District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., 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 in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Subsequent Report ☐ Final Report

Name of Company: BP	Contact: Steve Moskal
Address: 200 Energy Court, Farmington, NM 87401	Telephone No.: 505-326-9497
Facility Name: Mudge A 002	Facility Type: Natural gas well

Surface Owner: Federal	Mineral Owner: Federal	API No. 3004510948

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County: San Juan
A	10	31N	11W	660	North	660	East	

Latitude 36.918505° **Longitude** -107.972206°

NATURE OF RELEASE

Type of Release: Unknown - hydrocarbon	Volume of Release: unknown	Volume Recovered: none
Source of Release: Unknown – suspect earthen pit; 95 bbl BGT	Date and Hour of Occurrence: unknown	Date and Hour of Discovery: April 25, 2017
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	OIL CONS. DIV DIST. 3
By Whom? Steve Moskal	Date and Hour:	FEB 13 2018
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.* During the closure of a below grade tank sampling indicated what appears to be hydrocarbon impacts to the soil, likely associated with an earthen pit. The area in the immediate area of the below grade tank was excavated with impacted soils removed for landfarm treatment. Due to the presence of a high pressure gas line, the threatened Brack's cactus and depth, the excavation was stopped and backfilled using clean soil.

Describe Area Affected and Cleanup Action Taken.* BP partially remediated hydrocarbon impacted soils at the location via excavation. Due to the size and scope of work, BP elects to further delineate the impacts to determine future corrective action via drilling soil borings. The five soil borings fully delineate the area in the vertical and lateral direction. The delineation indicates no threat to groundwater or surface water, with minimal impacts remaining in place. The attached report documents the activities and contains laboratory data supporting site closure. BP proposes to use the installed wells to employ soil vapor extraction following the attached plan. Also attached is the data and excavation and drilling report for reference.

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:	OIL CONSERVATION DIVISION Approved by Environmental Specialist:	
Printed Name: Steve Moskal		
Title: Field Environmental Coordinator	Approval Date: 2/16/18	Expiration Date:
E-mail Address: steven.moskal@bp.com	Conditions of Approval:	Attached ☒
Date: February 12, 2018 Phone: 505-326-9497	— >	

* Attach Additional Sheets If Necessary

NVF1714348687

209

Fields, Vanessa, EMNRD

From: Fields, Vanessa, EMNRD
Sent: Thursday, February 15, 2018 2:49 PM
To: 'Moskal, Steven'
Cc: Smith, Cory, EMNRD
Subject: Conditions of Approval Mudge A 002 30-045-10948

Good afternoon Steve,

BP's submittal of the Remedial Assessment Report on a Subsequent C-141 received on February 13, 2018 has been approved with the following conditions of approval.

- BP will maintain a SVE runtime greater than or equal to 90% per quarter.
- BP will collect a gas sample and initial and annually thereafter. The gas sample will be analyzed for EPA Method 8260 Full.
- BP will submit to OCD District III a quarterly update report detailing remediation operations the report will include at a minimum.
  - Summary of remediation activity for the quarter
    - SVE run time
    - SVE mass removal and product recovery

Thank you,

Vanessa Fields
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 119
Cell: (505) 419-0463
vanessa.fields@state.nm.us

BP Remediation Plan

To: Cory Smith & Vanessa Fields (NMOCD)
From: Steve Moskal (BP)
CC: Blagg Engineering
Date: 2/12/2018
Re: Mudge A 002 – SVE Plan
API#30-045-10948 (A) S10, T31N, R11W

Dear Mr. Smith, Mrs. Fields,

The Mudge A 002 site is an active natural gas production pad within the San Juan Basin Gas Field in San Juan County, New Mexico. The site is located on land controlled by the Bureau of Land Management drilled by Delhi Oil Corporation in 1950. The ownership of the well has changed several times since it was drilled. The well pad is located in an area primarily used by oil and gas production but also for recreational and livestock grazing. Depth to groundwater is unknown at this time.

BACKGROUND

Discharge of natural gas liquids from production and process equipment into an earthen pit was highly likely and acceptable industry practice prior to the implementation of the pit rule. During closure of a below grade tank on April 25, 2017, soil impacts were identified. Remediation via soil shredding commenced on May 18, 2017, however due to soil conditions, soil shredding was not a viable remedial solution. The alternative of a dig and haul ensued. Due to the depth, size, nearby pipeline and biological restrictions, BP elected to terminate the excavation activities near the south and east edges of the pad. The excavated area was backfilled, with the western half of the excavated area meeting the NMOCD spill and release guidelines for closure. The east portion of the excavation remains to be delineated.

The remedial excavation measured approximately 58x44' with a total depth of 42' below wellhead surface. The overall excavation, required for proper sloping per engineered design, measured 100x85'. The outer extents of the excavation were limited by identified Brack's Cactus suitable habitat areas to the west, south and east, as well as an Enterprise pipeline, servicing wells operated by others, to the east. The attached data packet provides a field report, figures and laboratory data for reference.

Delineation of off-site impacts that could not be excavated was conducted on August 14 – 16, 2017, a total of five borings were advanced to a depth of 45 feet below surface grade (Figure 3). The boring locations were all between 9' – 12' below original well pad grade, so the total depth of the borings ranged between 54' – 57' below the original well pad elevation. No groundwater was encountered. Four of the five borings were completed as soil vapor extraction (SVE) or chemical injection points in the event that in-situ remediation might be necessary. These completions consisted of either a 5-foot or 10-foot long slotted screened section across the interval with greatest field OVM reading, with a riser extending to about 3 feet above grade. The piping used for completion was a schedule 40 PVC with threaded connections. The annulus of the screened section was sand packed with washed graded silica 10/20 mesh to approximately 2 feet above the top screen slot. Above this a 2 foot section of hydrated bentonite was placed, followed by a cement/bentonite grout mix installed in the annulus from immediately above the bentonite to the ground surface. The completion tops were secured with a steel, lockable well protector cemented into place. Borehole BH-5 was abandoned immediately after drilling by filling the borehole with cuttings to the ground surface since there was no evidence of hydrocarbon impacts in any cuttings or split spoon sample. Boring completions BH-1 through BH-4 were inspected for the presence of water on September 6, 2017. Between 3" and 5" of bentonite

hydration water was found to be accumulated in the end caps of BH-1, BH-2 and BH-4. This water was removed on September 7, 2017 using a sponge apparatus placed in a bailer. The boring completions were re-inspected for water on September 8, 2017 and no new water had accumulated in the end caps.

REMEDIATION PLAN

BP proposes to employ soil vapor extraction (SVE) technology to the existing wells described above. The system will incorporate the following:

1) An explosion proof, (Class 1, Div. 1) electrically driven skid mounted SVE pump will be installed on site. This pump will be driven with the largest of one of the following, depending on electric drop capabilities:

    a. Rotron EN454 (1.5 HP, single phase, 230 volt, 9.5 amp continuous, 48 amp inrush).

    b. Rotron EN505 (2.0 HP, single phase, 230 volt, 12 amp continuous, 56 amp inrush).

    The SVE package will be fitted with a water knockout drum, high water level shutoff, two vacuum gauges, one flow rate gauge and explosion proof starter switch.

2) Each of the four (4) air extraction points will be fitted with 2-inch quick-connect fittings.

3) A 2-inch diameter PVC pipe and/or flexible hose with quick connect fittings will be connected from the SVE blower to one SVE well at a time. The hose will be long enough to reach any of the four (4) SVE points.

4) During operation, the flexible air hose will be moved to other points as deemed necessary by site monitoring:

    A) Exhaust vapors from the SVE pump will be measured with an organic vapor meter (OVM) on a daily basis for the first 5 days operation, weekly for the first month of operation, and then monthly thereafter.

    B) Annually, a sample will be collected from the vacuum stream and will be laboratory analyzed for total petroleum hydrocarbons (TPH) by U.S. EPA Method 8015B and volatile hydrocarbons (BTEX) by U.S. EPA Method 8021. The location of the collection point will be determined based on the SVE system setup, but will preferably be upstream of the blower to reduce impacts of heat and turbulence to the air stream.

    C) When exhaust vapors appear to reach an asymptotic limit, the air injection hose will be moved to various other injection points and exhaust vapors from other unused observation points will be measured with an organic vapor meter (OVM) on a monthly basis.

5) When site remediation appears to be complete based on monitoring results from the active remediation system, a test borings will be advanced to a depth of approximately 45-50 feet at locations about 8 feet from the various remediation points. Soil samples will be collected at various depths for laboratory determination of residual hydrocarbons. This testing will include total petroleum hydrocarbons (TPH) by U.S. EPA Method 8015B and volatile hydrocarbons (BTEX) by U.S. EPA Method 8021. Note that the New Mexico Oil Conservation Division (NMOCD), Aztec District Office, will be notified prior to this drilling and sampling so that personnel may be available for witnessing.

6) NMOCD will be provided with laboratory test results. Following review of the remediation system monitoring and laboratory test results, either site closure, continued system operation or modifications to the remediation plan will be requested.

REPORTING

The performance of the SVE system and remediation will be reported bi-annually with field OVM data, estimated run times and system performance, maintenance or changes included. The sampling of the vacuum stream will be reported in an annual report.

A final report will be provided within 60 days of the final closure sampling event.

Regards,

Steve Moskal
BP America Production Co.

Remediation
of
Hydrocarbon Impacted Soils

Mudge A 2
(A) Sec 10 – T31N – R11W
API: 30-045-10948
San Juan County, New Mexico

Prepared for:
BP America Production Co.
Farmington, New Mexico

Prepared by:
Blagg Engineering, Inc.
P.O. Box 87
Bloomfield, New Mexico 87413
(505)632-1199

September 14
2017

REMEDIATION
OF
HYDROCARBON IMPACTED SOILS
MUDGE A 2

TABLE OF CONTENTS

APPENDICES

REMEDIATION OF
HYDROCARBON IMPACTED SOILS
MUDGE A 2

INTRODUCTION

Blagg Engineering Inc. (BEI) has been retained by BP America Production Co. (BP) to monitor, sample and document environmental remediation of hydrocarbon impacts at the Mudge A 2, a natural gas well located in rural San Juan County, New Mexico at (A) Sec. 10 – T31N – R11W (Figure 1). Hydrocarbon impacts at the site were discovered in on April 25, 2017 during routine closure at a 95 barrel below grade tank (BGT). There were no apparent integrity issues with the BGT and the source of impacts appeared to be historical, likely from a prior unlined earthen disposal pit at the same location as the 95 BGT. This was a common practice permitted by both New Mexico Oil Conservation Division (NMOCD) and the U.S. Bureau of Land Management (BLM) until the mid 1990's. During the site remediation no other hydrocarbon impact sources were observed. BP began initial remedial excavations of on-site impacts on May 18, 2017 and completed excavation of accessible impacts on June 12, 2017. Excavations were discontinued at that time due to the depth of the dig (exceeding 38' from original well pad surface) and because the excavation was approaching an active third party high pressure natural gas line that could not be taken out of service. Following backfilling the remedial dig with clean fill, a mobile hollow stem auger environmental drill rig was used to fully delineate impacts that could not be excavated. This drilling was conducted between August 14 – 16, 2017.

The site closure standard ranking was determined as follows:

Depth to Groundwater based on BGT permit research: 50 – 100 feet (10 points)
Distance to water well > 1,000' based on BGT permit research: (0 points)
Distance to dry wash < 200' based on site measurements: (10 points)

Total Site Ranking: 20

With a ranking of 20 points, the NMOCD/BLM site the closure standard was established as follows:

Total Petroleum Hydrocarbons (TPH) = 100 mg/Kg (parts per million)
Benzene = 10 mg/Kg
Benzene, Toluene, Ethyl-Benzene and Total Xylenes (BTEX) combined = 50 mg/Kg
Total Chlorides = 600 mg/Kg

REMEDIATION ACTIVITIES

Site remediation consisted of 2 separate activities: (1) excavation of impacted soils until site closure standards had been achieved, and (2) drilling to delineate impact areas that could not be excavated due to depth and/or pipeline utility issues. The procedures used for these activities are discussed below.

Excavation of Impacted Media to Achieve Site Remediation

Removal of hydrocarbon impacted media began on May 18, 2017 using excavators to strip clean, un-impacted soils and excavate impacted soils. The excavated impacted soils were placed on the well pad. A small scale test run was conducted to evaluate the soils for on-site treatment to remove hydrocarbons via shredding and chemical treatment. Based on laboratory test results, it was determined that this site was a poor candidate for on-site treatment and all excavated impacted materials were subsequently transported to a commercial landfarm for final remediation. Remedial excavations progressed from the southeast portion of the well pad, where the original source was discovered, and advanced off-pad towards the southeast. As previously discussed, the excavation was discontinued when a total depth of 38' below original well pad grade was reached and a third party gas pipeline was being encroached.

Closure sampling was progressive as the excavation advanced. Sampling areas were marked out on the excavation walls and base for collection of composites from each area (Figure 2). Sampling was primarily performed using an excavator trackhoe due to the danger of personnel entering the excavation because of the risk of collapsing sidewalls. All closure sampling was witnessed by the NMOCD. Representative composite portions of sample were placed into a gallon sized Ziploc® baggie for field headspace analysis of organic vapors with a calibrated IonScience Tiger model photo-ionization detector (PID) containing a 11.2 eV lamp. Split samples were placed into a 4-ounce laboratory supplied jar with Teflon® lid, labeled and placed on ice in an ice chest for further laboratory testing. The jarred samples were hand delivered to a representative of Hall Environmental Analytical Laboratories for analysis via U.S. EPA Method 8021B (volatile organics limited to benzene, toluene, ethyl benzene and total xylenes), U.S. EPA Method 8015 (gasoline range (GRO), diesel range (DRO) and motor oil range (MRO) organics), and chlorides via U.S. EPA Method 300. A chain-of-custody followed the samples.

Laboratory analytical test reports for the closure sampling is found in Appendix C and a summary of this laboratory data is found in Table 1:

Figure 3

Mudge A 2
(A) Sec 10 - T31N - R11W
API: 30-045-10948

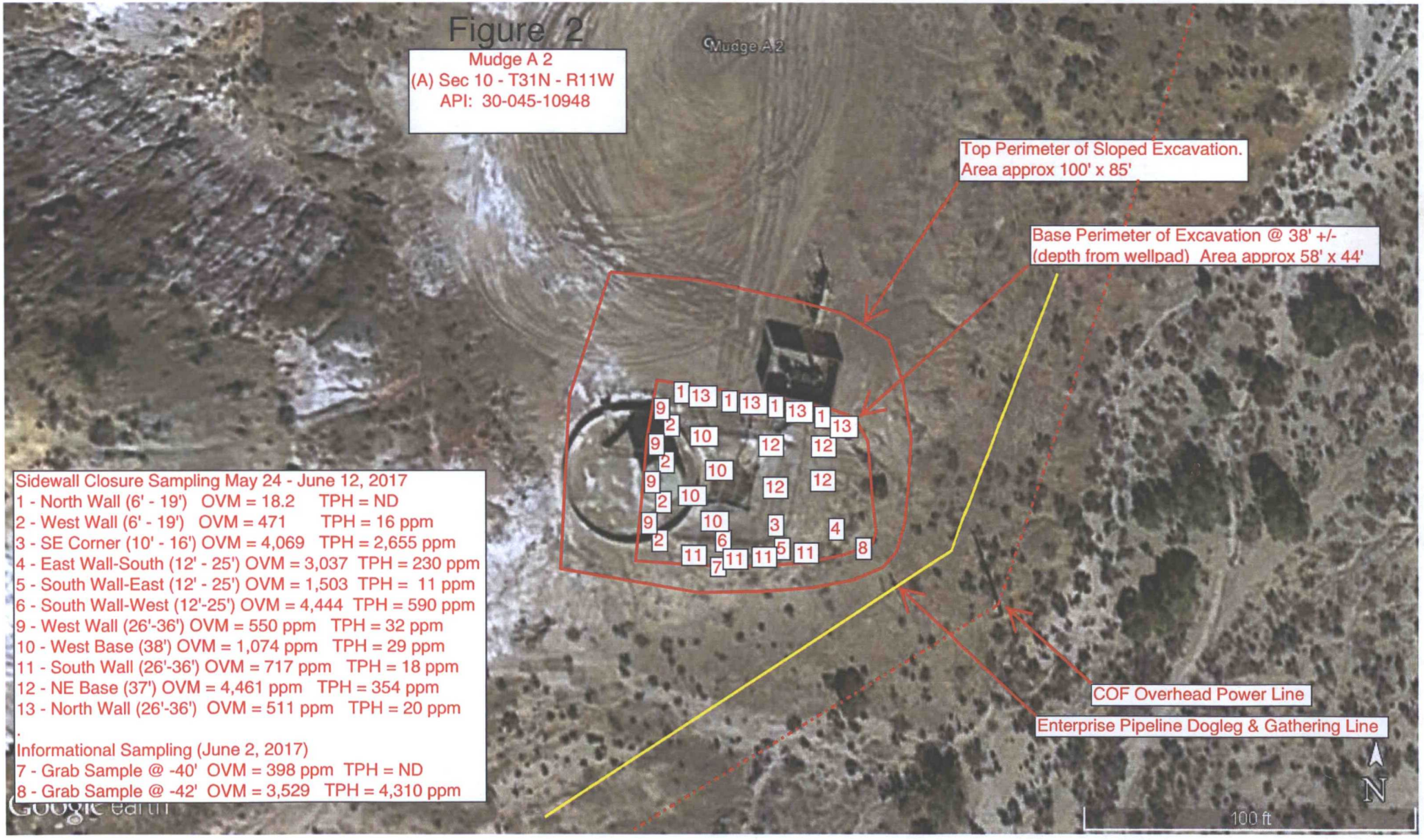


Figure 2
Mudge A 2
(A) Sec 10 - T31N - R11W
API: 30-045-10948
Mudge A2
Top Perimeter of Sloped Excavation.
Area approx 100' x 85'
Base Perimeter of Excavation @ 38' +/-
(depth from wellpad) Area approx 58' x 44'
Sidewall Closure Sampling May 24 - June 12, 2017
1 - North Wall (6' - 19') OVM = 18.2 TPH = ND
2 - West Wall (6' - 19') OVM = 471 TPH = 16 ppm
3 - SE Corner (10' - 16') OVM = 4,069 TPH = 2,655 ppm
4 - East Wall-South (12' - 25') OVM = 3,037 TPH = 230 ppm
5 - South Wall-East (12' - 25') OVM = 1,503 TPH = 11 ppm
6 - South Wall-West (12'-25') OVM = 4,444 TPH = 590 ppm
9 - West Wall (26'-36') OVM = 550 ppm TPH = 32 ppm
10 - West Base (38') OVM = 1,074 ppm TPH = 29 ppm
11 - South Wall (26'-36') OVM = 717 ppm TPH = 18 ppm
12 - NE Base (37') OVM = 4,461 ppm TPH = 354 ppm
13 - North Wall (26'-36') OVM = 511 ppm TPH = 20 ppm
Informational Sampling (June 2, 2017)
7 - Grab Sample @ -40' OVM = 398 ppm TPH = ND
8 - Grab Sample @ -42' OVM = 3,529 TPH = 4,310 ppm
COF Overhead Power Line
Enterprise Pipeline Dogleg & Gathering Line
N
100 ft
Google Earth

Table 1

Summary Excavation Closure Laboratory Data

Sample ID	Date	TPH Total (mg/Kg)	BTEX Total (mg/Kg)	Benzene (mg/Kg)	Comments
1 – North Wall (8-pt. comp) (6'-19')	5/24/2017	ND	ND	ND	
2 – West Wall (8-pt. comp) (6'-19')	5/24/2017	ND	ND	ND	
3 – SE Corner (3-pt. comp) (10'-16')	5/24/2017	2,655	169.8	3.7	Impacted soils, subsequently excavated.
4 – East Wall, South (5-pt. comp)(12'-25')	5/30/2017	230	4.1	ND	Subsequently excavated.
5 – South Wall, East (5-pt. comp)(12'-25')	5/30/2017	11	ND	ND	
6 – South Wall, West (5-pt. comp)(12'-25')	5/30/2017	590	26.8	ND	Subsequently excavated.
7 – Grab Sample, South Extent, @-40'	6/2/2017	ND	ND	ND	
8 – Grab Sample, SE Extent, @-42'	6/5/2017	4,310	468	11	Informational Sample. Impacts remain in place.
9 – West Wall (5-pt. comp) (26'-36')	6/9/2017	32	0.26	0.043	
10 – West Base (5-pt. comp @ -38')	6/9/2017	29	0.53	0.041	
11 – South Wall (5-pt. comp) (26'-36')	6/9/2017	18	ND	ND	
12 – NE Base (5-pt. comp @ -37')	6/12/2017	354	19.95	0.19	Impacts remain in place.
13 – North Wall (5-pt. comp) (26'-36')	6/12/2017	20	ND	ND	
NMOCD/BLM Closure Standard		100	50	10	

Off-Site Drilling to Delineate Residual Impacts

Delineation of off-site impacts that could not be excavated was conducted using a hollow stem auger drill rig. During this investigation, conducted on August 14 – 16, 2017, a total of five borings were advanced to a depth of 45 feet below surface grade (Figure 3). The boring locations were all between 9' – 12' below original well pad grade, so the total depth of the borings ranged between 54' – 57' below the original well pad elevation. Approximate drilling locations had been pre-determined and well permits were obtained through the New Mexico Office of the State Engineer in the event that groundwater was encountered.

Drilling operations were conducted by Enviro-Drill using a CME-75 drilling unit equipped with 5-foot long augers and sampling conducted with a conventional 24-inchlong x 2-inch diameter split spoon sampler. Split spoon samples were collected every 5 feet. Split samples were described on the drilling logs (Appendix B), then a representative portion was placed into a gallon sized Ziploc® baggie for field headspace analysis of organic vapors as previously described. Samples with the highest OVM reading from each boring were submitted for laboratory testing, as well as the deepest sample obtained.

Although no groundwater was encountered, four of the borings were completed as soil vapor extraction (SVE) or chemical injection points in the event that in-situ remediation might be necessary. These completions consisted of either a 5-foot or 10-foot long slotted screened section across the interval with greatest field OVM reading, with a riser extending to about 3 feet above grade. The piping used for completion was a schedule 40 PVC with threaded connections. The annulus of the screened section was sand packed with washed graded silica 10/20 mesh to approximately 2 feet above the top screen slot. Above this a 2 foot section of hydrated bentonite was placed, followed by a cement/bentonite grout mix installed in the annulus from immediately above the bentonite to the ground surface. The completion tops were secured with a steel, lockable well protector cemented into place.

Borehole BH-5 was abandoned immediately after drilling by filling the borehole with cuttings to the ground surface since there was no evidence of hydrocarbon impacts in any cuttings or split spoon sample.

Boring completions BH-1 through BH-4 were inspected for the presence of water on September 6, 2017. Between 3" and 5" of bentonite hydration water was found to be accumulated in the end caps of BH-1, BH-2 and BH-4. This water was removed on September 7, 2017 using a sponge apparatus placed in a bailer. The boring completions were re-inspected for water on September 8, 2017 and no new water had accumulated in the end caps.

Drill boring soil sample laboratory analytical reports are found in Appendix D and a summary of this laboratory data is presented in Table 2:

Table 2
Summary Drilling Laboratory Data

Sample ID	Date	Field OVM (ppm)	TPH Total (mg/Kg)	BTEX Total (mg/Kg)	Benzene (mg/Kg)	Comments
BH-1 (25'-26')	8/14/2017	1,638	309	1.1	ND	Backfill to about 33' boring depth.
BH-1 (35'-36')	8/14/2017	18.8	ND	0.047	ND	Boring surface grade about 9' below
BH-1 (45'-46')	8/14/2017	3.7	ND	ND	ND	original wellpad grade.
BH-2 (31.5'-32')	8/14/2017	606	14	ND	ND	Boring surface grade about 12' below
BH-2 (35'-36')	8/14/2017	12.2	ND	ND	ND	original wellpad grade.
BH-2 (45'-46')	8/14/2017	2.6	ND	ND	ND	
BH-3 (25'-26')	8/15/2017	224	10	ND	ND	Boring surface grade about 10' below
BH-3 (35'-36')	8/15/2017	16.8	ND	ND	ND	original wellpad grade.
BH-3 (45'-46')	8/15/2017	2.1	ND	ND	ND	
BH-4 (30'-31')	8/16/2017	95	11	ND	ND	Boring surface grade about 11' below
BH-4 (35'-36')	8/16/2017	41	ND	ND	ND	original wellpad grade.
BH-4 (45'-46')	8/16/2017	2.2	ND	ND	ND	
BH-5 (35'-36')	8/16/2017	17.6	ND	ND	ND	Boring surface grade about 12' below
BH-5 (45'-46')	8/16/2017	1.6	ND	ND	ND	original wellpad grade.
NMOCD/BLM Closure Standard			100	50	10	

CONCLUSIONS AND RECOMMENDATIONS

1) Hydrocarbon impacted soil and at the BP operated Mudge A 2 has been successfully excavated. Excavation sampling and analytical testing has confirmed that 11 of 13 separate sampling zones within the remedial excavation test below site closure standards. The two (2) zones with residual hydrocarbon impacts exceeding site closure standards (Areas 8 and 12) are not indicated to contribute a risk to surface or groundwater. Removal of additional soils in Areas 8 and 12 is not presently feasible due to an active third party high pressure natural gas line.

2) Drilling to further delineate in-place impacts has determined that no lateral movement of hydrocarbons exceeding site standards is present. Borings BH-2 through BH-5, outside the remedial excavation, tested residual hydrocarbons at values less than 14 mg/Kg. Boring BH-1, placed within the remedial excavation at the point of greatest residual impacts, found a minimum 10 foot separation between the base of impacts and the base of the boring. The maximum hydrocarbon value tested in BH-1 was 309 mg/Kg.

3) Site closure is recommended. The remaining hydrocarbon impacts at the site do not indicate a risk to surface or groundwater.

CLOSURE AND LIMITATIONS

This report has been prepared for the exclusive use of BP America Production Company as it pertains to hydrocarbon impact remediation at the Mudge A 2 in San Juan County, New Mexico. The data presented herein is based on visual observations, subsurface soil conditions encountered at sampling locations and on information reported by analytical laboratory testing of soils. This report does not reflect variations which may exist between sampling locations.

I certify that the work performed by Blagg Engineering, Inc. as described in this report was directed by my supervision, and that I am personally familiar with the remedial actions and the contents of this report.

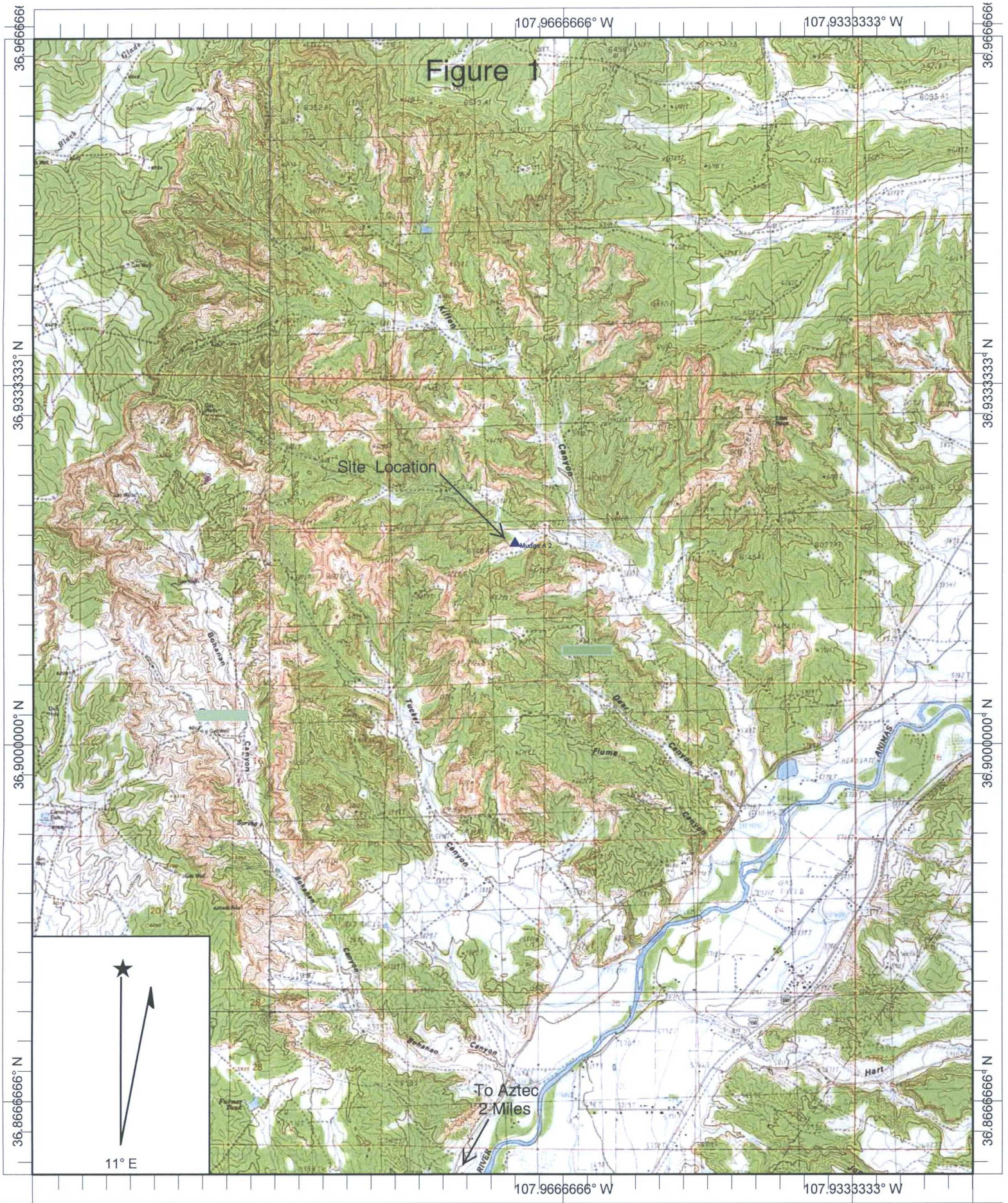
Submitted by:
Blagg Engineering, Inc.

Jeffrey C. Blagg, PE
NMPE 11607

Appendix A

Figures

Figure 1



Name: CEDAR HILL
Date: 9/14/2017
Scale: 1 inch equals 4000 feet

Location: 036.9127637° N 107.9737073° W
Caption: BP America
Mudge A 2

Appendix B

Drilling Logs

BLAGG ENGINEERING, INC.

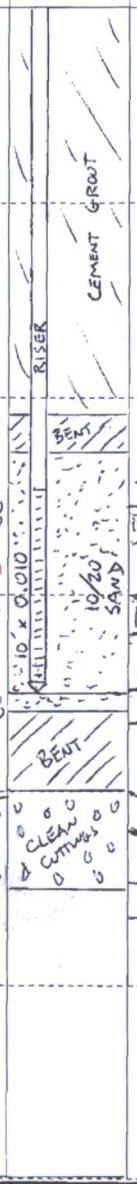
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-1

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger – CME 75
DATE START: 8/14/2017 DATE FINISH: 8/15/2017 DRILLER: A-Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 9 ± Below well PAD

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1120	Cuttings			START
4'					Silty SAND – BACKFILL – NO/NS
6'					
8'					
10'					
12'					
14'					
16'					
18'					
20					
22'					
24'					SAA – Except HC odor Beginning @ 23'
26'	1203	SS – 6 Blows	1638 TPH = 309 ppm		Recover 18" – mottled Gray Silty SAND, Strong HC odor (Backfill)
28'					
30'					
32'	1212	SS – 4 Blows	260		Recover 7" – SAA (Backfill)
34'					
36'	1228	SS 40 Blows	18.8 TPH = ND		Dense silt Stone, Grey Green, HC odor. (Recover 11")
38'					
40					
42'	1245	SS 67 Blows	6.5		Recover 13", Dense silt stone, Gray Green, Lite HC odor.
44'					
46'	1335	SS 68 Blows	3.7 TPH = ND		Recover 16", Blue Shalestone, Dry, Lite HC odor.
48'					
50'					
52'					
54'					
56'					
58'					
60					



BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-2

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/14/2017 DATE FINISH: 8/15/2017 DRILLER: A. Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: Surface 12'± Below Well Pad

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1411	Cuttings			START Silty SAND, Native, Tan, Dry, No odor No stain
4'					
6'					
8'					
10'					
12'	1419	22 Blows	1.2		Recover 14", lite brown silty SAND, NO/NS, Lite Moisture
14'					
16'	1426	32 Blows	0.5	Riser / Grout	Recover 24", SAA, less Moisture
18'					
20					
22'	1434	36 Blows	30.6		Recover 22", SAA, Increased Moisture
24'					
26'	1443	51 Blows	3.1		Recover 24", SAA Except Bottom 3": Fractured SANDSTONE.
28'				Bent	
30'			3.0		30'-31½': lite brown silty clayey mix, NO/NS, Moist
32'	1455	52 Blows	606	10/20 Sand	Recover 24" 31½'-32': Grey Fractured Sandstone, HC odor + stain
34'			TPH = 14 PPM	0.01 slots	
36'	1507	51 Blows	12.2	Bent	Recover 24" Dark Brown/Green Shalestone, Lite HC odor.
38'			TPH = ND		
40					
42'	1524	70 Blows	3.8		Recover 20", SAA
44'				cuttings Backfill	
46'	1537	34 Blows	2.6		Recover 21" SAA
48'			TPH = ND		
50'					
52'					
54'					
56'					
58'					
60					

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-3

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger - CME 75
DATE START: 8/15/2017 DATE FINISH: 8/15/2017 DRILLER: A. Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 10'± Belan well pad.

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	0758	CUTTINGS			START Silty SAND, NATIVE, TAN, DRY, No ODOR No stain
4'					
6'					
8'					
10'					
12'	0810	17 Blows	0.0	CEMENT GROUT	Recover 16" silty SAND, Lite Brown, Lite Moisture, NO/NS
14'					
16'	0815	30 Blows	0.2	RISER	Recover 24", SAA
18'					
20					
22'	0824	35 Blows	1.4	BENT	Recover 19", SAA
24'					
26'	0835	72 Blows	224 TPH = 10 PPM	5'x0.010 10/20 SAND	Recover 20", Green/Gray Shalestone, Lite HC ODOR.
28'					
30'					
32'	0845	98 Blows	93	BENT	Recover 18", Green ~~Shalestone~~ Siltstone, Occasional Gray Streaks, V. Lite HC ODOR.
34'					
36'	0904	72 Blows	16.8 TPH = ND	CLEAN CUTTINGS	Recover 17", SAA, No Gray Streaks, V.V. Lite HC ODOR.
38'					
40					
42'	0921	80 Blows	4.3		Recover 16", SAA
44'					
46'	0940	50 Blows	2.1 TPH = ND	45'	Recover 14", Blue Shalestone, Dry, No ODOR/No Stain
48'					
50'					
52'	TD	DRILLED: 45'		RUN POINTED END CAP @ 30', 5'x0.010 slotted 30'-25'; RISER TO surface.	
54'			Clean CUTTINGS		45'-35'
56'			Hydrated BENT		35'-31'
58'			10/20 SAND		31'-23'
60			Hydrated BENT		23'-21'

GROUT 21'-Surface.

BLAGG ENGINEERING, INC.

P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-4

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/16/2017 DATE FINISH: 8/16/2017 DRILLER: A. KENNEDY LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 11' ± Below well Pad Grade.

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	0810	Cuttings			START NATIVE Soil: TAN Silty SAND, Lite Moisture, No ODOR NO STAIN
4'					
6'					
8'					
10'					
12'	0823	50 Blows	0.8		RECOVER 14", SAA
14'					
16'	0831	35 Blows	0.9	RISER / CEMENT GROUT	RECOVER 18", SAA
18'					
20 22'	0842	27 Blows	1.4		RECOVER 14", SAA, Increased Moisture
24'					
26'	0852	38 Blows	5.9		RECOVER 24", SAA
28'				BENT	
30'					
32'	0901	20 Blows	95 TPH = 11 PPM	0.010 10/20 SAND	RECOVER 19": Silty SAND, DARK TAN with Gray Streaking, Lite Moisture, HC ODOR.
34'					
36'	0915	85 Blows	41 TPH = ND	BENT	RECOVER 22": Brown Siltstone, V. minor Gray Streaks, Lite Moisture, V. minor HC ODOR.
38'					
40 42'	0932	85 Blows	8.8	CLEAN Cuttings	RECOVER 20": Gray/Green Siltstone, Lite Moisture, NO HC Streaking, V.V. minor HC ODOR.
44'					
46'	0958	80 Blows	2.2 TPH = ND		RECOVER 18": BLUE SHALESTONE, Lite Moisture, NO HC ODOR OR STAIN
48'					
50'					
52'					
54'					
56'					
58'					
60					

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-5

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/16/2017 DATE FINISH: 8/16/17 DRILLER: A. Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45 CASING TYPE & SIZE: — SLOT SIZE: —
COMMENTS: Surface 12' ± Below well pad Grade

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1218	Cuttings			START Silty SAND, Native, Tan, Dry, No ODOR No STAIN
4'					
6'					
8'					
10'					
12'	1230	25 Blows	1.5	Backfilled with Cuttings	Recover 14": SAA
14'					
16'	1240	26 Blows	0.6		Recover 12": SAA
18'					
20					
22'	1251	55 Blows	0.4		Recover 24": Brown silty SAND, Lite moisture, No ODOR/No STAIN
24'					
26'	1303	28 Blows	0.9		Recover 14": SAA
28'					
30'					
32'	1315	24 Blows	5.1		Recover 24": SAA, Minor increase in moisture
34'					
36'	1322	48 Blows	17.6 TPH = ND		Recover 20": Grey/Gray Siltstone, lite moisture, No HC ODOR, Minor Gray streaking.
38'					
40					
42'	1338	85 Blows	3.2		Recover 22": SAA, Except No Gray streaking
44'					
46'	1352	65 Blows	1.6 TPH = ND		Recover 19": Blue Shalestone, Dry, No ODOR No Stain.
48'					
50'					
52'					
54'					
56'					
58'					
60					

Appendix C

Excavation Closure
Laboratory Analytical Data 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

May 26, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1705C79

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/25/2017 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 **1705C79**
Date Reported: **5/26/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-001 **Matrix:** SOIL

Client Sample ID: SE Corner 3-Point
Collection Date: 5/24/2017 3:10:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	35	30		mg/Kg	20	5/25/2017 11:25:26 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	160	9.2		mg/Kg	1	5/25/2017 10:07:54 AM	31956
Motor Oil Range Organics (MRO)	95	46		mg/Kg	1	5/25/2017 10:07:54 AM	31956
Surr: DNOP	103	70-130		%Rec	1	5/25/2017 10:07:54 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	2400	360		mg/Kg	100	5/25/2017 9:57:50 AM	G43065
Surr: BFB	191	54-150	S	%Rec	100	5/25/2017 9:57:50 AM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	3.7	1.8		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Toluene	3.1	1.8		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Ethylbenzene	13	3.6		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Xylenes, Total	150	7.3		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Surr: 4-Bromofluorobenzene	100	66.6-132		%Rec	100	5/25/2017 9:57:50 AM	B43065

ID as #3 on Figures and Tables

(Subsequently Excavated)

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: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-002 **Matrix:** SOIL

Client Sample ID: North Wall 8-Point
Collection Date: 5/24/2017 3:21:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/25/2017 11:37:50 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	5/25/2017 10:30:06 AM	31956
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	5/25/2017 10:30:06 AM	31956
Surr: DNOP	95.7	70-130		%Rec	1	5/25/2017 10:30:06 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	5/25/2017 11:36:34 AM	G43065
Surr: BFB	94.8	54-150		%Rec	1	5/25/2017 11:36:34 AM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.018		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Toluene	ND	0.037		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Ethylbenzene	ND	0.037		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Xylenes, Total	ND	0.074		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Surr: 4-Bromofluorobenzene	93.5	66.6-132		%Rec	1	5/25/2017 11:36:34 AM	B43065

ID as #1 on Figures and Tables

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: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-003 **Matrix:** SOIL

Client Sample ID: West Wall 8-Point
Collection Date: 5/24/2017 3:30:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/25/2017 11:50:15 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	16	9.8		mg/Kg	1	5/25/2017 10:52:10 AM	31956
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/25/2017 10:52:10 AM	31956
Surr: DNOP	101	70-130		%Rec	1	5/25/2017 10:52:10 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	21		mg/Kg	5	5/25/2017 12:00:11 PM	G43065
Surr: BFB	127	54-150		%Rec	5	5/25/2017 12:00:11 PM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.11		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Toluene	ND	0.21		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Ethylbenzene	ND	0.21		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Xylenes, Total	ND	0.43		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Surr: 4-Bromofluorobenzene	97.4	66.6-132		%Rec	5	5/25/2017 12:00:11 PM	B43065

ID as #2 on Figures and Tables

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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID	**MB-31974**	SampType:	**MBLK**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**31974**		RunNo:	**43067**				
Prep Date:	**5/25/2017**	Analysis Date:	**5/25/2017**		SeqNo:	**1355858**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-31974**	SampType:	**LCS**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**31974**		RunNo:	**43067**				
Prep Date:	**5/25/2017**	Analysis Date:	**5/25/2017**		SeqNo:	**1355859**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			

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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-31943**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31943**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354741**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.8		5.000		95.2	70	130			

Sample ID **MB-31943**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31943**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354742**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.6		10.00		96.1	70	130			

Sample ID **LCS-31956**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31956**			RunNo: **43052**					
Prep Date: **5/25/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354925**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.1	73.2	114			
Surr: DNOP	4.3		5.000		85.7	70	130			

Sample ID **MB-31956**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31956**			RunNo: **43052**					
Prep Date: **5/25/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354926**		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	8.1		10.00		81.3	70	130			

Sample ID **LCS-31932**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31932**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1355829**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		89.3	70	130			

Sample ID **MB-31932**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31932**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1355830**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.4		10.00		94.4	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
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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **G43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355625** 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	920		1000		92.3	54	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **G43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355626** 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	104	76.4	125			
Surr: BFB	1000		1000		103	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
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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355634** 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	0.91		1.000		90.7	66.6	132			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355635** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.025	1.000	0	85.3	80	120			
Toluene	0.90	0.050	1.000	0	89.6	80	120			
Ethylbenzene	0.92	0.050	1.000	0	92.0	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.6	80	120			
Surr: 4-Bromofluorobenzene	0.94		1.000		93.9	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
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: BLAGG | Work Order Number: 1705C79 | RcptNo: 1

Received By: Anne Thorne 5/25/2017 7:10:00 AM

Completed By: Anne Thorne 5/25/2017 7:58:21 AM

Reviewed By: 5/25/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP America
Blagg Engineering Inc.
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:

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

Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time: SAME DAY
☐ Standard ☒ Rush

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: .8

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 # (05/25/17 MeOH Kit)	Preservative Type	HEAL No. 1705C79	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)	CHLORIDE				Air Bubbles (Y or N)
5/24/17	1510	SOIL	SE Corner 3-Point	4 oz x 1	COOL	001	X		X									X				
"	1521	"	North Wall 8-Point	"	"	002	X		X									X				
"	1530	"	West Wall 8-Point	"	"	003	X		X									X				

Date	Time	Relinquished by	Received by	Date	Time
5/24/17	1640	Jeff Blagg			
5/24/17	1804			05/25/17	0710

Remarks: Bill BP Contact: Steve Moskal
VID: VHIXONEVRM
WBS Element: L1-0018M-E:10984

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.

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 01, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A #2 OrderNo.: 1705E89

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/31/2017 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 **1705E89**
Date Reported: **6/1/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-001 **Matrix:** SOIL

Client Sample ID: East Wall S End 5-pt
Collection Date: 5/30/2017 2:08:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	330	30		mg/Kg	20	5/31/2017 11:11:03 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	120	9.6		mg/Kg	1	5/31/2017 10:51:53 AM	32035
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/31/2017 10:51:53 AM	32035
Surr: DNOP	96.9	70-130		%Rec	1	5/31/2017 10:51:53 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	110	17		mg/Kg	5	5/31/2017 11:48:53 AM	R43151
Surr: BFB	311	54-150	S	%Rec	5	5/31/2017 11:48:53 AM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.084		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Toluene	0.30	0.17		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Ethylbenzene	ND	0.17		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Xylenes, Total	3.8	0.34		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Surr: 4-Bromofluorobenzene	125	66.6-132		%Rec	5	5/31/2017 11:48:53 AM	B43151

ID as #4 on Figures and Tables
(Subsequently Excavated)

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: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-002 **Matrix:** SOIL

Client Sample ID: South Wall E End 5-pt
Collection Date: 5/30/2017 2:11:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	390	30		mg/Kg	20	5/31/2017 11:23:28 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	11	10		mg/Kg	1	5/31/2017 11:13:51 AM	32035
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	5/31/2017 11:13:51 AM	32035
Surr: DNOP	98.1	70-130		%Rec	1	5/31/2017 11:13:51 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	16		mg/Kg	5	5/31/2017 12:12:49 PM	R43151
Surr: BFB	103	54-150		%Rec	5	5/31/2017 12:12:49 PM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.080		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Toluene	ND	0.16		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Ethylbenzene	ND	0.16		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Xylenes, Total	ND	0.32		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Surr: 4-Bromofluorobenzene	113	66.6-132		%Rec	5	5/31/2017 12:12:49 PM	B43151

ID as #5 on Figures and Tables

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: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-003 **Matrix:** SOIL

Client Sample ID: South Wall W End 5-pt
Collection Date: 5/30/2017 2:15:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	270	30		mg/Kg	20	5/31/2017 11:35:52 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	210	9.8		mg/Kg	1	5/31/2017 11:35:51 AM	32035
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/31/2017 11:35:51 AM	32035
Surr: DNOP	103	70-130		%Rec	1	5/31/2017 11:35:51 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	380	66		mg/Kg	20	5/31/2017 12:36:43 PM	R43151
Surr: BFB	199	54-150	S	%Rec	20	5/31/2017 12:36:43 PM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.33		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Toluene	3.0	0.66		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Ethylbenzene	1.8	0.66		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Xylenes, Total	22	1.3		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Surr: 4-Bromofluorobenzene	118	66.6-132		%Rec	20	5/31/2017 12:36:43 PM	B43151

ID as #6 on Figures and Tables
(Subsequently Excavated)

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#: **1705E89**

01-Jun-17

Client: Blagg Engineering

Project: MUDGE A #2

Sample ID	**MB-32038**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**32038**	RunNo:	**43159**					
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**	SeqNo:	**1359147**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32038**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**32038**	RunNo:	**43159**					
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**	SeqNo:	**1359148**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.7	90	110			

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#: **1705E89**

01-Jun-17

Client: Blagg Engineering
Project: MUDGE A #2

Sample ID	**LCS-32035**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**32035**		RunNo:	**43153**				
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**		SeqNo:	**1358341**	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	84.2	73.2	114			
Surr: DNOP	4.2		5.000		85.0	70	130			

Sample ID	**MB-32035**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**32035**		RunNo:	**43153**				
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**		SeqNo:	**1358342**	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	9.1		10.00		91.1	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
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#: **1705E89**

01-Jun-17

Client: Blagg Engineering
Project: MUDGE A #2

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **R43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359038** 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	95.0	76.4	125			
Surr: BFB	1100		1000		107	54	150			

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **R43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359039** 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	920		1000		92.2	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
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#: **1705E89**

01-Jun-17

Client: Blagg Engineering

Project: MUDGE A #2

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359043** 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	1.0	0.050	1.000	0	105	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		114	66.6	132			

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359046** 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	1.1		1.000		112	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
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: BLAGG | Work Order Number: 1705E89 | RcptNo: 1

Received By: Anne Thorne 5/31/2017 7:15:00 AM

Completed By: Anne Thorne 5/31/2017 7:49:02 AM

Reviewed By: 5/31/17

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 ☑	# of preserved bottles checked for pH: ____ (<2 or >12 unless noted)
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
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	1.3	Good	Yes			

Chain-of-Custody Record

Client: BP America
Blagg Engineering
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time: SAME DAY
☐ Standard ☒ Rush
Project Name: MUDGE A #2
Project #:
Project Manager: STEVE MOSKAL
Sampler: J. BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.3

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 # (4 oz x 1 Mason Jars)	Preservative Type	HEAL No.	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)	CHLORIDE				Air Bubbles (Y or N)
5/30/17	1408	SOIL	EAST WALL-S. END 5-pt	4 oz x 1	COOL	001	X		X									X				
1	1411	1	SOUTH WALL-E. END 5-pt	1	1	002	X		X									X				
1	1415	1	SOUTH WALL-W. END 5-pt	1	1	003	X		X									X				

Date	Time	Relinquished by:	Received by:	Date	Time
5/30/17	1620	J. Blagg		05/31/17	0715
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS Element: L1-0018M-E:10984

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.

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 06, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1706155

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/5/2017 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 **1706155**
Date Reported: **6/6/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1706155-001 **Matrix:** SOIL

Client Sample ID: GRAB @ 40'
Collection Date: 6/2/2017 2:38:00 PM
Received Date: 6/5/2017 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	6/5/2017 9:11:35 AM	32097
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/5/2017 9:11:35 AM	32097
Surr: DNOP	85.2	70-130		%Rec	1	6/5/2017 9:11:35 AM	32097
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.6		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Surr: BFB	102	54-150		%Rec	1	6/5/2017 12:39:20 PM	32090
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.018		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Toluene	ND	0.036		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Ethylbenzene	ND	0.036		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Xylenes, Total	ND	0.072		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Surr: 4-Bromofluorobenzene	123	66.6-132		%Rec	1	6/5/2017 12:39:20 PM	32090

ID as #7 on Figures and Tables

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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-32097**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32097**	RunNo: **43241**
Prep Date: **6/5/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361182** 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	3.6		5.000		72.5	70	130			

Sample ID **MB-32097**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32097**	RunNo: **43241**
Prep Date: **6/5/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361183** 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		85.0	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
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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32090**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361956** 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	1000		1000		102	54	150			

Sample ID **LCS-32090**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361957** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.0	76.4	125			
Surr: BFB	1100		1000		108	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
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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32090**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361976** 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	1.3		1.000		126	66.6	132			

Sample ID **LCS-32090**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361977** 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	99.8	80	120			
Toluene	1.0	0.050	1.000	0	99.9	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		126	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
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: BLAGG Work Order Number: 1706155 RcptNo: 1

Received By: Anne Thorne 6/5/2017 7:30:00 AM
Completed By: Anne Thorne 6/5/2017 7:52:43 AM
Reviewed By: 6/5/17

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA
BLAGG ENGINEERING
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time: SAME DAY
☐ Standard ☒ Rush
Project Name: MUDGE A 2
Project #:
Project Manager: STEVE MOSKAL
Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: .0

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 # (6/05/17 MeoH Kit)	Preservative Type	HEAL No. 1706155	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)
6/2/2017	1438	SOIL	GRAB @ 40'	4oz x 1	COOL	001	X		X													

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/4/2017	1847	Jeff Blagg	Chantae Waeta	6/4/2017	1847
6/4/17	1915	Chantae Waeters		06/05/17	0230

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.

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 07, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1706219

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/6/2017 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 **1706219**
Date Reported: **6/7/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1706219-001 **Matrix:** SOIL

Client Sample ID: GRAB @ 42'
Collection Date: 6/5/2017 4:31:00 PM
Received Date: 6/6/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	510	30		mg/Kg	20	6/6/2017 12:01:16 PM	32133
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	210	9.6		mg/Kg	1	6/6/2017 9:10:01 AM	32126
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/6/2017 9:10:01 AM	32126
Surr: DNOP	90.9	70-130		%Rec	1	6/6/2017 9:10:01 AM	32126
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	4100	190		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Surr: BFB	345	54-150	S	%Rec	50	6/6/2017 11:27:39 AM	32111
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	11	0.95		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Toluene	100	1.9		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Ethylbenzene	27	1.9		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Xylenes, Total	330	3.8		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Surr: 4-Bromofluorobenzene	140	66.6-132	S	%Rec	50	6/6/2017 11:27:39 AM	32111

ID as #8 on Figures and Tables

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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID	**MB-32133**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32133**		RunNo:	**43284**				
Prep Date:	**6/6/2017**	Analysis Date:	**6/6/2017**		SeqNo:	**1363498**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32133**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32133**		RunNo:	**43284**				
Prep Date:	**6/6/2017**	Analysis Date:	**6/6/2017**		SeqNo:	**1363499**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.4	90	110			

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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-32126**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **32126**			RunNo: **43268**					
Prep Date: **6/6/2017**	Analysis Date: **6/6/2017**			SeqNo: **1362102**		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	85.6	73.2	114			
Surr: DNOP	3.6		5.000		72.9	70	130			

Sample ID **MB-32126**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **32126**			RunNo: **43268**					
Prep Date: **6/6/2017**	Analysis Date: **6/6/2017**			SeqNo: **1362103**		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	9.6		10.00		96.4	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
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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32111**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363134** 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	990		1000		99.2	54	150			

Sample ID **LCS-32111**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363135** 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	1100		1000		111	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
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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32111**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363144** 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		124	66.6	132			

Sample ID **LCS-32111**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363145** 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	102	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	108	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		128	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
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: BLAGG | Work Order Number: 1706219 | RcptNo: 1

Received By: Anne Thorne 6/6/2017 7:15:00 AM

Completed By: Anne Thorne 6/6/2017 7:31:30 AM

Reviewed By: 6/6/17

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP America

Blagg Engineering

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation: ☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time: ☐ Standard ☒ Rush SAME DAY

Project Name: Mudge A 2

Project #:

Project Manager: Steve Moskal

Sampler: J- Blagg

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

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 # (Moulium MeOH Kit)	Preservative Type	HEAL No. 1706219	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)	CHLORIDE				Air Bubbles (Y or N)
6/5/17	1631	Soil	GRAB @ 42'	4oz ×1	Cool	-001	X		X									X				

Date	Time	Relinquished by:	Received by:	Date	Time
6/5/17	1744	Jeff Blagg	Chet Walt	6/5/17	1744
6/5/17	1830	Chet Walt	[signature]	06/06/17	0715

Remarks: Bill BP Contact: Steve Moskal
VID: VHIXONEVRM
WBS: L1-0018M-E:22147

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.

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 19, 2017

Steven Moskal

Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1706575

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 6/10/2017 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 **1706575**
Date Reported: **6/19/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-001 **Matrix:** SOIL

Client Sample ID: West Wall (26'-36') 5-pt
Collection Date: 6/9/2017 3:54:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	45	30		mg/Kg	20	6/17/2017 8:56:00 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	32	9.3		mg/Kg	1	6/14/2017 9:36:20 PM	32258
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/14/2017 9:36:20 PM	32258
Surr: DNOP	100	70-130		%Rec	1	6/14/2017 9:36:20 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Surr: BFB	134	54-150		%Rec	1	6/14/2017 8:57:29 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.043	0.023		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Toluene	ND	0.047		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Ethylbenzene	0.050	0.047		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Xylenes, Total	0.17	0.094		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Surr: 4-Bromofluorobenzene	110	66.6-132		%Rec	1	6/14/2017 8:57:29 PM	32244

ID as #9 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-002 **Matrix:** SOIL

Client Sample ID: West Base (38') 5-pt
Collection Date: 6/9/2017 3:47:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	44	30		mg/Kg	20	6/17/2017 9:08:24 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	24	9.8		mg/Kg	1	6/14/2017 10:04:56 PM	32258
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/14/2017 10:04:56 PM	32258
Surr: DNOP	97.3	70-130		%Rec	1	6/14/2017 10:04:56 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	5.0	4.9		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Surr: BFB	146	54-150		%Rec	1	6/14/2017 9:21:16 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.041	0.024		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Toluene	ND	0.049		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Ethylbenzene	0.091	0.049		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Xylenes, Total	0.40	0.098		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Surr: 4-Bromofluorobenzene	112	66.6-132		%Rec	1	6/14/2017 9:21:16 PM	32244

ID as #10 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-003 **Matrix:** SOIL

Client Sample ID: South Wall (26'-36') 5-pt
Collection Date: 6/9/2017 3:33:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	600	30		mg/Kg	20	6/17/2017 9:20:48 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	18	9.5		mg/Kg	1	6/14/2017 10:33:49 PM	32258
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/14/2017 10:33:49 PM	32258
Surr: DNOP	95.9	70-130		%Rec	1	6/14/2017 10:33:49 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Surr: BFB	120	54-150		%Rec	1	6/14/2017 9:44:50 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Toluene	ND	0.046		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Ethylbenzene	ND	0.046		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Xylenes, Total	ND	0.093		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Surr: 4-Bromofluorobenzene	112	66.6-132		%Rec	1	6/14/2017 9:44:50 PM	32244

ID as #11 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID	**MB-32341**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32341**		RunNo:	**43585**				
Prep Date:	**6/17/2017**	Analysis Date:	**6/17/2017**		SeqNo:	**1372898**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32341**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32341**		RunNo:	**43585**				
Prep Date:	**6/17/2017**	Analysis Date:	**6/17/2017**		SeqNo:	**1372899**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.5	90	110			

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32258**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1369816** 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	10		10.00		104	70	130			

Sample ID **LCS-32258**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370823** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	73.2	114			
Surr: DNOP	4.9		5.000		98.7	70	130			

Sample ID **LCS-32292**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32292**	RunNo: **43528**
Prep Date: **6/14/2017**	Analysis Date: **6/15/2017**	SeqNo: **1372096** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.1		5.000		81.4	70	130			

Sample ID **MB-32292**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32292**	RunNo: **43528**
Prep Date: **6/14/2017**	Analysis Date: **6/15/2017**	SeqNo: **1372097** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.7		10.00		87.4	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32244**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370036** 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	1100		1000		110	54	150			

Sample ID **LCS-32244**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370037** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.8	76.4	125			
Surr: BFB	1200		1000		119	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32244**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370062** 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	1.1		1.000		108	66.6	132			

Sample ID **LCS-32244**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370063** 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	99.6	80	120			
Toluene	1.0	0.050	1.000	0	99.8	80	120			
Ethylbenzene	0.98	0.050	1.000	0	97.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.2	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		111	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

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: BLAGG | Work Order Number: 1706575 | RcptNo: 1

Received By: Andy Freeman 6/10/2017 11:15:00 AM

Completed By: Ashley Gallegos 6/12/2017 11:39:32 AM

Reviewed By: 6/12/17

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	2.8	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING INC

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: ~~SAME DAY~~ 6/12
X Standard X Rush Standard TAT

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG
On Ice: X Yes ☐ No
Sample Temperature: 2.3

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. 1706575	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)	CHLORIDE				Air Bubbles (Y or N)
6/9/2017	1554	SOIL	West Wall (26'-36') 5-pt	4oz x1	COOL	-001	X		X									X				
"	1547	"	West Base (38') 5-pt	"	"	-002	"		"									"				
"	1533	"	South Wall (26'-36') 5-pt	"	"	-003	"		"									"				

Date: 6/9/2017 Time: 1730 Relinquished by: Jeff Blagg
Received by: Date 6/10/17 Time 1115

Date: Time: Relinquished by:
Received by: Date Time

Remarks: Bill BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E:10984

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

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1706650

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/13/2017 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 **1706650**
Date Reported: **6/21/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706650-001 **Matrix:** SOIL

Client Sample ID: NE BASE 5-pt @ 37'
Collection Date: 6/12/2017 10:16:00 AM
Received Date: 6/13/2017 7:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	74	30		mg/Kg	20	6/20/2017 3:51:18 PM	32385
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	89	9.9		mg/Kg	1	6/14/2017 11:59:55 PM	32258
Motor Oil Range Organics (MRO)	65	50		mg/Kg	1	6/14/2017 11:59:55 PM	32258
Surr: DNOP	97.1	70-130		%Rec	1	6/14/2017 11:59:55 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	200	24		mg/Kg	5	6/15/2017 11:18:36 PM	32257
Surr: BFB	296	54-150	S	%Rec	5	6/15/2017 11:18:36 PM	32257
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.19	0.12		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Toluene	0.56	0.24		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Ethylbenzene	1.2	0.24		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Xylenes, Total	18	0.48		mg/Kg	5	6/15/2017 11:18:36 PM	32257
Surr: 4-Bromofluorobenzene	132	66.6-132		%Rec	5	6/14/2017 5:47:27 PM	32257

ID as #12 on Figures and Tables

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706650-002 **Matrix:** SOIL

Client Sample ID: N. Wall 5-pt (26'-36')
Collection Date: 6/12/2017 10:24:00 AM
Received Date: 6/13/2017 7:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	410	30		mg/Kg	20	6/20/2017 4:03:43 PM	32385
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	20	10		mg/Kg	1	6/15/2017 12:28:15 AM	32258
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/15/2017 12:28:15 AM	32258
Surr: DNOP	94.3	70-130		%Rec	1	6/15/2017 12:28:15 AM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/16/2017 12:06:20 AM	32257
Surr: BFB	116	54-150		%Rec	1	6/16/2017 12:06:20 AM	32257
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Toluene	ND	0.047		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Ethylbenzene	ND	0.047		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Xylenes, Total	ND	0.095		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Surr: 4-Bromofluorobenzene	118	66.6-132		%Rec	1	6/14/2017 6:35:26 PM	32257

ID as #13 on Figures and Tables

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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID	**MB-32385**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32385**		RunNo:	**43638**				
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**		SeqNo:	**1375850**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32385**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32385**		RunNo:	**43638**				
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**		SeqNo:	**1375851**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.4	90	110			

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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32258**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1369816** 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	10		10.00		104	70	130			

Sample ID **LCS-32258**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370823** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	73.2	114			
Surr: DNOP	4.9		5.000		98.7	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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32257**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370009** 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		95.9	54	150			

Sample ID **LCS-32257**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370010** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	76.4	125			
Surr: BFB	1000		1000		103	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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32257**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370018** 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		123	66.6	132			

Sample ID **LCS-32257**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370019** 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	105	80	120			
Toluene	1.1	0.050	1.000	0	106	80	120			
Ethylbenzene	1.1	0.050	1.000	0	106	80	120			
Xylenes, Total	3.2	0.10	3.000	0	108	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: BLAGG | Work Order Number: 1706650 | RcptNo: 1

Received By: Anne Thorne 6/13/2017 7:55:00 AM

Completed By: Sophia Campuzano 6/13/2017 11:16:14 AM

Reviewed By: ENM 06/13/17

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 ☑	# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING INC.

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name:
MUDGE A 2

Project #:

Project Manager:
STEVE MOSKAL

Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0°

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. 1706650	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)	CHLORIDE				Air Bubbles (Y or N)
6/12/17	1016	SOIL	NE BASE 5-pt @ 37'	4 oz x 1	COOL	-001	X		X									X				
"	1024	"	N. WALL 5-pt (26'-36")	"	"	-002	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/12/17	1119	Jeff Blagg		6/12/17	1119
6/12/17	1817			06/13/17	0753

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E: 10984

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.

Appendix D

Drill Boring
Laboratory Analytical Data 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

August 27, 2017

Steve Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1708A09

Dear Steve Moskal:

Hall Environmental Analysis Laboratory received 9 sample(s) on 8/16/2017 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 **1708A09**
Date Reported: **8/27/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-001 **Matrix:** SOIL

Client Sample ID: BH-1 (25'-26')
Collection Date: 8/14/2017 12:03:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	330	30		mg/Kg	20	8/24/2017 1:14:23 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	120	9.8		mg/Kg	1	8/21/2017 10:59:53 PM	33448
Motor Oil Range Organics (MRO)	110	49		mg/Kg	1	8/21/2017 10:59:53 PM	33448
Surr: DNOP	97.6	70-130		%Rec	1	8/21/2017 10:59:53 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	79	24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Surr: BFB	167	54-150	S	%Rec	5	8/18/2017 11:53:49 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.12		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Toluene	ND	0.24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Ethylbenzene	ND	0.24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Xylenes, Total	1.1	0.49		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Surr: 4-Bromofluorobenzene	111	66.6-132		%Rec	5	8/18/2017 11:53:49 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-002 **Matrix:** SOIL

Client Sample ID: BH-1 (35'-36')
Collection Date: 8/14/2017 12:28:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	50	30		mg/Kg	20	8/24/2017 1:26:47 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/21/2017 11:22:17 PM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2017 11:22:17 PM	33448
Surr: DNOP	88.8	70-130		%Rec	1	8/21/2017 11:22:17 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Surr: BFB	92.0	54-150		%Rec	1	8/21/2017 2:36:06 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Toluene	ND	0.046		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Ethylbenzene	0.047	0.046		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Xylenes, Total	ND	0.093		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Surr: 4-Bromofluorobenzene	104	66.6-132		%Rec	1	8/21/2017 2:36:06 PM	33432

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
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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: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-003 **Matrix:** SOIL

Client Sample ID: BH-1 (45'-46')
Collection Date: 8/14/2017 1:35:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	8/24/2017 2:28:49 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	8/21/2017 11:44:24 PM	33448
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/21/2017 11:44:24 PM	33448
Surr: DNOP	83.8	70-130		%Rec	1	8/21/2017 11:44:24 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Surr: BFB	89.2	54-150		%Rec	1	8/19/2017 12:40:47 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Xylenes, Total	ND	0.096		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Surr: 4-Bromofluorobenzene	102	66.6-132		%Rec	1	8/19/2017 12:40:47 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-004 **Matrix:** SOIL

Client Sample ID: BH-2 (31.5'-32')
Collection Date: 8/14/2017 2:55:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	54	30		mg/Kg	20	8/24/2017 2:41:14 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	14	9.3		mg/Kg	1	8/22/2017 12:06:37 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 12:06:37 AM	33448
Surr: DNOP	90.6	70-130		%Rec	1	8/22/2017 12:06:37 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Surr: BFB	99.5	54-150		%Rec	1	8/21/2017 2:59:49 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Toluene	ND	0.047		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Xylenes, Total	ND	0.094		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Surr: 4-Bromofluorobenzene	104	66.6-132		%Rec	1	8/21/2017 2:59:49 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-005 **Matrix:** SOIL

Client Sample ID: BH-2 (35'-36')
Collection Date: 8/14/2017 3:07:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	150	30		mg/Kg	20	8/24/2017 2:53:39 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/22/2017 12:28:57 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 12:28:57 AM	33448
Surr: DNOP	91.6	70-130		%Rec	1	8/22/2017 12:28:57 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Surr: BFB	92.1	54-150		%Rec	1	8/21/2017 3:23:36 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Toluene	ND	0.046		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Ethylbenzene	ND	0.046		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Xylenes, Total	ND	0.092		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Surr: 4-Bromofluorobenzene	105	66.6-132		%Rec	1	8/21/2017 3:23:36 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-006 **Matrix:** SOIL

Client Sample ID: BH-2 (45'-46')
Collection Date: 8/14/2017 3:37:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	34	30		mg/Kg	20	8/24/2017 3:06:04 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/22/2017 12:51:15 AM	33448
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/22/2017 12:51:15 AM	33448
Surr: DNOP	92.8	70-130		%Rec	1	8/22/2017 12:51:15 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Surr: BFB	88.5	54-150		%Rec	1	8/19/2017 1:51:45 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Toluene	ND	0.049		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Ethylbenzene	ND	0.049		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Xylenes, Total	ND	0.098		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Surr: 4-Bromofluorobenzene	101	66.6-132		%Rec	1	8/19/2017 1:51:45 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-007 **Matrix:** SOIL

Client Sample ID: BH-3 (25'-26')
Collection Date: 8/15/2017 8:35:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	370	30		mg/Kg	20	8/24/2017 3:18:28 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	10	9.7		mg/Kg	1	8/22/2017 1:35:57 AM	33448
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/22/2017 1:35:57 AM	33448
Surr: DNOP	93.5	70-130		%Rec	1	8/22/2017 1:35:57 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Surr: BFB	124	54-150		%Rec	1	8/21/2017 5:21:57 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Toluene	ND	0.047		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Xylenes, Total	ND	0.095		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Surr: 4-Bromofluorobenzene	106	66.6-132		%Rec	1	8/21/2017 5:21:57 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-008 **Matrix:** SOIL

Client Sample ID: BH-3 (35'-36')
Collection Date: 8/15/2017 9:04:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	490	30		mg/Kg	20	8/24/2017 3:30:52 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/22/2017 1:58:12 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 1:58:12 AM	33448
Surr: DNOP	101	70-130		%Rec	1	8/22/2017 1:58:12 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Surr: BFB	88.9	54-150		%Rec	1	8/19/2017 2:39:02 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Xylenes, Total	ND	0.096		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Surr: 4-Bromofluorobenzene	101	66.6-132		%Rec	1	8/19/2017 2:39:02 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-009 **Matrix:** SOIL

Client Sample ID: BH-3 (45'-46')
Collection Date: 8/15/2017 9:40:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	460	30		mg/Kg	20	8/24/2017 3:43:17 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/22/2017 2:20:33 AM	33448
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/22/2017 2:20:33 AM	33448
Surr: DNOP	94.4	70-130		%Rec	1	8/22/2017 2:20:33 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Surr: BFB	89.2	54-150		%Rec	1	8/19/2017 3:02:41 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Xylenes, Total	ND	0.097		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Surr: 4-Bromofluorobenzene	100	66.6-132		%Rec	1	8/19/2017 3:02:41 AM	33432

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#: **1708A09**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-33539**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **33539**	RunNo: **45189**
Prep Date: **8/24/2017**	Analysis Date: **8/24/2017**	SeqNo: **1432108** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID **LCS-33539**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **33539**	RunNo: **45189**
Prep Date: **8/24/2017**	Analysis Date: **8/24/2017**	SeqNo: **1432109** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.3	90	110			

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#: **1708A09**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **LCS-33448**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **33448**	RunNo: **45117**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428776** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	101	73.2	114			
Surr: DNOP	3.9		5.000		77.7	70	130			

Sample ID **MB-33448**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **33448**	RunNo: **45117**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428777** 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	8.4		10.00		84.0	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#: **1708A09**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-33432**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427097** 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	900		1000		89.8	54	150			

Sample ID **LCS-33432**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427098** 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	96.9	76.4	125			
Surr: BFB	980		1000		97.8	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#: **1708A09**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-33432**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427128** 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	1.0		1.000		103	66.6	132			

Sample ID **LCS-33432**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427129** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	95.3	80	120			
Toluene	0.93	0.050	1.000	0	92.8	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	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: BLAGG | Work Order Number: 1708A09 | RcptNo: 1

Received By: Anne Thorne 8/16/2017 7:15:00 AM

Completed By: Ashley Gallegos 8/16/2017 3:34:13 PM

Reviewed By: ENM 8/17/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA
BLAGG ENGINEERING INC.
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: MUDGE A 2
Project #:
Project Manager: STEVE MOSKAL
Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: .6

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 #	Preservative Type	HEAL No. 1708A09	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)	CHLORIDE				Air Bubbles (Y or N)
8/14/2017	1203	SOIL	BH-1 (25'-26')	4 oz x1	COOL	-001	X		X									X				
	1228		BH-1 (35'-36')			-002																
	1335		BH-1 (45'-46')			-003																
	1455		BH-2 (31½'-32')			-004																
	1507		BH-2 (35'-36')			-005																
	1537		BH-2 (45'-46')			-006																
8/15/2017	0835		BH-3 (25'-26')			-007																
	0904		BH-3 (35'-36')			-008																
	0940		BH-3 (45'-46')			-009																

Date:	Time:	Relinquished by:	Received by:	Date	Time
8/15/17	1508	Jeff Blagg		8/15/17	1505
8/15/17	1804	Christine Walsh		08/16/17	0715

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-005 **Matrix:** SOIL

Client Sample ID: BH-5 (45'-46')
Collection Date: 8/16/2017 1:52:00 PM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	87	30		mg/Kg	20	8/24/2017 5:10:09 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2017 10:54:16 PM	33453
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2017 10:54:16 PM	33453
Surr: DNOP	73.5	70-130		%Rec	1	8/21/2017 10:54:16 PM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Surr: BFB	74.0	54-150		%Rec	1	8/21/2017 8:18:13 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Toluene	ND	0.049		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Surr: 4-Bromofluorobenzene	105	66.6-132		%Rec	1	8/21/2017 8:18:13 PM	33452

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#: **1708B02**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-33539**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **33539**	RunNo: **45189**
Prep Date: **8/24/2017**	Analysis Date: **8/24/2017**	SeqNo: **1432108** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID **LCS-33539**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **33539**	RunNo: **45189**
Prep Date: **8/24/2017**	Analysis Date: **8/24/2017**	SeqNo: **1432109** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.3	90	110			

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#: **1708B02**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **LCS-33453**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **33453**	RunNo: **45091**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428105** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	105	73.2	114			
Surr: DNOP	3.9		5.000		78.1	70	130			

Sample ID **MB-33453**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **33453**	RunNo: **45091**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428106** 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	7.3		10.00		73.0	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#: **1708B02**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-33452**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428026** 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	840		1000		84.3	54	150			

Sample ID **LCS-33452**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428027** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.0	76.4	125			
Surr: BFB	920		1000		92.2	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#: **1708B02**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-33452**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428054** 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		119	66.6	132			

Sample ID **LCS-33452**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428055** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	109	80	120			
Toluene	1.1	0.050	1.000	0	108	80	120			
Ethylbenzene	1.1	0.050	1.000	0	107	80	120			
Xylenes, Total	3.3	0.10	3.000	0	108	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		123	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: BLAGG Work Order Number: 1708B02 RcptNo: 1

Received By: Anne Thorne 8/17/2017 7:10:00 AM

Completed By: Ashley Gallegos 8/17/2017 3:17:26 PM

Reviewed By: 8/18/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING INC.

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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. 1708B02	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)	CHLORIDE				Air Bubbles (Y or N)
8/10/2017	0901	SOIL	BH-4 (30'-31')	4 oz x 1	COOL	-001	X		X									X				
	0915		BH-4 (35'-36')			-002																
	0958		BH-4 (45'-46')			-003																
	1322		BH-5 (35'-36')			-004																
	1352		BH-5 (45'-46')			-005																

Date:	Time:	Relinquished by:	Received by:	Date	Time
8/10/2017	1502	Jeff Blagg	Christen Walker	8/10/2017	1502
8/10/17	1832	Christen Walker		08/11/17	0710

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHKONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.

Remediation
of
Hydrocarbon Impacted Soils

Mudge A 2
(A) Sec 10 – T31N – R11W
API: 30-045-10948
San Juan County, New Mexico

Prepared for:
BP America Production Co.
Farmington, New Mexico

Prepared by:
Blagg Engineering, Inc.
P.O. Box 87
Bloomfield, New Mexico 87413
(505)632-1199

September 14
2017

REMEDIATION
OF
HYDROCARBON IMPACTED SOILS
MUDGE A 2

TABLE OF CONTENTS

APPENDICES

REMEDIATION OF
HYDROCARBON IMPACTED SOILS
MUDGE A 2

INTRODUCTION

Blagg Engineering Inc. (BEI) has been retained by BP America Production Co. (BP) to monitor, sample and document environmental remediation of hydrocarbon impacts at the Mudge A 2, a natural gas well located in rural San Juan County, New Mexico at (A) Sec. 10 – T31N – R11W (Figure 1). Hydrocarbon impacts at the site were discovered in on April 25, 2017 during routine closure at a 95 barrel below grade tank (BGT). There were no apparent integrity issues with the BGT and the source of impacts appeared to be historical, likely from a prior unlined earthen disposal pit at the same location as the 95 BGT. This was a common practice permitted by both New Mexico Oil Conservation Division (NMOCD) and the U.S. Bureau of Land Management (BLM) until the mid 1990's. During the site remediation no other hydrocarbon impact sources were observed. BP began initial remedial excavations of on-site impacts on May 18, 2017 and completed excavation of accessible impacts on June 12, 2017. Excavations were discontinued at that time due to the depth of the dig (exceeding 38' from original well pad surface) and because the excavation was approaching an active third party high pressure natural gas line that could not be taken out of service. Following backfilling the remedial dig with clean fill, a mobile hollow stem auger environmental drill rig was used to fully delineate impacts that could not be excavated. This drilling was conducted between August 14 – 16, 2017.

The site closure standard ranking was determined as follows:

Depth to Groundwater based on BGT permit research: 50 – 100 feet (10 points)
Distance to water well > 1,000' based on BGT permit research: (0 points)
Distance to dry wash < 200' based on site measurements: (10 points)

Total Site Ranking: 20

With a ranking of 20 points, the NMOCD/BLM site the closure standard was established as follows:

Total Petroleum Hydrocarbons (TPH) = 100 mg/Kg (parts per million)
Benzene = 10 mg/Kg
Benzene, Toluene, Ethyl-Benzene and Total Xylenes (BTEX) combined = 50 mg/Kg
Total Chlorides = 600 mg/Kg

REMEDIATION ACTIVITIES

Site remediation consisted of 2 separate activities: (1) excavation of impacted soils until site closure standards had been achieved, and (2) drilling to delineate impact areas that could not be excavated due to depth and/or pipeline utility issues. The procedures used for these activities are discussed below.

Excavation of Impacted Media to Achieve Site Remediation

Removal of hydrocarbon impacted media began on May 18, 2017 using excavators to strip clean, un-impacted soils and excavate impacted soils. The excavated impacted soils were placed on the well pad. A small scale test run was conducted to evaluate the soils for on-site treatment to remove hydrocarbons via shredding and chemical treatment. Based on laboratory test results, it was determined that this site was a poor candidate for on-site treatment and all excavated impacted materials were subsequently transported to a commercial landfarm for final remediation. Remedial excavations progressed from the southeast portion of the well pad, where the original source was discovered, and advanced off-pad towards the southeast. As previously discussed, the excavation was discontinued when a total depth of 38' below original well pad grade was reached and a third party gas pipeline was being encroached.

Closure sampling was progressive as the excavation advanced. Sampling areas were marked out on the excavation walls and base for collection of composites from each area (Figure 2). Sampling was primarily performed using an excavator trackhoe due to the danger of personnel entering the excavation because of the risk of collapsing sidewalls. All closure sampling was witnessed by the NMOCD. Representative composite portions of sample were placed into a gallon sized Ziploc® baggie for field headspace analysis of organic vapors with a calibrated IonScience Tiger model photo-ionization detector (PID) containing a 11.2 eV lamp. Split samples were placed into a 4-ounce laboratory supplied jar with Teflon® lid, labeled and placed on ice in an ice chest for further laboratory testing. The jarred samples were hand delivered to a representative of Hall Environmental Analytical Laboratories for analysis via U.S. EPA Method 8021B (volatile organics limited to benzene, toluene, ethyl benzene and total xylenes), U.S. EPA Method 8015 (gasoline range (GRO), diesel range (DRO) and motor oil range (MRO) organics), and chlorides via U.S. EPA Method 300. A chain-of-custody followed the samples.

Laboratory analytical test reports for the closure sampling is found in Appendix C and a summary of this laboratory data is found in Table 1:

Table 1

Summary Excavation Closure Laboratory Data

Sample ID	Date	TPH Total (mg/Kg)	BTEX Total (mg/Kg)	Benzene (mg/Kg)	Comments
1 – North Wall (8-pt. comp) (6'-19')	5/24/2017	ND	ND	ND	
2 – West Wall (8-pt. comp) (6'-19')	5/24/2017	ND	ND	ND	
3 – SE Corner (3-pt. comp) (10'-16')	5/24/2017	2,655	169.8	3.7	Impacted soils, subsequently excavated.
4 – East Wall, South (5-pt. comp)(12'-25')	5/30/2017	230	4.1	ND	Subsequently excavated.
5 – South Wall, East (5-pt. comp)(12'-25')	5/30/2017	11	ND	ND	
6 – South Wall, West (5-pt. comp)(12'-25')	5/30/2017	590	26.8	ND	Subsequently excavated.
7 – Grab Sample, South Extent, @-40'	6/2/2017	ND	ND	ND	
8 – Grab Sample, SE Extent, @-42'	6/5/2017	4,310	468	11	Informational Sample. Impacts remain in place.
9 – West Wall (5-pt. comp) (26'-36')	6/9/2017	32	0.26	0.043	
10 – West Base (5-pt. comp @ -38')	6/9/2017	29	0.53	0.041	
11 – South Wall (5-pt. comp) (26'-36')	6/9/2017	18	ND	ND	
12 – NE Base (5-pt. comp @ -37')	6/12/2017	354	19.95	0.19	Impacts remain in place.
13 – North Wall (5-pt. comp) (26'-36')	6/12/2017	20	ND	ND	
NMOCD/BLM Closure Standard		100	50	10	

Off-Site Drilling to Delineate Residual Impacts

Delineation of off-site impacts that could not be excavated was conducted using a hollow stem auger drill rig. During this investigation, conducted on August 14 – 16, 2017, a total of five borings were advanced to a depth of 45 feet below surface grade (Figure 3). The boring locations were all between 9' – 12' below original well pad grade, so the total depth of the borings ranged between 54' – 57' below the original well pad elevation. Approximate drilling locations had been pre-determined and well permits were obtained through the New Mexico Office of the State Engineer in the event that groundwater was encountered.

Drilling operations were conducted by Enviro-Drill using a CME-75 drilling unit equipped with 5-foot long augers and sampling conducted with a conventional 24-inchlong x 2-inch diameter split spoon sampler. Split spoon samples were collected every 5 feet. Split samples were described on the drilling logs (Appendix B), then a representative portion was placed into a gallon sized Ziploc® baggie for field headspace analysis of organic vapors as previously described. Samples with the highest OVM reading from each boring were submitted for laboratory testing, as well as the deepest sample obtained.

Although no groundwater was encountered, four of the borings were completed as soil vapor extraction (SVE) or chemical injection points in the event that in-situ remediation might be necessary. These completions consisted of either a 5-foot or 10-foot long slotted screened section across the interval with greatest field OVM reading, with a riser extending to about 3 feet above grade. The piping used for completion was a schedule 40 PVC with threaded connections. The annulus of the screened section was sand packed with washed graded silica 10/20 mesh to approximately 2 feet above the top screen slot. Above this a 2 foot section of hydrated bentonite was placed, followed by a cement/bentonite grout mix installed in the annulus from immediately above the bentonite to the ground surface. The completion tops were secured with a steel, lockable well protector cemented into place.

Borehole BH-5 was abandoned immediately after drilling by filling the borehole with cuttings to the ground surface since there was no evidence of hydrocarbon impacts in any cuttings or split spoon sample.

Boring completions BH-1 through BH-4 were inspected for the presence of water on September 6, 2017. Between 3" and 5" of bentonite hydration water was found to be accumulated in the end caps of BH-1, BH-2 and BH-4. This water was removed on September 7, 2017 using a sponge apparatus placed in a bailer. The boring completions were re-inspected for water on September 8, 2017 and no new water had accumulated in the end caps.

Drill boring soil sample laboratory analytical reports are found in Appendix D and a summary of this laboratory data is presented in Table 2:

Table 2
Summary Drilling Laboratory Data

Sample ID	Date	Field OVM (ppm)	TPH Total (mg/Kg)	BTEX Total (mg/Kg)	Benzene (mg/Kg)	Comments
BH-1 (25'-26')	8/14/2017	1,638	309	1.1	ND	Backfill to about 33' boring depth.
BH-1 (35'-36')	8/14/2017	18.8	ND	0.047	ND	Boring surface grade about 9' below
BH-1 (45'-46')	8/14/2017	3.7	ND	ND	ND	original wellpad grade.
BH-2 (31.5'-32')	8/14/2017	606	14	ND	ND	Boring surface grade about 12' below
BH-2 (35'-36')	8/14/2017	12.2	ND	ND	ND	original wellpad grade.
BH-2 (45'-46')	8/14/2017	2.6	ND	ND	ND	
BH-3 (25'-26')	8/15/2017	224	10	ND	ND	Boring surface grade about 10' below
BH-3 (35'-36')	8/15/2017	16.8	ND	ND	ND	original wellpad grade.
BH-3 (45'-46')	8/15/2017	2.1	ND	ND	ND	
BH-4 (30'-31')	8/16/2017	95	11	ND	ND	Boring surface grade about 11' below
BH-4 (35'-36')	8/16/2017	41	ND	ND	ND	original wellpad grade.
BH-4 (45'-46')	8/16/2017	2.2	ND	ND	ND	
BH-5 (35'-36')	8/16/2017	17.6	ND	ND	ND	Boring surface grade about 12' below
BH-5 (45'-46')	8/16/2017	1.6	ND	ND	ND	original wellpad grade.
NMOCD/BLM Closure Standard			100	50	10	

CONCLUSIONS AND RECOMMENDATIONS

1) Hydrocarbon impacted soil and at the BP operated Mudge A 2 has been successfully excavated. Excavation sampling and analytical testing has confirmed that 11 of 13 separate sampling zones within the remedial excavation test below site closure standards. The two (2) zones with residual hydrocarbon impacts exceeding site closure standards (Areas 8 and 12) are not indicated to contribute a risk to surface or groundwater. Removal of additional soils in Areas 8 and 12 is not presently feasible due to an active third party high pressure natural gas line.

2) Drilling to further delineate in-place impacts has determined that no lateral movement of hydrocarbons exceeding site standards is present. Borings BH-2 through BH-5, outside the remedial excavation, tested residual hydrocarbons at values less than 14 mg/Kg. Boring BH-1, placed within the remedial excavation at the point of greatest residual impacts, found a minimum 10 foot separation between the base of impacts and the base of the boring. The maximum hydrocarbon value tested in BH-1 was 309 mg/Kg.

3) Site closure is recommended. The remaining hydrocarbon impacts at the site do not indicate a risk to surface or groundwater.

CLOSURE AND LIMITATIONS

This report has been prepared for the exclusive use of BP America Production Company as it pertains to hydrocarbon impact remediation at the Mudge A 2 in San Juan County, New Mexico. The data presented herein is based on visual observations, subsurface soil conditions encountered at sampling locations and on information reported by analytical laboratory testing of soils. This report does not reflect variations which may exist between sampling locations.

I certify that the work performed by Blagg Engineering, Inc. as described in this report was directed by my supervision, and that I am personally familiar with the remedial actions and the contents of this report.

Submitted by:
Blagg Engineering, Inc.

Jeffrey C Blagg, PE

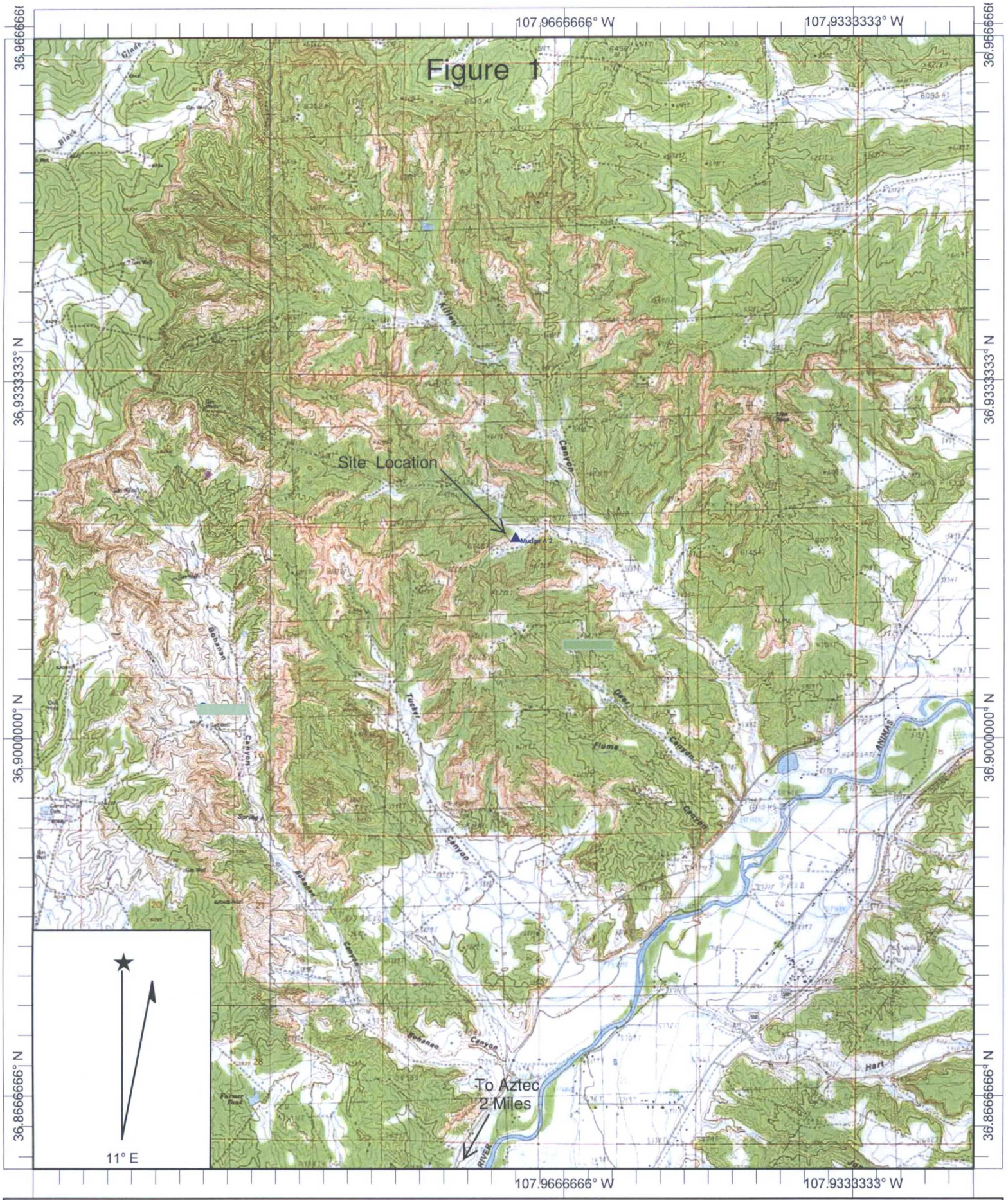
Digitally signed by Jeffrey C Blagg, PE
DN: cn=Jeffrey C Blagg, PE, o, ou, email=jeffcblagg@aol.com, c=US
Date: 2017.09.14 13:05:07 -06'00'

Jeffrey C. Blagg, PE
NMPE 11607

Appendix A

Figures

Figure 1

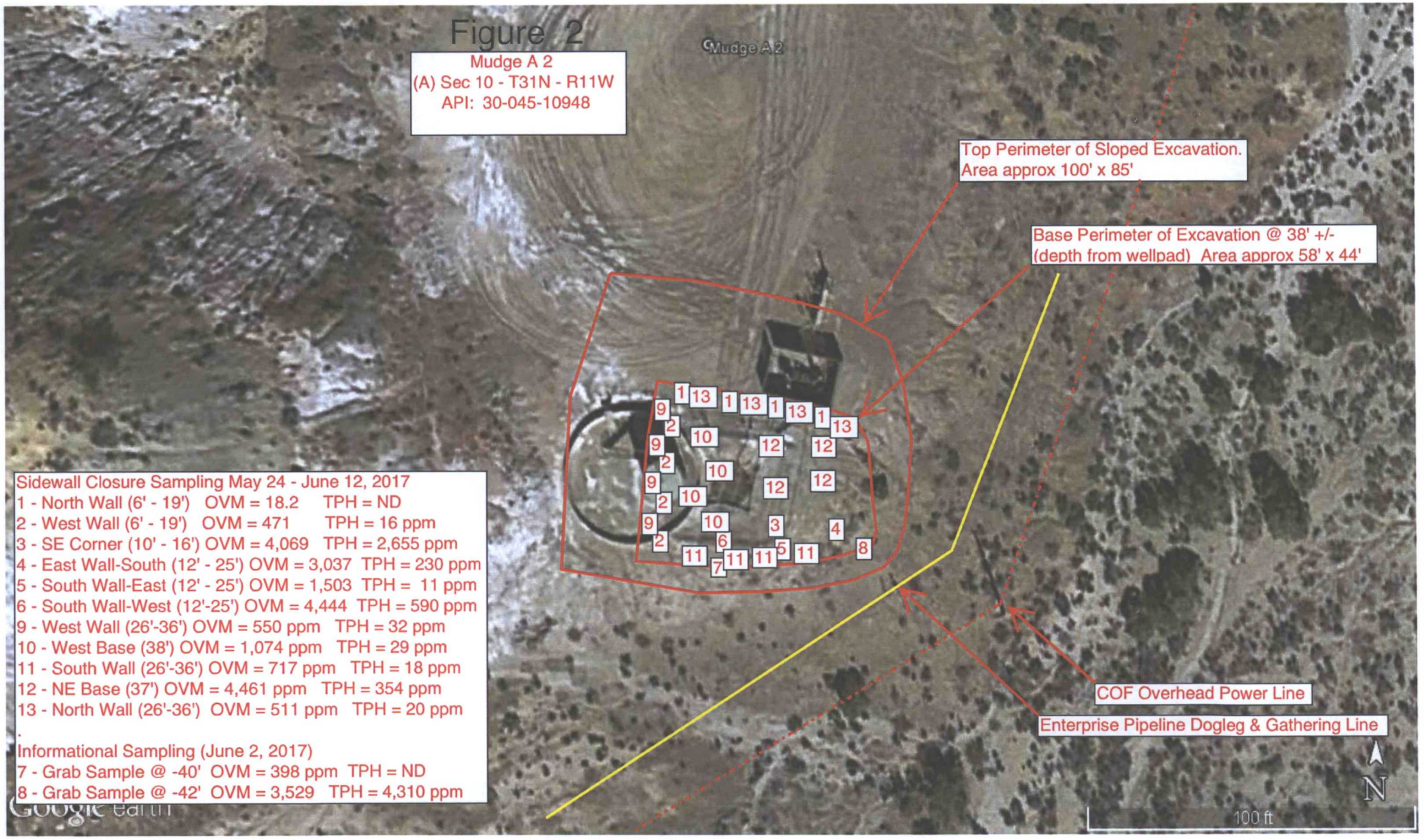


Name: CEDAR HILL
Date: 9/14/2017
Scale: 1 inch equals 4000 feet

Location: 036.9127637° N 107.9737073° W
Caption: BP America
Mudge A 2

Figure 2

Mudge A 2
(A) Sec 10 - T31N - R11W
API: 30-045-10948



Sidewall Closure Sampling May 24 - June 12, 2017
1 - North Wall (6' - 19') OVM = 18.2 TPH = ND
2 - West Wall (6' - 19') OVM = 471 TPH = 16 ppm
3 - SE Corner (10' - 16') OVM = 4,069 TPH = 2,655 ppm
4 - East Wall-South (12' - 25') OVM = 3,037 TPH = 230 ppm
5 - South Wall-East (12' - 25') OVM = 1,503 TPH = 11 ppm
6 - South Wall-West (12'-25') OVM = 4,444 TPH = 590 ppm
9 - West Wall (26'-36') OVM = 550 ppm TPH = 32 ppm
10 - West Base (38') OVM = 1,074 ppm TPH = 29 ppm
11 - South Wall (26'-36') OVM = 717 ppm TPH = 18 ppm
12 - NE Base (37') OVM = 4,461 ppm TPH = 354 ppm
13 - North Wall (26'-36') OVM = 511 ppm TPH = 20 ppm

.

Informational Sampling (June 2, 2017)
7 - Grab Sample @ -40' OVM = 398 ppm TPH = ND
8 - Grab Sample @ -42' OVM = 3,529 TPH = 4,310 ppm

Figure 3


Mudge A 2
(A) Sec 10 - T31N - R11W
API: 30-045-10948
Mudge A2
Top Perimeter of Sloped Excavation.
Area approx 100' x 85'
Base Perimeter of Excavation @ 38' +/-
(depth from wellpad) Area approx 58' x 44'
Sidewalls Meet Closure Standard to base of excavation at -38'
Base Meets Site Closure Standard at -38'
Base Exceeds Site Closure Standard at -37' (354 mg/Kg)
BH-5
BH-2
BH-4
BH-1
BH-3
Boring Maximum TPH Values:
(Note: Depths are from boring ground surface, which is 9'-12' below wellpad surface grade):
BH-1: 309 mg/Kg @ 25'-26'
BH-2: 14 mg/Kg @ 31.5'-32'
BH-3: 10 mg/Kg @ 25'-26'
BH-4: 11 mg/Kg @ 30'-31'
BH-5: All non-detect
COF Overhead Power Line
Enterprise Pipeline Dogleg & Gathering Line
N
100 ft
Google earth

Appendix B

Drilling Logs

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-1

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger – CME 75
DATE START: 8/14/2017 DATE FINISH: 9/15/2017 DRILLER: A-Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45 CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 9 ± Below well PAD

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1120	Cuttings			START Silty SAND - Backfill - NO/NS
4'					
6'					
8'					
10'					
12'					
14'					
16'					
18'					
20					
22'					
24'					SAA - Except HC odor Beginning @ 23'
26'	1203	SS - 6 Blows	1638 TPH = 309 ppm		Recover 18" - mottled Gray Silty SAND, Strong HC odor (Backfill)
28'					
30'					
32'	1212	SS - 4 Blows	260		Recover 7" - SAA (Backfill)
34'					
36'	1228	SS 40 Blows	18.8 TPH = ND		Dense silt Stone, Grey Green, HC odor. (Recover 11")
38'					
40					
42'	1245	SS 67 Blows	6.5		Recover 13", Dense Silt Stone, Gray Green, Lite HC odor.
44'					
46'	1335	SS 68 Blows	3.7 TPH = ND		Recover 16", Blue Shalestone, Dry, Lite HC odor.
48'					
50'					
52'					
54'					
56'					
58'					
60					

MW Schematic: 10 x 0.010 Well; RISER; CEMENT GROUT; BENT; 10/20 SAND; BENT; CLEAN CUTTINGS

BLAGG ENGINEERING, INC.

P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-2

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/14/2017 DATE FINISH: 8/15/2017 DRILLER: A. Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: Surface 12'± Below Well Pad

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1411	Cuttings			START
4'					Silty SAND, Native, Tan, Dry, No Odor No Stain
6'					
8'					
10'					
12'	1419	22 Blows	1.2		Recover 14", lite brown silty Sand, NO/NS, Lite Moisture
14'					
16'	1426	32 Blows	0.5	Riser / Grout	Recover 24", SAA, less Moisture
18'					
20 22'	1434	36 Blows	30.6		Recover 22", SAA, Increased Moisture
24'					
26'	1443	51 Blows	3.1		Recover 24", SAA Except Bottom 3": Fractured Sandstone.
28'				Bent	
30'					
32'	1455	52 Blows	3.0 606 TPH = 14 PPM	10/20 Sand	Recover 24" 30'-31½': Lite brown silty clayey mix, NO/NS, Moist 31½-32: Grey Fractured Sandstone, HC Odor + Stain
34'					
36'	1507	51 Blows	12.2 TPH = ND	Bent	Recover 24" Dark Brown/Green Shalestone, Lite HC Odor.
38'					
40 42'	1524	70 Blows	3.8	Cuttings Backfill	Recover 20", SAA
44'					
46'	1537	34 Blows	2.6 TPH = ND		Recover 21" SAA
48'					
50'					
52'					
54'					
56'					
58'					
60					

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-3

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger - CME 75
DATE START: 8/15/2017 DATE FINISH: 8/15/2017 DRILLER: A. Kennedy LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 10' ± Below well pad.

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	0758	CUTTINGS			START Silty SAND, NATIVE, TAN, DRY, No ODOR No stain
4'					
6'					
8'					
10'					
12'	0810	17 Blows	0.0	CEMENT GROUT	Recover 16" silty SAND, Lite Brown, lite Moisture, No/NS
14'					
16'	0815	30 Blows	0.2	RISER	Recover 24", SAA
18'					
20					
22'	0824	35 Blows	1.4	BENT	Recover 18", SAA
24'					
26'	0835	72 Blows	224 TPH = 10 PPM	5'x0.010 10/20 SAND	Recover 20", Green/Gray Shalestone, Lite HC ODOR.
28'					
30'					
32'	0845	98 Blows	93		Recover 18", Green ~~Shalestone~~ Siltstone, Occasional Gray Streaks, V. Lite HC ODOR.
34'				BENT	
36'	0904	72 Blows	16.8 TPH = ND	CLEAN CUTTINGS	Recover 17", SAA, No Gray Streaks, V.V. Lite HC ODOR.
38'					
40					
42'	0921	80 Blows	4.3		Recover 16", SAA
44'					
46'	0940	50 Blows	2.1 TPH = ND	45'	Recover 14", Blue Shalestone, Dry, No ODOR/No Stain
48'					
50'					
52'	TD	DRILLED:	45'	RUN POINTED END CAP @ 30', 5'x0.010 slotted 30'-25'; RISER TO Surface.	
54'				Clean CUTTINGS	45'-35'
56'				Hydrated BENT	35'-31'
58'				10/20 SAND	31'-23'
60				Hydrated BENT	23'-21'

GROUT 21'-Surface.

BLAGG ENGINEERING, INC.

P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-4

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/16/2017 DATE FINISH: 8/16/2017 DRILLER: A. KENNEDY LOGGED BY: JCB
TOTAL DEPTH: 45' CASING TYPE & SIZE: 2" PVC SLOT SIZE: 0.010
COMMENTS: SURFACE 11' ± Below well Pad Grade.

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	0810	Cuttings			START NATIVE Soil: TAN Silty SAND, lite Moisture, No ODOR NO STAIN
4'					
6'					
8'					
10'					
12'	0823	50 Blows	0.8		Recover 14", SAA
14'					
16'	0831	35 Blows	0.9	RISER / CEMENT GROUT	Recover 18", SAA
18'					
20 22'	0842	27 Blows	1.4		Recover 14", SAA, Increased Moisture
24'					
26'	0852	38 Blows	5.9	BENT	Recover 24", SAA
28'					
30'					
32'	0901	20 Blows	95 TPH = 11 PPM	0.010 / 10/20 SAND	Recover 19": Silty SAND, DARK TAN with Gray Streaking, Lite Moisture, HC ODOR.
34'					
36'	0915	85 Blows	41 TPH = ND	BENT	Recover 22": Brown Siltstone, V. minor Gray Streaks, Lite Moisture, V. minor HC ODOR.
38'					
40 42'	0932	85 Blows	8.8	CLEAN Cuttings	Recover 20": Grey/Green Siltstone, lite Moisture, NO HC Streaking, V.V. Minor HC ODOR.
44'					
46'	0958	80 Blows	2.2 TPH = ND		Recover 18": BLUE SHALESTONE, Lite Moisture, NO HC ODOR OR STAIN
48'					
50'					
52'					
54'					
56'					
58'					
60					

BLAGG ENGINEERING, INC.
P.O. BOX 87, BLOOMFIELD, NM 87413
(505) 632-1199

BORING LOG

BORING ID: BH-5

PROJECT: Mudge A 2
CLIENT: BP America
DRILLING CONTRACTOR: Enviro-Drill
EQUIPMENT USED: Hollow Stem Auger
DATE START: 8/16/2017 DATE FINISH: 8/16/17 DRILLER: A. KENNEDY LOGGED BY: JCB
TOTAL DEPTH: 45 CASING TYPE & SIZE: — SLOT SIZE: —
COMMENTS: SURFACE 12'± Below well pad Grade

DEPTH FEET	TIME	SAMPLE TYPE	FIELD OVM	MW Schematic	SAMPLE DESCRIPTION
2'	1218	CUTTINGS			START SILTY SAND, NATIVE, TAN, DRY, NO ODOR NO STAIN
4'					
6'					
8'					
10'					
12'	1230	25 Blows	1.5		RECOVER 14": SAA
14'					
16'	1240	26 Blows	0.6		RECOVER 12": SAA
18'					
20				BACKFILLED WITH CUTTINGS	
22'	1251	35 Blows	0.4		RECOVER 24": BROWN SILTY SAND, LITE MOISTURE, NO ODOR/NO STAIN
24'					
26'	1303	28 Blows	0.9		RECOVER 14": SAA
28'					
30'					
32'	1315	24 Blows	5.1		RECOVER 24": SAA, MINOR INCREASE IN MOISTURE
34'					
36'	1322	48 Blows	17.6 TPH = ND		RECOVER 20": GREEN/GRAY SILTSTONE, LITE MOISTURE, NO HC ODOR, MINOR GRAY STREAKING.
38'					
40					
42'	1338	85 Blows	3.2		RECOVER 22": SAA, EXCEPT NO GRAY STREAKING
44'					
46'	1352	65 Blows	1.6 TPH = ND		RECOVER 19": BLUE SHALESTONE, DRY, NO ODOR NO STAIN.
48'					
50'					
52'					
54'					
56'					
58'					
60					

Appendix C

Excavation Closure
Laboratory Analytical Data 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

May 26, 2017

Steven Moskal

Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1705C79

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/25/2017 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 **1705C79**
Date Reported: **5/26/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-001 **Matrix:** SOIL

Client Sample ID: SE Corner 3-Point
Collection Date: 5/24/2017 3:10:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	35	30		mg/Kg	20	5/25/2017 11:25:26 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	160	9.2		mg/Kg	1	5/25/2017 10:07:54 AM	31956
Motor Oil Range Organics (MRO)	95	46		mg/Kg	1	5/25/2017 10:07:54 AM	31956
Surr: DNOP	103	70-130		%Rec	1	5/25/2017 10:07:54 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	2400	360		mg/Kg	100	5/25/2017 9:57:50 AM	G43065
Surr: BFB	191	54-150	S	%Rec	100	5/25/2017 9:57:50 AM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	3.7	1.8		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Toluene	3.1	1.8		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Ethylbenzene	13	3.6		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Xylenes, Total	150	7.3		mg/Kg	100	5/25/2017 9:57:50 AM	B43065
Surr: 4-Bromofluorobenzene	100	66.6-132		%Rec	100	5/25/2017 9:57:50 AM	B43065

ID as #3 on Figures and Tables

(Subsequently Excavated)

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: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-002 **Matrix:** SOIL

Client Sample ID: North Wall 8-Point
Collection Date: 5/24/2017 3:21:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/25/2017 11:37:50 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	5/25/2017 10:30:06 AM	31956
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	5/25/2017 10:30:06 AM	31956
Surr: DNOP	95.7	70-130		%Rec	1	5/25/2017 10:30:06 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.7		mg/Kg	1	5/25/2017 11:36:34 AM	G43065
Surr: BFB	94.8	54-150		%Rec	1	5/25/2017 11:36:34 AM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.018		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Toluene	ND	0.037		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Ethylbenzene	ND	0.037		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Xylenes, Total	ND	0.074		mg/Kg	1	5/25/2017 11:36:34 AM	B43065
Surr: 4-Bromofluorobenzene	93.5	66.6-132		%Rec	1	5/25/2017 11:36:34 AM	B43065

ID as #1 on Figures and Tables

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: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1705C79-003 **Matrix:** SOIL

Client Sample ID: West Wall 8-Point
Collection Date: 5/24/2017 3:30:00 PM
Received Date: 5/25/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	5/25/2017 11:50:15 AM	31974
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	16	9.8		mg/Kg	1	5/25/2017 10:52:10 AM	31956
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/25/2017 10:52:10 AM	31956
Surr: DNOP	101	70-130		%Rec	1	5/25/2017 10:52:10 AM	31956
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	21		mg/Kg	5	5/25/2017 12:00:11 PM	G43065
Surr: BFB	127	54-150		%Rec	5	5/25/2017 12:00:11 PM	G43065
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.11		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Toluene	ND	0.21		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Ethylbenzene	ND	0.21		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Xylenes, Total	ND	0.43		mg/Kg	5	5/25/2017 12:00:11 PM	B43065
Surr: 4-Bromofluorobenzene	97.4	66.6-132		%Rec	5	5/25/2017 12:00:11 PM	B43065

ID as #2 on Figures and Tables

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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID	**MB-31974**	SampType:	**MBLK**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**31974**		RunNo:	**43067**				
Prep Date:	**5/25/2017**	Analysis Date:	**5/25/2017**		SeqNo:	**1355858**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-31974**	SampType:	**LCS**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**31974**		RunNo:	**43067**				
Prep Date:	**5/25/2017**	Analysis Date:	**5/25/2017**		SeqNo:	**1355859**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			

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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-31943**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31943**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354741**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.8		5.000		95.2	70	130			

Sample ID **MB-31943**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31943**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354742**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.6		10.00		96.1	70	130			

Sample ID **LCS-31956**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31956**			RunNo: **43052**					
Prep Date: **5/25/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354925**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.1	73.2	114			
Surr: DNOP	4.3		5.000		85.7	70	130			

Sample ID **MB-31956**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31956**			RunNo: **43052**					
Prep Date: **5/25/2017**	Analysis Date: **5/25/2017**			SeqNo: **1354926**		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	8.1		10.00		81.3	70	130			

Sample ID **LCS-31932**	SampType: **LCS**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **LCSS**	Batch ID: **31932**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1355829**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		89.3	70	130			

Sample ID **MB-31932**	SampType: **MBLK**			TestCode: **EPA Method 8015M/D: Diesel Range Organics**					
Client ID: **PBS**	Batch ID: **31932**			RunNo: **43051**					
Prep Date: **5/24/2017**	Analysis Date: **5/25/2017**			SeqNo: **1355830**		Units: **%Rec**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.4		10.00		94.4	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
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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **G43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355625** 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	920		1000		92.3	54	150			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **G43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355626** 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	104	76.4	125			
Surr: BFB	1000		1000		103	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
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#: **1705C79**

26-May-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355634** 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	0.91		1.000		90.7	66.6	132			

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B43065**	RunNo: **43065**
Prep Date:	Analysis Date: **5/25/2017**	SeqNo: **1355635** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.85	0.025	1.000	0	85.3	80	120			
Toluene	0.90	0.050	1.000	0	89.6	80	120			
Ethylbenzene	0.92	0.050	1.000	0	92.0	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.6	80	120			
Surr: 4-Bromofluorobenzene	0.94		1.000		93.9	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
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: BLAGG | Work Order Number: 1705C79 | RcptNo: 1

Received By: Anne Thorne 5/25/2017 7:10:00 AM

Completed By: Anne Thorne 5/25/2017 7:58:21 AM

Reviewed By: 5/25/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP America

Blagg Engineering Inc.

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: SAME DAY

☐ Standard ☒ Rush

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG

On Ice: ☒ Yes ☐ No

Sample Temperature: .8

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 # (05/25/17 MeOH kit)	Preservative Type	HEAL No. 1705C79	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)	CHLORIDE				Air Bubbles (Y or N)
5/24/17	1510	SOIL	SE Corner 3-Point	4oz x1	COOL	001	X		X									X				
"	1521	"	North Wall 8-Point	"	"	002	X		X									X				
"	1530	"	West Wall 8-Point	"	"	003	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
5/24/17	1640	Jeff Blagg	Chantel Walls	5/24/17	1640
5/24/17	1804	Chantel Walls		05/25/17	0710

Remarks: Bill BP contact: Steve Moskal
VID: VHIXONEVRM
WBS Element: L1-0018M-E:10984

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.

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 01, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A #2 OrderNo.: 1705E89

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 5/31/2017 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 **1705E89**
Date Reported: **6/1/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-001 **Matrix:** SOIL

Client Sample ID: East Wall S End 5-pt
Collection Date: 5/30/2017 2:08:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	330	30		mg/Kg	20	5/31/2017 11:11:03 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	120	9.6		mg/Kg	1	5/31/2017 10:51:53 AM	32035
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/31/2017 10:51:53 AM	32035
Surr: DNOP	96.9	70-130		%Rec	1	5/31/2017 10:51:53 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	110	17		mg/Kg	5	5/31/2017 11:48:53 AM	R43151
Surr: BFB	311	54-150	S	%Rec	5	5/31/2017 11:48:53 AM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.084		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Toluene	0.30	0.17		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Ethylbenzene	ND	0.17		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Xylenes, Total	3.8	0.34		mg/Kg	5	5/31/2017 11:48:53 AM	B43151
Surr: 4-Bromofluorobenzene	125	66.6-132		%Rec	5	5/31/2017 11:48:53 AM	B43151

ID as #4 on Figures and Tables
(Subsequently Excavated)

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: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-002 **Matrix:** SOIL

Client Sample ID: South Wall E End 5-pt
Collection Date: 5/30/2017 2:11:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	390	30		mg/Kg	20	5/31/2017 11:23:28 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	11	10		mg/Kg	1	5/31/2017 11:13:51 AM	32035
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	5/31/2017 11:13:51 AM	32035
Surr: DNOP	98.1	70-130		%Rec	1	5/31/2017 11:13:51 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	16		mg/Kg	5	5/31/2017 12:12:49 PM	R43151
Surr: BFB	103	54-150		%Rec	5	5/31/2017 12:12:49 PM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.080		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Toluene	ND	0.16		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Ethylbenzene	ND	0.16		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Xylenes, Total	ND	0.32		mg/Kg	5	5/31/2017 12:12:49 PM	B43151
Surr: 4-Bromofluorobenzene	113	66.6-132		%Rec	5	5/31/2017 12:12:49 PM	B43151

ID as #5 on Figures and Tables

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: Blagg Engineering
Project: MUDGE A #2
Lab ID: 1705E89-003 **Matrix:** SOIL

Client Sample ID: South Wall W End 5-pt
Collection Date: 5/30/2017 2:15:00 PM
Received Date: 5/31/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	270	30		mg/Kg	20	5/31/2017 11:35:52 AM	32038
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	210	9.8		mg/Kg	1	5/31/2017 11:35:51 AM	32035
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/31/2017 11:35:51 AM	32035
Surr: DNOP	103	70-130		%Rec	1	5/31/2017 11:35:51 AM	32035
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	380	66		mg/Kg	20	5/31/2017 12:36:43 PM	R43151
Surr: BFB	199	54-150	S	%Rec	20	5/31/2017 12:36:43 PM	R43151
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.33		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Toluene	3.0	0.66		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Ethylbenzene	1.8	0.66		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Xylenes, Total	22	1.3		mg/Kg	20	5/31/2017 12:36:43 PM	B43151
Surr: 4-Bromofluorobenzene	118	66.6-132		%Rec	20	5/31/2017 12:36:43 PM	B43151

ID as #6 on Figures and Tables
(Subsequently Excavated)

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#: **1705E89**

01-Jun-17

Client: Blagg Engineering

Project: MUDGE A #2

Sample ID	**MB-32038**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32038**		RunNo:	**43159**				
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**		SeqNo:	**1359147**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32038**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32038**		RunNo:	**43159**				
Prep Date:	**5/31/2017**	Analysis Date:	**5/31/2017**		SeqNo:	**1359148**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.7	90	110			

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#: **1705E89**

01-Jun-17

Client: Blagg Engineering
Project: MUDGE A #2

Sample ID **LCS-32035**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32035**	RunNo: **43153**
Prep Date: **5/31/2017**	Analysis Date: **5/31/2017**	SeqNo: **1358341** 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	84.2	73.2	114			
Surr: DNOP	4.2		5.000		85.0	70	130			

Sample ID **MB-32035**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32035**	RunNo: **43153**
Prep Date: **5/31/2017**	Analysis Date: **5/31/2017**	SeqNo: **1358342** 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	9.1		10.00		91.1	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
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#: **1705E89**

01-Jun-17

Client: Blagg Engineering

Project: MUDGE A #2

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **R43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359038** 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	95.0	76.4	125			
Surr: BFB	1100		1000		107	54	150			

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **R43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359039** 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	920		1000		92.2	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
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#: **1705E89**

01-Jun-17

Client: Blagg Engineering

Project: MUDGE A #2

Sample ID **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359043** 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	1.0	0.050	1.000	0	105	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		114	66.6	132			

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B43151**	RunNo: **43151**
Prep Date:	Analysis Date: **5/31/2017**	SeqNo: **1359046** 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	1.1		1.000		112	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
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: BLAGG | Work Order Number: 1705E89 | RcptNo: 1

Received By: Anne Thorne 5/31/2017 7:15:00 AM
Completed By: Anne Thorne 5/31/2017 7:49:02 AM
Reviewed By: 5/31/17

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	1.3	Good	Yes			

Chain-of-Custody Record

Client: BP America
Blagg Engineering
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time: SAME DAY
☐ Standard ☒ Rush
Project Name: MUDGE A #2
Project #:
Project Manager: STEVE MOSKAL
Sampler: J. BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.3

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 # (MeOH kits)	Preservative Type	HEAL No.	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)	Chloride				Air Bubbles (Y or N)
5/30/17	1408	SOIL	EAST WALL-S. END 5-pt	4 oz x 1	COOL	701	X		X									X				
1	1411	1	SOUTH WALL-E. END 5-pt	1	1	702	X		X									X				
1	1415	1	SOUTH WALL-W. END 5-pt	1	1	703	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
5/30/17	1620	Jeff Blagg		05/31/17	0715
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHILONEVRM
WBS Element: L1-0018M-E:10984

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.

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 06, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1706155

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/5/2017 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 **1706155**
Date Reported: **6/6/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1706155-001 **Matrix:** SOIL

Client Sample ID: GRAB @ 40'
Collection Date: 6/2/2017 2:38:00 PM
Received Date: 6/5/2017 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	6/5/2017 9:11:35 AM	32097
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	6/5/2017 9:11:35 AM	32097
Surr: DNOP	85.2	70-130		%Rec	1	6/5/2017 9:11:35 AM	32097
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	3.6		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Surr: BFB	102	54-150		%Rec	1	6/5/2017 12:39:20 PM	32090
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.018		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Toluene	ND	0.036		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Ethylbenzene	ND	0.036		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Xylenes, Total	ND	0.072		mg/Kg	1	6/5/2017 12:39:20 PM	32090
Surr: 4-Bromofluorobenzene	123	66.6-132		%Rec	1	6/5/2017 12:39:20 PM	32090

ID as #7 on Figures and Tables

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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-32097**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32097**	RunNo: **43241**
Prep Date: **6/5/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361182** 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	3.6		5.000		72.5	70	130			

Sample ID **MB-32097**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32097**	RunNo: **43241**
Prep Date: **6/5/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361183** 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		85.0	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
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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32090**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361956** 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	1000		1000		102	54	150			

Sample ID **LCS-32090**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361957** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.0	76.4	125			
Surr: BFB	1100		1000		108	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
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#: **1706155**

06-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32090**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361976** 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	1.3		1.000		126	66.6	132			

Sample ID **LCS-32090**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32090**	RunNo: **43255**
Prep Date: **6/2/2017**	Analysis Date: **6/5/2017**	SeqNo: **1361977** 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	99.8	80	120			
Toluene	1.0	0.050	1.000	0	99.9	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		126	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
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: BLAGG Work Order Number: 1706155 RcptNo: 1

Received By: Anne Thorne 6/5/2017 7:30:00 AM

Completed By: Anne Thorne 6/5/2017 7:52:43 AM

Reviewed By: 6/5/17

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation

☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: SAME DAY

☐ Standard ☒ Rush

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.0

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 # (AT 06/05/17 MeOH Kit)	Preservative Type	HEAL No. 1706155	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)
6/2/2017	1438	SOIL	GRAB @ 40'	4 oz x 1	COOL	-001	X		X													

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/4/2017	1847	Jeff Blagg	Christine Waters	6/4/2017	1847
6/4/17	1915	Christine Waters	[signature]	06/05/17	0730

Remarks: BILL BP CONTACT: STEVE MOSKAL

VID: VHIXONEVRM

WBS ELEMENT: L1-0018M-E:10984

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.

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 07, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: MUDGE A 2 OrderNo.: 1706219

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/6/2017 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 **1706219**
Date Reported: **6/7/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: MUDGE A 2
Lab ID: 1706219-001 **Matrix:** SOIL

Client Sample ID: GRAB @ 42'
Collection Date: 6/5/2017 4:31:00 PM
Received Date: 6/6/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	510	30		mg/Kg	20	6/6/2017 12:01:16 PM	32133
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	210	9.6		mg/Kg	1	6/6/2017 9:10:01 AM	32126
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/6/2017 9:10:01 AM	32126
Surr: DNOP	90.9	70-130		%Rec	1	6/6/2017 9:10:01 AM	32126
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	4100	190		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Surr: BFB	345	54-150	S	%Rec	50	6/6/2017 11:27:39 AM	32111
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	11	0.95		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Toluene	100	1.9		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Ethylbenzene	27	1.9		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Xylenes, Total	330	3.8		mg/Kg	50	6/6/2017 11:27:39 AM	32111
Surr: 4-Bromofluorobenzene	140	66.6-132	S	%Rec	50	6/6/2017 11:27:39 AM	32111

ID as #8 on Figures and Tables

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#: **1706219**

07-Jun-17

Client: Blagg Engineering

Project: MUDGE A 2

Sample ID	**MB-32133**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32133**		RunNo:	**43284**				
Prep Date:	**6/6/2017**	Analysis Date:	**6/6/2017**		SeqNo:	**1363498**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32133**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32133**		RunNo:	**43284**				
Prep Date:	**6/6/2017**	Analysis Date:	**6/6/2017**		SeqNo:	**1363499**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.4	90	110			

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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **LCS-32126**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32126**	RunNo: **43268**
Prep Date: **6/6/2017**	Analysis Date: **6/6/2017**	SeqNo: **1362102** 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	85.6	73.2	114			
Surr: DNOP	3.6		5.000		72.9	70	130			

Sample ID **MB-32126**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32126**	RunNo: **43268**
Prep Date: **6/6/2017**	Analysis Date: **6/6/2017**	SeqNo: **1362103** 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	9.6		10.00		96.4	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
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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32111**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363134** 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	990		1000		99.2	54	150			

Sample ID **LCS-32111**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363135** 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	1100		1000		111	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
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#: **1706219**

07-Jun-17

Client: Blagg Engineering
Project: MUDGE A 2

Sample ID **MB-32111**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363144** 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		124	66.6	132			

Sample ID **LCS-32111**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32111**	RunNo: **43287**
Prep Date: **6/5/2017**	Analysis Date: **6/6/2017**	SeqNo: **1363145** 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	102	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.2	0.10	3.000	0	108	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		128	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
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: BLAGG | Work Order Number: 1706219 | RcptNo: 1

Received By: Anne Thorne 6/6/2017 7:15:00 AM

Completed By: Anne Thorne 6/6/2017 7:31:30 AM

Reviewed By: 6/6/17

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP America
Blagg Engineering
Mailing Address:

Phone #: (505) 320-4183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time: SAME DAY
☐ Standard ☒ Rush
Project Name: Mudge A 2
Project #:
Project Manager: Steve Moskal
Sampler: J. Blagg
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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 #	Preservative Type	HEAL No.	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)	CHLORIDE				Air Bubbles (Y or N)
				Analysis Request																		
6/5/17	1631	Soil	GRAB @ 42'	4 oz Jar	Cool	1706219-001	X		X									X				

Date	Time	Relinquished by:	Received by:	Date	Time
6/5/17	1744	Jeff Blagg	Chris Walters	6/5/17	1744
6/5/17	1830	Chris Walters	Andrew Hughes	6/6/17	0715

Remarks: Bill BP Contact: Steve Moskal
VID: VHIXONEVRM
WBS: LI-0018M-E:22147

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.

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 19, 2017

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1706575

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 3 sample(s) on 6/10/2017 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 **1706575**
Date Reported: **6/19/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-001 **Matrix:** SOIL

Client Sample ID: West Wall (26'-36') 5-pt
Collection Date: 6/9/2017 3:54:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	45	30		mg/Kg	20	6/17/2017 8:56:00 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	32	9.3		mg/Kg	1	6/14/2017 9:36:20 PM	32258
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	6/14/2017 9:36:20 PM	32258
Surr: DNOP	100	70-130		%Rec	1	6/14/2017 9:36:20 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Surr: BFB	134	54-150		%Rec	1	6/14/2017 8:57:29 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.043	0.023		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Toluene	ND	0.047		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Ethylbenzene	0.050	0.047		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Xylenes, Total	0.17	0.094		mg/Kg	1	6/14/2017 8:57:29 PM	32244
Surr: 4-Bromofluorobenzene	110	66.6-132		%Rec	1	6/14/2017 8:57:29 PM	32244

ID as #9 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-002 **Matrix:** SOIL

Client Sample ID: West Base (38') 5-pt
Collection Date: 6/9/2017 3:47:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	44	30		mg/Kg	20	6/17/2017 9:08:24 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	24	9.8		mg/Kg	1	6/14/2017 10:04:56 PM	32258
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	6/14/2017 10:04:56 PM	32258
Surr: DNOP	97.3	70-130		%Rec	1	6/14/2017 10:04:56 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	5.0	4.9		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Surr: BFB	146	54-150		%Rec	1	6/14/2017 9:21:16 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.041	0.024		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Toluene	ND	0.049		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Ethylbenzene	0.091	0.049		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Xylenes, Total	0.40	0.098		mg/Kg	1	6/14/2017 9:21:16 PM	32244
Surr: 4-Bromofluorobenzene	112	66.6-132		%Rec	1	6/14/2017 9:21:16 PM	32244

ID as #10 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706575-003 **Matrix:** SOIL

Client Sample ID: South Wall (26'-36') 5-pt
Collection Date: 6/9/2017 3:33:00 PM
Received Date: 6/10/2017 11:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	600	30		mg/Kg	20	6/17/2017 9:20:48 PM	32341
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	18	9.5		mg/Kg	1	6/14/2017 10:33:49 PM	32258
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/14/2017 10:33:49 PM	32258
Surr: DNOP	95.9	70-130		%Rec	1	6/14/2017 10:33:49 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Surr: BFB	120	54-150		%Rec	1	6/14/2017 9:44:50 PM	32244
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Toluene	ND	0.046		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Ethylbenzene	ND	0.046		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Xylenes, Total	ND	0.093		mg/Kg	1	6/14/2017 9:44:50 PM	32244
Surr: 4-Bromofluorobenzene	112	66.6-132		%Rec	1	6/14/2017 9:44:50 PM	32244

ID as #11 on Figures and Tables

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID	**MB-32341**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**32341**		RunNo:	**43585**				
Prep Date:	**6/17/2017**	Analysis Date:	**6/17/2017**		SeqNo:	**1372898**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32341**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**32341**		RunNo:	**43585**				
Prep Date:	**6/17/2017**	Analysis Date:	**6/17/2017**		SeqNo:	**1372899**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.5	90	110			

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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32258**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1369816** 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	10		10.00		104	70	130			

Sample ID **LCS-32258**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370823** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	73.2	114			
Surr: DNOP	4.9		5.000		98.7	70	130			

Sample ID **LCS-32292**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32292**	RunNo: **43528**
Prep Date: **6/14/2017**	Analysis Date: **6/15/2017**	SeqNo: **1372096** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.1		5.000		81.4	70	130			

Sample ID **MB-32292**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32292**	RunNo: **43528**
Prep Date: **6/14/2017**	Analysis Date: **6/15/2017**	SeqNo: **1372097** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.7		10.00		87.4	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32244**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370036** 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	1100		1000		110	54	150			

Sample ID **LCS-32244**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370037** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	98.8	76.4	125			
Surr: BFB	1200		1000		119	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706575**

19-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32244**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370062** 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	1.1		1.000		108	66.6	132			

Sample ID **LCS-32244**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32244**	RunNo: **43491**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370063** 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	99.6	80	120			
Toluene	1.0	0.050	1.000	0	99.8	80	120			
Ethylbenzene	0.98	0.050	1.000	0	97.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.2	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		111	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	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

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: BLAGG | Work Order Number: 1706575 | RcptNo: 1

Received By: Andy Freeman 6/10/2017 11:15:00 AM

Completed By: Ashley Gallegos 6/12/2017 11:39:32 AM

Reviewed By: 6/12/17

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	2.8	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING INC

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: SAME DAY 6/12
X Standard X Rush Standard TAT

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG

On Ice: X Yes ☐ No

Sample Temperature: 2.8

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. 1706575	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)	CHLORIDE				Air Bubbles (Y or N)
6/9/2017	1554	SOIL	West Wall (26'-36') 5-pt	4oz x1	COOL	-001	X		X									X				
"	1547	"	West Base (38') 5-pt	"	"	-002	"		"									"				
"	1533	"	South Wall (26'-36') 5-pt	"	"	-003	"		"									"				

Date: 6/9/2017 Time: 1730 Relinquished by: Jeff Blagg Received by: Date: 6/10/17 Time: 1115

Date: Time: Relinquished by: Received by: Date: Time:

Remarks: Bill BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.

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

Steven Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1706650

Dear Steven Moskal:

Hall Environmental Analysis Laboratory received 2 sample(s) on 6/13/2017 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 **1706650**
Date Reported: **6/21/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706650-001 **Matrix:** SOIL

Client Sample ID: NE BASE 5-pt @ 37'
Collection Date: 6/12/2017 10:16:00 AM
Received Date: 6/13/2017 7:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	74	30		mg/Kg	20	6/20/2017 3:51:18 PM	32385
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	89	9.9		mg/Kg	1	6/14/2017 11:59:55 PM	32258
Motor Oil Range Organics (MRO)	65	50		mg/Kg	1	6/14/2017 11:59:55 PM	32258
Surr: DNOP	97.1	70-130		%Rec	1	6/14/2017 11:59:55 PM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	200	24		mg/Kg	5	6/15/2017 11:18:36 PM	32257
Surr: BFB	296	54-150	S	%Rec	5	6/15/2017 11:18:36 PM	32257
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.19	0.12		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Toluene	0.56	0.24		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Ethylbenzene	1.2	0.24		mg/Kg	5	6/14/2017 5:47:27 PM	32257
Xylenes, Total	18	0.48		mg/Kg	5	6/15/2017 11:18:36 PM	32257
Surr: 4-Bromofluorobenzene	132	66.6-132		%Rec	5	6/14/2017 5:47:27 PM	32257

ID as #12 on Figures and Tables

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1706650-002 **Matrix:** SOIL

Client Sample ID: N. Wall 5-pt (26'-36')
Collection Date: 6/12/2017 10:24:00 AM
Received Date: 6/13/2017 7:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	410	30		mg/Kg	20	6/20/2017 4:03:43 PM	32385
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	20	10		mg/Kg	1	6/15/2017 12:28:15 AM	32258
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/15/2017 12:28:15 AM	32258
Surr: DNOP	94.3	70-130		%Rec	1	6/15/2017 12:28:15 AM	32258
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	6/16/2017 12:06:20 AM	32257
Surr: BFB	116	54-150		%Rec	1	6/16/2017 12:06:20 AM	32257
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Toluene	ND	0.047		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Ethylbenzene	ND	0.047		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Xylenes, Total	ND	0.095		mg/Kg	1	6/14/2017 6:35:26 PM	32257
Surr: 4-Bromofluorobenzene	118	66.6-132		%Rec	1	6/14/2017 6:35:26 PM	32257

ID as #13 on Figures and Tables

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#: **1706650**

21-Jun-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID	**MB-32385**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**32385**	RunNo:	**43638**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1375850**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-32385**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**32385**	RunNo:	**43638**					
Prep Date:	**6/20/2017**	Analysis Date:	**6/20/2017**	SeqNo:	**1375851**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.4	90	110			

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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32258**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1369816** 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	10		10.00		104	70	130			

Sample ID **LCS-32258**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **32258**	RunNo: **43496**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370823** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	73.2	114			
Surr: DNOP	4.9		5.000		98.7	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#: **1706650**

21-Jun-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-32257**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370009** 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		95.9	54	150			

Sample ID **LCS-32257**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370010** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	76.4	125			
Surr: BFB	1000		1000		103	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#: **1706650**

21-Jun-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-32257**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370018** 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		123	66.6	132			

Sample ID **LCS-32257**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **32257**	RunNo: **43490**
Prep Date: **6/13/2017**	Analysis Date: **6/14/2017**	SeqNo: **1370019** 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	105	80	120			
Toluene	1.1	0.050	1.000	0	106	80	120			
Ethylbenzene	1.1	0.050	1.000	0	106	80	120			
Xylenes, Total	3.2	0.10	3.000	0	108	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: BLAGG | Work Order Number: 1706650 | RcptNo: 1

Received By: Anne Thorne 6/13/2017 7:55:00 AM

Completed By: Sophia Campuzano 6/13/2017 11:16:14 AM

Reviewed By: ENM 06/13/17

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA
BLAGG ENGINEERING INC.
Mailing Address:

Phone #: (505) 320-1193
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: MUDGE A 2
Project #:
Project Manager: STEVE MOSKAL
Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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. 1706650	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)	CHLORIDE				Air Bubbles (Y or N)
6/12/17	1016	SOIL	NE BASE 5-pt @ 37'	4 oz x 1	COOL	-001	X		X									X				
"	1024	"	N. WALL 5-pt (26'-36')	"	"	-002	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/12/17	1119	Jeff Blagg		6/12/17	1119
6/12/17	1817			06/13/17	0753

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E: 10984

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.

Appendix D

Drill Boring
Laboratory Analytical Data 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

August 27, 2017

Steve Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1708A09

Dear Steve Moskal:

Hall Environmental Analysis Laboratory received 9 sample(s) on 8/16/2017 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 **1708A09**
Date Reported: **8/27/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-001 **Matrix:** SOIL

Client Sample ID: BH-1 (25'-26')
Collection Date: 8/14/2017 12:03:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	330	30		mg/Kg	20	8/24/2017 1:14:23 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	120	9.8		mg/Kg	1	8/21/2017 10:59:53 PM	33448
Motor Oil Range Organics (MRO)	110	49		mg/Kg	1	8/21/2017 10:59:53 PM	33448
Surr: DNOP	97.6	70-130		%Rec	1	8/21/2017 10:59:53 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	79	24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Surr: BFB	167	54-150	S	%Rec	5	8/18/2017 11:53:49 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.12		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Toluene	ND	0.24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Ethylbenzene	ND	0.24		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Xylenes, Total	1.1	0.49		mg/Kg	5	8/18/2017 11:53:49 PM	33432
Surr: 4-Bromofluorobenzene	111	66.6-132		%Rec	5	8/18/2017 11:53:49 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-002 **Matrix:** SOIL

Client Sample ID: BH-1 (35'-36')
Collection Date: 8/14/2017 12:28:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	50	30		mg/Kg	20	8/24/2017 1:26:47 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/21/2017 11:22:17 PM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2017 11:22:17 PM	33448
Surr: DNOP	88.8	70-130		%Rec	1	8/21/2017 11:22:17 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Surr: BFB	92.0	54-150		%Rec	1	8/21/2017 2:36:06 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Toluene	ND	0.046		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Ethylbenzene	0.047	0.046		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Xylenes, Total	ND	0.093		mg/Kg	1	8/21/2017 2:36:06 PM	33432
Surr: 4-Bromofluorobenzene	104	66.6-132		%Rec	1	8/21/2017 2:36:06 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-003 **Matrix:** SOIL

Client Sample ID: BH-1 (45'-46')
Collection Date: 8/14/2017 1:35:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	8/24/2017 2:28:49 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	8/21/2017 11:44:24 PM	33448
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/21/2017 11:44:24 PM	33448
Surr: DNOP	83.8	70-130		%Rec	1	8/21/2017 11:44:24 PM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Surr: BFB	89.2	54-150		%Rec	1	8/19/2017 12:40:47 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Xylenes, Total	ND	0.096		mg/Kg	1	8/19/2017 12:40:47 AM	33432
Surr: 4-Bromofluorobenzene	102	66.6-132		%Rec	1	8/19/2017 12:40:47 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-004 **Matrix:** SOIL

Client Sample ID: BH-2 (31.5'-32')
Collection Date: 8/14/2017 2:55:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	54	30		mg/Kg	20	8/24/2017 2:41:14 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	14	9.3		mg/Kg	1	8/22/2017 12:06:37 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 12:06:37 AM	33448
Surr: DNOP	90.6	70-130		%Rec	1	8/22/2017 12:06:37 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Surr: BFB	99.5	54-150		%Rec	1	8/21/2017 2:59:49 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Toluene	ND	0.047		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Xylenes, Total	ND	0.094		mg/Kg	1	8/21/2017 2:59:49 PM	33432
Surr: 4-Bromofluorobenzene	104	66.6-132		%Rec	1	8/21/2017 2:59:49 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-005 **Matrix:** SOIL

Client Sample ID: BH-2 (35'-36')
Collection Date: 8/14/2017 3:07:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	150	30		mg/Kg	20	8/24/2017 2:53:39 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/22/2017 12:28:57 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 12:28:57 AM	33448
Surr: DNOP	91.6	70-130		%Rec	1	8/22/2017 12:28:57 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Surr: BFB	92.1	54-150		%Rec	1	8/21/2017 3:23:36 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Toluene	ND	0.046		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Ethylbenzene	ND	0.046		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Xylenes, Total	ND	0.092		mg/Kg	1	8/21/2017 3:23:36 PM	33432
Surr: 4-Bromofluorobenzene	105	66.6-132		%Rec	1	8/21/2017 3:23:36 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-006 **Matrix:** SOIL

Client Sample ID: BH-2 (45'-46')
Collection Date: 8/14/2017 3:37:00 PM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	34	30		mg/Kg	20	8/24/2017 3:06:04 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	8/22/2017 12:51:15 AM	33448
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/22/2017 12:51:15 AM	33448
Surr: DNOP	92.8	70-130		%Rec	1	8/22/2017 12:51:15 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Surr: BFB	88.5	54-150		%Rec	1	8/19/2017 1:51:45 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Toluene	ND	0.049		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Ethylbenzene	ND	0.049		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Xylenes, Total	ND	0.098		mg/Kg	1	8/19/2017 1:51:45 AM	33432
Surr: 4-Bromofluorobenzene	101	66.6-132		%Rec	1	8/19/2017 1:51:45 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-007 **Matrix:** SOIL

Client Sample ID: BH-3 (25'-26')
Collection Date: 8/15/2017 8:35:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	370	30		mg/Kg	20	8/24/2017 3:18:28 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	10	9.7		mg/Kg	1	8/22/2017 1:35:57 AM	33448
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/22/2017 1:35:57 AM	33448
Surr: DNOP	93.5	70-130		%Rec	1	8/22/2017 1:35:57 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Surr: BFB	124	54-150		%Rec	1	8/21/2017 5:21:57 PM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Toluene	ND	0.047		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Ethylbenzene	ND	0.047		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Xylenes, Total	ND	0.095		mg/Kg	1	8/21/2017 5:21:57 PM	33432
Surr: 4-Bromofluorobenzene	106	66.6-132		%Rec	1	8/21/2017 5:21:57 PM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-008 **Matrix:** SOIL

Client Sample ID: BH-3 (35'-36')
Collection Date: 8/15/2017 9:04:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	490	30		mg/Kg	20	8/24/2017 3:30:52 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	8/22/2017 1:58:12 AM	33448
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/22/2017 1:58:12 AM	33448
Surr: DNOP	101	70-130		%Rec	1	8/22/2017 1:58:12 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Surr: BFB	88.9	54-150		%Rec	1	8/19/2017 2:39:02 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Xylenes, Total	ND	0.096		mg/Kg	1	8/19/2017 2:39:02 AM	33432
Surr: 4-Bromofluorobenzene	101	66.6-132		%Rec	1	8/19/2017 2:39:02 AM	33432

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708A09-009 **Matrix:** SOIL

Client Sample ID: BH-3 (45'-46')
Collection Date: 8/15/2017 9:40:00 AM
Received Date: 8/16/2017 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	460	30		mg/Kg	20	8/24/2017 3:43:17 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	8/22/2017 2:20:33 AM	33448
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/22/2017 2:20:33 AM	33448
Surr: DNOP	94.4	70-130		%Rec	1	8/22/2017 2:20:33 AM	33448
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Surr: BFB	89.2	54-150		%Rec	1	8/19/2017 3:02:41 AM	33432
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Toluene	ND	0.048		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Ethylbenzene	ND	0.048		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Xylenes, Total	ND	0.097		mg/Kg	1	8/19/2017 3:02:41 AM	33432
Surr: 4-Bromofluorobenzene	100	66.6-132		%Rec	1	8/19/2017 3:02:41 AM	33432

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#: **1708A09**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID	**MB-33539**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**33539**		RunNo:	**45189**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/24/2017**		SeqNo:	**1432108**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-33539**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**33539**		RunNo:	**45189**				
Prep Date:	**8/24/2017**	Analysis Date:	**8/24/2017**		SeqNo:	**1432109**	Units:	**mg/Kg**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.3	90	110			

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#: **1708A09**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **LCS-33448**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **33448**	RunNo: **45117**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428776** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	101	73.2	114			
Surr: DNOP	3.9		5.000		77.7	70	130			

Sample ID **MB-33448**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **33448**	RunNo: **45117**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428777** 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	8.4		10.00		84.0	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#: **1708A09**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **MB-33432**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427097** 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	900		1000		89.8	54	150			

Sample ID **LCS-33432**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427098** 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	96.9	76.4	125			
Surr: BFB	980		1000		97.8	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#: **1708A09**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-33432**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427128** 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	1.0		1.000		103	66.6	132			

Sample ID **LCS-33432**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **33432**	RunNo: **45053**
Prep Date: **8/17/2017**	Analysis Date: **8/18/2017**	SeqNo: **1427129** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	95.3	80	120			
Toluene	0.93	0.050	1.000	0	92.8	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	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: BLAGG | Work Order Number: 1708A09 | RcptNo: 1

Received By: Anne Thorne 8/16/2017 7:15:00 AM

Completed By: Ashley Gallegos 8/16/2017 3:34:13 PM

Reviewed By: ENM 8/17/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA
BLAGG ENGINEERING INC.
Mailing Address:

Phone #: (505) 320-1183
email or Fax#:
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: MUDGE A 2
Project #:
Project Manager: STEVE MOSKAL
Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: .6

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. 1708A09	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)	CHLORIDE	Air Bubbles (Y or N)
8/14/2017	1203	SOIL	BH-1 (25'-26')	4 oz x1	COOL	-001	X		X									X	
	1228		BH-1 (35'-36')			-002													
	1335		BH-1 (45'-46')			-003													
	1455		BH-2 (31½'-32')			-004													
	1507		BH-2 (35'-36')			-005													
	1537		BH-2 (45'-46')			-006													
8/15/2017	0835		BH-3 (25'-26')			-007													
	0904		BH-3 (35'-36')			-008													
	0940		BH-3 (45'-46')			-009													

Date:	Time:	Relinquished by:	Received by:	Date	Time
8/15/17	1508	Jeff Blagg		8/15/17	1505
8/15/17	1804	Christine Walker		08/16/17	0715

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VHIXONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.

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

August 27, 2017

Steve Moskal
Blagg Engineering
P. O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX (505) 632-3903

RE: Mudge A 2 OrderNo.: 1708B02

Dear Steve Moskal:

Hall Environmental Analysis Laboratory received 5 sample(s) on 8/17/2017 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 **1708B02**
Date Reported: **8/27/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-001 **Matrix:** SOIL

Client Sample ID: BH-4 (30'-31')
Collection Date: 8/16/2017 9:01:00 AM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	120	30		mg/Kg	20	8/24/2017 3:55:42 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	11	9.6		mg/Kg	1	8/22/2017 10:48:32 AM	33453
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/22/2017 10:48:32 AM	33453
Surr: DNOP	91.2	70-130		%Rec	1	8/22/2017 10:48:32 AM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2017 6:42:41 PM	33452
Surr: BFB	77.0	54-150		%Rec	1	8/21/2017 6:42:41 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/21/2017 6:42:41 PM	33452
Toluene	ND	0.049		mg/Kg	1	8/21/2017 6:42:41 PM	33452
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2017 6:42:41 PM	33452
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2017 6:42:41 PM	33452
Surr: 4-Bromofluorobenzene	108	66.6-132		%Rec	1	8/21/2017 6:42:41 PM	33452

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-002 **Matrix:** SOIL

Client Sample ID: BH-4 (35'-36')
Collection Date: 8/16/2017 9:15:00 AM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	110	30		mg/Kg	20	8/24/2017 4:32:55 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/21/2017 9:28:35 PM	33453
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/21/2017 9:28:35 PM	33453
Surr: DNOP	73.5	70-130		%Rec	1	8/21/2017 9:28:35 PM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2017 7:06:34 PM	33452
Surr: BFB	76.7	54-150		%Rec	1	8/21/2017 7:06:34 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/21/2017 7:06:34 PM	33452
Toluene	ND	0.049		mg/Kg	1	8/21/2017 7:06:34 PM	33452
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2017 7:06:34 PM	33452
Xylenes, Total	ND	0.099		mg/Kg	1	8/21/2017 7:06:34 PM	33452
Surr: 4-Bromofluorobenzene	108	66.6-132		%Rec	1	8/21/2017 7:06:34 PM	33452

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-003 **Matrix:** SOIL

Client Sample ID: BH-4 (45'-46')
Collection Date: 8/16/2017 9:58:00 AM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	120	30		mg/Kg	20	8/24/2017 4:45:20 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/21/2017 9:57:07 PM	33453
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/21/2017 9:57:07 PM	33453
Surr: DNOP	77.4	70-130		%Rec	1	8/21/2017 9:57:07 PM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2017 7:30:26 PM	33452
Surr: BFB	75.4	54-150		%Rec	1	8/21/2017 7:30:26 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/21/2017 7:30:26 PM	33452
Toluene	ND	0.049		mg/Kg	1	8/21/2017 7:30:26 PM	33452
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2017 7:30:26 PM	33452
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2017 7:30:26 PM	33452
Surr: 4-Bromofluorobenzene	107	66.6-132		%Rec	1	8/21/2017 7:30:26 PM	33452

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-004 **Matrix:** SOIL

Client Sample ID: BH-5 (35'-36')
Collection Date: 8/16/2017 1:22:00 PM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	430	30		mg/Kg	20	8/24/2017 4:57:44 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/21/2017 10:25:41 PM	33453
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/21/2017 10:25:41 PM	33453
Surr: DNOP	71.4	70-130		%Rec	1	8/21/2017 10:25:41 PM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/21/2017 7:54:18 PM	33452
Surr: BFB	75.8	54-150		%Rec	1	8/21/2017 7:54:18 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	8/21/2017 7:54:18 PM	33452
Toluene	ND	0.048		mg/Kg	1	8/21/2017 7:54:18 PM	33452
Ethylbenzene	ND	0.048		mg/Kg	1	8/21/2017 7:54:18 PM	33452
Xylenes, Total	ND	0.095		mg/Kg	1	8/21/2017 7:54:18 PM	33452
Surr: 4-Bromofluorobenzene	109	66.6-132		%Rec	1	8/21/2017 7:54:18 PM	33452

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering
Project: Mudge A 2
Lab ID: 1708B02-005 **Matrix:** SOIL

Client Sample ID: BH-5 (45'-46')
Collection Date: 8/16/2017 1:52:00 PM
Received Date: 8/17/2017 7:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	87	30		mg/Kg	20	8/24/2017 5:10:09 PM	33539
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	8/21/2017 10:54:16 PM	33453
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	8/21/2017 10:54:16 PM	33453
Surr: DNOP	73.5	70-130		%Rec	1	8/21/2017 10:54:16 PM	33453
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Surr: BFB	74.0	54-150		%Rec	1	8/21/2017 8:18:13 PM	33452
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Toluene	ND	0.049		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Ethylbenzene	ND	0.049		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Xylenes, Total	ND	0.098		mg/Kg	1	8/21/2017 8:18:13 PM	33452
Surr: 4-Bromofluorobenzene	105	66.6-132		%Rec	1	8/21/2017 8:18:13 PM	33452

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#: **1708B02**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID	**MB-33539**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**33539**	RunNo:	**45189**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/24/2017**	SeqNo:	**1432108**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-33539**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**33539**	RunNo:	**45189**					
Prep Date:	**8/24/2017**	Analysis Date:	**8/24/2017**	SeqNo:	**1432109**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.3	90	110			

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#: **1708B02**

27-Aug-17

Client: Blagg Engineering

Project: Mudge A 2

Sample ID **LCS-33453**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **33453**	RunNo: **45091**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428105** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	105	73.2	114			
Surr: DNOP	3.9		5.000		78.1	70	130			

Sample ID **MB-33453**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **33453**	RunNo: **45091**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428106** 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	7.3		10.00		73.0	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#: **1708B02**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID	**MB-33452**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBS**	Batch ID:	**33452**		RunNo:	**45097**				
Prep Date:	**8/18/2017**	Analysis Date:	**8/21/2017**		SeqNo:	**1428026**	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	840		1000		84.3	54	150			

Sample ID	**LCS-33452**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSS**	Batch ID:	**33452**		RunNo:	**45097**				
Prep Date:	**8/18/2017**	Analysis Date:	**8/21/2017**		SeqNo:	**1428027**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.0	76.4	125			
Surr: BFB	920		1000		92.2	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#: **1708B02**

27-Aug-17

Client: Blagg Engineering
Project: Mudge A 2

Sample ID **MB-33452**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428054** 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		119	66.6	132			

Sample ID **LCS-33452**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **33452**	RunNo: **45097**
Prep Date: **8/18/2017**	Analysis Date: **8/21/2017**	SeqNo: **1428055** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	109	80	120			
Toluene	1.1	0.050	1.000	0	108	80	120			
Ethylbenzene	1.1	0.050	1.000	0	107	80	120			
Xylenes, Total	3.3	0.10	3.000	0	108	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		123	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: BLAGG Work Order Number: 1708B02 RcptNo: 1

Received By: Anne Thorne 8/17/2017 7:10:00 AM

Completed By: Ashley Gallegos 8/17/2017 3:17:26 PM

Reviewed By: 8/18/17

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 ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
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 ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

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	1.0	Good	Yes			

Chain-of-Custody Record

Client: BP AMERICA

BLAGG ENGINEERING INC.

Mailing Address:

Phone #: (505) 320-1183

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: MUDGE A 2

Project #:

Project Manager: STEVE MOSKAL

Sampler: JEFF BLAGG
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

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. 1708B02	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)	CHLORIDE					Air Bubbles (Y or N)
8/14/2017	0901	SOIL	BH-4 (30'-31')	4 oz x1	COOL	-001	X		X									X					
	0915		BH-4 (35'-36')			-002																	
	0958		BH-4 (45'-46')			-003																	
	1322		BH-5 (35'-36')			-004																	
	1352		BH-5 (45'-46')			-005																	

Date:	Time:	Relinquished by:	Received by:	Date	Time
8/14/2017	1502	Jeff Blagg		8/14/2017	1502
8/16/17	1832			08/17/17	0710

Remarks: BILL BP CONTACT: STEVE MOSKAL
VID: VH6XONEVRM
WBS ELEMENT: L1-0018M-E:10984

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.