



# Q3 2020 SVE

LT Environmental, Inc.

848 East Second Avenue  
Durango, Colorado 81301  
970.385.1096

October 23, 2020

Mr. Cory Smith  
New Mexico Oil Conservation Division  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

**RE: Quarterly Solar SVE System Update  
Trunk L Tank Battery  
Harvest Four Corners, LLC  
Incident Number NVF1900731813  
Remediation Permit Number 3RP-13665  
Rio Arriba County, New Mexico**

Reviewed/RCVD by

CS 

Continue to Operate as Approved,  
Operator will consult with OCD,  
and submit a soil sample closure plan  
to confirm remediation at that time.

Dear Mr. Smith:

LT Environmental, Inc. (LTE), a member of WSP, on behalf of Harvest Four Corners, LLC (Harvest), presents the following quarterly report summarizing the solar soil vapor extraction (SVE) system performance at the Trunk L Tank Battery (Site), located in Unit A of Section 28, Township 28 North, Range 05 West, in Rio Arriba County, New Mexico (Figure 1).

## BACKGROUND

The solar SVE system was installed on September 18, 2019, to remediate subsurface soil impacts following a release on December 14, 2018. Excessive liquids were released onto the Site during a pigging event. Additionally, the volume of fluid in the slug catcher was elevated due to a stuck float valve, causing a release of approximately 22 barrels (bbls) into the lined secondary containment. Harvest reported the release to the New Mexico Oil Conservation Division (NMOCD) on a Release Notification and Corrective Action Form C-141 on December 28, 2018, and the event was assigned Incident Number NVF1900731813. A SVE system was installed to remediate impacts resulting from the release. Previous SVE installation, soil sampling, and delineation activities are summarized in earlier reports submitted to the NMOCD dated April 12, 2019, January 24, 2020, April 30, 2020, and July 31, 2020.

## SOLAR SVE SYSTEM OPERATION AND MONITORING

The solar SVE system consists of 3 deep SVE wells, 3 shallow SVE wells, and a 2.75 horsepower, three-phase blower capable of producing 105 cubic feet per minute (cfm) at 50 inches of water column (IWC) vacuum, with a maximum vacuum capability of 84 IWC. Each SVE well was installed with its own adjustable valve and vacuum gauge on a manifold to control flow and vacuum. LTE utilized a solar-powered SVE system due to the remote location and the lack of electrical grid power at the Site. The blower is powered by 10 solar panels with a nominal maximum power output of 3,050 watts. The blower is connected to the solar panels via a motor controller that

automatically starts the system as soon as sunlight is available and throttles the blower up as sun power increases throughout the day to maximize efficiency. Seasonally, there are approximately 10 hours in the winter and 12 hours in the summer of available solar power in Farmington, New Mexico. The complete solar SVE system is constructed as one unit designed for utilization at off-grid locations and operates autonomously. The layout of the solar SVE system is depicted on Figure 2.

Between startup of the SVE system on September 18, 2019, and the most recent site visit on September 15, 2020, there have been 363 days of operation, with an estimated 4,489 total hours of nominal daylight available for solar SVE system operation. Since installation, the system had an actual runtime of 4,447 hours, for an overall runtime efficiency of 99.1 percent (%). Below is a table showing SVE system runtime in comparison with nominal available daylight hours per month, according to the National Oceanic and Atmospheric Administration's National Weather Service.

Time Period	Start up on September 18, 2019 to June 10, 2020	June 11, 2020 to June 30, 2020	July 2020	August 2020	September 1, 2020 to September 15, 2020
Days	266	20	31	31	15
Avg. Nominal Daylight Hours	12	14	14	13	12
Available Runtime Hours	3,192	280	434	403	180
<b>Total Available Daylight Runtime Hours</b>					<b>4,489</b>
<b>Actual Runtime Hours</b>					<b>4,447</b>
<b>Cumulative % Runtime</b>					<b>99.1%</b>
<b>Quarterly Available Daylight Runtime Hours</b>					<b>1,297</b>
<b>Quarterly Runtime Hours</b>					<b>1,332</b>
<b>Quarterly % Runtime</b>					<b>102.7%</b>

### Air Emissions Monitoring

An initial air sample was collected on September 18, 2019, from the influent side of the blower on the solar SVE system. Subsequent air samples were collected with the most recent sample collected September 15, 2020 (Table 1). Samples were collected in Tedlar® bags and submitted to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico, for analyses of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (EPA) Method 8021 and total volatile petroleum hydrocarbons (TVPH) using EPA Method 8015.

Estimated air emissions were calculated using air sample data collected to-date (Table 2). The impacted mass source removal via the solar SVE system to-date is an estimated 11,372 pounds (lbs) of TVPH. An estimated 1,834 gallons of air equivalent condensate has been recovered to-date. An increase in TVPH analytical results was observed due to system optimization, through

focusing system operation on the four SVE wells with the highest photoionization detector measurements.

### PLAN FOR NEXT QUARTER OF OPERATION

During the upcoming 4<sup>th</sup> quarter 2020 operations, visits to the Site will continue on a monthly basis by LTE personnel to ensure 90% runtime efficiency continues and that any maintenance issues are addressed. An air sample will be collected in the 4<sup>th</sup> quarter and analyzed for BTEX by EPA Method 8021 and TVPH by EPA Method 8015. An updated quarterly report with sample results, runtime, and mass source removal will be submitted under separate cover.

Quarterly air sampling and reporting will continue until a decline in volatile organic compounds (VOCs) is observed and indicates that hydrocarbon impacts have been reduced. At that time, LTE will conduct additional soil sampling to investigate potential residual impacts and request closure if concentrations of BTEX and TPH are below the applicable standards as detailed in the approved Remediation Work Plan dated May 28, 2019.

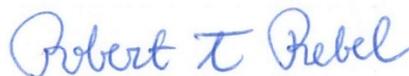
If the final delineation samples indicate hydrocarbon impact has been reduced to below Table 1 Closure Criteria, LTE will present the confirmation laboratory analysis data in a report and request closure of the release. Should the results indicate that analytes in the soil exceed Table 1 Closure Criteria, LTE will continue to operate the system and potentially make adjustments based on results of the investigation.

Sincerely,

LT ENVIRONMENTAL, INC.



Eric Carroll  
Staff Geologist



Robert Rebel, P.E.  
Senior Engineer

cc: Kijun Hong, Harvest Four Corners

### ATTACHMENTS

Figure 1	Site Location Map
Figure 2	SVE System Layout
Table 1	Air Sample Analytical Results
Table 2	Soil Vapor Extraction System Recovery & Emissions Summary
Attachment 1	Laboratory Analytical Report



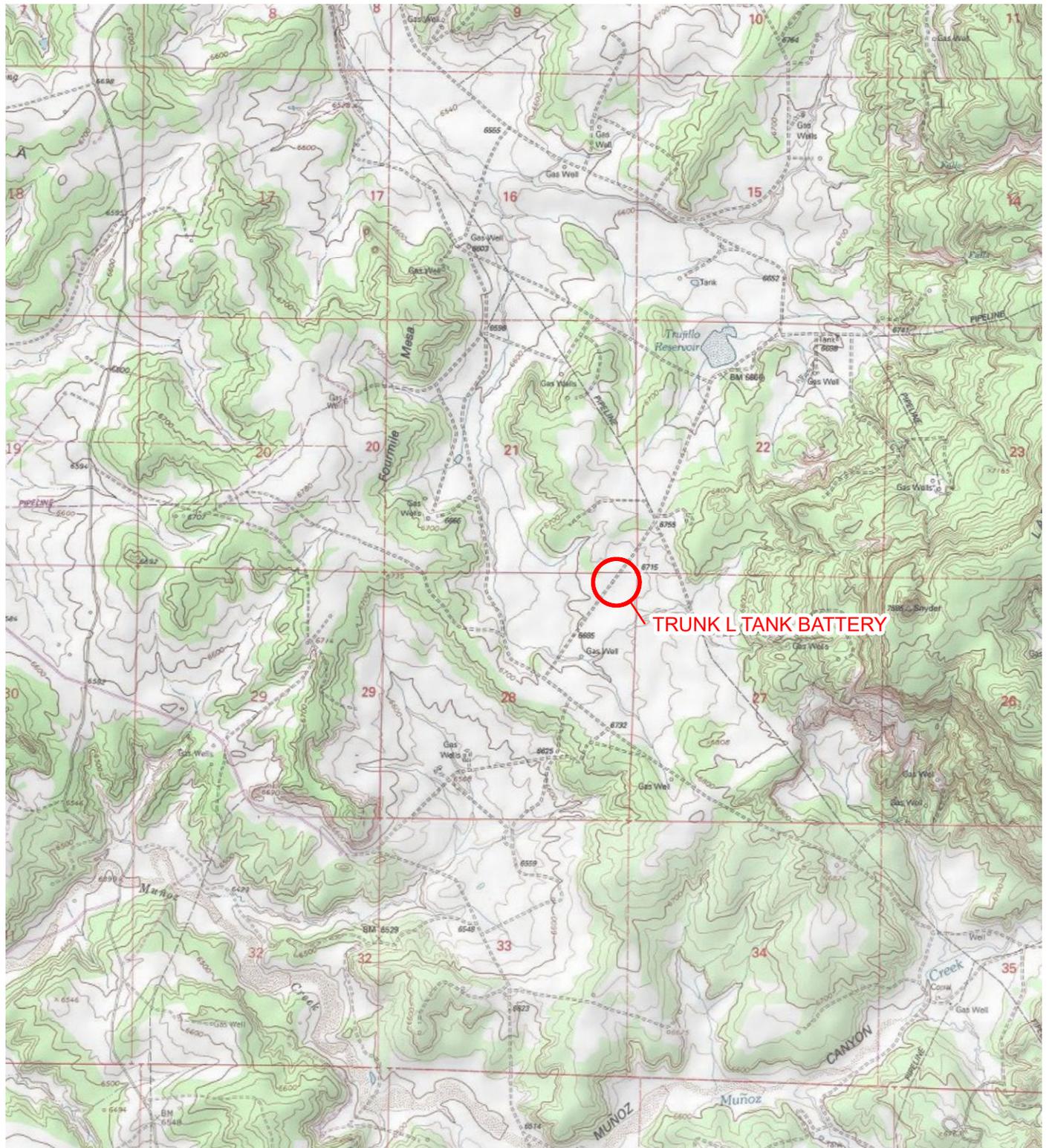
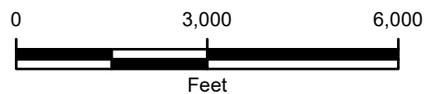


IMAGE COURTESY OF ESRI/USGS

**LEGEND**

 SITE LOCATION



**FIGURE 1**  
**SITE LOCATION MAP**  
**TRUNK L TANK BATTERY**  
**NENE SEC 28 T28N R5W**  
**RIO ARRIBA COUNTY, NEW MEXICO**  
**HARVEST FOUR CORNERS, LLC**



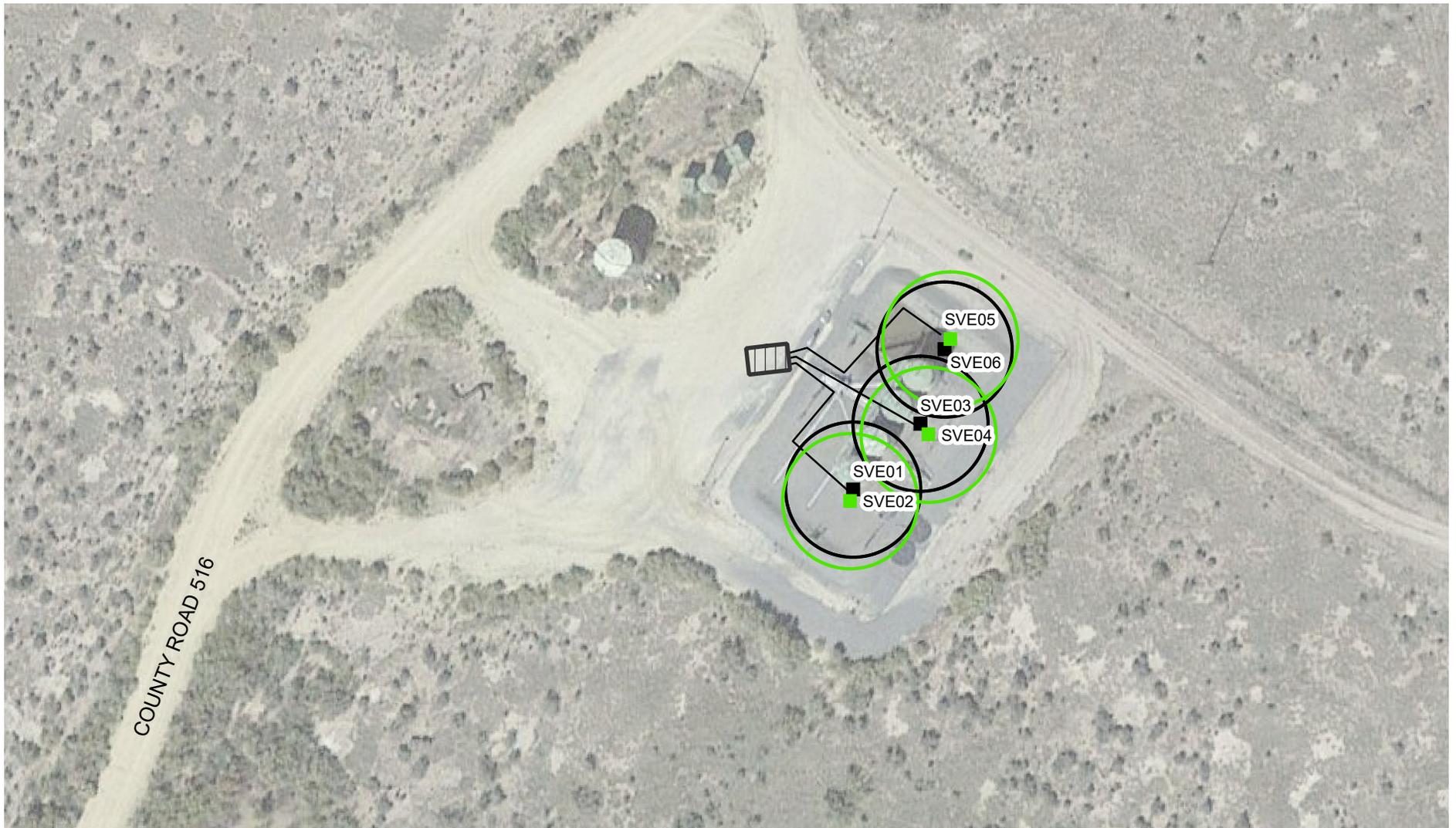
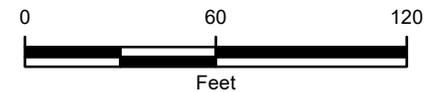


IMAGE COURTESY OF GOOGLE EARTH 2016

**LEGEND**

- SHALLOW SVE WELL
- DEEP SVE WELL
- ABOVEGROUND REMEDIATION SYSTEM LINE
- ▨ SOLAR SVE SKID
- 27.5 FOOT SHALLOW SVE RADIUS OF INFLUENCE
- 27.5 FOOT DEEP SVE RADIUS OF INFLUENCE



**FIGURE 2**  
**SVE SYSTEM LAYOUT**  
**TRUNK L TANK BATTERY**  
**NENE SEC 28 T28N R5W**  
**RIO ARRIBA COUNTY, NEW MEXICO**  
**HARVEST FOUR CORNERS, LLC**





**TABLE 1  
AIR SAMPLE ANALYTICAL RESULTS**

**TRUNK L TANK BATTERY  
HARVEST FOUR CORNERS, LLC  
RIO ARRIBA COUNTY, NEW MEXICO**

Sample ID	Sample Date	Vapor PID (ppm)	Benzene (µg/L)	Toluene (µ/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
Influent 9/18	9/18/2019	946	1,000	1,500	50	550	NA
Influent 10/18	10/18/2019	931	250	410	6.5	74	NA
Influent 11/14	11/14/2019	578	1.8	4.3	0.19	1.7	250
Influent 3/3/20	3/3/2020	868	3.9	22	1.3	13	760
Influent 5/1/20	5/1/2020	913	610	1,500	58	570	95,000
Influent 6/10/20	6/10/2020	1,527	640	1,600	56	530	95,000
Influent 9/15	9/15/2020	1,077	180	840	24	230	35,000

**NOTES:**

µg/L - micrograms per liter

NA - not analyzed

pid - photoionization detector

PPM - parts per million

TVPH- total volume petroleum hydrocarbons



**TABLE 2  
SOIL VAPOR EXTRACTION SYSTEM RECOVERY & EMISSIONS SUMMARY**

**TRUNK L TANK BATTERY  
HARVEST FOUR CORNERS, LLC  
RIO ARRIBA COUNTY, NEW MEXICO**

**Sample Information and Lab Analysis**

Date	Total Flow (cf)	Delta Flow (cf)	PID (ppm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TVPH (µg/L)
9/18/2019*	3,033	3,033	1,435	1,000	1,500	50	550	3,013
10/18/2019*	723,303	720,270	931	250	410	6.5	74	744
11/14/2019	1,334,343	611,040	578	1.8	4.3	0.19	1.7	250
3/3/2020	2,898,866	1,564,523	868	3.9	22	1.3	13	760
4/1/2020**	3,795,613	896,747	838	3.7	21	1.2	12	733
5/1/2020	3,882,637	87,024	913	610	1,500	58	570	95,000
6/10/2020	4,869,885	987,248	1,527	640	1,600	56	530	95,000
9/15/2020	7,089,263	3,293,650	1,077	180	840	24	230	35,000
Average			1,021	336	737	25	248	28,813

**Vapor Extraction Calculations**

Date	Flow Rate (cfm)	Benzene (lb/hr)	Toluene (lb/hr)	Ethylbenzene (lb/hr)	Total Xylenes (lb/hr)	TVPH (lb/hr)
9/18/2019	33.70	0.1262	0.1892	0.0063	0.0694	0.380
10/18/2019	37.75	0.0353	0.0579	0.0009	0.0105	0.105
11/14/2019	38.00	0.0003	0.0006	0.0000	0.0002	0.036
3/3/2020	21.26	0.0003	0.0018	0.0001	0.0010	0.060
4/1/2020	21.26	0.0003	0.0017	0.0001	0.0010	0.058
5/1/2020	39.20	0.0895	0.2201	0.0085	0.0836	13.940
6/10/2020	29.33	0.0703	0.1757	0.0061	0.0582	10.430
9/15/2020	27.77	0.0187	0.0873	0.0025	0.0239	3.638
Average	31.03	0.05	0.09	0.00	0.03	3.57

**Pounds Extracted Over Total Operating Time**

Date	Total Operational Hours	Delta Hours	Benzene (lbs)	Toluene (lbs)	Ethylbenzene (lbs)	Total Xylenes (lbs)	Total BTEX (lbs)	TVPH (lbs)
9/18/2019	1.5	1.5	0.2	0.3	0.0	0.1	0.6	0.6
10/18/2019	319.5	318.0	11.2	18.4	0.3	3.3	33.3	33.4
11/14/2019	587.5	268.0	0.1	0.2	0.0	0.1	0.3	9.5
3/3/2020	1,814	1,226.5	0.4	2.1	0.1	1.3	3.9	74.2
4/1/2020	2,517	703.0	0.2	1.2	0.1	0.7	2.1	41.0
5/1/2020	2,554	37.0	3.3	8.1	0.3	3.1	14.9	515.8
6/10/2020	3,115	561.0	39.4	98.6	3.4	32.6	174.1	5,851
9/15/2020	4,447	1,332.0	24.9	116.3	3.3	31.8	176.4	4,846
Total Extracted to Date			79.7	245.2	7.6	73.0	405.5	11,372

**NOTES**

\* - TVPH data extrapolated from PID values

\*\* - Analytical data extrapolated from PID values

BTEX - benzene, toluene, ethylbenzene, total xylenes

cf - cubic feet

cfm - cubic feet per minute

lbs - pounds

lb/hr - pounds per hour

µg/L - microgram per liter

PID - photoionization detector

ppm - parts per million

TVPH - total volatile petroleum hydrocarbons







Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [clients.hallenvironmental.com](http://clients.hallenvironmental.com)

September 21, 2020

Kijun Hong

Harvest

1755 Arroyo Dr.

Bloomfield, NM 87413

TEL: (505) 632-4475

FAX:

RE: Trunk L

OrderNo.: 2009842

Dear Kijun Hong:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/16/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2009842

Date Reported: 9/21/2020

**CLIENT:** Harvest

**Client Sample ID:** Influent 9/15

**Project:** Trunk L

**Collection Date:** 9/15/2020 11:45:00 AM

**Lab ID:** 2009842-001

**Matrix:** AIR

**Received Date:** 9/16/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	35000	250		µg/L	50	9/17/2020 9:10:59 AM	GA71929
Surr: BFB	173	28.9-257		%Rec	50	9/17/2020 9:10:59 AM	GA71929
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	180	5.0		µg/L	50	9/17/2020 9:10:59 AM	BA71929
Toluene	840	10		µg/L	100	9/17/2020 1:30:03 PM	BA71929
Ethylbenzene	24	5.0		µg/L	50	9/17/2020 9:10:59 AM	BA71929
Xylenes, Total	230	10		µg/L	50	9/17/2020 9:10:59 AM	BA71929
Surr: 4-Bromofluorobenzene	104	79.9-124		%Rec	50	9/17/2020 9:10:59 AM	BA71929

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2009842

21-Sep-20

Client: Harvest

Project: Trunk L

Sample ID: <b>2009842-001adup</b>	SampType: <b>DUP</b>	TestCode: <b>EPA Method 8015D: Gasoline Range</b>								
Client ID: <b>Influent 9/15</b>	Batch ID: <b>GA71929</b>	RunNo: <b>71929</b>								
Prep Date:	Analysis Date: <b>9/17/2020</b>	SeqNo: <b>2518406</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	31000	250						10.5	20	
Surr: BFB	190000		100000		185	28.9	257	0	0	

## Qualifiers:

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 2009842

21-Sep-20

**Client:** Harvest

**Project:** Trunk L

Sample ID: <b>2009842-001adup</b>	SampType: <b>DUP</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>Influent 9/15</b>	Batch ID: <b>BA71929</b>	RunNo: <b>71929</b>								
Prep Date:	Analysis Date: <b>9/17/2020</b>	SeqNo: <b>2518415</b> Units: <b>µg/L</b>								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	160	5.0						14.0	20	
Toluene	550	5.0						10.0	20	E
Ethylbenzene	23	5.0						3.85	20	
Xylenes, Total	220	10						5.12	20	
Surr: 4-Bromofluorobenzene	100		100.0		99.8	79.9	124	0	0	

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
 D Sample Diluted Due to Matrix  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 PQL Practical Quantitative Limit  
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 P Sample pH Not In Range  
 RL Reporting Limit

**Sample Log-In Check List**

Client Name: **Harvest**

Work Order Number: **2009842**

RcptNo: 1

Received By: **Cheyenne Cason** 9/15/2020 8:00:00 AM

Completed By: **Isaiah Ortiz** 9/16/2020 8:43:01 AM

Reviewed By: **SPA 9.16.20**

*IOX*

**Chain of Custody**

1. Is Chain of Custody complete? Yes  No  Not Present
2. How was the sample delivered? Courier

**Log In**

3. Was an attempt made to cool the samples? Yes  No  NA
4. Were all samples received at a temperature of >0° C to 6.0°C Yes  No  NA
5. Sample(s) in proper container(s)? Yes  No
6. Sufficient sample volume for indicated test(s)? Yes  No
7. Are samples (except VOA and ONG) properly preserved? Yes  No
8. Was preservative added to bottles? Yes  No  NA
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes  No  NA
10. Were any sample containers received broken? Yes  No
11. Does paperwork match bottle labels? Yes  No   
 (Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes  No
13. Is it clear what analyses were requested? Yes  No
14. Were all holding times able to be met? Yes  No   
 (If no, notify customer for authorization.)

# of preserved bottles checked for pH: \_\_\_\_\_  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: *Care 9/16/20*

**Special Handling (if applicable)**

15. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified: \_\_\_\_\_ Date: \_\_\_\_\_  
 By Whom: \_\_\_\_\_ Via:  eMail  Phone  Fax  In Person  
 Regarding: \_\_\_\_\_  
 Client Instructions: \_\_\_\_\_

16. Additional remarks:

**17. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Not Present			
2	2.7	Good	Not Present			

