District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office to accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company Burlington Resources Oil &Gas Co.	Contact **Bobby Spearman**
Address 3401 East 30th St, Farmington, NM	Telephone No.(505)-320-3045
Facility Name: Howell A 2	Facility Type: Gas well

Surface Owner: BLM	Mineral Owner: BLM	API No. 3004512165

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
N	**05**	**30N**	**8W**	**990**	**South**	**1650**	**West**	**San Juan**

Latitude 36.83587 Longitude -107.70237

NATURE OF RELEASE

Type of Release Condensate / Produce water	Volume of Release 29/ 12	Volume Recovered 0/0
Source of Release Production tank	Date and Hour of Occurrence	Date and Hour of Discovery **11-28-16 11:30 AM**
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? **Cory Smith NMOCD,**	
By Whom? Bobby Spearman	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Production tank had a corrosion failure

Describe Area Affected and Cleanup Action Taken.*
Excavation was 44 x 42' x5' Deep. 342 c/yds of soil was transported to IEI Land Farm and 342 c/yds of clean soil and placed in the excavation site. Analytical results were above the regulatory standards but COP was allowed to to apply Potassium Permanganate to the excavation – no further action required. The soil sampling report and authorization e-mail for the Potassium is attached for review.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: R.Spearman	OIL CONSERVATION DIVISION	
Printed Name: **Bobby Spearman**	Approved by Environmental Specialist:	
Title: **Field Environmental Specialist**	Approval Date: 7/31/2017	Expiration Date:
E-mail Address: Robert.E.Spearman@conocophillips.com	Conditions of Approval: —	Attached ☐
Date: 7-18-17 Phone: (505) 320-3045		

* Attach Additional Sheets If Necessary

NVF1634435600

Spearman, Bobby E

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Monday, June 26, 2017 9:16 AM
To: Hunter, Lisa
Cc: Spearman, Bobby E; Fields, Vanessa, EMNRD
Subject: RE: [EXTERNAL] RE: Howell A 2 Confirmation sampling Case # NVF16344356

All,

Please try to keep us in the loops for sampling so we can avoid any confusion if the future. OCD Approved COPC plan to spray Potassium Permanganate on the exposed excavation and complete backfill operations. Please include this approval with your Final C-141.

OCD approval does not relieve COPC of any requirements imposed by other regulatory agencies.

Cory Smith
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

From: Hunter, Lisa [mailto:Lisa.Hunter@conocophillips.com]
Sent: Monday, June 26, 2017 9:06 AM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Spearman, Bobby E <Robert.E.Spearman@conocophillips.com>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Subject: RE: [EXTERNAL] RE: Howell A 2 Confirmation sampling Case # NVF16344356

Cory –

My apologies, the scheduling time frame got away from me. I had requested Projects to remove more of the east wall (SC-2), and I knew they had got started on Thursday, June 15th, and in a passing text with Rule, I commented that they may be ready to sample as soon as Monday (June 19th), but had not rejoined the conversation with Projects later Thursday to confirm.

Monday a.m. I received a call from Justin (Rule) saying he was on location (no Project crew), he asked if I still wanted him to grab a sample, and I approved. It was then that I called Projects to confirm how much they had removed from the wall, and in learning that they had removed approximately another 7-8 feet I felt confident that the east wall would be below action levels.

If you need us to schedule another confirmation sampling, I can arrange it.

Thanks,

Lisa Hunter
Field Environmental Specialist
ConocoPhillips Company
505.258.1607
Lisa.Hunter@cop.com

"Archaeology permits us to see small moments in time to witness events in everyday lives not recorded by history."

From: Spearman, Bobby E
Sent: Friday, June 23, 2017 11:16 AM
To: 'Smith, Cory, EMNRD' <Cory.Smith@state.nm.us>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Hunter, Lisa <Lisa.Hunter@conocophillips.com>
Subject: RE: [EXTERNAL] RE: Howell A 2 Confirmation sampling Case # NVF16344356

Cory,
I spoke with the project lead an Conoco did bring in a larger track hoe to excavate the base material but wasn't able to penetrate the rock. He also indicated that a second confirmation notice for the East wall was sent to NMOCD by Lisa. I will check with her on Monday. I was on vacation when this occurred as she was covering for me. So I will have to confirm.

Bobby

From: Smith, Cory, EMNRD [mailto:Cory.Smith@state.nm.us]
Sent: Friday, June 23, 2017 11:01 AM
To: Spearman, Bobby E <Robert.E.Spearman@conocophillips.com>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Hunter, Lisa <Lisa.Hunter@conocophillips.com>
Subject: [EXTERNAL] RE: Howell A 2 Confirmation sampling Case # NVF16344356

Bobby,

After reviewing the results how come Conoco made no further attempt of remediation at the base of the Excavation? While onsite Conco was utilizing a Backhoe was there any consideration for larger equipment? How come Conoco didn't notify the OCD of the results and resampling of SC-2?

Thanks

Cory Smitht
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

From: Spearman, Bobby E [mailto:Robert.E.Spearman@conocophillips.com]
Sent: Friday, June 23, 2017 10:17 AM
To: Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>; Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Hunter, Lisa <Lisa.Hunter@conocophillips.com>
Subject: RE: Howell A 2 Confirmation sampling Case # NVF16344356

Attached are the lab results for the Howell A2 confirmation sampling.
Dimension are 40' x 40'x 5' ft. deep
The site ranking is a 10
The east wall SC-2 was above action levels and was excavated and is now below action levels. See second report
The base SC-5 was terminated on extremely hard sandstone and is excavated to maximum depth practicable but is above closure limits for BTEX.

I would like to request that COP be allowed to spray the bottom of the excavation with Potassium Permanganate and close the excavation based on a site ranking of 10 and Action levels for Benzene of 10 mg/kg, BTEX of 50 mg/kg, and TPH of 5,000 mg/kg.

Thanks

Bobby

From: Spearman, Bobby E
Sent: Tuesday, June 06, 2017 2:04 PM
To: 'Fields, Vanessa, EMNRD' <Vanessa.Fields@state.nm.us>; 'Smith, Cory, EMNRD' <Cory.Smith@state.nm.us>
Cc: Smith, Randall O <Randy.O.Smith@conocophillips.com>; Hunter, Lisa <Lisa.Hunter@conocophillips.com>; 'Heather Woods' <hwoods@ruleengineering.com>
Subject: Howell A 2 Confirmation sampling Case # NVF16344356

Folks
COP will be performing confirmation sampling on the Howell A 2
API No. 3004512165
Unit Letter N S
Section 05
Township 30N
Range 8W
Latitude 36.83515 Longitude -107.70159

On Thursday 6-8-17 beginning at 9:30 AM If you would like to witness

Thanks

Bobby

Howell A #2 Release Report

Unit Letter N, Section 5, Township 30 North, Range 8 West
San Juan County, New Mexico

July 14, 2017

Prepared for:
ConocoPhillips
5525 Highway 64
Farmington, New Mexico 87401

Prepared by:
Rule Engineering, LLC
501 Airport Drive, Suite 205
Farmington, New Mexico 87401

Rule Engineering, LLC
Solutions to Regulations for Industry

ConocoPhillips
Howell A #2 Release Report

Prepared for:

ConocoPhillips
5525 Highway 64
Farmington, New Mexico 87401

Prepared by:

Rule Engineering, LLC
501 Airport Drive, Suite 205
Farmington, New Mexico 87401

Heather M. Woods

Heather M. Woods, P.G., Area Manager

Reviewed by:

Russell Knight, PG, Principal Hydrogeologist

July 14, 2017

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Table 2 Site Assessment Field Screening and Laboratory Analytical Results
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Figure 3 Excavation Confirmation Sample Location Map

Appendices

Appendix A Analytical Laboratory Reports

1.0 Introduction

The ConocoPhillips Howell A #2 release site is located in Unit Letter N, Section 5, Township 30 North, Range 8 West, in San Juan County, New Mexico. A release of condensate and produced water was discovered at the site on November 28, 2016.

A topographic map of the location reproduced from the United States Geological Society quadrangle map of the area is included as Figure 1 and an aerial site map is included as Figure 2.

2.0 Release Summary

Site Name	Howell A #2		
Site Location Description	Unit Letter N, Section 5, Township 30 North, Range 8 West		
Wellhead GPS Location	N36.83551 and W107.70221	***Release GPS Location***	N36.83587 and W107.70237
Land Jurisdiction	Bureau of Land Management	***Discovery Date***	November 28, 2016
Release Source	Integrity failure of the above ground tank due to corrosion		
NMOCD Site Rank	0		
Distance to Nearest Surface Water	No surface water features were identified within 1,000 feet of the release location.		
Estimated Depth to Groundwater	Greater than 100 feet below ground surface (bgs)	***Distance to Nearest Water Well or Spring***	Greater than 1,000 feet

3.0 NMOCD Site Ranking

In accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills, and Releases (August 1993), this site was assigned a ranking score of 0 (Table 1).

Depth to groundwater at the site is greater than 100 feet bgs based on the elevation differential between the location and local drainages and the depths to groundwater reported for registered water wells and cathodic wells in the area.

A review was completed of the New Mexico Office of the State Engineer (NMOSE) online New Mexico Water Rights Reporting System (NMWRRS) and no water wells were identified within a 1,000 foot radius of the location. No water wells were observed within a 1,000 foot radius of the location during a visual inspection.

No surface water features were identified within 1,000 feet of the release location. The nearest surface water is the wash of Manga Canyon located approximately 2,300 feet to the west.

Based on the ranking score of 0, action levels for remediated soils at the site are as follows: 10 milligrams per kilogram (mg/kg) benzene, 50 mg/kg total benzene, toluene, ethylbenzene, and total xylenes (BTEX), and 5,000 mg/kg total petroleum hydrocarbons (TPH).

4.0 Site Assessment

4.1 Field Activities

A site assessment was conducted to determine the approximate horizontal and vertical extents of the release. On December 28, 2016, Rule personnel advanced nine soil borings (SB-1 through SB-9) utilizing a hand auger. Soil borings were advanced to approximately 1 foot to 4 feet bgs where refusal was encountered on sandstone or tree roots.

Soil boring locations are illustrated on Figure 2.

4.2 Soil Sampling

Rule collected soil samples from each soil boring at selected intervals or at changes in lithology or contamination. The lithology encountered at the site included interbedded clayey sand and poorly graded sand with clay underlain by sandstone to the maximum depths reached.

A portion of each sample was field screened for VOCs and selected samples were also field analyzed for TPH. Field screening for VOC vapors was conducted with a MiniRAE 3000 photoionization detector (PID). Prior to field screening, the PID was calibrated with 100 parts per million (ppm) isobutylene gas. Field analysis for TPH was conducted for selected samples per United States Environmental Protection Agency (USEPA) Method 418.1, utilizing a Buck Scientific HC-404 total hydrocarbon analyzer. Prior to field analysis, the analyzer was calibrated following the manufacturer's procedure which includes calculation of a calibration curve using known concentration standards. Rule's practical quantitation limit for USEPA Method 418.1 is 20 mg/kg.

Site assessment field screening results are summarized in Table 2.

4.3 Field Screening Results

Field screening results for samples collected from soil borings SB-1 through SB-9 indicated VOC concentrations ranging from 4.6 ppm to 3,500 ppm. Field screening results for the site assessment samples in indicated TPH concentrations ranging from 23.0 mg/kg to greater than 5,000 mg/kg.

5.0 Excavation Confirmation Sampling

5.1 Field Activities

Rule personnel collected five excavation confirmation samples (SC-1 through SC-5) on June 8, 2017. Laboratory results for the wall sample SC-2 and the base sample SC-5 indicated Total BTEX and/or TPH concentrations greater than NMOCD action levels. The excavation wall associated with SC-2 was extended and Rule collected an additional sample from this wall on June 19, 2017. ConocoPhillips was granted a variance to spray the sandstone base of the excavation with an oxidizing agent prior to backfilling. The final excavation measured approximately 44 feet by 42 feet by 5 feet in depth. Excavated hydrocarbon impacted soils were transported to a local NMOCD approved landfarm for disposal/remediation and the excavation was backfilled with clean, imported material. A depiction of the final excavation with sample locations is included on Figure 3.

5.2 Soil Sampling

Rule collected five composite confirmation soil samples (SC-1 through SC-5) on June 8, 2017. Rule personnel returned to the site on June 19, 2017, to sample the extended wall represented by sample SC-2. Each confirmation soil sample is a representative composite comprised of five equivalent portions of soil collected from the sampled area.

A portion of each sample was field screened for VOCs and field analyzed for TPH utilizing the same methods as described in Section 4.2.

Soil samples collected for laboratory analysis were placed into laboratory supplied glassware, labeled, and maintained on ice until delivery to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico. Samples were analyzed for BTEX per USEPA Method 8021B, and TPH per USEPA Method 8015M/D.

Field screening and laboratory analytical results are summarized in Table 3. The analytical laboratory reports are included in Appendix A.

5.3 Field Screening Results

Field screening results for soil confirmation samples SC-1 through SC-5 indicated VOC concentrations ranging from 3.5 ppm to 1,919 ppm. Field TPH concentration results for these samples ranged from 35 mg/kg to greater than 2,600 mg/kg.

5.4 Laboratory Analytical Results

Sample SC-2 collected on June 8, 2017, was removed by excavation and is not included in the following discussion.

Laboratory analytical results for final excavation confirmation samples SC-1 through SC-5 reported benzene concentrations ranging from below the laboratory reporting limits, which are below the NMOCD action level of 10 mg/kg. Total BTEX concentrations for the excavation confirmation samples were below the laboratory limit for samples SC-1 though SC-4, which are below the NMOCD action level of 100 mg/kg. The total BTEX concentration for sample SC-5 was reported as 138 mg/kg, which exceeds the NMOCD action level, but was treated with an oxidizing agent prior to backfilling the excavation. Laboratory analytical results for final excavation samples SC-1 though SC-4 reported TPH concentrations below the laboratory reporting limits, which are below the NMOCD action level of 5,000 mg/kg for a site rank of 0. The total TPH concentration for sample SC-5 was reported as 6,320 mg/kg, which exceeds the NMOCD action level, but was treated with an oxidizing agent prior to backfilling.

6.0 Conclusions

Hydrocarbon impacted soils associated with a release discovered November 28, 2016, at the ConocoPhillips Howell A #2 have been excavated and transported to an NMOCD approved landfarm for disposal/remediation. Field screening and laboratory analytical results for samples collected from the final excavation sidewalls indicate that concentrations of benzene, total BTEX, and TPH are below NMOCD action levels for a site rank of 0. However, laboratory results for the sample collected from the sandstone base of the excavation indicate that concentrations of total BTEX and TPH exceed the NMOCD action levels. ConocoPhillips was granted a variance to spray the excavation base with an oxidizing agent prior to backfilling the excavation with clean, imported material. Therefore, no further work is recommended at this time.

7.0 Closure and Limitations

This report has been prepared for the exclusive use of ConocoPhillips and is subject to the terms, conditions, and limitations stated in Rule's report and Service Agreement with ConocoPhillips. All work has been performed in accordance with generally accepted professional environmental consulting practices. No other warranty is expressed or implied.

Tables

Table 1. NMOCD Site Ranking Determination
ConocoPhillips
Howell A #2
San Juan County, New Mexico

Ranking Criteria	Ranking Score	Site-Based Ranking Score	Basis for Determination	Data Sources
Depth to Groundwater				
<50 feet	20	0	Elevation information derived from the topographic map of the area and reported depth to groundwater for registered water wells and cathodic wells in the area.	NMOCD Online database, NMOSE NMWRRS, Archuleta Quadrangle, Google Earth, and Visual Inspection
50-99 feet	10			
>100 feet	0			
Wellhead Protection Area				
<1,000 feet from a water source, or <200 feet from private domestic water source	20 (Yes)	0	No water source or recorded water wells within 1,000 foot radius of location.	NMOSE NMWRRS, Archuleta Quadrangle, Google Earth, and Visual Inspection
	0 (No)			
Distance to Surface Water Body				
<200 horizontal feet	20	0	No surface water features were identified within 1,000 feet of the site.	Archuleta Quadrangle, Google Earth, and Visual Inspection
200 to 1,000 horizontal feet	10			
>1,000 horizontal feet	0			
Site Based Total Ranking Score		**0**		

Table 2. Field Screening Results - VOCs and TPH
ConocoPhillips
Howell A #2
San Juan County, New Mexico

Sample Name	Date	Approximate Sample Depth (ft bgs)	Field VOCs by PID (ppm)	Field TPH by 418.1 (mg/kg)
NMOCD Action Level*			100	5,000
SB-1	12/28/2016	1	**3,389**	--
		2	**3,093**	--
		3	**3,000**	--
		4	**3,165**	**>5,000**
SB-2	12/28/2016	0.5	**2,081**	--
		1	**2,781**	--
		2	**3,100**	--
		3	**3,477**	--
		3.5	**3,500**	**>5,000**
SB-3	12/28/2016	0.5	8.9	--
		1	11.4	--
		2	4.6	--
		2.75	7.0	--
SB-4	12/28/2016	0.5	19.7	--
		1	**169**	--
		2	**212**	--
		3	**393**	<20
		3.25	**232**	--
SB-5	12/28/2016	0.5	26.6	--
SB-6	12/28/2016	1	**129**	--
		2	**289**	--
		3	**2,789**	**>5,000**
SB-7	12/28/2016	1	69.4	--
SB-8	12/28/2016	1.25	**125**	--
		2	**252**	45.9
		3	18.1	--
SB-9	12/28/2016	1	77.4	23.0
		2	65.9	--
		3	23.3	--
		3.25	31.3	--

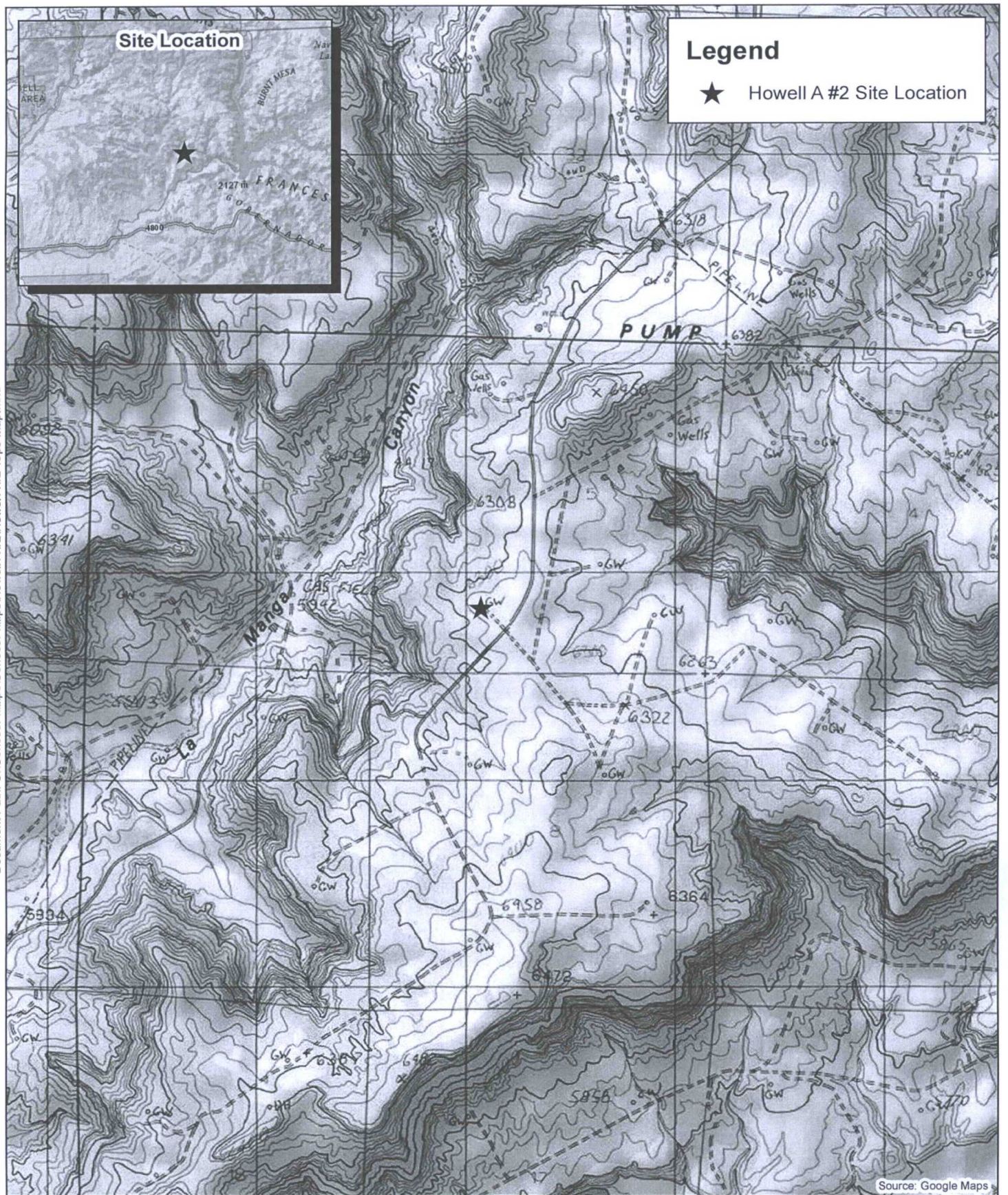
Notes: All borings were terminated at auger refusal weathered sandstone or tree roots.
VOCs - volatile organic compounds
PID - photoionization detector
ft bgs - feet below grade surface
ppm - parts per million
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
NMOCD - New Mexico Oil Conservation Division
*Based on the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases (August 1993)*
**Based on a site ranking of 0.

Table 3. Excavation Field Screening and Laboratory Analytical Results
ConocoPhillips
Howell A #2
San Juan County, New Mexico

Sample Name	Date	Approximate Sample Depth (ft bgs)	Location	Field Results		Preliminary Laboratory Results							
				Field VOCs by PID (ppm)	Field TPH by 418.1 (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylben-zene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH as GRO (mg/kg)	TPH as DRO (mg/kg)	TPH as MRO (mg/kg)
NMOCD Action Level*				**100**	**5,000****	**10**	**NE**	**NE**	**NE**	**50**		**5,000****	
SC-1	6/8/2017	0 to 5	North Wall	65	54	<0.019	<0.038	<0.038	<0.076	ND	<3.8	<9.2	<46
SC-2	6/8/2017	0 to 5	East Wall	**755**	80†	<0.10	9.5	8.0	120	**138**	1,500	2,200	440
	6/19/2017			7.5	63	<0.018	<0.037	<0.037	<0.074	ND	<3.7	<9.8	<49
SC-3	6/8/2017	0 to 5	South Wall	24	43	<0.020	<0.040	<0.040	<0.080	ND	<4.0	<9.5	<47
SC-4	6/8/2017	0 to 5	West Wall	3.5	35	<0.016	<0.033	<0.033	<0.065	ND	<3.3	<9.7	<48
SC-5	6/8/2017	5	Base	**1,919**	**>2,600**	<0.091	1.4	4.9	95	**101**	**1,300**	**4,200**	**820**

Notes:
VOCs - volatile organic compounds
PID - photoionization detector
ft bgs - feet below grade surface
ppm - parts per million
mg/kg - milligrams per kilogram
NE - not-established
ND - not detected above the laboratory reporting limit
TPH - total petroleum hydrocarbons
GRO - gasoline range organics
DRO - diesel range organics
MRO - mineral oil range organics
NMOCD - New Mexico Oil Conservation Division
†Result likely an error due to processing deficiencies
*Based on the NMOCD *Guidelines for Remediation of Leaks, Spills and Releases (August 1993)*
**Based on a site ranking of 30.

Figures



Document Path: U:\ConocoPhillips\ConocoPhillips\Howell A #2\Howell A #2 Topo Map.mxd

Rule Engineering, LLC
Solutions to Regulations for Industry

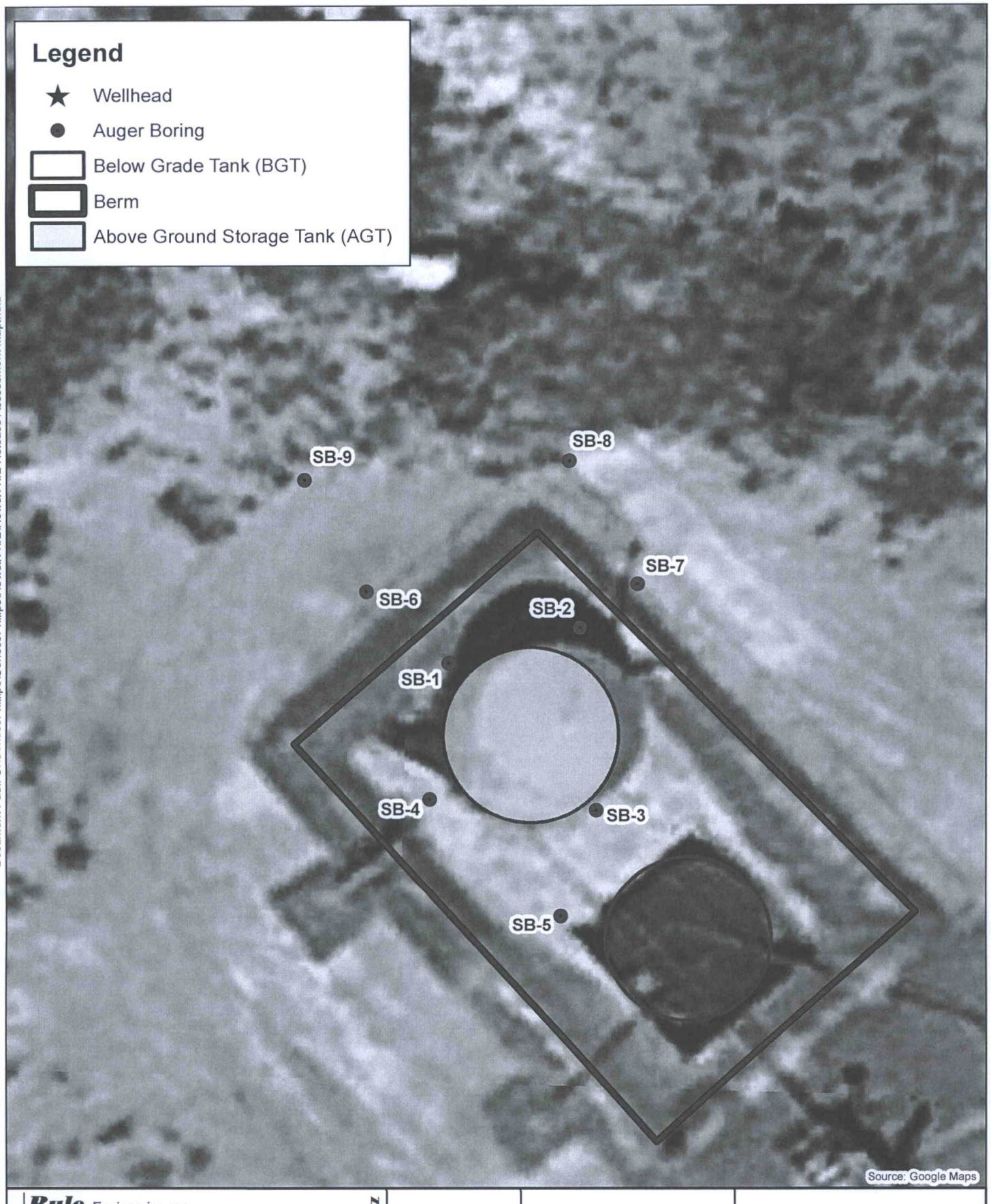
0 0.2 0.4 0.8 Miles

Archuleta Quadrangle
1:24,000

ConocoPhillips

N-5-T30N-R8W
N36.83551, W107.70221
San Juan County, NM
API: 30-045-02165

Figure 1
Topographic Site Map
Howell A #2



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Rule Engineering, LLC
Solutions to Regulations for Industry

0 3 6 12 18 24 Feet

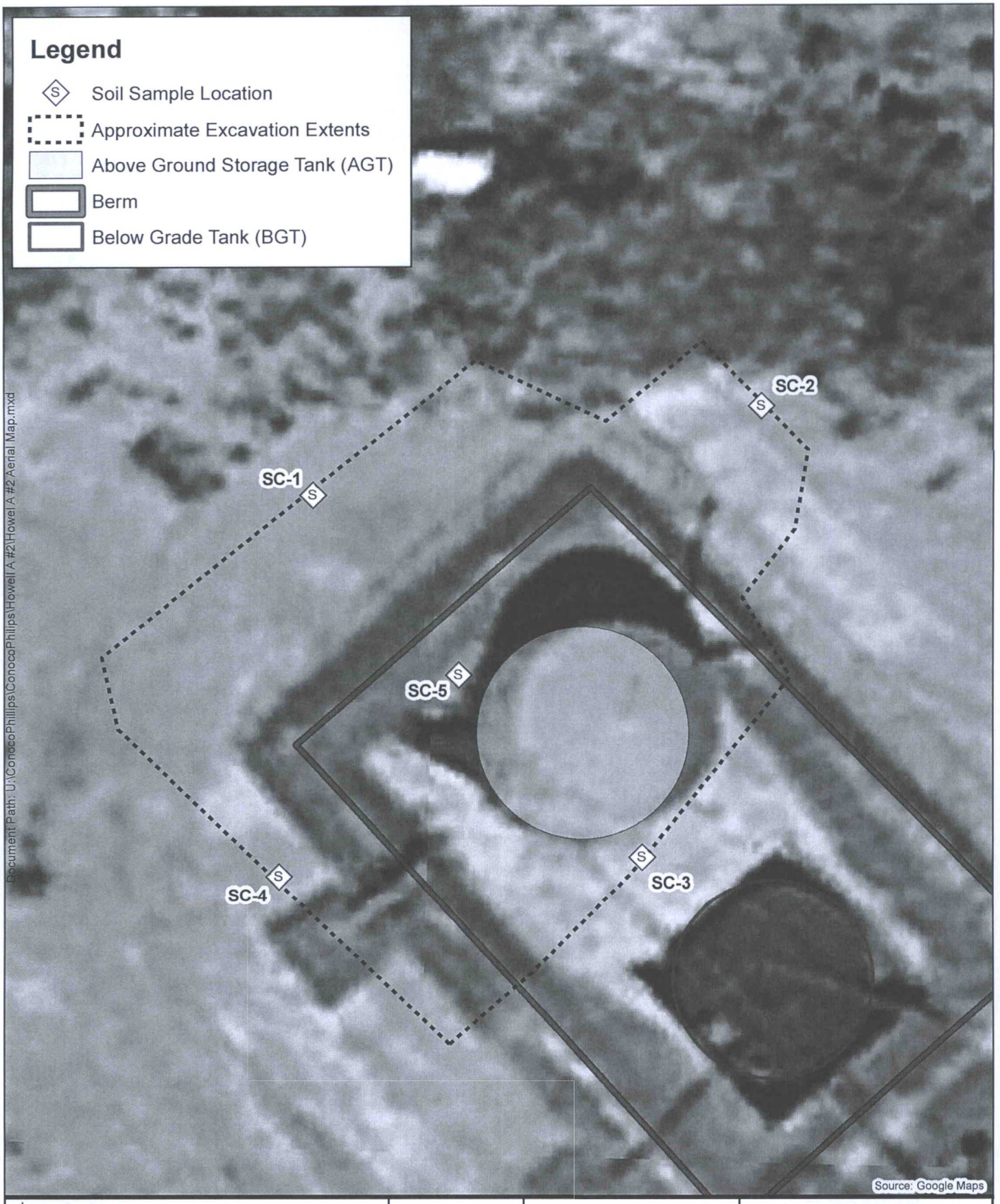
1 inch = 12 feet

N

ConocoPhillips

N-5-T30N-R8W
N36.83551, W107.70221
San Juan County, NM
API: 30-045-02165

Figure 2
Site Assessment Map
Howell A #2



Rule Engineering, LLC
Solutions to Regulations for Industry

0 2.5 5 10 15 20 Feet

1 inch = 10 feet

ConocoPhillips

N-5-T30N-R8W
N36.83551, W107.70221
San Juan County, NM
API: 30-045-02165

Figure 3
Excavation Confirmation Sample Location Map
Howell A #2

Appendix A

Analytical Laboratory Reports

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 12, 2017

Heather Woods
Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: Howell A #2 OrderNo.: 1706480

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 5 sample(s) on 6/9/2017 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 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706480**
Date Reported: **6/12/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Client Sample ID: SC-1
Project: Howell A #2
Collection Date: 6/8/2017 9:15:00 AM
Lab ID: 1706480-001
Matrix: SOIL
Received Date: 6/9/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	6/9/2017 9:26:06 AM	32192
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/9/2017 9:26:06 AM	32192
Surr: DNOP	88.5	70-130		%Rec	1	6/9/2017 9:26:06 AM	32192
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	6/9/2017 9:42:36 AM	G43390
Surr: BFB	99.2	54-150		%Rec	1	6/9/2017 9:42:36 AM	G43390
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.019		mg/Kg	1	6/9/2017 9:42:36 AM	B43390
Toluene	ND	0.038		mg/Kg	1	6/9/2017 9:42:36 AM	B43390
Ethylbenzene	ND	0.038		mg/Kg	1	6/9/2017 9:42:36 AM	B43390
Xylenes, Total	ND	0.076		mg/Kg	1	6/9/2017 9:42:36 AM	B43390
Surr: 4-Bromofluorobenzene	121	66.6-132		%Rec	1	6/9/2017 9:42:36 AM	B43390

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

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Project: Howell A #2
Lab ID: 1706480-002 **Matrix:** SOIL

Client Sample ID: SC-2
Collection Date: 6/8/2017 9:30:00 AM
Received Date: 6/9/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	2200	37		mg/Kg	4	6/9/2017 12:50:03 PM	32192
Motor Oil Range Organics (MRO)	440	190		mg/Kg	4	6/9/2017 12:50:03 PM	32192
Surr: DNOP	107	70-130		%Rec	4	6/9/2017 12:50:03 PM	32192
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1500	21		mg/Kg	5	6/9/2017 10:06:29 AM	G43390
Surr: BFB	2230	54-150	S	%Rec	5	6/9/2017 10:06:29 AM	G43390
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.10		mg/Kg	5	6/9/2017 10:06:29 AM	B43390
Toluene	9.5	0.21		mg/Kg	5	6/9/2017 10:06:29 AM	B43390
Ethylbenzene	8.0	0.21		mg/Kg	5	6/9/2017 10:06:29 AM	B43390
Xylenes, Total	120	4.1		mg/Kg	50	6/9/2017 12:30:38 PM	B43390
Surr: 4-Bromofluorobenzene	135	66.6-132	S	%Rec	50	6/9/2017 12:30:38 PM	B43390

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

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Client Sample ID: SC-3
Project: Howell A #2
Collection Date: 6/8/2017 9:40:00 AM
Lab ID: 1706480-003
Matrix: SOIL
Received Date: 6/9/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	6/9/2017 10:32:29 AM	32192
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/9/2017 10:32:29 AM	32192
Surr: DNOP	95.3	70-130		%Rec	1	6/9/2017 10:32:29 AM	32192
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.0		mg/Kg	1	6/9/2017 10:54:25 AM	G43390
Surr: BFB	102	54-150		%Rec	1	6/9/2017 10:54:25 AM	G43390
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.020		mg/Kg	1	6/9/2017 10:54:25 AM	B43390
Toluene	ND	0.040		mg/Kg	1	6/9/2017 10:54:25 AM	B43390
Ethylbenzene	ND	0.040		mg/Kg	1	6/9/2017 10:54:25 AM	B43390
Xylenes, Total	ND	0.080		mg/Kg	1	6/9/2017 10:54:25 AM	B43390
Surr: 4-Bromofluorobenzene	122	66.6-132		%Rec	1	6/9/2017 10:54:25 AM	B43390

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

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Project: Howell A #2
Lab ID: 1706480-004 **Matrix:** SOIL

Client Sample ID: SC-4
Collection Date: 6/8/2017 9:45:00 AM
Received Date: 6/9/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	6/9/2017 10:54:47 AM	32192
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/9/2017 10:54:47 AM	32192
Surr: DNOP	96.8	70-130		%Rec	1	6/9/2017 10:54:47 AM	32192
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.3		mg/Kg	1	6/9/2017 11:18:39 AM	G43390
Surr: BFB	103	54-150		%Rec	1	6/9/2017 11:18:39 AM	G43390
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.016		mg/Kg	1	6/9/2017 11:18:39 AM	B43390
Toluene	ND	0.033		mg/Kg	1	6/9/2017 11:18:39 AM	B43390
Ethylbenzene	ND	0.033		mg/Kg	1	6/9/2017 11:18:39 AM	B43390
Xylenes, Total	ND	0.065		mg/Kg	1	6/9/2017 11:18:39 AM	B43390
Surr: 4-Bromofluorobenzene	127	66.6-132		%Rec	1	6/9/2017 11:18:39 AM	B43390

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

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Project: Howell A #2
Lab ID: 1706480-005 **Matrix:** SOIL

Client Sample ID: SC-5
Collection Date: 6/8/2017 9:50:00 AM
Received Date: 6/9/2017 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	4200	92		mg/Kg	10	6/9/2017 12:28:01 PM	32192
Motor Oil Range Organics (MRO)	820	460		mg/Kg	10	6/9/2017 12:28:01 PM	32192
Surr: DNOP	0	70-130	S	%Rec	10	6/9/2017 12:28:01 PM	32192
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1300	18		mg/Kg	5	6/9/2017 11:42:35 AM	G43390
Surr: BFB	2560	54-150	S	%Rec	5	6/9/2017 11:42:35 AM	G43390
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.091		mg/Kg	5	6/9/2017 11:42:35 AM	B43390
Toluene	1.4	0.18		mg/Kg	5	6/9/2017 11:42:35 AM	B43390
Ethylbenzene	4.9	0.18		mg/Kg	5	6/9/2017 11:42:35 AM	B43390
Xylenes, Total	95	3.6		mg/Kg	50	6/9/2017 12:54:38 PM	B43390
Surr: 4-Bromofluorobenzene	137	66.6-132	S	%Rec	50	6/9/2017 12:54:38 PM	B43390

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

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706480**

12-Jun-17

Client: Rule Engineering LLC
Project: Howell A #2

Sample ID **LCS-32192**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32192**	RunNo: **43379**
Prep Date: **6/9/2017**	Analysis Date: **6/9/2017**	SeqNo: **1365958** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	83.2	73.2	114			
Surr: DNOP	4.6		5.000		91.6	70	130			

Sample ID **MB-32192**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32192**	RunNo: **43379**
Prep Date: **6/9/2017**	Analysis Date: **6/9/2017**	SeqNo: **1365959** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.5		10.00		84.6	70	130			

Sample ID **1706480-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **SC-1**	Batch ID: **32192**	RunNo: **43379**
Prep Date: **6/9/2017**	Analysis Date: **6/9/2017**	SeqNo: **1366629** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	41	9.5	47.26	5.883	74.9	55.8	122			
Surr: DNOP	4.1		4.726		87.5	70	130			

Sample ID **1706480-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **SC-1**	Batch ID: **32192**	RunNo: **43379**
Prep Date: **6/9/2017**	Analysis Date: **6/9/2017**	SeqNo: **1366630** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	9.3	46.60	5.883	85.4	55.8	122	10.1	20	
Surr: DNOP	4.2		4.660		89.2	70	130	0	0	

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706480**

12-Jun-17

Client: Rule Engineering LLC
Project: Howell A #2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **G43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366595** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	960		1000		96.4	54	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **G43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366596** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	76.4	125			
Surr: BFB	1200		1000		115	54	150			

Sample ID **1706480-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SC-1**	Batch ID: **G43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366597** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	3.8	18.96	0	108	77.8	128			
Surr: BFB	900		758.2		119	54	150			

Sample ID **1706480-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **SC-1**	Batch ID: **G43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366598** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	3.8	18.96	0	101	77.8	128	6.48	20	
Surr: BFB	870		758.2		115	54	150	0	0	

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706480**

12-Jun-17

Client: Rule Engineering LLC
Project: Howell A #2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366613** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.2		1.000		120	66.6	132			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366614** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	104	80	120			
Toluene	1.1	0.050	1.000	0	105	80	120			
Ethylbenzene	1.1	0.050	1.000	0	106	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		127	66.6	132			

Sample ID **1706480-003AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **SC-3**	Batch ID: **B43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366615** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.020	0.7955	0	104	61.5	138			
Toluene	0.84	0.040	0.7955	0.008035	105	71.4	127			
Ethylbenzene	0.85	0.040	0.7955	0	107	70.9	132			
Xylenes, Total	2.6	0.080	2.386	0.03285	108	76.2	123			
Surr: 4-Bromofluorobenzene	1.1		0.7955		139	66.6	132			S

Sample ID **1706480-003AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **SC-3**	Batch ID: **B43390**	RunNo: **43390**
Prep Date:	Analysis Date: **6/9/2017**	SeqNo: **1366616** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.020	0.7955	0	103	61.5	138	0.918	20	
Toluene	0.83	0.040	0.7955	0.008035	103	71.4	127	2.03	20	
Ethylbenzene	0.84	0.040	0.7955	0	106	70.9	132	1.36	20	
Xylenes, Total	2.6	0.080	2.386	0.03285	106	76.2	123	1.56	20	
Surr: 4-Bromofluorobenzene	1.1		0.7955		132	66.6	132	0	0	S

Qualifiers:

*	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL Work Order Number: 1706480 RcptNo: 1

Received By: Anne Thorne 6/9/2017 7:30:00 AM Anne Thorne
Completed By: Anne Thorne 6/9/2017 8:01:57 AM Anne Thorne
Reviewed By: ENM 06/09/17

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client: Rule Engineering, LLC

Mailing Address: 501 Airport Drive Suite 205 Farmington, NM 87401

Phone #: 505 793 9486

email or Fax#: jvaldez@ruleengineering.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:

☐ Standard ☒ Rush SAME DAY

Project Name: HOWELL A #2

Project #:

Project Manager:

Sampler: JV

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1706480	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
6/8/17	915	Soil	SC-1	(1) 4oz Glass	COLD	-001	X		X													
↓	930	↓	SC-2	↓	↓	-002	X		X													
↓	940	↓	SC-3	↓	↓	-003	X		X													
↓	945	↓	SC-4	↓	↓	-004	X		X													
↓	950	↓	SC-5	↓	↓	-005	X		X													

Note in container column: 6/8/17 AT; M-COHLib

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/8/17	1247	[signature]	Christ Walt	6/8/17	1247
6/8/17	1810	Christine Walt	[signature]	06/09/17	0730

Remarks: DIRECT BILL TO CONOCO PHILLIPS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 21, 2017

Heather Woods
Rule Engineering LLC
501 Airport Dr., Ste 205
Farmington, NM 87401
TEL: (505) 325-1055
FAX

RE: HOWELL A #2 OrderNo.: 1706A35

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/20/2017 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 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706A35**
Date Reported: **6/21/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Rule Engineering LLC
Client Sample ID: SC-2
Project: HOWELL A #2
Collection Date: 6/19/2017 9:30:00 AM
Lab ID: 1706A35-001
Matrix: SOIL
Received Date: 6/20/2017 7:35:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	6/20/2017 11:23:43 AM	32384
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/20/2017 11:23:43 AM	32384
Surr: DNOP	93.8	70-130		%Rec	1	6/20/2017 11:23:43 AM	32384
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	6/20/2017 12:26:12 PM	32371
Surr: BFB	98.1	54-150		%Rec	1	6/20/2017 12:26:12 PM	32371
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.018		mg/Kg	1	6/20/2017 12:26:12 PM	32371
Toluene	ND	0.037		mg/Kg	1	6/20/2017 12:26:12 PM	32371
Ethylbenzene	ND	0.037		mg/Kg	1	6/20/2017 12:26:12 PM	32371
Xylenes, Total	ND	0.074		mg/Kg	1	6/20/2017 12:26:12 PM	32371
Surr: 4-Bromofluorobenzene	122	66.6-132		%Rec	1	6/20/2017 12:26:12 PM	32371

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

Qualifiers:

*	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 Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706A35**

21-Jun-17

Client: Rule Engineering LLC

Project: HOWELL A #2

Sample ID **LCS-32384**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32384**	RunNo: **43630**
Prep Date: **6/20/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374743** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	86.7	73.2	114			
Surr: DNOP	3.9		5.000		77.1	70	130			

Sample ID **MB-32384**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32384**	RunNo: **43630**
Prep Date: **6/20/2017**	Analysis Date: **6/20/2017**	SeqNo: **1374744** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.3		10.00		92.6	70	130			

Qualifiers:

*	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 Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706A35**

21-Jun-17

Client: Rule Engineering LLC
Project: HOWELL A #2

Sample ID **MB-32371**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32371**	RunNo: **43647**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375311** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		94.3	54	150			

Sample ID **LCS-32371**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32371**	RunNo: **43647**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375312** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.8	76.4	125			
Surr: BFB	1100		1000		109	54	150			

Qualifiers:

*	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 Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706A35**

21-Jun-17

Client: Rule Engineering LLC

Project: HOWELL A #2

Sample ID **MB-32371**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32371**	RunNo: **43647**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375343** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.2		1.000		122	66.6	132			

Sample ID **LCS-32371**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32371**	RunNo: **43647**
Prep Date: **6/19/2017**	Analysis Date: **6/20/2017**	SeqNo: **1375344** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	104	80	120			
Toluene	1.1	0.050	1.000	0	106	80	120			
Ethylbenzene	1.1	0.050	1.000	0	107	80	120			
Xylenes, Total	3.3	0.10	3.000	0	109	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		125	66.6	132			

Qualifiers:

*	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 Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RULE ENGINEERING LL Work Order Number: 1706A35 RcptNo: 1

Received By: Anne Thorne 6/20/2017 7:35:00 AM Anne Thorne

Completed By: Anne Thorne 6/20/2017 8:09:03 AM Anne Thorne

Reviewed By: ENM 06/20/17

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: ____ (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? ____
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: ____

Special Handling (if applicable)

16. 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: ____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			

Chain-of-Custody Record

Client: RULE ENGINEERING, LLC

Mailing Address: 501 AIRPORT DRIVE SUITE 205 FARMINGTON, N.M 87401

Phone #: 505 793 9486

email or Fax#: jvalder@ruleengineering.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☑ Rush SAME DAY

Project Name: HOWELL A #2

Project #:

Project Manager: Heather Woods

Sampler: Justin Valdez

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and # (06/20/17)	Preservative Type	HEAL No. 1706A35	Analysis Request: BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
6/19/17	930	SOIL	SL-2	4oz Glass	Cold	001	X		X													

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
6/19/17	1655	Justin Valdez	Matt Walda	6/19/17	1655	DIRECT BILL TO CONOCO PHILLIPS
6/19/17	1839	Matt Walda		06/20/17	0735	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.