited volume to perform all analysis.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16) Is there an Hg-1631 trip blank present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17) Is there a VOA trip blank present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Lone Pine Gas, Inc.**  
LONE PINE GAS

ACZ Project ID: L95687  
Date Received: 07/17/2012 09:56  
Received By: ksj  
Date Printed: 7/17/2012

18) Were all samples received within hold time?

☒ X

**Chain of Custody Related Remarks**

**Client Contact Remarks**

**Shipping Containers**

Cooler Id	Temp (°C)	Rad (µR/Hr)	Custody Seal Intact?
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3715	5.8	15	Yes

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

695687

## CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Steven Skute  
Company: Lone Pine Cars, Inc  
E-mail: pipeline@rofl.net

Address: 4505 S. Broadway  
Englewood, CO 80113

Telephone: 970-928-9208

Copy of Report to

Name: Randy Miller  
Company: North Park Engineering

E-mail:	randy@npeng.com
Telephone:	270-218-4974

Invoice to

Name: Steven Shute  
Company: Lone Pine Gas, Inc.  
E-mail: pipeline @ rop.net

Address: 4505 S. Broadway  
Englewood CO 80113  
Telephone: 970-722-7208

If sample(s) received past holding time (HT), or if insufficient H<sup>+</sup> remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES	<input checked="" type="checkbox"/>
NO	<input type="checkbox"/>

If "No" then A&Z will contact client for further instruction. If neither "Yes" nor "No" is entered

As indicated, AICZ will proceed with the requested analyses, even if off-, expired, and data-wait-to-be-qualified

Are samples for SDWA Compliance Monitoring?

Yes		No	X
-----	--	----	---

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: <u>R. Miller</u>	Sampler's site information	State: <u>CO</u>	Zip code: <u>80480</u>	Time Zone: <u>Mtn</u>
----------------------------------	----------------------------	------------------	------------------------	-----------------------

## PROJECT INFORMATION

Quote #:	910-1
Project/PO #:	Long Pine
Reporting state for compliance testing:	
Check box if samples include NRC licensed material?	<input type="checkbox"/>

of Containers	101	10-1 W/PAH	EX, TPA-GGO, DSC'				
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SAMPLE IDENTIFICATION	DATE/TIME	Matrix
-----------------------	-----------	--------

Sludge Pit Bottom 35	7-12-12	11:00	50
Sludge Pit North 24		13:30	50
Sludge Pit West 24		13:40	50
Sludge Pit South 24		13:50	50
Sludge Pit East 24		14:00	50
		<del>14:10</del>	<del>50</del>
Sludge Pit GW 35		14:50	6W


Matrix	SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify):
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## REMARKS

PAH on sample #1 only

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RE INQUISITION BY

DATE TIME

RECEIVED BY

DATE TIME

\_\_\_\_\_  
Kenneth R. Miller

7/16/12

low - Retain for your records.