

1RP-313
DELINEATION REPORT AND REMEDIATION PLAN
Northeast Drinkard Unit
Drilling Pit Trenches
Lea County, New Mexico

LAI Project No. 19-0112-22

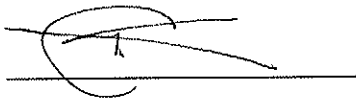
November 11, 2019

Prepared for:

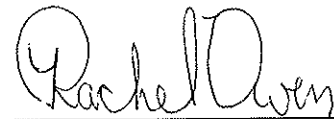
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Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
November 11, 2019

1.0 INTRODUCTION

Larson & Associates, Inc. (LAI) submits this plan (path forward) to the New Mexico Oil Conservation Division (OCD) District 1 on behalf Apache Corporation (Apache) for remediation and closure of trenches associated with drilling pits at the Northeast Drinkard Unit (NEDU) Wells 829, 830, 922, 928, & 929. Figure 1 presents a topographic and location map for NEDU Wells #829, #830, #922, #928 and #929. Figure 2 presents an aerial map.

1.1 Background

The trenches were discovered on April 6, 2001 when a landowner reported the drilling pits were being closed by disposing pit fluid in trenches adjacent to the drilling pits. The trenches are located on private land. Apache was notified and submitted the initial C-141 on April 23, 2001. OCD assigned the wells remediation permit 1RP-313. Appendix A presents the initial C-141.

On April 23, 2001, Apache submitted a work plan for the remediating the trenches. OCD approved the work plan on May 8, 2001. The work plan stated that the trenches at wells #829, #830 and #929 were excavated to approximately 19 feet bgs and to approximately 13 feet bgs at #928. There is no evidence that a trench was excavated at #922. An Apache contractor collected bottom and composite samples from the excavations and found chloride above the remediation closure limits in all excavations. TPH was reported above the remediation closure limits in the excavation at #928. No documentation is available in OCD files to confirm remediation was performed.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation ranges from approximately 3,416 feet above mean sea level (msl) at Well #829 to 3,401 feet above msl at Well #929;
- The topography slopes gently towards the southeast towards Monument Draw;
- There are no surface water features within 1,000 feet of the Site;
- The soils are designated as "Pyote maljamar fine sands", consisting of 0 to 24 inches of fine sand underlain by 24 to 50 inches of a sandy clay loam;
- The surface geology consists of Eolian and piedmont deposits (Holocene to middle Pleistocene) interlayered eolian sands and piedmont-slope deposits;
- Groundwater occurs in the Ogallala formation between approximately 49.55 feet below ground surface (bgs) at NEDU #929 and 53.98 feet bgs at NEDU #830 based on the gauging depth to groundwater from borings during soil sample collection;

1.3 Remediation Levels

Remediation standards are based on closure criteria for soils impacted by a release of unknown volume as presented in Table 1 of 19.15.29 NMAC: and vary by location and depth to groundwater. Further, 19.15.29.13 NMAC (Restoration, Reclamation and Re-Vegetation) requires the operator to restore the impacted surface area that existed prior to the release or their final land use.

2.0 DELINEATION REPORT AND REMEDIATION PLAN

2.1 NEDU #829: 32° 27' 50.28" North, 103° 09' 20.74" West

Depth to groundwater was recorded at 52.79 feet bgs therefore the following remediation standards apply (Table 1 of 19.15.29 NMAC):

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 2,500 mg/Kg
- Chloride 10,000 mg/Kg

Apache conducted the following investigations:

- Soil sample were collected at five (5) locations (SP-1, SP-4, SP-5, SP-6 and SP-7) in and around the trench area to delineate impacts to soil;
- Sample location SP-1 was located near the center of the trench and was sampled to approximately sixty (60) feet bgs every five (5) feet ;
- Samples were collected in each cardinal direction from the trench (SP- 4 through SP-7) and were sampled every five (5) feet to 20 and 25 feet bgs;
- The laboratory reported benzene, BTEX, and TPH below OCD remediation limits of 10 milligrams per kilogram (mg/Kg), 50 mg/Kg, and 100 mg/Kg, respectively;
- Chloride was delineated to 600 mg/Kg, as required by 19.15.11(5)(c);
- The laboratory reported chloride above the OCD surface restoration limit in 19.15.13 NMAC of 600 mg/Kg in samples SP-4, 5 feet bgs (1,630 mg/Kg) and SP-6, 5 feet bgs (1,240 mg/Kg).

Table 1a presents the laboratory analytical data summary. Figure 3a presents a site drawing and soil sample locations. Appendix B presents the laboratory reports. Appendix C presents boring logs. Appendix D presents photographs.

Apache proposes the following remediation:

- Excavate soil in the vicinity of SP-4 and SP-6 to four (4) feet bgs;
- Collect sidewall confirmation samples per 19.15.25.12D and analyze for BTEX, TPH and chloride;
- Backfill to surface with clean topsoil assuming BTEX, TPH and chloride concentration are below OCD closure limits (Table 1) of 10 mg/Kg, 50 mg/Kg, 2,500 mg/Kg and 600 mg/Kg, respectively;
- Seed to landowner requirements; and
- Prepare report for submittal to NMOCD.

2.2 NEDU #830: 32° 27' 53.01" North, 103° 09' 6.71" West

Depth to groundwater was recorded at 53.98 feet bgs therefore the following remediation standards apply (Table 1 of 19.15.29 NMAC):

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 2,500 mg/Kg
- Chloride 10,000 mg/Kg

Apache conducted the following investigations:

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- Soil samples were collected at five (5) locations (SP-2, SP-4, SP-5, SP-7 and SP-8) in and around the trench area to vertically and horizontally delineate the trench;
- The location located near the center of the trench (SP-2) was sampled to 60 feet bgs at five (5) feet intervals;
- The locations outside the trench (SP-4, SP-5, SP-7 and SP-8) were sampled at 5 and 10 feet bgs;
- The laboratory reported benzene, BTEX, and TPH below OCD remediation limits of 10 mg/Kg, 50 mg/Kg, and 2,500 mg/Kg, respectively;
- The laboratory reported chloride above the OCD remediation limits of 10,000 mg/Kg in samples SP-2, 10 feet (45,400 mg/Kg) and SP-2, 30 feet (14,300 mg/Kg); Chloride was 1,220 mg/Kg in sample SP-2, 50 feet and decreased to 928 mg/Kg in sample SP-2, 55 feet which was collected below the water table (53.98 feet bgs).

Table 1b presents the laboratory analytical data summary. Figure 3b presents a site drawing and soil sample locations. Appendix B presents the laboratory reports. Appendix C presents boring logs. Appendix D presents photographs.

Apache proposes the following remediation:

- Request variance for approval to excavate soil from trench area (SP-2) to four (4) feet bgs;
- Collect sidewall confirmation samples per 19.15.25.12D and analyze for BTEX, TPH and chloride;
- Install a 20 mil polyethylene liner in bottom of the excavation;
- Backfill to surface with clean topsoil and seed to landowner specifications;
- Install a monitor well to approximately 70 feet bgs about 50 feet hydraulically down gradient (east-southeast) from the trench and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS); and
- Prepare report for submittal to NMOCD.

2.3 NEDU #922: 32° 27' 41.39" North, 103° 09' 3.57" West

Depth to groundwater was recorded at 53.08 feet bgs therefore the following remediation standards apply (Table 1 of 19.15.29 NMAC):

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 2,500 mg/Kg
- Chloride 10,000 mg/Kg

Apache conducted the following investigations:

- Soil samples were collected at five (5) locations (SP-2, SP-3, SP-4, SP-5 and SP-6) in and around the trench area to vertically and horizontally delineate the trench;
- The sample location near the center of the trench (SP-2) was sampled to 65 feet (bgs) at five (5) feet intervals;
- The samples collected outside the trench (SP-3 through SP-6) were sampled from 25 and 35 feet bgs at five (5) 5 feet intervals;
- The laboratory reported benzene, BTEX, and TPH below OCD remediation limits of 10 mg/Kg, 50 mg/Kg, and 2,500 mg/Kg, respectively;

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- The laboratory reported chloride concentrations above the OCD remediation limit of 10,000 mg/Kg in samples SP-2, 30 feet (12,700 mg/Kg), Sp-2, 35 feet (17,800 mg/Kg) and SP-2, 40 feet (23,700 mg/Kg);
- Chloride was 5,290 mg/Kg in sample SP-2, 50 feet and decreased to 2,170 mg/Kg in sample SP-2, 55 feet which was collected below the water table (53.08 feet bgs).

Table 1c presents the laboratory analytical data summary. Figure 3c presents a site drawing and soil sample locations. Appendix B presents the laboratory reports. Appendix C presents boring logs. Appendix D presents photographs.

Apache proposes the following remediation:

- Request variance for approval to excavate soil from trench area (SP-2) to four (4) feet bgs;
- Collect sidewall confirmation samples per 19.15.25.12D and analyze for BTEX, TPH and chloride;
- Install a 20 mil polyethylene liner in bottom of the excavation;
- Backfill to surface with clean topsoil and seed to landowner specifications;
- Install a monitor well to approximately 70 feet bgs about 50 feet hydraulically down gradient (east-southeast) from the trench and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS); and
- Prepare report for submittal to NMOCD.

2.4 NEDU #928: 32° 27' 28.87" North, 103° 09' 20.99" West

The maximum depth of drilling was approximately 40 feet bgs (SP-2) and groundwater is expected to occur around 50 feet bgs therefore the following remediation standards apply (Table 1 of 19.15.29 NMAC):

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 100 mg/Kg
- Chloride 600 mg/Kg

Apache conducted the following investigations:

- Soil samples were collected at six (6) locations (SP-2, SP-3, SP-4, SP-5, SP-6 and SP-8) in and around the trench to vertically and horizontally delineate the trench;
- The sample location near the center of the trench (SP-2) was sampled to 40 feet bgs at five (5) feet intervals;
- The samples collected outside the trench (SP-3 through SP-6 and SP-8) were sampled to 20 feet bgs at 5 feet intervals;
- The laboratory reported benzene and BTEX below OCD remediation limits of 10 mg/Kg, 50 mg/Kg, respectively;
- The laboratory reported TPH above the OCD closure limit (100 mg/Kg) in sample SP-3, 15 feet (122 mg/Kg);
- The laboratory reported chloride concentrations above the OCD remediation limit of 600 mg/Kg in the following samples:

SP-2, 25 feet - 9,440 mg/Kg	SP-2, 30 feet - 6,940 mg/Kg
SP-3, 10 feet - 1,940 mg/Kg	SP-3, 15 feet - 757 mg/Kg

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- | | |
|-----------------------------|-----------------------------|
| SP-3, 20 feet - 1,420 mg/Kg | SP-4, 10 feet - 1,020 mg/Kg |
| SP-4, 15 feet - 5,320mg/Kg | SP-4, 20 feet - 6,810 mg/Kg |
| SP-8, 5 feet - 1,570 mg/Kg | SP-8, 10 feet - 955 mg/Kg |
- Chloride was not delineated to 600 mg/Kg at location SP-3 (1,420 mg/Kg) and SP-4 (6,810 mg/Kg); and
 - It is assumed that chloride in soil at SP-2 is above the OCD closure criteria between ground surface and 20 feet bgs.

Table 1d presents the laboratory analytical data summary. Figure 3d presents a site drawing and soil sample locations. Appendix B presents the laboratory reports. Appendix C presents boring logs. Appendix D presents photographs.

Apache proposes the following remediation:

- Request variance for approval to excavate soil from trench area (SP-2) to four (4) feet bgs;
- Collect sidewall confirmation samples per 19.15.25.12D and analyze for BTEX, TPH and chloride;
- Install a 20 mil polyethylene liner in bottom of the excavation;
- Backfill to surface with clean topsoil and seed to landowner specifications;
- Install a monitor well to approximately 70 feet bgs about 50 feet hydraulically down gradient (east-southeast) from the trench and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS)); and
- Prepare report for submittal to NMOCD.

2.5 NEDU #929: 32° 27' 28.88" North, 103° 09' 5.22" West

Depth to groundwater was recorded at 49.55 feet bgs therefore the following remediation standards apply (Table 1 of 19.15.29 NMAC):

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 100 mg/Kg
- Chloride 600 mg/Kg

Apache conducted the following investigations:

- Soil samples were collected at four (4) soil sample locations (SP-1, SP-3, SP-4 and SP-5) were collected in and around the trench to vertically and horizontally delineate the trench;
- The sample location near the center of the trench (SP-3) was sampled to 55 feet bgs at five (5) feet intervals;
- The samples collected outside the trench (SP-1, SP-4, and SP-5) were sampled at 5 and 10 feet bgs;
- The laboratory reported benzene and BTEX below OCD remediation limits of 10 mg/Kg and 50 mg/Kg;
- The laboratory reported TPH above the OCD closure limit (100 mg/Kg) in samples SP-3, 5 feet (454 mg/Kg), SP-3, 10 feet (308 mg/Kg), SP-3, 20 feet (454 mg/Kg) and SP-5, 5 feet (533 mg/Kg);
- Chloride was 1,230 mg/Kg in sample SP-2, 45 feet and decreased to 899 mg/Kg in sample SP-2, 50 feet which was collected below the water table (49.55 feet bgs).

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Table 1e presents the laboratory analytical data summary. Figure 3e presents a site drawing and soil sample locations. Appendix B presents the laboratory reports. Appendix C presents boring logs. Appendix D presents photographs.

Apache proposes the following remediation:

- Request variance for approval to excavate soil from trench area (SP-3) and at SP-5 to four (4) feet bgs;
- Collect sidewall confirmation samples per 19.15.25.12D and analyze for BTEX, TPH and chloride;
- Install a 20 mil polyethylene liner in bottom of the excavation;
- Backfill to surface with clean topsoil and seed to landowner specifications;
- Install a monitor well to approximately 65 feet bgs about 50 feet hydraulically down gradient (east-southeast) from the trench and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS); and
- Prepare report for submittal to NMOCD.

Tables

Table 1a
Xenco Analytical Data Summary
Apache Corp., NEDU 829, 1RP-313
Lea County, New Mexico

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Sample ID	Depth (Feet)	Collection Date	Status (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Remediation Level:				10	50				2,500	10,000
SP-1	5	09/26/2019	In-situ	<0.00199	<0.00199	<49.8	<49.8	<49.8	<49.8	97.7
	10		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	51.2
	15		In-situ	<0.00199	<0.00199	<49.8	<49.8	<49.8	<49.8	323
	20		In-situ	<0.00201	<0.00201	<50.0	<50.0	<50.0	<50.0	4,880
	25		In-situ	<0.00200	<0.00200	<49.9	56.1	<49.9	56.1	5,200
	30		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	2,210
	35		In-situ	<0.00202	<0.00202	<49.8	<49.8	<49.8	<49.8	968
	40		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	2,710
	45		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	2,100
	50		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	2,080
	55		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	592
	60		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	361
SP-4	5	09/26/2019	In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	1,630
	10		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	375
	15		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	149
	20		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	285
SP-5	5	09/26/2019	In-situ	<0.00202	<0.00202	<50.0	<50.0	<50.0	<50.0	498
	10		In-situ	<0.00199	<0.00199	<49.8	<49.8	<49.8	<49.8	224
	15		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	345
	20		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	217
	25		In-situ	<0.00202	<0.00202	<50.0	99.4	92.6	192	324
SP-6	5	09/26/2019	In-situ	<0.00200	<0.00200	<49.9	58.3	60.1	118	1,240
	10		In-situ	<0.00198	<0.00198	<50.0	68.7	<50.0	68.7	120
	15		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	83.3
	20		In-situ	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	230
	25		In-situ	<0.00201	<0.00201	<49.9	<49.9	<49.9	<49.9	258
SP-7	5	09/26/2019	In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	102
	10		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	339
	15		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	170
	20		In-situ	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	139
	25		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	238

Notes: analysis performed by Xenoco Labs, Midland, Texas, by EPA Method 300

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

<: denotes concentration less than analytical method reporting limit

Highlighted denotes concentration exceeds OCD surface restoration limit (19.15.13 NMAC)

Table 1b
Xenco Analytical Data Summary
Apache Corp., NEDU 830, 1RP-313
Lea County, New Mexico

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Sample ID	Depth (Feet)	Collection Date	Status (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Remediation Level:				10	50				2,500	10,000
SP-2	0	09/25/2019	<0.00200	<0.00200	<0.00199	<49.9	<49.9	<49.9	<49.9	294
	5		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	5,150
	10		In-situ	<0.00200	<0.00200	<49.8	137	<49.8	137	45,400
	15		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	2,460
	20		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	3,740
	25		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	4,080
	30		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	14,300
	35		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	8,920
	40		In-situ	<0.00198	<0.00198	<49.8	<49.8	<49.8	<49.8	3,240
	45		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	1,270
	50		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	1,220
	55		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	928
	60		In-situ	<0.00201	<0.00201	<49.9	<49.9	<49.9	<49.9	857
SP-4	5	09/25/2019	In-situ	<0.00199	<0.00199	<49.8	<49.8	<49.8	<49.8	63.6
	10		In-situ	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	93.6
SP-5	5	09/26/2019	In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	11.3
	10		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	81.8
SP-7	5	09/26/2019	In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	54.1
	10		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	89.5
SP-8	5	09/26/2019	In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	32.2
	10		In-situ	<0.00199	<0.00199	<50.0	87.0	<50.0	87.0	288

Notes: analysis performed by Xenoco Labs, Midland, Texas, by EPA Method 300

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

<: denotes concentration less than analytical method reporting limit

Highlighted denotes concentration exceeds OCD closure criteria in Table 1 (19.15.12 NMAC)

Highlighted denotes concentration exceeds OCD delineation limit (19.15.11(5)(c) NMAC)

Table 1c
Xenco Analytical Data Summary
Apache Corp., NEDU 922, 1RP-313
Lea County, New Mexico

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Sample ID	Depth (Feet)	Collection Date	Status (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Remediation Level:				10	50				2,500	10,000
SP-2	5	09/27/2019	In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	46.8
	10		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	1.43
	15		In-situ	<0.00199	<0.00199	<49.9	155	86.9	242	1,680
	20		In-situ	<0.00199	<0.00199	<49.9	139	<49.9	139	2,450
	25		In-situ	<0.00202	<0.00202	<50.0	<50.0	<50.0	<50.0	5,150
	30		In-situ	<0.00199	<0.00199	<50.0	66.5	<50.0	66.5	12,700
	35		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	17,800
	40		In-situ	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	23,700
	45		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	7,770
	50		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	5,290
	55		In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	2,170
	60		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	1,500
	65		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	661
SP-3	5	09/27/2019	In-situ	<0.00201	<0.00201	<49.9	<49.9	<49.9	<49.9	58.6
	10		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	0.654
	15		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	0.83
	20		In-situ	<0.00198	<0.00198	<49.8	<49.8	<49.8	<49.8	42
	25		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	125
SP-4	5	09/27/2019	<0.00200	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	61.2
	10		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	2.65
	15		In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	<0.500
	20		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	20.3
	25		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	48.8
SP-5	5	09/27/2019	In-situ	<0.00201	<0.00201	<49.9	<49.9	<49.9	<49.9	32.4
	10		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	7.37
	15		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	26.4
	20		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	5.11
	25		In-situ	<0.00202	<0.00202	<50.0	<50.0	<50.0	<50.0	13.8
	30		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	9.49
	35		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	37.4
SP-6	5	09/27/2019	In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	89.3
	10		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	18.6
	15		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	14.1
	20		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	42.9
	25		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	14.1
	30		In-situ	<0.00198	<0.00198	<49.8	<49.8	<49.8	<49.8	146.0
	35		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	39.2

Notes: analysis performed by Xenoco Labs, Midland, Texas, by EPA Method 300

Depth in feet below ground surface (bgs) mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

<: denotes concentration less than analytical method reporting limit

Highlighted denotes concentration exceeds OCD closure criteria in Table 1 (19.15.12 NMAC)

Highlighted denotes concentration exceeds OCD delineation limit (19.15.11(5)(c) NMAC)

Table 1d
Xenco Analytical Data Summary
Apache Corp., NEDU 928, 1RP-313
Lea County, New Mexico

Page 1 of 1

Sample ID	Depth (Feet)	Collection Date	Status (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Remediation Level:				10	50				100	600
SP-2	5	09/23/2019	In-situ	--	--	--	--	--	--	--
	10		In-situ	--	--	--	--	--	--	--
	15		In-situ	--	--	--	--	--	--	--
	20		In-situ	--	--	--	--	--	--	--
	25		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	9,440
	30		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	6,940
	35		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	573
	40		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	349
SP-3	5	09/23/2019	In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	45.1
	10		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	1,940
	15		In-situ	<0.00199	<0.00199	<49.9	122	<49.9	122	757
	20		In-situ	<0.00202	<0.00202	<50.0	<50.0	<50.0	<50.0	1,420
SP-4	5	09/23/2019	<0.00200	<0.00201	<0.00201	<49.9	<49.9	<49.9	<49.9	345
	10		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	1,020
	15		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	5,320
	20		In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	6,810
SP-5	5	09/23/2019	In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	176
	10		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	248
	15		In-situ	<0.00202	<0.00202	<50.0	<50.0	<50.0	<50.0	726
	20		In-situ	<0.00201	<0.00201	<49.8	<49.8	<49.8	<49.8	601
SP-6	5	09/23/2019	<0.00200	<0.00199	<0.00199	<49.8	<49.8	<49.8	<49.8	94.4
	10		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	149
	15		In-situ	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	394
	20		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	224
SP-8	5	09/24/2019	In-situ	<0.001999	<0.00199	<49.9	<49.9	<49.9	<49.9	1,570
	10		In-situ	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	955
	15		In-situ	<0.00198	<0.00198	<49.8	<49.8	<49.8	<49.8	398
	20		In-situ	<0.001999	<0.00199	<50.0	<50.0	<50.0	<50.0	260

Notes: analysis performed by Xenoco Labs, Midland, Texas, by EPA Method 300
Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

<: denotes concentration less than analytical method reporting limit

Highlighted denotes concentration exceeds OCD closure criteria in Table 1 (19.15.12 NMAC)

Highlighted denotes concentration exceeds OCD delineation limit (19.15.11(5)(c) NMAC)

Table 1e
Xenco Analytical Data Summary
Apache Corp., NEDU 929, 1RP-313
Lea County, New Mexico

Page 1 of 1

Sample ID	Depth (Feet)	Collection Date	Status (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
Remediation Level:				10	50				100	600
SP-1	5	09/24/2019	In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	198
	10		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	63.3
SP-3	5	09/24/2019	In-situ	<0.00199	<0.00199	<49.9	454	<49.9	454	23,500
	10		In-situ	<0.00202	<0.00202	<50.0	308	<50.0	308	20,400
	15		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	8,020
	20		In-situ	<0.00198	<0.00198	<49.9	454	<49.9	454	9,170
	25		In-situ	<0.00198	<0.00198	<49.8	<49.8	<49.8	<49.8	3,460
	30		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	3,590
	35		In-situ	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	3,740
	40		In-situ	<0.00200	<0.00200	<50.0	<50.0	<50.0	<50.0	2,040
	45		In-situ	<0.00200	<0.00200	<49.9	<49.9	<49.9	<49.9	1,230
	50		In-situ	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	899
	55		In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	429
SP-4	5	09/24/2019	In-situ	<0.00200	<0.00200	<49.8	<49.8	<49.8	<49.8	51.6
	10		In-situ	<0.00198	<0.00198	<50.0	<50.0	<50.0	<50.0	255
SP-5	5	09/24/2019	In-situ	<0.00201	<0.00201	<50.0	409	124	533	2,630
	10		In-situ	<0.00199	<0.00199	<49.9	95.8	<49.9	95.8	6,030

Notes: analysis performed by Xenoco Labs, Midland, Texas, by EPA Method 300

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

<: denotes concentration less than analytical method reporting limit

Highlighted denotes concentration exceeds OCD closure criteria in Table 1 (19.15.12 NMAC)

Highlighted denotes concentration exceeds OCD delineation limit (19.15.11(5)(c) NMAC)

Figures

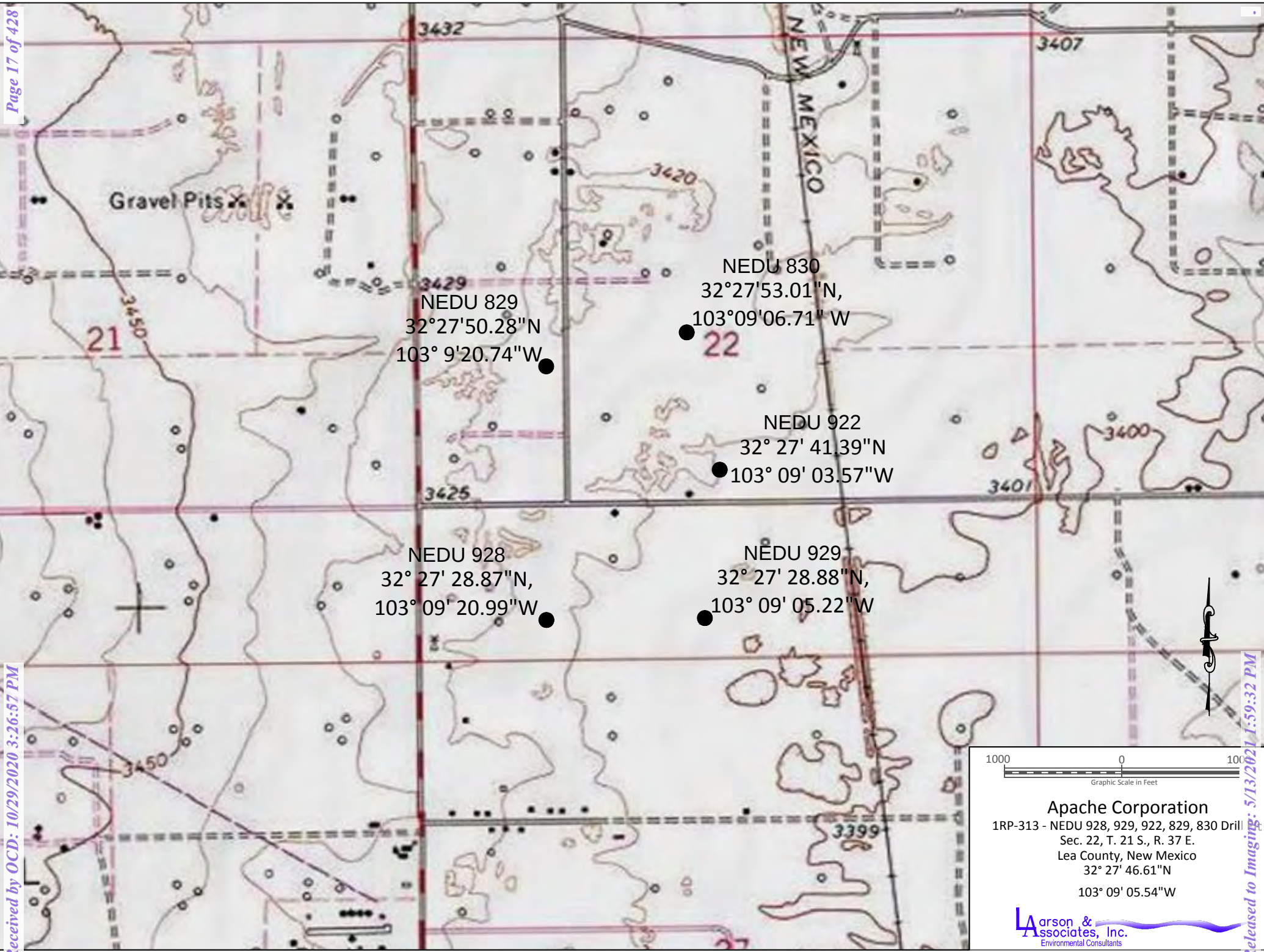
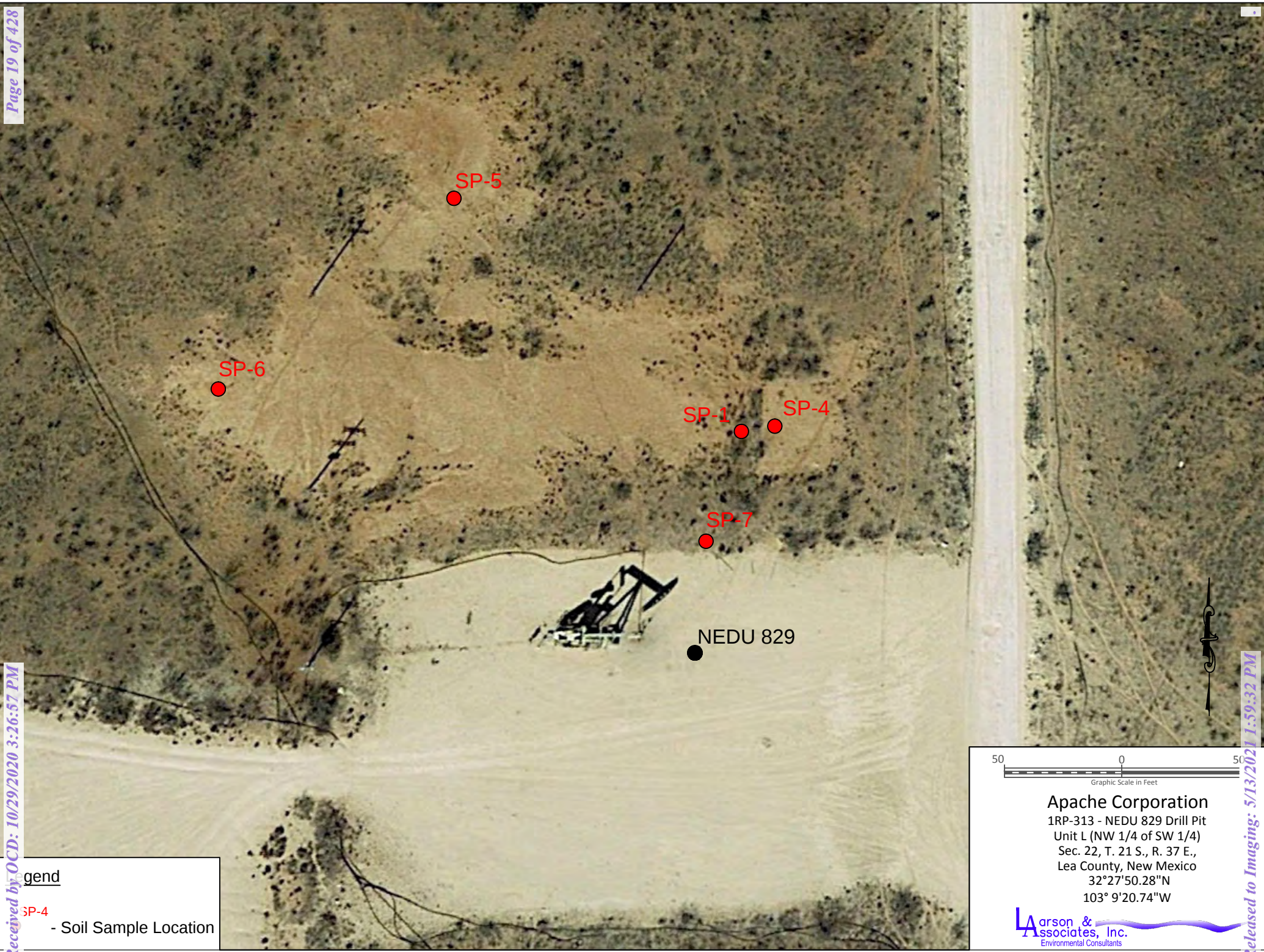


Figure 1 - Topographic Map



Figure 2 - Aerial Map



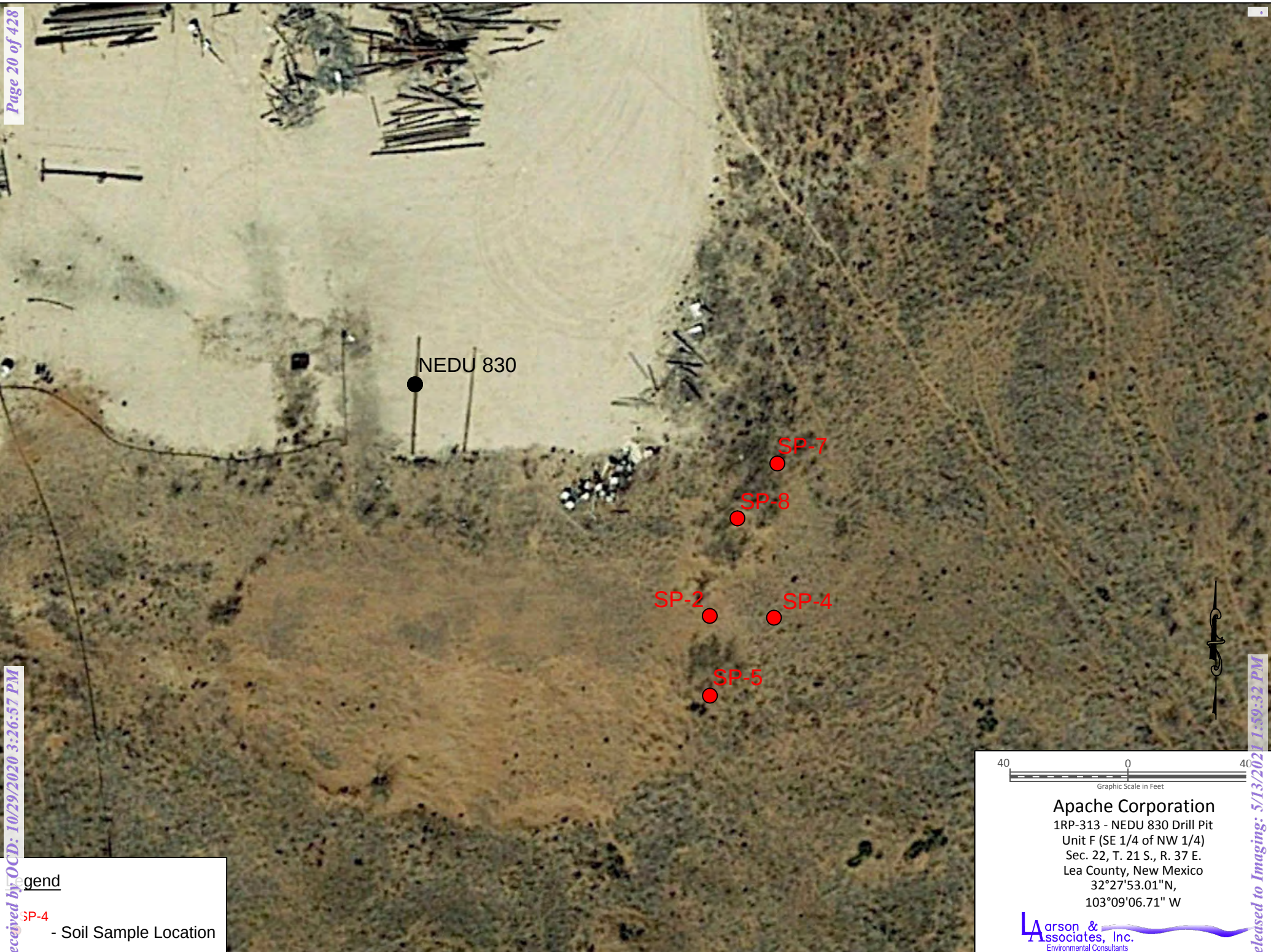
Legend
SP-4 - Soil Sample Location

50 0 50
Graphic Scale in Feet

Apache Corporation
1RP-313 - NEDU 829 Drill Pit
Unit L (NW 1/4 of SW 1/4)
Sec. 22, T. 21 S., R. 37 E.,
Lea County, New Mexico
32°27'50.28"N
103° 9'20.74"W

Larson & Associates, Inc.
Environmental Consultants

Figure 3a - Aerial Map Showing NEDU 829



Legend
SP-4 - Soil Sample Location

40 0 40
Graphic Scale in Feet

Apache Corporation
1RP-313 - NEDU 830 Drill Pit
Unit F (SE 1/4 of NW 1/4)
Sec. 22, T. 21 S., R. 37 E.
Lea County, New Mexico
32°27'53.01"N,
103°09'06.71" W

Larson & Associates, Inc.
Environmental Consultants

Figure 3b - Aerial Map Showing NEDU 830



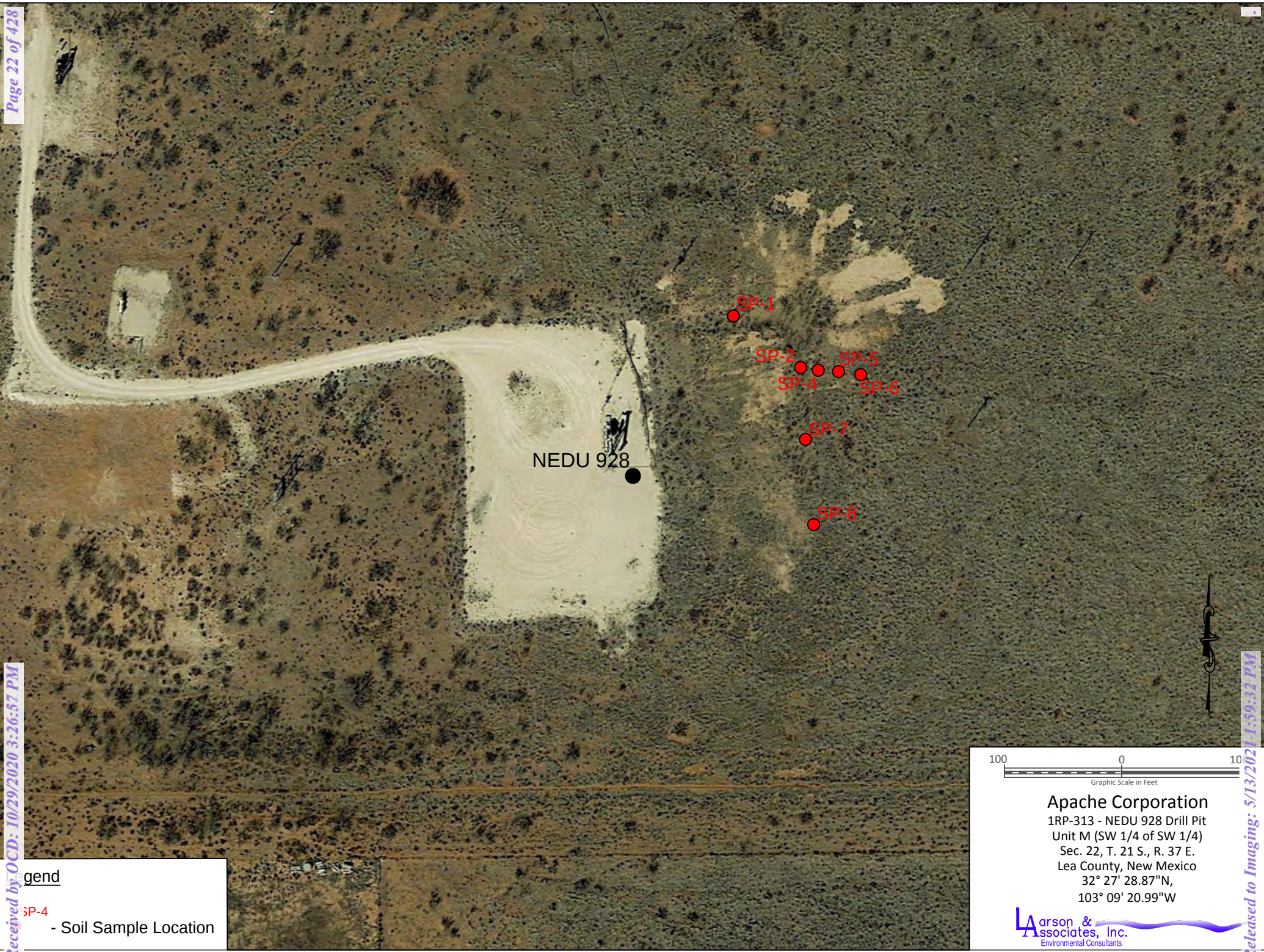
Legend
SP-4 - Soil Sample Location

40 0 40
Graphic Scale in Feet

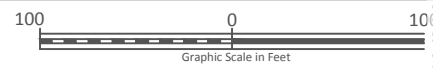
Apache Corporation
1RP-313 - NEDU 922 Drill Pit
Unit K (NE 1/4 of SW 1/4)
Sec. 22, T. 21 S., R. 37 E.
Lea County, New Mexico
32° 27' 41.39"N
103° 09' 03.57"W

Larson & Associates, Inc.
Environmental Consultants

Figure 3c - Aerial Map Showing NEDU 922



Legend
SP-4 - Soil Sample Location



Apache Corporation
1RP-313 - NEDU 928 Drill Pit
Unit M (SW 1/4 of SW 1/4)
Sec. 22, T. 21 S., R. 37 E.
Lea County, New Mexico
32° 27' 28.87"N,
103° 09' 20.99"W

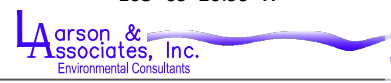


Figure 3d - Aerial Map Showing NEDU 928



Legend
SP-4 - Soil Sample Location

100 0 100
Graphic Scale in Feet

Apache Corporation
1RP-313 - NEDU 929 Drill Pit
Unit N (SE 1/4 of SW 1/4)
Sec. 22, T. 21 S., R. 37 E.
Lea County, New Mexico
32° 27' 28.88"N,
103° 09' 05.22"W

Larson & Associates, Inc.
Environmental Consultants

Figure 3e - Aerial Map Showing NEDU 929

Appendix A

C-141

Appendix B
Laboratory Reports

NEDU #829



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm
Report Date: 08-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638333-001	638333-002	638333-003	638333-004	638333-005	638333-006
	<i>Field Id:</i>	SP-1 (5')	SP-1 (10')	SP-1 (15')	SP-1 (20')	SP-1 (25')	SP-1 (30')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-26-19 09:20	Sep-26-19 09:21	Sep-26-19 09:22	Sep-26-19 09:23	Sep-26-19 09:24	Sep-26-19 09:25
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00
	<i>Analyzed:</i>	Oct-02-19 06:04	Oct-02-19 06:24	Oct-02-19 06:44	Oct-02-19 07:05	Oct-02-19 07:25	Oct-02-19 07:45
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
Toluene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
Ethylbenzene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
m,p-Xylenes		<0.00398 0.00398	<0.00396 0.00396	<0.00398 0.00398	<0.00402 0.00402	<0.00399 0.00399	<0.00397 0.00397
o-Xylene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
Total Xylenes		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
Total BTEX		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00200 0.00200	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30
	<i>Analyzed:</i>	Sep-30-19 16:10	Sep-30-19 16:16	Sep-30-19 16:34	Sep-30-19 16:39	Sep-30-19 17:22	Sep-30-19 17:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		97.7 4.96	51.2 5.00	323 5.02	4880 50.5	5200 50.5	2210 25.0
TPH by SW8015 Mod	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Oct-01-19 23:11	Oct-02-19 00:14	Oct-02-19 00:35	Oct-02-19 00:56	Oct-02-19 01:17	Oct-02-19 01:38
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.8 49.8	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0
Diesel Range Organics (DRO)		<49.8 49.8	<49.9 49.9	<49.8 49.8	<50.0 50.0	56.1 49.9	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.8 49.8	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0
Total TPH		<49.8 49.8	<49.9 49.9	<49.8 49.8	<50.0 50.0	56.1 49.9	<50.0 50.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Version: 1.9%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638333-007	638333-008	638333-009	638333-010	638333-011	638333-012
	<i>Field Id:</i>	SP-1 (35')	SP-1 (40')	SP-1 (45')	SP-1 (50')	SP-1 (55')	SP-1 (60')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-26-19 09:26	Sep-26-19 09:30	Sep-26-19 09:31	Sep-26-19 09:50	Sep-26-19 09:51	Sep-26-19 10:00
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00
	<i>Analyzed:</i>	Oct-02-19 08:05	Oct-02-19 08:25	Oct-02-19 08:45	Oct-02-19 09:05	Oct-02-19 10:24	Oct-02-19 10:44
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
Toluene		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
Ethylbenzene		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
m,p-Xylenes		<0.00404 0.00404	<0.00398 0.00398	<0.00398 0.00398	<0.00399 0.00399	<0.00398 0.00398	<0.00401 0.00401
o-Xylene		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
Total Xylenes		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
Total BTEX		<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 10:30	Sep-30-19 11:00	Sep-30-19 08:15
	<i>Analyzed:</i>	Sep-30-19 17:34	Sep-30-19 17:40	Sep-30-19 17:46	Sep-30-19 17:51	Sep-30-19 14:11	Sep-30-19 08:39
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		968 5.00	2710 25.0	2100 25.2	2080 24.8	592 5.00	361 5.02
TPH by SW8015 Mod	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Oct-02-19 01:59	Oct-02-19 02:20	Oct-02-19 02:41	Oct-02-19 03:02	Oct-02-19 03:44	Oct-02-19 04:05
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.8 49.8	<50.0 50.0	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.8 49.8	<50.0 50.0	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.8 49.8	<50.0 50.0	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.9 49.9
Total TPH		<49.8 49.8	<50.0 50.0	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.9 49.9

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Version: 1.9%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638333-013	638333-014	638333-015	638333-016	638333-017	638333-018
	<i>Field Id:</i>	SP-4 (5')	SP-4 (10')	SP-4 (15')	SP-4 (20')	SP-5 (5')	SP-5 (10')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-26-19 11:30	Sep-26-19 11:31	Sep-26-19 11:32	Sep-26-19 11:33	Sep-26-19 12:30	Sep-26-19 12:31
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:00
	<i>Analyzed:</i>	Oct-02-19 11:04	Oct-02-19 11:24	Oct-02-19 11:44	Oct-02-19 12:04	Oct-02-19 12:25	Oct-02-19 12:45
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
Toluene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
Ethylbenzene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
m,p-Xylenes		<0.00400 0.00400	<0.00399 0.00399	<0.00397 0.00397	<0.00396 0.00396	<0.00403 0.00403	<0.00398 0.00398
o-Xylene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
Total Xylenes		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
Total BTEX		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00202 0.00202	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15
	<i>Analyzed:</i>	Sep-30-19 08:58	Sep-30-19 09:05	Sep-30-19 09:11	Sep-30-19 09:18	Sep-30-19 09:37	Sep-30-19 09:44
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		1630 24.8	375 4.99	149 4.95	285 4.95	498 5.05	224 5.05
TPH by SW8015 Mod	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Oct-02-19 04:25	Oct-02-19 04:46	Oct-02-19 05:07	Oct-02-19 05:28	Oct-02-19 05:49	Oct-02-19 06:10
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.8 49.8
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.8 49.8
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.8 49.8
Total TPH		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.8 49.8

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm
Report Date: 08-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638333-019	638333-020	638333-021	638333-022	638333-023	638333-024
	<i>Field Id:</i>	SP-5 (15')	SP-5 (20')	SP-5 (25')	SP-6 (5')	SP-6 (10')	SP-6 (15')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-26-19 12:32	Sep-26-19 12:33	Sep-26-19 12:34	Sep-26-19 13:14	Sep-26-19 13:15	Sep-26-19 13:16
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-27-19 14:00	Sep-27-19 14:00	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30
	<i>Analyzed:</i>	Oct-02-19 13:05	Oct-02-19 13:25	Sep-30-19 23:33	Oct-01-19 00:51	Oct-01-19 01:11	Oct-01-19 01:31
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
Toluene		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
Ethylbenzene		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
m,p-Xylenes		<0.00397 0.00397	<0.00399 0.00399	<0.00404 0.00404	<0.00399 0.00399	<0.00396 0.00396	<0.00398 0.00398
o-Xylene		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
Total Xylenes		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
Total BTEX		<0.00198 0.00198	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15
	<i>Analyzed:</i>	Sep-30-19 09:50	Sep-30-19 09:57	Sep-30-19 10:03	Sep-30-19 10:09	Sep-30-19 10:29	Sep-30-19 10:35
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		345 5.05	217 4.98	324 5.02	1240 4.96	120 5.00	83.3 5.04
TPH by SW8015 Mod	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Oct-04-19 09:00	Oct-04-19 09:00	Oct-04-19 08:00	Oct-04-19 16:00
	<i>Analyzed:</i>	Oct-02-19 06:31	Oct-02-19 06:52	Oct-04-19 19:20	Oct-04-19 19:41	Oct-04-19 20:22	Oct-05-19 00:54
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	99.4 50.0	58.3 49.9	68.7 50.0	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	92.6 50.0	60.1 49.9	<50.0 50.0	<50.0 50.0
Total TPH		<49.9 49.9	<50.0 50.0	192 50.0	118 49.9	68.7 50.0	<50.0 50.0

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm
Report Date: 08-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638333-025	638333-026	638333-027	638333-028	638333-029	638333-030
	<i>Field Id:</i>	SP-6 (20')	SP-6 (25')	SP-7 (5')	SP-7 (10')	SP-7 (15')	SP-7 (20')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-26-19 13:17	Sep-26-19 13:18	Sep-26-19 14:00	Sep-26-19 14:01	Sep-26-19 14:02	Sep-26-19 14:03
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30	Sep-27-19 14:30
	<i>Analyzed:</i>	Oct-01-19 01:52	Oct-01-19 02:12	Oct-01-19 02:32	Oct-01-19 02:52	Oct-01-19 03:12	Oct-01-19 03:32
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
Toluene		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
Ethylbenzene		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
m,p-Xylenes		<0.00404 0.00404	<0.00402 0.00402	<0.00401 0.00401	<0.00399 0.00399	<0.00398 0.00398	<0.00403 0.00403
o-Xylene		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
Total Xylenes		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
Total BTEX		<0.00202 0.00202	<0.00201 0.00201	<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00202 0.00202
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15	Sep-30-19 08:15
	<i>Analyzed:</i>	Sep-30-19 10:55	Sep-30-19 11:01	Sep-30-19 11:07	Sep-30-19 11:14	Sep-30-19 11:20	Sep-30-19 11:27
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		230 4.98	258 4.97	102 5.00	339 5.04	170 4.97	139 5.00
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00
	<i>Analyzed:</i>	Oct-05-19 00:54	Oct-05-19 01:15	Oct-05-19 01:36	Oct-05-19 01:56	Oct-05-19 02:38	Oct-05-19 02:59
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638333

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 829



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

Analysis Requested	Lab Id:	638333-031					
	Field Id:	SP-7 (25')					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Sep-26-19 14:04					
BTEX by EPA 8021B	Extracted:	Sep-27-19 14:30					
	Analyzed:	Oct-01-19 03:52					
	Units/RL:	mg/kg RL					
Benzene		<0.00198 0.00198					
Toluene		<0.00198 0.00198					
Ethylbenzene		<0.00198 0.00198					
m,p-Xylenes		<0.00397 0.00397					
o-Xylene		<0.00198 0.00198					
Total Xylenes		<0.00198 0.00198					
Total BTEX		<0.00198 0.00198					
Chloride by EPA 300	Extracted:	Sep-30-19 08:15					
	Analyzed:	Sep-30-19 11:33					
	Units/RL:	mg/kg RL					
Chloride		238 5.03					
TPH by SW8015 Mod	Extracted:	Oct-04-19 16:00					
	Analyzed:	Oct-05-19 03:20					
	Units/RL:	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0					
Diesel Range Organics (DRO)		<50.0 50.0					
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0					
Total TPH		<50.0 50.0					

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Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant

Analytical Report 638333

for
Larson and Associates, Inc.

Project Manager: Mark Larson

Apache Corp. NEDU 829

19-0112-22

08-OCT-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)



08-OCT-19

Project Manager: **Mark Larson**

Larson and Associates, Inc.

P. O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **638333**

Apache Corp. NEDU 829

Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 638333. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 638333 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'.

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 638333

Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-1 (5')	S	09-26-19 09:20		638333-001
SP-1 (10')	S	09-26-19 09:21		638333-002
SP-1 (15')	S	09-26-19 09:22		638333-003
SP-1 (20')	S	09-26-19 09:23		638333-004
SP-1 (25')	S	09-26-19 09:24		638333-005
SP-1 (30')	S	09-26-19 09:25		638333-006
SP-1 (35')	S	09-26-19 09:26		638333-007
SP-1 (40')	S	09-26-19 09:30		638333-008
SP-1 (45')	S	09-26-19 09:31		638333-009
SP-1 (50')	S	09-26-19 09:50		638333-010
SP-1 (55')	S	09-26-19 09:51		638333-011
SP-1 (60')	S	09-26-19 10:00		638333-012
SP-4 (5')	S	09-26-19 11:30		638333-013
SP-4 (10')	S	09-26-19 11:31		638333-014
SP-4 (15')	S	09-26-19 11:32		638333-015
SP-4 (20')	S	09-26-19 11:33		638333-016
SP-5 (5')	S	09-26-19 12:30		638333-017
SP-5 (10')	S	09-26-19 12:31		638333-018
SP-5 (15')	S	09-26-19 12:32		638333-019
SP-5 (20')	S	09-26-19 12:33		638333-020
SP-5 (25')	S	09-26-19 12:34		638333-021
SP-6 (5')	S	09-26-19 13:14		638333-022
SP-6 (10')	S	09-26-19 13:15		638333-023
SP-6 (15')	S	09-26-19 13:16		638333-024
SP-6 (20')	S	09-26-19 13:17		638333-025
SP-6 (25')	S	09-26-19 13:18		638333-026
SP-7 (5')	S	09-26-19 14:00		638333-027
SP-7 (10')	S	09-26-19 14:01		638333-028
SP-7 (15')	S	09-26-19 14:02		638333-029
SP-7 (20')	S	09-26-19 14:03		638333-030
SP-7 (25')	S	09-26-19 14:04		638333-031

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 829**Project ID: 19-0112-22
Work Order Number(s): 638333Report Date: 08-OCT-19
Date Received: 09/27/2019**Sample receipt non conformances and comments:**

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3102891 BTEX by EPA 8021B

Lab Sample ID 638333-021 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638333-021, -022, -023, -024, -025, -026, -027, -028, -029, -030, -031.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene Relative Percent Difference (RPD) between matrix spike and duplicate were above quality control limits.

Samples in the analytical batch are: 638333-021, -022, -023, -024, -025, -026, -027, -028, -029, -030, -031

Batch: LBA-3102920 Chloride by EPA 300

Lab Sample ID 638333-022 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638333-012, -013, -014, -015, -016, -017, -018, -019, -020, -021, -022, -023, -024, -025, -026, -027, -028, -029, -030, -031.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 829**Project ID: 19-0112-22
Work Order Number(s): 638333Report Date: 08-OCT-19
Date Received: 09/27/2019

Batch: LBA-3103029 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638333-001 SD,638333-010,638333-012,638333-007.

Lab Sample ID 638333-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Diesel Range Organics (DRO), Gasoline Range Hydrocarbons (GRO) recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are:

638333-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020.

The Laboratory Control Sample for Gasoline Range Hydrocarbons (GRO), Diesel Range Organics (DRO) is within laboratory Control Limits, therefore the data was accepted.

MS/MSD not spiked in error; BKS/BSD shows recovery for the batch.

Batch: LBA-3103086 BTEX by EPA 8021B

Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene Relative Percent Difference (RPD) between matrix spike and duplicate were above quality control limits.

Samples in the analytical batch are: 638333-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Lab Sample ID 638333-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638333-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3103522 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687564-1-BKS,638333-022,638333-021.

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 829**Project ID: 19-0112-22
Work Order Number(s): 638333Report Date: 08-OCT-19
Date Received: 09/27/2019

Batch: LBA-3103523 TPH by SW8015 Mod

Gasoline Range Hydrocarbons (GRO) recovered above QC limits Analyte was not detected in any of the associated samples and therefore the data was accepted. Diesel Range Organics (DRO) recovered above QC limits in the Blank Spike and Duplicate. Analyte was not detected in any of the associated samples and therefore the data was accepted. Samples in the analytical batch are: 638333-024. The MS/MSD shows recovery for the batch.

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687566-1-BKS, 7687566-1-BSD.

Batch: LBA-3103535 TPH by SW8015 Mod

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687563-1-BLK.

Batch: LBA-3103538 TPH by SW8015 Mod

Diesel Range Organics (DRO), Gasoline Range Hydrocarbons (GRO) recovered above QC limits in the laboratory control sample. Samples in the analytical batch are: 638333-025, -026, -027, -028, -029, -030, -031.

Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687567-1-BKS, 638118-011 SD, 638333-030, 638333-031.

Surrogate 1-Chlorooctane recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687567-1-BKS, 7687567-1-BSD, 638118-011 S, 638118-011 SD, 638333-027, 638333-026, 638333-025, 638333-028, 638333-031, 638333-030, 638333-029.

MS/MSD shows recovery for the batch.

Diesel Range Organics (DRO), Gasoline Range Hydrocarbons (GRO) RPD was outside laboratory control limits.

Samples in the analytical batch are: 638333-025, -026, -027, -028, -029, -030, -031



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (5')**
Lab Sample Id: 638333-001

Matrix: Soil
Date Collected: 09.26.19 09.20

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	97.7	4.96	mg/kg	09.30.19 16.10		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.01.19 23.11	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.01.19 23.11	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.01.19 23.11	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.01.19 23.11	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.01.19 23.11		
o-Terphenyl	84-15-1	120	%	70-135	10.01.19 23.11		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (5')**
Lab Sample Id: 638333-001

Matrix: Soil
Date Collected: 09.26.19 09.20

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 06.04	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 06.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.02.19 06.04		
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.02.19 06.04		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-002

Date Collected: 09.26.19 09.21

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	51.2	5.00	mg/kg	09.30.19 16.16		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 00.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 00.14	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 00.14	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 00.14	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	112	%	70-135	10.02.19 00.14		
o-Terphenyl	84-15-1	116	%	70-135	10.02.19 00.14		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-002

Date Collected: 09.26.19 09.21

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.02.19 06.24	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 06.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	109	%	70-130	10.02.19 06.24		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.02.19 06.24		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-003

Date Collected: 09.26.19 09.22

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	323	5.02	mg/kg	09.30.19 16.34		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 00.35	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 00.35	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 00.35	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 00.35	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	107	%	70-135	10.02.19 00.35		
o-Terphenyl	84-15-1	117	%	70-135	10.02.19 00.35		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-003

Date Collected: 09.26.19 09.22

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 06.44	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 06.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.02.19 06.44		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 06.44		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-004

Date Collected: 09.26.19 09.23

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4880	50.5	mg/kg	09.30.19 16.39		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 00.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 00.56	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 00.56	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 00.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	119	%	70-135	10.02.19 00.56		
o-Terphenyl	84-15-1	129	%	70-135	10.02.19 00.56		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-004

Date Collected: 09.26.19 09.23

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.02.19 07.05	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.02.19 07.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	109	%	70-130	10.02.19 07.05		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 07.05		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-005

Date Collected: 09.26.19 09.24

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5200	50.5	mg/kg	09.30.19 17.22		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 01.17	U	1
Diesel Range Organics (DRO)	C10C28DRO	56.1	49.9	mg/kg	10.02.19 01.17		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 01.17	U	1
Total TPH	PHC635	56.1	49.9	mg/kg	10.02.19 01.17		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	121	%	70-135	10.02.19 01.17		
o-Terphenyl	84-15-1	133	%	70-135	10.02.19 01.17		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-005

Date Collected: 09.26.19 09.24

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 07.25	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 07.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.02.19 07.25		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 07.25		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-006

Date Collected: 09.26.19 09.25

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2210	25.0	mg/kg	09.30.19 17.28		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 01.38	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 01.38	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 01.38	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 01.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.02.19 01.38		
o-Terphenyl	84-15-1	129	%	70-135	10.02.19 01.38		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-006

Date Collected: 09.26.19 09.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 07.45	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 07.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.02.19 07.45		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.02.19 07.45		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (35')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-007

Date Collected: 09.26.19 09.26

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	968	5.00	mg/kg	09.30.19 17.34		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 01.59	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 01.59	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 01.59	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 01.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	127	%	70-135	10.02.19 01.59		
o-Terphenyl	84-15-1	139	%	70-135	10.02.19 01.59	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (35')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-007

Date Collected: 09.26.19 09.26

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.02.19 08.05	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.02.19 08.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 08.05		
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.02.19 08.05		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-008

Date Collected: 09.26.19 09.30

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2710	25.0	mg/kg	09.30.19 17.40		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 02.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 02.20	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 02.20	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 02.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	108	%	70-135	10.02.19 02.20		
o-Terphenyl	84-15-1	120	%	70-135	10.02.19 02.20		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-008

Date Collected: 09.26.19 09.30

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 08.25	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 08.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.02.19 08.25		
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.02.19 08.25		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (45')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-009

Date Collected: 09.26.19 09.31

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2100	25.2	mg/kg	09.30.19 17.46		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 02.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 02.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 02.41	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 02.41	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	117	%	70-135	10.02.19 02.41		
o-Terphenyl	84-15-1	127	%	70-135	10.02.19 02.41		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (45')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-009

Date Collected: 09.26.19 09.31

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 08.45	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 08.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 08.45		
4-Bromofluorobenzene	460-00-4	667	%	70-130	10.02.19 08.45	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-010

Date Collected: 09.26.19 09.50

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 10.30

Basis: Wet Weight

Seq Number: 3102921

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2080	24.8	mg/kg	09.30.19 17.51		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 03.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 03.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 03.02	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 03.02	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	129	%	70-135	10.02.19 03.02		
o-Terphenyl	84-15-1	140	%	70-135	10.02.19 03.02	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-010

Date Collected: 09.26.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 09.05	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 09.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.02.19 09.05		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.02.19 09.05		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-1 (55')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-011

Date Collected: 09.26.19 09.51

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	592	5.00	mg/kg	09.30.19 14.11		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 03.44	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 03.44	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 03.44	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 03.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	121	%	70-135	10.02.19 03.44		
o-Terphenyl	84-15-1	134	%	70-135	10.02.19 03.44		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (55')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-011

Date Collected: 09.26.19 09.51

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 10.24	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 10.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.02.19 10.24		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.02.19 10.24		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (60')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-012

Date Collected: 09.26.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	361	5.02	mg/kg	09.30.19 08.39		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 04.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 04.05	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 04.05	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 04.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	125	%	70-135	10.02.19 04.05		
o-Terphenyl	84-15-1	137	%	70-135	10.02.19 04.05	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-1 (60')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-012

Date Collected: 09.26.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.02.19 10.44	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 10.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.02.19 10.44		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 10.44		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (5')**
Lab Sample Id: 638333-013

Matrix: Soil
Date Collected: 09.26.19 11.30

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1630	24.8	mg/kg	09.30.19 08.58		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 04.25	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 04.25	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 04.25	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 04.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	110	%	70-135	10.02.19 04.25		
o-Terphenyl	84-15-1	120	%	70-135	10.02.19 04.25		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (5')**
Lab Sample Id: 638333-013

Matrix: Soil
Date Collected: 09.26.19 11.30

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.02.19 11.04	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 11.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.02.19 11.04		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.02.19 11.04		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-014

Date Collected: 09.26.19 11.31

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	375	4.99	mg/kg	09.30.19 09.05		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 04.46	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 04.46	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 04.46	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 04.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.02.19 04.46		
o-Terphenyl	84-15-1	126	%	70-135	10.02.19 04.46		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-014

Date Collected: 09.26.19 11.31

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 11.24	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 11.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.02.19 11.24		
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.02.19 11.24		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-015

Date Collected: 09.26.19 11.32

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	149	4.95	mg/kg	09.30.19 09.11		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 05.07	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 05.07	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 05.07	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 05.07	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	115	%	70-135	10.02.19 05.07	
o-Terphenyl	84-15-1	126	%	70-135	10.02.19 05.07	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-015

Date Collected: 09.26.19 11.32

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 11.44	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 11.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.02.19 11.44		
1,4-Difluorobenzene	540-36-3	84	%	70-130	10.02.19 11.44		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-016

Date Collected: 09.26.19 11.33

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	285	4.95	mg/kg	09.30.19 09.18		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 05.28	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 05.28	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 05.28	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 05.28	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	114	%	70-135	10.02.19 05.28		
o-Terphenyl	84-15-1	125	%	70-135	10.02.19 05.28		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-016

Date Collected: 09.26.19 11.33

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.02.19 12.04	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 12.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.02.19 12.04		
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.02.19 12.04		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (5')
Lab Sample Id: 638333-017

Matrix: Soil
Date Collected: 09.26.19 12.30

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	498	5.05	mg/kg	09.30.19 09.37		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 05.49	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 05.49	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 05.49	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 05.49	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.02.19 05.49		
o-Terphenyl	84-15-1	119	%	70-135	10.02.19 05.49		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-5 (5')**
Lab Sample Id: 638333-017

Matrix: Soil
Date Collected: 09.26.19 12.30

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.02.19 12.25	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.02.19 12.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.02.19 12.25		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.02.19 12.25		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-018

Date Collected: 09.26.19 12.31

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	224	5.05	mg/kg	09.30.19 09.44		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 06.10	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 06.10	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 06.10	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 06.10	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	108	%	70-135	10.02.19 06.10		
o-Terphenyl	84-15-1	121	%	70-135	10.02.19 06.10		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-018

Date Collected: 09.26.19 12.31

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 12.45	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 12.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	95	%	70-130	10.02.19 12.45		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 12.45		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-019

Date Collected: 09.26.19 12.32

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	345	5.05	mg/kg	09.30.19 09.50		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 06.31	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 06.31	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 06.31	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 06.31	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	113	%	70-135	10.02.19 06.31		
o-Terphenyl	84-15-1	122	%	70-135	10.02.19 06.31		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-019

Date Collected: 09.26.19 12.32

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 13.05	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 13.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.02.19 13.05		
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.02.19 13.05		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (20')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-020

Date Collected: 09.26.19 12.33

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	217	4.98	mg/kg	09.30.19 09.57		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3103029

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 06.52	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 06.52	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 06.52	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 06.52	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	107	%	70-135	10.02.19 06.52		
o-Terphenyl	84-15-1	116	%	70-135	10.02.19 06.52		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-5 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-020

Date Collected: 09.26.19 12.33

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.00

Basis: Wet Weight

Seq Number: 3103086

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 13.25	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 13.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.02.19 13.25		
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.02.19 13.25		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-021

Date Collected: 09.26.19 12.34

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	324	5.02	mg/kg	09.30.19 10.03		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 09.00

Basis: Wet Weight

Seq Number: 3103522

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 19.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	99.4	50.0	mg/kg	10.04.19 19.20		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	92.6	50.0	mg/kg	10.04.19 19.20		1
Total TPH	PHC635	192	50.0	mg/kg	10.04.19 19.20		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	148	%	70-135	10.04.19 19.20	**	
o-Terphenyl	84-15-1	133	%	70-135	10.04.19 19.20		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-5 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-021

Date Collected: 09.26.19 12.34

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	09.30.19 23.33	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
Total BTEX		<0.00202	0.00202	mg/kg	09.30.19 23.33	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	09.30.19 23.33		
4-Bromofluorobenzene	460-00-4	110	%	70-130	09.30.19 23.33		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (5')**
Lab Sample Id: 638333-022

Matrix: Soil
Date Collected: 09.26.19 13.14

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1240	4.96	mg/kg	09.30.19 10.09		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 09.00

Basis: Wet Weight

Seq Number: 3103522

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 19.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	58.3	49.9	mg/kg	10.04.19 19.41		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	60.1	49.9	mg/kg	10.04.19 19.41		1
Total TPH	PHC635	118	49.9	mg/kg	10.04.19 19.41		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	141	%	70-135	10.04.19 19.41	**	
o-Terphenyl	84-15-1	126	%	70-135	10.04.19 19.41		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (5')**
Lab Sample Id: 638333-022

Matrix: Soil
Date Collected: 09.26.19 13.14

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.01.19 00.51	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.01.19 00.51	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 00.51		
4-Bromofluorobenzene	460-00-4	104	%	70-130	10.01.19 00.51		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-023

Date Collected: 09.26.19 13.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	120	5.00	mg/kg	09.30.19 10.29		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 20.22	U	1
Diesel Range Organics (DRO)	C10C28DRO	68.7	50.0	mg/kg	10.04.19 20.22		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 20.22	U	1
Total TPH	PHC635	68.7	50.0	mg/kg	10.04.19 20.22		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	117	%	70-135	10.04.19 20.22		
o-Terphenyl	84-15-1	124	%	70-135	10.04.19 20.22		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-023

Date Collected: 09.26.19 13.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.01.19 01.11	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.01.19 01.11	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.01.19 01.11		
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.01.19 01.11		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-6 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-024

Date Collected: 09.26.19 13.16

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	83.3	5.04	mg/kg	09.30.19 10.35		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 00.54	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 00.54	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 00.54	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 00.54	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	102	%	70-135	10.05.19 00.54		
o-Terphenyl	84-15-1	110	%	70-135	10.05.19 00.54		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-024

Date Collected: 09.26.19 13.16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.01.19 01.31	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.01.19 01.31	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.01.19 01.31		
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.01.19 01.31		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-025

Date Collected: 09.26.19 13.17

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	230	4.98	mg/kg	09.30.19 10.55		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 00.54	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 00.54	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 00.54	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 00.54	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	144	%	70-135	10.05.19 00.54	**	
o-Terphenyl	84-15-1	133	%	70-135	10.05.19 00.54		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-025

Date Collected: 09.26.19 13.17

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.01.19 01.52	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.01.19 01.52	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.01.19 01.52		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 01.52		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-6 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-026

Date Collected: 09.26.19 13.18

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	258	4.97	mg/kg	09.30.19 11.01		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 01.15	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 01.15	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 01.15	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 01.15	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	138	%	70-135	10.05.19 01.15	**	
o-Terphenyl	84-15-1	127	%	70-135	10.05.19 01.15		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-6 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-026

Date Collected: 09.26.19 13.18

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.01.19 02.12	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.01.19 02.12	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	124	%	70-130	10.01.19 02.12		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 02.12		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (5')**
Lab Sample Id: 638333-027

Matrix: Soil
Date Collected: 09.26.19 14.00

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	102	5.00	mg/kg	09.30.19 11.07		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.05.19 01.36	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.05.19 01.36	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.05.19 01.36	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.05.19 01.36	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	143	%	70-135	10.05.19 01.36	**	
o-Terphenyl	84-15-1	130	%	70-135	10.05.19 01.36		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (5')**
Lab Sample Id: 638333-027

Matrix: Soil
Date Collected: 09.26.19 14.00

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.01.19 02.32	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.01.19 02.32	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.01.19 02.32		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 02.32		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-028

Date Collected: 09.26.19 14.01

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	339	5.04	mg/kg	09.30.19 11.14		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 01.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 01.56	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 01.56	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 01.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	147	%	70-135	10.05.19 01.56	**	
o-Terphenyl	84-15-1	132	%	70-135	10.05.19 01.56		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-028

Date Collected: 09.26.19 14.01

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.01.19 02.52	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.01.19 02.52	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.01.19 02.52		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 02.52		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-7 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-029

Date Collected: 09.26.19 14.02

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	170	4.97	mg/kg	09.30.19 11.20		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 02.38	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 02.38	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 02.38	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 02.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	145	%	70-135	10.05.19 02.38	**	
o-Terphenyl	84-15-1	128	%	70-135	10.05.19 02.38		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-029

Date Collected: 09.26.19 14.02

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.01.19 03.12	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.01.19 03.12	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.01.19 03.12		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 03.12		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-7 (20')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-030

Date Collected: 09.26.19 14.03

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	139	5.00	mg/kg	09.30.19 11.27		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 02.59	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 02.59	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 02.59	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 02.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	154	%	70-135	10.05.19 02.59	**	
o-Terphenyl	84-15-1	137	%	70-135	10.05.19 02.59	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-030

Date Collected: 09.26.19 14.03

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.01.19 03.32	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.01.19 03.32	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	124	%	70-130	10.01.19 03.32		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.01.19 03.32		



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: SP-7 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-031

Date Collected: 09.26.19 14.04

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 08.15

Basis: Wet Weight

Seq Number: 3102920

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	238	5.03	mg/kg	09.30.19 11.33		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 03.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 03.20	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 03.20	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 03.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	153	%	70-135	10.05.19 03.20	**	
o-Terphenyl	84-15-1	141	%	70-135	10.05.19 03.20	**	



Certificate of Analytical Results 638333



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 829

Sample Id: **SP-7 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638333-031

Date Collected: 09.26.19 14.04

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.27.19 14.30

Basis: Wet Weight

Seq Number: 3102891

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.01.19 03.52	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.01.19 03.52	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.01.19 03.52		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.01.19 03.52		



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

****** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: Chloride by EPA 300

Seq Number: 3102920

MB Sample Id: 7687095-1-BLK

Matrix: Solid

LCS Sample Id: 7687095-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687095-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	256	102	257	103	90-110	0	20	mg/kg	09.30.19 08:26	

Analytical Method: Chloride by EPA 300

Seq Number: 3102921

MB Sample Id: 7687137-1-BLK

Matrix: Solid

LCS Sample Id: 7687137-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687137-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	244	98	244	98	90-110	0	20	mg/kg	09.30.19 14:43	

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

MB Sample Id: 7687138-1-BLK

Matrix: Solid

LCS Sample Id: 7687138-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687138-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	266	106	267	107	90-110	0	20	mg/kg	09.30.19 13:58	

Analytical Method: Chloride by EPA 300

Seq Number: 3102920

Parent Sample Id: 638333-012

Matrix: Soil

MS Sample Id: 638333-012 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638333-012 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	361	251	606	98	603	96	90-110	0	20	mg/kg	09.30.19 08:46	

Analytical Method: Chloride by EPA 300

Seq Number: 3102920

Parent Sample Id: 638333-022

Matrix: Soil

MS Sample Id: 638333-022 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638333-022 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1240	248	1430	77	1440	81	90-110	1	20	mg/kg	09.30.19 10:16	X

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: Chloride by EPA 300

Seq Number: 3102921

Parent Sample Id: 638225-047

Matrix: Soil

MS Sample Id: 638225-047 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638225-047 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	626	252	848	88	844	87	90-110	0	20	mg/kg	09.30.19 15:01	X

Analytical Method: Chloride by EPA 300

Seq Number: 3102921

Parent Sample Id: 638333-002

Matrix: Soil

MS Sample Id: 638333-002 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638333-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	51.2	250	302	100	301	100	90-110	0	20	mg/kg	09.30.19 16:22	

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

Parent Sample Id: 638333-011

Matrix: Soil

MS Sample Id: 638333-011 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638333-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	592	250	861	108	861	108	90-110	0	20	mg/kg	09.30.19 14:17	

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

Parent Sample Id: 638334-010

Matrix: Soil

MS Sample Id: 638334-010 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638334-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	248	253	510	104	512	104	90-110	0	20	mg/kg	09.30.19 16:00	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103029

MB Sample Id: 7687146-1-BLK

Matrix: Solid

LCS Sample Id: 7687146-1-BKS

Prep Method: SW8015P

Date Prep: 09.30.19

LCSD Sample Id: 7687146-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1000	100	1040	104	70-135	4	20	mg/kg	10.01.19 22:29	
Diesel Range Organics (DRO)	<15.0	1000	1030	103	1080	108	70-135	5	20	mg/kg	10.01.19 22:29	

Surrogate

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	116		108		114		70-135	%	10.01.19 22:29
o-Terphenyl	128		114		119		70-135	%	10.01.19 22:29

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103535

MB Sample Id: 7687563-1-BLK

Matrix: Solid

LCS Sample Id: 7687563-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687563-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1150	115	997	100	70-135	14	20	mg/kg	10.04.19 11:57	
Diesel Range Organics (DRO)	26.0	1000	1300	130	1190	119	70-135	9	20	mg/kg	10.04.19 11:57	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103522

MB Sample Id: 7687564-1-BLK

Matrix: Solid

LCS Sample Id: 7687564-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687564-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1230	123	1040	104	70-135	17	20	mg/kg	10.04.19 11:57	
Diesel Range Organics (DRO)	<15.0	1000	1330	133	1100	110	70-135	19	20	mg/kg	10.04.19 11:57	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	111		155	**	129		70-135	%	10.04.19 11:57
o-Terphenyl	104		132		111		70-135	%	10.04.19 11:57

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

MB Sample Id: 7687566-1-BLK

Matrix: Solid

LCS Sample Id: 7687566-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687566-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1380	138	1150	115	70-135	18	20	mg/kg	10.04.19 21:25	H
Diesel Range Organics (DRO)	<15.0	1000	1670	167	1450	145	70-135	14	20	mg/kg	10.04.19 21:25	H

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	99		176	**	153	**	70-135	%	10.04.19 21:25
o-Terphenyl	110		180	**	158	**	70-135	%	10.04.19 21:25

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103538

MB Sample Id: 7687567-1-BLK

Matrix: Solid

LCS Sample Id: 7687567-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687567-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1570	157	1160	116	70-135	30	20	mg/kg	10.04.19 21:25	HF
Diesel Range Organics (DRO)	<15.0	1000	1710	171	1200	120	70-135	35	20	mg/kg	10.04.19 21:25	HF

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	134		202	**	145	**	70-135	%	10.04.19 21:25
o-Terphenyl	123		174	**	124		70-135	%	10.04.19 21:25

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* |(C-E) / (C+E)|
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103029

Parent Sample Id: 638333-001

Matrix: Soil

MS Sample Id: 638333-001 S

Prep Method: SW8015P

Date Prep: 09.30.19

MSD Sample Id: 638333-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	<50.0	0	<49.9	0	70-135	NC	20	mg/kg	10.01.19 23:32	X
Diesel Range Organics (DRO)	<15.0	999	15.5	2	16.0	2	70-135	3	20	mg/kg	10.01.19 23:32	X

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	121		126		70-135	%	10.01.19 23:32
o-Terphenyl	131		136	**	70-135	%	10.01.19 23:32

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103535

Parent Sample Id: 638335-001

Matrix: Soil

MS Sample Id: 638335-001 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638335-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1100	110	1090	109	70-135	1	20	mg/kg	10.04.19 13:00	
Diesel Range Organics (DRO)	31.1	999	1130	110	1130	110	70-135	0	20	mg/kg	10.04.19 13:00	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	117		116		70-135	%	10.04.19 13:00
o-Terphenyl	116		117		70-135	%	10.04.19 13:00

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103522

Parent Sample Id: 638118-001

Matrix: Soil

MS Sample Id: 638118-001 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638118-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1260	126	1260	126	70-135	0	20	mg/kg	10.04.19 13:00	
Diesel Range Organics (DRO)	15.9	999	1190	118	1210	119	70-135	2	20	mg/kg	10.04.19 13:00	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	133		133		70-135	%	10.04.19 13:00
o-Terphenyl	116		118		70-135	%	10.04.19 13:00

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

Parent Sample Id: 638334-008

Matrix: Soil

MS Sample Id: 638334-008 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638334-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	829	83	826	83	70-135	0	20	mg/kg	10.04.19 22:27	
Diesel Range Organics (DRO)	<15.0	997	1010	101	997	100	70-135	1	20	mg/kg	10.04.19 22:27	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	112		110		70-135	%	10.04.19 22:27
o-Terphenyl	119		119		70-135	%	10.04.19 22:27

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103538

Parent Sample Id: 638118-011

Matrix: Soil

MS Sample Id: 638118-011 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638118-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	1080	108	1150	115	70-135	6	20	mg/kg	10.04.19 22:27	
Diesel Range Organics (DRO)	24.0	998	1140	112	1250	123	70-135	9	20	mg/kg	10.04.19 22:27	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	169	**	155	**	70-135	%	10.04.19 22:27
o-Terphenyl	128		137	**	70-135	%	10.04.19 22:27

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103086

MB Sample Id: 7687073-1-BLK

Matrix: Solid

LCS Sample Id: 7687073-1-BKS

Prep Method: SW5030B

Date Prep: 09.27.19

LCSD Sample Id: 7687073-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0995	100	0.113	113	70-130	13	35	mg/kg	10.02.19 04:05	
Toluene	<0.00200	0.100	0.0928	93	0.111	111	70-130	18	35	mg/kg	10.02.19 04:05	
Ethylbenzene	<0.00200	0.100	0.0967	97	0.124	124	70-130	25	35	mg/kg	10.02.19 04:05	
m,p-Xylenes	<0.00400	0.200	0.190	95	0.249	125	70-130	27	35	mg/kg	10.02.19 04:05	
o-Xylene	<0.00200	0.100	0.100	100	0.129	129	70-130	25	35	mg/kg	10.02.19 04:05	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		98		96		70-130	%	10.02.19 04:05
4-Bromofluorobenzene	109		116		119		70-130	%	10.02.19 04:05

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 829

Analytical Method: BTEX by EPA 8021B

Seq Number: 3102891

MB Sample Id: 7687074-1-BLK

Matrix: Solid

LCS Sample Id: 7687074-1-BKS

Prep Method: SW5030B

Date Prep: 09.27.19

LCSD Sample Id: 7687074-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.118	118	0.103	103	70-130	14	35	mg/kg	09.30.19 18:32	
Toluene	<0.00200	0.100	0.109	109	0.0962	96	70-130	12	35	mg/kg	09.30.19 18:32	
Ethylbenzene	<0.00200	0.100	0.116	116	0.102	102	70-130	13	35	mg/kg	09.30.19 18:32	
m,p-Xylenes	<0.00400	0.200	0.228	114	0.200	100	70-130	13	35	mg/kg	09.30.19 18:32	
o-Xylene	<0.00200	0.100	0.116	116	0.103	103	70-130	12	35	mg/kg	09.30.19 18:32	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		101		101		70-130	%	09.30.19 18:32
4-Bromofluorobenzene	96		107		107		70-130	%	09.30.19 18:32

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103086

Parent Sample Id: 638333-001

Matrix: Soil

MS Sample Id: 638333-001 S

Prep Method: SW5030B

Date Prep: 09.27.19

MSD Sample Id: 638333-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0992	0.0757	76	0.0342	34	70-130	76	35	mg/kg	10.02.19 04:45	XF
Toluene	<0.00198	0.0992	0.0728	73	0.0148	15	70-130	132	35	mg/kg	10.02.19 04:45	XF
Ethylbenzene	<0.00198	0.0992	0.0732	74	0.00725	7	70-130	164	35	mg/kg	10.02.19 04:45	XF
m,p-Xylenes	<0.00397	0.198	0.147	74	0.0129	6	70-130	168	35	mg/kg	10.02.19 04:45	XF
o-Xylene	<0.00198	0.0992	0.0759	77	0.00860	9	70-130	159	35	mg/kg	10.02.19 04:45	XF

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		97		70-130	%	10.02.19 04:45
4-Bromofluorobenzene	112		112		70-130	%	10.02.19 04:45

Analytical Method: BTEX by EPA 8021B

Seq Number: 3102891

Parent Sample Id: 638333-021

Matrix: Soil

MS Sample Id: 638333-021 S

Prep Method: SW5030B

Date Prep: 09.27.19

MSD Sample Id: 638333-021 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0850	85	0.0543	54	70-130	44	35	mg/kg	09.30.19 19:12	XF
Toluene	<0.00200	0.100	0.0754	75	0.0274	27	70-130	93	35	mg/kg	09.30.19 19:12	XF
Ethylbenzene	<0.00200	0.100	0.0765	77	0.0129	13	70-130	142	35	mg/kg	09.30.19 19:12	XF
m,p-Xylenes	<0.00400	0.200	0.148	74	0.0207	10	70-130	151	35	mg/kg	09.30.19 19:12	XF
o-Xylene	<0.00200	0.100	0.0781	78	0.0138	14	70-130	140	35	mg/kg	09.30.19 19:12	XF

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	102		100		70-130	%	09.30.19 19:12
4-Bromofluorobenzene	110		105		70-130	%	09.30.19 19:12

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200 * |(C-E) / (C+E)|
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Varson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: **Bruce Baker / Rachel Carter**

DATE: **9/23/2019** PO#: **1038333**
PROJECT LOCATION OR NAME: **Apache Corp, NEDU 829**
LAB PROJECT #: **19-012-22** COLLECTOR: **BN/EC**

CHAIN-OF-CUSTODY

Nº 0780

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES		FIELD NOTES
SP-1 (5)		9/20/19	9:20	S	1						☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (10)		9/22	9:21								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (15)		9/22	9:22								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (20)		9/23	9:23								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (25)		9/24	9:24								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (30)		9/25	9:25								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (35)		9/26	9:26								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (40)		9/30	9:30								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (45)		9/31	9:31								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (50)		9/31	9:31								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (55)		9/31	9:31								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-1 (60)		10/10	10:10								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-4 (5)		11/30	11:30								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-4 (10)		11/31	11:31								☒ TPH 1005 ☐ TPH 1006 ☐		
SP-4 (15)		11/32	11:32								☒ TPH 1005 ☐ TPH 1006 ☐		
TOTAL		15											

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	TURN AROUND TIME	LABORATORY USE ONLY:
Donna	9-23-19 / 1:30	BN/EC	NORMAL	RECEIVING TEMP: 13/1 THERM#: 12
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	TURN AROUND TIME	CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	TURN AROUND TIME	CARRIER BILL #
LABORATORY: Yenco				HAND DELIVERED

Varson & Associates, Inc.
Environmental Consultants

507 N. Martenfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 9/27/2019 PAGE 2 OF 3
PO#: _____ LAB WORK ORDER#: APACHE CORP, NCDU 829
PROJECT LOCATION OR NAME: APACHE CORP, NCDU 829
LAI PROJECT #: 19-012-22 COLLECTOR: PN/CL

U38333

CHAIN-OF-CUSTODY

No 0781

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	FIELD NOTES	
						HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE			UNPRESERVED
SP-4 (20')		9/26/19	11:33	S	1					X		
SP-5 (5')			12:30							X		
SP-5 (10')			12:31							X		
SP-5 (15')			12:32							X		
SP-5 (20')			12:33							X		
SP-5 (25')			12:34							X		
SP-6 (5')			13:14							X		
SP-6 (10')			13:15							X		
SP-6 (15')			13:16							X		
SP-6 (20')			13:17							X		
SP-6 (25')			13:18							X		
SP-7 (5')			14:00							X		
SP-7 (10')			14:01							X		
SP-7 (15')			14:02							X		
SP-7 (20')			14:03							X		
TOTAL			15									

RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>9-27-19/1300</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	TURN AROUND TIME NORMAL ☒ 1 DAY ☐ 2 DAY ☐ OTHER ☐
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	LABORATORY USE ONLY: RECEIVING TEMP: <u>13.1</u> THERM: <u>12</u> CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED ☐ CARRIER BILL # _____ ☐ HAND DELIVERED
LABORATORY: <u>Varson</u>			

Varson & Associates, Inc.
Environmental Consultants

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 9/27/2019 PAGE 3 OF 3
PO#: _____ LAB WORK ORDER#: _____
PROJECT LOCATION OR NAME: Parade Corp, NEBU 829
LAI PROJECT #: 19-012-22 COLLECTOR: PN/EC

TRRP report?
☐ Yes ☒ No

S=SOIL
W=WATER
A=AIR
P=PAINT
SL=SLUDGE
OT=OTHER

TIME ZONE:
Time zone/State:

MSI

Field
Sample I.D.

Lab #

Date

Time

Matrix

of Containers

HCl

HNO₃

H₂SO₄ ☐ NaOH ☐

ICE

UNPRESSERVED

ANALYSES

BTX ☒ MTBE ☐
TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐
GASOLINE MOD 8015 ☒
DIESEL - MOD 8015 ☒
OIL - MOD 8015 ☒
VOC 8260 ☒
SVOC 8270 ☒ PAH 8270 ☐ HOLDPAH ☐
8081 PESTICIDES ☐ 8151 HERBICIDES ☐
TBLP - METALS (RCRA) ☐ TCLP VOC ☐
TCLP - PEST ☐ HERB ☐ Semi-VOC ☐
TOTAL METALS (RCRA) ☐ OTHER LIST ☐
LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐
RCI ☐ TOX ☐ FLASHPOINT ☐
TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐
pH ☐ HEXAVALENT CHROMIUM ☐
EXPLOSIVES ☐ PENTACHLORATE ☐
CHLORIDE ANIONS ☐ ALKALINITY ☐

FIELD NOTES

TOTAL

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

LABORATORY: Xenoco

TURN AROUND TIME

NORMAL ☒

1 DAY ☐

2 DAY ☐

OTHER ☐

LABORATORY USE ONLY:

RECEIVING TEMP: 131.1 THERM#: 128

CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED

CARRIER BILL #

☐ HAND DELIVERED

0350333

CHAIN-OF-CUSTODY

NO 0782

NEDU #830



Certificate of Analysis Summary 638335

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 830

Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638335-001	638335-002	638335-003	638335-004	638335-005	638335-006
	<i>Field Id:</i>	SP-2 (0')	SP-2 (5')	SP-2 (10')	SP-2 (15')	SP-2 (20')	SP-2 (25')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-25-19 09:55	Sep-25-19 10:04	Sep-25-19 10:10	Sep-25-19 10:15	Sep-25-19 10:20	Sep-25-19 10:23
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-04-19 14:59	Oct-04-19 14:59	Oct-04-19 14:59	Oct-02-19 13:00
	<i>Analyzed:</i>	Oct-04-19 05:37	Oct-04-19 05:57	Oct-04-19 14:59	Oct-04-19 14:59	Oct-04-19 14:59	Oct-03-19 07:29
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Toluene		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Ethylbenzene		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
m,p-Xylenes		<0.00399 0.00399	<0.00398 0.00398	<0.00400 0.00400	<0.00400 0.00400	<0.00400 0.00400	<0.00397 0.00397
o-Xylene		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total Xylenes		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total BTEX		<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25
	<i>Analyzed:</i>	Sep-30-19 18:54	Sep-30-19 19:01	Sep-30-19 19:07	Sep-30-19 19:14	Sep-30-19 19:20	Sep-30-19 19:46
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		294 5.01	5150 49.9	45400 250	2460 24.9	3740 25.1	4080 25.2
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00
	<i>Analyzed:</i>	Oct-04-19 12:39	Oct-04-19 13:42	Oct-04-19 14:03	Oct-04-19 14:24	Oct-04-19 14:45	Oct-04-19 15:06
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	137 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0
Total TPH		<49.9 49.9	<50.0 50.0	137 49.8	<50.0 50.0	<49.9 49.9	<50.0 50.0

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Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638335

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 830



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638335-007	638335-008	638335-009	638335-010	638335-011	638335-012
	<i>Field Id:</i>	SP-2 (30')	SP-2 (35')	SP-2 (40')	SP-2 (45')	SP-2 (50')	SP-2 (55')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-25-19 10:30	Sep-25-19 10:38	Sep-25-19 11:09	Sep-25-19 11:10	Sep-25-19 11:15	Sep-25-19 11:32
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00
	<i>Analyzed:</i>	Oct-03-19 07:50	Oct-03-19 08:10	Oct-03-19 08:30	Oct-03-19 08:50	Oct-04-19 11:23	Oct-04-19 11:44
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Toluene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Ethylbenzene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
m,p-Xylenes		<0.00398 0.00398	<0.00398 0.00398	<0.00397 0.00397	<0.00400 0.00400	<0.00399 0.00399	<0.00396 0.00396
o-Xylene		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total Xylenes		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total BTEX		<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25
	<i>Analyzed:</i>	Sep-30-19 19:52	Sep-30-19 20:12	Sep-30-19 20:18	Sep-30-19 20:25	Sep-30-19 20:31	Sep-30-19 20:38
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		14300 100	8920 50.3	3240 25.2	1270 4.97	1220 4.95	928 5.00
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00
	<i>Analyzed:</i>	Oct-04-19 15:27	Oct-04-19 15:47	Oct-04-19 16:08	Oct-04-19 16:29	Oct-04-19 17:11	Oct-04-19 17:36
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638335

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 830

Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638335-013	638335-014	638335-015	638335-016	638335-017	638335-020
	<i>Field Id:</i>	SP-2 (60')	SP-4 (5')	SP-4 (10')	SP-5 (5')	SP-5 (10')	SP-7 (5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-25-19 12:01	Sep-25-19 13:20	Sep-25-19 13:25	Sep-25-19 13:45	Sep-25-19 13:47	Sep-25-19 15:09
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00
	<i>Analyzed:</i>	Oct-04-19 12:04	Oct-04-19 12:24	Oct-04-19 12:44	Oct-04-19 13:04	Oct-04-19 13:24	Oct-04-19 13:44
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Toluene		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Ethylbenzene		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
m,p-Xylenes		<0.00402 0.00402	<0.00398 0.00398	<0.00403 0.00403	<0.00399 0.00399	<0.00399 0.00399	<0.00396 0.00396
o-Xylene		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total Xylenes		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Total BTEX		<0.00201 0.00201	<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55
	<i>Analyzed:</i>	Sep-30-19 20:44	Sep-30-19 20:51	Sep-30-19 19:27	Sep-30-19 18:32	Sep-30-19 18:50	Sep-30-19 19:54
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		857 5.04	63.6 4.99	93.6 5.02	11.3 4.96	81.8 4.95	54.1 4.96
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00	Oct-04-19 08:00
	<i>Analyzed:</i>	Oct-04-19 17:57	Oct-04-19 18:18	Oct-04-19 18:39	Oct-04-19 19:00	Oct-04-19 19:20	Oct-04-19 19:41
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		<49.9 49.9	<49.8 49.8	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9

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Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638335

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 830

Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638335-021	638335-022	638335-023			
	<i>Field Id:</i>	SP-7 (10')	SP-8 (5')	SP-8 (10')			
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL			
	<i>Sampled:</i>	Sep-25-19 15:15	Sep-25-19 15:20	Sep-25-19 15:25			
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00			
	<i>Analyzed:</i>	Oct-04-19 14:04	Oct-04-19 14:46	Oct-04-19 18:48			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL			
Benzene		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
Toluene		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
m,p-Xylenes		<0.00398 0.00398	<0.00399 0.00399	<0.00398 0.00398			
o-Xylene		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
Total BTEX		<0.00199 0.00199	<0.00200 0.00200	<0.00199 0.00199			
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55			
	<i>Analyzed:</i>	Sep-30-19 18:55	Sep-30-19 19:01	Sep-30-19 19:07			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL			
Chloride		89.5 5.04	32.2 4.99	288 25.1			
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 08:00	Oct-01-19 17:00	Oct-01-19 17:00			
	<i>Analyzed:</i>	Oct-04-19 20:02	Oct-02-19 19:04	Oct-02-19 19:26			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL			
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.8 49.8	<50.0 50.0			
Diesel Range Organics (DRO)		<49.9 49.9	<49.8 49.8	87.0 50.0			
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.8 49.8	<50.0 50.0			
Total TPH		<49.9 49.9	<49.8 49.8	87.0 50.0			

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Jessica Kramer
Project Assistant

Analytical Report 638335

for
Larson and Associates, Inc.

Project Manager: Mark Larson

Apache Corp. NEDU 830

19-0112-22

08-OCT-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)



08-OCT-19

Project Manager: **Mark Larson**

Larson and Associates, Inc.

P. O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **638335**

Apache Corp. NEDU 830

Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 638335. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 638335 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'.

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 638335

Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-2 (0')	S	09-25-19 09:55		638335-001
SP-2 (5')	S	09-25-19 10:04		638335-002
SP-2 (10')	S	09-25-19 10:10		638335-003
SP-2 (15')	S	09-25-19 10:15		638335-004
SP-2 (20')	S	09-25-19 10:20		638335-005
SP-2 (25')	S	09-25-19 10:23		638335-006
SP-2 (30')	S	09-25-19 10:30		638335-007
SP-2 (35')	S	09-25-19 10:38		638335-008
SP-2 (40')	S	09-25-19 11:09		638335-009
SP-2 (45')	S	09-25-19 11:10		638335-010
SP-2 (50')	S	09-25-19 11:15		638335-011
SP-2 (55')	S	09-25-19 11:32		638335-012
SP-2 (60')	S	09-25-19 12:01		638335-013
SP-4 (5')	S	09-25-19 13:20		638335-014
SP-4 (10')	S	09-25-19 13:25		638335-015
SP-5 (5')	S	09-25-19 13:45		638335-016
SP-5 (10')	S	09-25-19 13:47		638335-017
SP-7 (5')	S	09-25-19 15:09		638335-020
SP-7 (10')	S	09-25-19 15:15		638335-021
SP-8 (5')	S	09-25-19 15:20		638335-022
SP-8 (10')	S	09-25-19 15:25		638335-023
SP-6 (5')	S	09-25-19 14:13		Not Analyzed
SP-6 (10')	S	09-25-19 14:14		Not Analyzed

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 830**Project ID: 19-0112-22
Work Order Number(s): 638335Report Date: 08-OCT-19
Date Received: 09/27/2019**Sample receipt non conformances and comments:**

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3103183 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638225-042 SD.

Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687303-1-BLK, 638335-022, 638335-023.

Batch: LBA-3103378 BTEX by EPA 8021B

Ethylbenzene, m,p-Xylenes, o-Xylene Relative Percent Difference (RPD) between matrix spike and duplicate were above quality control limits.

Samples in the analytical batch are: 638335-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -020, -021, -022

Lab Sample ID 638335-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638335-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -020, -021, -022.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3103535 TPH by SW8015 Mod

Lab Sample ID 638335-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Motor Oil Range Hydrocarbons (MRO) Relative Percent Difference (RPD) between matrix spike and duplicate was above quality control limits.

Samples in the analytical batch are: 638335-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -020, -021

Outlier/s are due to possible matrix interference.

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687563-1-BLK.



CASE NARRATIVE

Client Name: Larson and Associates, Inc.

Project Name: Apache Corp. NEDU 830

Project ID: 19-0112-22
Work Order Number(s): 638335

Report Date: 08-OCT-19
Date Received: 09/27/2019

Batch: LBA-3103594 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (0')**
Lab Sample Id: 638335-001

Matrix: Soil
Date Collected: 09.25.19 09.55

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102927

Prep Method: E300P

% Moisture:

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	294	5.01	mg/kg	09.30.19 18.54		1

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103535

Prep Method: SW8015P

% Moisture:

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 12.39	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 12.39	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 12.39	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 12.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	99	%	70-135	10.04.19 12.39		
o-Terphenyl	84-15-1	107	%	70-135	10.04.19 12.39		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (0')**
Lab Sample Id: 638335-001

Matrix: Soil
Date Collected: 09.25.19 09.55

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.04.19 05.37	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 05.37	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	93	%	70-130	10.04.19 05.37		
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.04.19 05.37		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (5')
Lab Sample Id: 638335-002

Matrix: Soil
Date Collected: 09.25.19 10.04

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102927

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Date Prep: 09.30.19 11.25

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5150	49.9	mg/kg	09.30.19 19.01		10

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103535

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Date Prep: 10.04.19 08.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 13.42	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 13.42	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 13.42	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 13.42	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	105	%	70-135	10.04.19 13.42		
o-Terphenyl	84-15-1	111	%	70-135	10.04.19 13.42		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (5')**
Lab Sample Id: 638335-002

Matrix: Soil
Date Collected: 09.25.19 10.04

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 05.57	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 05.57	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	118	%	70-130	10.04.19 05.57		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 05.57		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (10')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-003

Date Collected: 09.25.19 10.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	45400	250	mg/kg	09.30.19 19.07		50

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.04.19 14.03	U	1
Diesel Range Organics (DRO)	C10C28DRO	137	49.8	mg/kg	10.04.19 14.03		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.04.19 14.03	U	1
Total TPH	PHC635	137	49.8	mg/kg	10.04.19 14.03		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 14.03	
o-Terphenyl	84-15-1	118	%	70-135	10.04.19 14.03	

Analytical Method: BTEX by EPA 8021B

Tech: KTL

% Moisture:

Analyst: KTL

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.04.19 14.59	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-004

Date Collected: 09.25.19 10.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2460	24.9	mg/kg	09.30.19 19.14		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 14.24	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 14.24	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 14.24	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 14.24	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	110	%	70-135	10.04.19 14.24	
o-Terphenyl	84-15-1	115	%	70-135	10.04.19 14.24	

Analytical Method: BTEX by EPA 8021B

Tech: KTL

% Moisture:

Analyst: KTL

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.04.19 14.59	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (20')
Lab Sample Id: 638335-005

Matrix: Soil
Date Collected: 09.25.19 10.20

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3740	25.1	mg/kg	09.30.19 19.20		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 14.45	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 14.45	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 14.45	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 14.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	108	%	70-135	10.04.19 14.45		
o-Terphenyl	84-15-1	114	%	70-135	10.04.19 14.45		

Analytical Method: BTEX by EPA 8021B

Tech: KTL

% Moisture:

Analyst: KTL

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.04.19 14.59	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 14.59	U	1



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-006

Date Collected: 09.25.19 10.23

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4080	25.2	mg/kg	09.30.19 19.46		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 15.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 15.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 15.06	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 15.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	104	%	70-135	10.04.19 15.06		
o-Terphenyl	84-15-1	111	%	70-135	10.04.19 15.06		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-006

Date Collected: 09.25.19 10.23

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.03.19 07.29	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.03.19 07.29	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 07.29		
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.03.19 07.29		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-007

Date Collected: 09.25.19 10.30

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14300	100	mg/kg	09.30.19 19.52		20

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 15.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 15.27	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 15.27	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 15.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 15.27		
o-Terphenyl	84-15-1	117	%	70-135	10.04.19 15.27		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-007

Date Collected: 09.25.19 10.30

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 07.50	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 07.50	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 07.50		
4-Bromofluorobenzene	460-00-4	121	%	70-130	10.03.19 07.50		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (35')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-008

Date Collected: 09.25.19 10.38

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	8920	50.3	mg/kg	09.30.19 20.12		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 15.47	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 15.47	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 15.47	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 15.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	106	%	70-135	10.04.19 15.47		
o-Terphenyl	84-15-1	112	%	70-135	10.04.19 15.47		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (35')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-008

Date Collected: 09.25.19 10.38

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 08.10	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 08.10	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.03.19 08.10		
4-Bromofluorobenzene	460-00-4	118	%	70-130	10.03.19 08.10		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-009

Date Collected: 09.25.19 11.09

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3240	25.2	mg/kg	09.30.19 20.18		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.04.19 16.08	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.04.19 16.08	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.04.19 16.08	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.04.19 16.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	107	%	70-135	10.04.19 16.08		
o-Terphenyl	84-15-1	114	%	70-135	10.04.19 16.08		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-009

Date Collected: 09.25.19 11.09

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.03.19 08.30	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.03.19 08.30	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.03.19 08.30		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 08.30		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (45')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-010

Date Collected: 09.25.19 11.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1270	4.97	mg/kg	09.30.19 20.25		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 16.29	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 16.29	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 16.29	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 16.29	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	110	%	70-135	10.04.19 16.29	
o-Terphenyl	84-15-1	115	%	70-135	10.04.19 16.29	



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (45')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-010

Date Collected: 09.25.19 11.10

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.03.19 08.50	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.03.19 08.50	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.03.19 08.50		
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.03.19 08.50		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-011

Date Collected: 09.25.19 11.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1220	4.95	mg/kg	09.30.19 20.31		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 17.11	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 17.11	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 17.11	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 17.11	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	108	%	70-135	10.04.19 17.11		
o-Terphenyl	84-15-1	114	%	70-135	10.04.19 17.11		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-011

Date Collected: 09.25.19 11.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.04.19 11.23	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 11.23	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 11.23		
4-Bromofluorobenzene	460-00-4	101	%	70-130	10.04.19 11.23		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (55')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-012

Date Collected: 09.25.19 11.32

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	928	5.00	mg/kg	09.30.19 20.38		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 17.36	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 17.36	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 17.36	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 17.36	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	107	%	70-135	10.04.19 17.36		
o-Terphenyl	84-15-1	113	%	70-135	10.04.19 17.36		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-2 (55')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-012

Date Collected: 09.25.19 11.32

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.04.19 11.44	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.04.19 11.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.04.19 11.44		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 11.44		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (60')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-013

Date Collected: 09.25.19 12.01

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	857	5.04	mg/kg	09.30.19 20.44		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 17.57	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 17.57	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 17.57	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 17.57	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	106	%	70-135	10.04.19 17.57		
o-Terphenyl	84-15-1	113	%	70-135	10.04.19 17.57		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-2 (60')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-013

Date Collected: 09.25.19 12.01

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.04.19 12.04	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.04.19 12.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	105	%	70-130	10.04.19 12.04		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 12.04		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-4 (5')**
Lab Sample Id: 638335-014

Matrix: Soil
Date Collected: 09.25.19 13.20

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	63.6	4.99	mg/kg	09.30.19 20.51		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.04.19 18.18	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.04.19 18.18	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.04.19 18.18	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.04.19 18.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	103	%	70-135	10.04.19 18.18		
o-Terphenyl	84-15-1	104	%	70-135	10.04.19 18.18		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-4 (5')**
 Lab Sample Id: 638335-014

Matrix: Soil
 Date Collected: 09.25.19 13.20

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 12.24	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 12.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.04.19 12.24		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.04.19 12.24		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-4 (10')**
Lab Sample Id: 638335-015

Matrix: Soil
Date Collected: 09.25.19 13.25

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	93.6	5.02	mg/kg	09.30.19 19.27		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 18.39	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 18.39	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 18.39	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 18.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.04.19 18.39		
o-Terphenyl	84-15-1	123	%	70-135	10.04.19 18.39		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-015

Date Collected: 09.25.19 13.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.04.19 12.44	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.04.19 12.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.04.19 12.44		
4-Bromofluorobenzene	460-00-4	105	%	70-130	10.04.19 12.44		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: SP-5 (5')
Lab Sample Id: 638335-016

Matrix: Soil
Date Collected: 09.25.19 13.45

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	11.3	4.96	mg/kg	09.30.19 18.32		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 19.00	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 19.00	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 19.00	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 19.00	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	110	%	70-135	10.04.19 19.00		
o-Terphenyl	84-15-1	113	%	70-135	10.04.19 19.00		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-5 (5')**
Lab Sample Id: 638335-016

Matrix: Soil
Date Collected: 09.25.19 13.45

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.04.19 13.04	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 13.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.04.19 13.04		
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.04.19 13.04		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-017

Date Collected: 09.25.19 13.47

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	81.8	4.95	mg/kg	09.30.19 18.50		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 19.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 19.20	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 19.20	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 19.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	112	%	70-135	10.04.19 19.20		
o-Terphenyl	84-15-1	122	%	70-135	10.04.19 19.20		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-017

Date Collected: 09.25.19 13.47

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.04.19 13.24	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 13.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.04.19 13.24		
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.04.19 13.24		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-7 (5')**
Lab Sample Id: 638335-020

Matrix: Soil
Date Collected: 09.25.19 15.09

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	54.1	4.96	mg/kg	09.30.19 19.54		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 19.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 19.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 19.41	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 19.41	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 19.41		
o-Terphenyl	84-15-1	119	%	70-135	10.04.19 19.41		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-7 (5')**
Lab Sample Id: 638335-020

Matrix: Soil
Date Collected: 09.25.19 15.09

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.04.19 13.44	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.04.19 13.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	109	%	70-130	10.04.19 13.44		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.04.19 13.44		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-7 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-021

Date Collected: 09.25.19 15.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	89.5	5.04	mg/kg	09.30.19 18.55		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 08.00

Basis: Wet Weight

Seq Number: 3103535

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 20.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 20.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 20.02	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 20.02	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	109	%	70-135	10.04.19 20.02		
o-Terphenyl	84-15-1	118	%	70-135	10.04.19 20.02		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-7 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-021

Date Collected: 09.25.19 15.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 14.04	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 14.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.04.19 14.04		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.04.19 14.04		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-8 (5')**
Lab Sample Id: 638335-022

Matrix: Soil
Date Collected: 09.25.19 15.20

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102929

Prep Method: E300P

% Moisture:

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	32.2	4.99	mg/kg	09.30.19 19.01		1

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: DVM

Seq Number: 3103183

Prep Method: SW8015P

% Moisture:

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 19.04	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 19.04	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 19.04	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 19.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	129	%	70-135	10.02.19 19.04		
o-Terphenyl	84-15-1	140	%	70-135	10.02.19 19.04	**	



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-8 (5')**
Lab Sample Id: 638335-022

Matrix: Soil
Date Collected: 09.25.19 15.20

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103378

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.04.19 14.46	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 14.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.04.19 14.46		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.04.19 14.46		



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-8 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-023

Date Collected: 09.25.19 15.25

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	288	25.1	mg/kg	09.30.19 19.07		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 19.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	87.0	50.0	mg/kg	10.02.19 19.26		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 19.26	U	1
Total TPH	PHC635	87.0	50.0	mg/kg	10.02.19 19.26		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	132	%	70-135	10.02.19 19.26	
o-Terphenyl	84-15-1	141	%	70-135	10.02.19 19.26	**



Certificate of Analytical Results 638335



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 830

Sample Id: **SP-8 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638335-023

Date Collected: 09.25.19 15.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 18.48	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 18.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	108	%	70-130	10.04.19 18.48		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.04.19 18.48		



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Larson and Associates, Inc.
Apache Corp. NEDU 830

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

MB Sample Id: 7687139-1-BLK

Matrix: Solid

LCS Sample Id: 7687139-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687139-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	274	110	271	108	90-110	1	20	mg/kg	09.30.19 17:43	

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

MB Sample Id: 7687141-1-BLK

Matrix: Solid

LCS Sample Id: 7687141-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687141-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	245	98	244	98	90-110	0	20	mg/kg	09.30.19 18:21	

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

Parent Sample Id: 638334-020

Matrix: Soil

MS Sample Id: 638334-020 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638334-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	224	251	497	109	498	109	90-110	0	20	mg/kg	09.30.19 18:03	

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

Parent Sample Id: 638335-015

Matrix: Soil

MS Sample Id: 638335-015 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-015 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	93.6	251	370	110	367	109	90-110	1	20	mg/kg	09.30.19 19:33	

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

Parent Sample Id: 638335-016

Matrix: Soil

MS Sample Id: 638335-016 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-016 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	11.3	248	261	101	260	100	90-110	0	20	mg/kg	09.30.19 18:38	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 830

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

Parent Sample Id: 638335-020

Matrix: Soil

MS Sample Id: 638335-020 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	54.1	248	299	99	296	98	90-110	1	20	mg/kg	09.30.19 19:59	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103183

MB Sample Id: 7687303-1-BLK

Matrix: Solid

LCS Sample Id: 7687303-1-BKS

Prep Method: SW8015P

Date Prep: 10.01.19

LCSD Sample Id: 7687303-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	941	94	1090	109	70-135	15	20	mg/kg	10.02.19 10:55	
Diesel Range Organics (DRO)	<15.0	1000	987	99	1180	118	70-135	18	20	mg/kg	10.02.19 10:55	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	129		103		132		70-135	%	10.02.19 10:55
o-Terphenyl	142	**	105		127		70-135	%	10.02.19 10:55

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103535

MB Sample Id: 7687563-1-BLK

Matrix: Solid

LCS Sample Id: 7687563-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687563-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1150	115	997	100	70-135	14	20	mg/kg	10.04.19 11:57	
Diesel Range Organics (DRO)	26.0	1000	1300	130	1190	119	70-135	9	20	mg/kg	10.04.19 11:57	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103183

Parent Sample Id: 638225-042

Matrix: Soil

MS Sample Id: 638225-042 S

Prep Method: SW8015P

Date Prep: 10.01.19

MSD Sample Id: 638225-042 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1160	116	1120	112	70-135	4	20	mg/kg	10.02.19 11:58	
Diesel Range Organics (DRO)	<15.0	999	1240	124	1190	119	70-135	4	20	mg/kg	10.02.19 11:58	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	129		140	**	70-135	%	10.02.19 11:58
o-Terphenyl	131		128		70-135	%	10.02.19 11:58

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 830

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103535

Parent Sample Id: 638335-001

Matrix: Soil

MS Sample Id: 638335-001 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638335-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1100	110	1090	109	70-135	1	20	mg/kg	10.04.19 13:00	
Diesel Range Organics (DRO)	31.1	999	1130	110	1130	110	70-135	0	20	mg/kg	10.04.19 13:00	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	117		116		70-135	%	10.04.19 13:00
o-Terphenyl	116		117		70-135	%	10.04.19 13:00

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103378

MB Sample Id: 7687328-1-BLK

Matrix: Solid

LCS Sample Id: 7687328-1-BKS

Prep Method: SW5030B

Date Prep: 10.02.19

LCSD Sample Id: 7687328-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.101	101	0.100	100	70-130	1	35	mg/kg	10.04.19 03:37	
Toluene	<0.00200	0.100	0.0987	99	0.0998	100	70-130	1	35	mg/kg	10.04.19 03:37	
Ethylbenzene	<0.00200	0.100	0.108	108	0.110	110	70-130	2	35	mg/kg	10.04.19 03:37	
m,p-Xylenes	<0.00400	0.200	0.215	108	0.219	110	70-130	2	35	mg/kg	10.04.19 03:37	
o-Xylene	<0.00200	0.100	0.111	111	0.115	115	70-130	4	35	mg/kg	10.04.19 03:37	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	92		97		96		70-130	%	10.04.19 03:37
4-Bromofluorobenzene	102		114		115		70-130	%	10.04.19 03:37

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103594

MB Sample Id: 7687327-1-BLK

Matrix: Solid

LCS Sample Id: 7687327-1-BKS

Prep Method: SW5030B

Date Prep: 10.02.19

LCSD Sample Id: 7687327-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.107	107	0.111	111	70-130	4	35	mg/kg	10.04.19 16:48	
Toluene	<0.00200	0.100	0.101	101	0.106	106	70-130	5	35	mg/kg	10.04.19 16:48	
Ethylbenzene	<0.00200	0.100	0.107	107	0.114	114	70-130	6	35	mg/kg	10.04.19 16:48	
m,p-Xylenes	<0.00400	0.200	0.209	105	0.226	113	70-130	8	35	mg/kg	10.04.19 16:48	
o-Xylene	<0.00200	0.100	0.108	108	0.116	116	70-130	7	35	mg/kg	10.04.19 16:48	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		100		99		70-130	%	10.04.19 16:48
4-Bromofluorobenzene	99		104		110		70-130	%	10.04.19 16:48

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 830

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103378

Parent Sample Id: 638335-001

Matrix: Soil

MS Sample Id: 638335-001 S

Prep Method: SW5030B

Date Prep: 10.02.19

MSD Sample Id: 638335-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.00782	8	0.00602	6	70-130	26	35	mg/kg	10.04.19 04:17	X
Toluene	<0.00200	0.0998	0.00793	8	0.00577	6	70-130	32	35	mg/kg	10.04.19 04:17	X
Ethylbenzene	<0.00200	0.0998	0.0101	10	0.00546	5	70-130	60	35	mg/kg	10.04.19 04:17	XF
m,p-Xylenes	<0.00399	0.200	0.0197	10	0.0108	5	70-130	58	35	mg/kg	10.04.19 04:17	XF
o-Xylene	<0.00200	0.0998	0.0118	12	0.00637	6	70-130	60	35	mg/kg	10.04.19 04:17	XF

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		95		70-130	%	10.04.19 04:17
4-Bromofluorobenzene	122		109		70-130	%	10.04.19 04:17

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103594

Parent Sample Id: 638335-023

Matrix: Soil

MS Sample Id: 638335-023 S

Prep Method: SW5030B

Date Prep: 10.02.19

MSD Sample Id: 638335-023 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0992	0.116	117	0.121	122	70-130	4	35	mg/kg	10.04.19 17:28	
Toluene	<0.00198	0.0992	0.112	113	0.115	116	70-130	3	35	mg/kg	10.04.19 17:28	
Ethylbenzene	<0.00198	0.0992	0.121	122	0.124	125	70-130	2	35	mg/kg	10.04.19 17:28	
m,p-Xylenes	<0.00397	0.198	0.205	104	0.214	108	70-130	4	35	mg/kg	10.04.19 17:28	
o-Xylene	<0.00198	0.0992	0.129	130	0.129	130	70-130	0	35	mg/kg	10.04.19 17:28	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	104		103		70-130	%	10.04.19 17:28
4-Bromofluorobenzene	124		112		70-130	%	10.04.19 17:28

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

Varison & Associates, Inc.
Environmental Consultants
507 N. Martenfield, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: **Bruce Baker / Rachel Owen**

DATE: **9/27/2019** PAGE **1** OF **2**
PO#: **1038335**
PROJECT LOCATION OR NAME: **Arche Corp, NEDU 830**
LAB WORK ORDER#: **19-0112-22**
LAI PROJECT #: **19-0112-22** COLLECTOR: **PN/EC/ML**

CHAIN-OF-CUSTODY

No 0778

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION	ANALYSES	FIELD NOTES
SP-2 (D1)		9/25/19	9:55	S	1		☒ BTEX ☒ TPH 418.1 ☒ TPH 1005 ☒ TPH 1006 ☒ GASOLINE MOD 8015 ☒ DIESEL - MOD 8015 ☒ OIL - MOD 8015 ☒ VOC 8260 ☒ SVOC 8270 ☒ PAH 8270 ☒ HOLDPAH ☒ 8081 PESTICIDES ☒ 8082 PCBS ☒ TBLP - METALS (RCRA) ☒ TCLP - METALS (RCRA) ☒ TOTAL METALS (RCRA) ☒ LEAD - TOTAL ☒ RCL ☒ TDS ☒ TOX ☒ TSS ☒ % MOISTURE ☒ HEXAVALENT CHROMIUM ☒ PCHLORATE ☒ PH ☒ EXPLOSIVES ☒ CHLORIDE ANIONS ☒ ALKALINITY	
SP-2 (S)		10:04						
SP-2 (10')		10:10						
SP-2 (15')		10:15						
SP-2 (20')		10:20						
SP-2 (25')		10:23						
SP-2 (30')		10:30						
SP-2 (35')		10:38						
SP-2 (40')		11:09						
SP-2 (45')		11:10						
SP-2 (50')		11:15						
SP-2 (55')		11:32						
SP-2 (60')		12:01						
SP-4 (5')		13:20						
SP-4 (10')		13:25						
TOTAL	15							

RELINQUISHED BY: (Signature) Rachel Owen	DATE/TIME 9-27-19/13:00	RECEIVED BY: (Signature) [Signature]	TURN AROUND TIME NORMAL ☒ 1 DAY ☐ 2 DAY ☐ OTHER ☐
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	LABORATORY USE ONLY: RECEIVING TEMP: 131.1 THERM: DE
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
LABORATORY: YENCO			☐ CARRIER BILL # ☐ HAND DELIVERED



Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 09/27/2019 01:00:00 PM

Work Order #: 638335

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Date: 09/27/2019

Checklist reviewed by:

Holly Taylor

Date: 09/27/2019

NEDU #922



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
Report Date: 10-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-001	638428-002	638428-003	638428-004	638428-005	638428-006
	<i>Field Id:</i>	SP-3 (5')	SP-3 (10')	SP-3 (15')	SP-3 (20')	SP-3 (25')	SP-4 (5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 08:48	Sep-27-19 08:51	Sep-27-19 08:53	Sep-27-19 08:56	Sep-27-19 09:06	Sep-27-19 09:38
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00
	<i>Analyzed:</i>	Oct-04-19 21:49	Oct-04-19 23:07	Oct-04-19 23:27	Oct-04-19 23:47	Oct-05-19 00:08	Oct-05-19 00:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
Toluene		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
Ethylbenzene		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
m,p-Xylenes		<0.00402 0.00402	<0.00400 0.00400	<0.00398 0.00398	<0.00396 0.00396	<0.00399 0.00399	<0.00398 0.00398
o-Xylene		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
Total Xylenes		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
Total BTEX		<0.00201 0.00201	<0.00200 0.00200	<0.00199 0.00199	<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Oct-01-19 10:00			Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00
	<i>Analyzed:</i>	Oct-01-19 15:28	Oct-02-19 09:54	Oct-02-19 10:01	Oct-01-19 16:00	Oct-01-19 16:07	Oct-01-19 16:13
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		58.6 4.99	0.654 0.500	0.827 0.500	42.0 4.97	125 4.96	61.2 4.95
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00
	<i>Analyzed:</i>	Oct-07-19 16:52	Oct-07-19 17:56	Oct-07-19 18:17	Oct-07-19 18:38	Oct-07-19 18:59	Oct-07-19 19:19
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.9 49.9	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9
Total TPH		<49.9 49.9	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0	<49.9 49.9

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Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
 Contact: Mark Larson
 Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
 Report Date: 10-OCT-19
 Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-007	638428-008	638428-009	638428-010	638428-011	638428-012
	<i>Field Id:</i>	SP-4 (10')	SP-4 (15')	SP-4 (20')	SP-4 (25')	SP-2 (5')	SP-2 (10')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 09:41	Sep-27-19 09:44	Sep-27-19 09:47	Sep-27-19 09:52	Sep-27-19 10:19	Sep-27-19 10:22
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-02-19 13:00	Oct-04-19 12:00
	<i>Analyzed:</i>	Oct-05-19 00:48	Oct-05-19 01:08	Oct-05-19 01:28	Oct-05-19 01:48	Oct-05-19 02:08	Oct-05-19 05:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
Toluene		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
Ethylbenzene		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
m,p-Xylenes		<0.00397 0.00397	<0.00401 0.00401	<0.00398 0.00398	<0.00399 0.00399	<0.00397 0.00397	<0.00397 0.00397
o-Xylene		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
Total Xylenes		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
Total BTEX		<0.00198 0.00198	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>			Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00	
	<i>Analyzed:</i>	Oct-02-19 10:07	Oct-02-19 10:14	Oct-02-19 10:20	Oct-01-19 16:52	Oct-01-19 16:58	Oct-02-19 10:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		2.65 0.500	<0.500 0.500	20.3 5.02	48.8 5.00	46.8 4.96	1.43 0.500
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00
	<i>Analyzed:</i>	Oct-07-19 19:40	Oct-07-19 20:01	Oct-07-19 20:22	Oct-07-19 20:42	Oct-07-19 21:24	Oct-07-19 21:45
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0
Diesel Range Organics (DRO)		<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0
Total TPH		<49.9 49.9	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0

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 Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922



Project Id: 19-012-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
Report Date: 10-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-013	638428-014	638428-015	638428-016	638428-017	638428-018
	<i>Field Id:</i>	SP-2 (15')	SP-2 (20')	SP-2 (25')	SP-2 (30')	SP-2 (35')	SP-2 (40')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 10:25	Sep-27-19 10:27	Sep-27-19 10:32	Sep-27-19 10:45	Sep-27-19 10:51	Sep-27-19 11:12
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00
	<i>Analyzed:</i>	Oct-05-19 05:46	Oct-05-19 06:07	Oct-05-19 06:27	Oct-05-19 06:47	Oct-05-19 07:07	Oct-05-19 07:27
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
Toluene		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
Ethylbenzene		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
m,p-Xylenes		<0.00398 0.00398	<0.00398 0.00398	<0.00403 0.00403	<0.00398 0.00398	<0.00396 0.00396	<0.00403 0.00403
o-Xylene		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
Total Xylenes		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
Total BTEX		<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00198 0.00198	<0.00202 0.00202
Chloride by EPA 300	<i>Extracted:</i>	Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00	Oct-01-19 10:00
	<i>Analyzed:</i>	Oct-01-19 17:24	Oct-01-19 17:31	Oct-01-19 17:37	Oct-01-19 17:43	Oct-01-19 17:50	Oct-01-19 17:56
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		1680 49.8	2450 50.0	5150 49.6	12700 99.8	17800 101	23700 250
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-04-19 16:00	Oct-04-19 16:00
	<i>Analyzed:</i>	Oct-07-19 22:06	Oct-07-19 22:27	Oct-07-19 22:48	Oct-07-19 23:09	Oct-05-19 04:44	Oct-05-19 05:05
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		155 49.9	139 49.9	<50.0 50.0	66.5 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		86.9 49.9	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		242 49.9	139 49.9	<50.0 50.0	66.5 50.0	<50.0 50.0	<49.9 49.9

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Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
 Contact: Mark Larson
 Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
 Report Date: 10-OCT-19
 Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-019	638428-020	638428-021	638428-022	638428-023	638428-024
	<i>Field Id:</i>	SP-2 (45')	SP-2 50')	SP-2 (55')	SP2 (60')	SP-2 (65')	SP-5 (5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 11:21	Sep-27-19 11:38	Sep-27-19 11:45	Sep-27-19 11:59	Sep-27-19 12:10	Sep-27-19 13:03
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00
	<i>Analyzed:</i>	Oct-05-19 07:47	Oct-05-19 08:07	Oct-05-19 08:27	Oct-05-19 09:46	Oct-05-19 10:06	Oct-05-19 10:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
Toluene		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
Ethylbenzene		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
m,p-Xylenes		<0.00400 0.00400	<0.00397 0.00397	<0.00401 0.00401	<0.00399 0.00399	<0.00400 0.00400	<0.00402 0.00402
o-Xylene		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
Total Xylenes		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
Total BTEX		<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00201 0.00201
Chloride by EPA 300	<i>Extracted:</i>	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15
	<i>Analyzed:</i>	Oct-01-19 15:12	Oct-01-19 15:17	Oct-01-19 15:33	Oct-01-19 15:38	Oct-01-19 15:43	Oct-01-19 15:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7770 50.1	5290 49.6	2170 25.2	1500 25.0	661 4.97	32.4 5.02
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-07-19 15:00
	<i>Analyzed:</i>	Oct-05-19 05:26	Oct-05-19 05:47	Oct-05-19 14:33	Oct-05-19 14:54	Oct-05-19 15:14	Oct-07-19 23:30
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0	<50.0 50.0	<49.9 49.9

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Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
Report Date: 10-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-025	638428-026	638428-027	638428-028	638428-029	638428-030
	<i>Field Id:</i>	SP-5 (10')	SP-5 (15')	SP-5 (20')	SP-5 (25')	SP-5 (30')	SP-5 (35')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 13:06	Sep-27-19 13:08	Sep-27-19 13:10	Sep-27-19 13:12	Sep-27-19 13:15	Sep-27-19 13:18
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00
	<i>Analyzed:</i>	Oct-05-19 10:46	Oct-05-19 11:06	Oct-05-19 11:26	Oct-05-19 11:47	Oct-05-19 12:07	Oct-05-19 12:27
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Toluene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Ethylbenzene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
m,p-Xylenes		<0.00401 0.00401	<0.00400 0.00400	<0.00397 0.00397	<0.00404 0.00404	<0.00396 0.00396	<0.00398 0.00398
o-Xylene		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Total Xylenes		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Total BTEX		<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15
	<i>Analyzed:</i>	Oct-02-19 09:06	Oct-01-19 15:59	Oct-02-19 09:12	Oct-01-19 16:20	Oct-01-19 16:36	Oct-01-19 16:41
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7.37 4.97	26.4 4.98	5.11 5.02	13.8 5.05	9.49 5.05	37.4 5.05
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-07-19 15:00	Oct-07-19 15:00	Oct-07-19 15:00	Oct-08-19 09:00	Oct-08-19 09:00	Oct-08-19 09:00
	<i>Analyzed:</i>	Oct-07-19 23:51	Oct-08-19 00:12	Oct-08-19 00:33	Oct-08-19 11:02	Oct-08-19 12:04	Oct-08-19 12:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9
Diesel Range Organics (DRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9
Total TPH		<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9

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Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
 Contact: Mark Larson
 Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
 Report Date: 10-OCT-19
 Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638428-031	638428-032	638428-033	638428-034	638428-035	638428-036
	<i>Field Id:</i>	SP-6 (5')	SP-6 (10')	SP-6 (15')	SP-6 (20')	SP-6 (25')	SP-6 (30')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-27-19 13:52	Sep-27-19 13:54	Sep-27-19 13:56	Sep-27-19 14:00	Sep-27-19 14:05	Sep-27-19 14:10
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00	Oct-04-19 12:00
	<i>Analyzed:</i>	Oct-05-19 12:47	Oct-05-19 16:05	Oct-05-19 16:25	Oct-05-19 16:45	Oct-05-19 17:06	Oct-05-19 17:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
Toluene		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
Ethylbenzene		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
m,p-Xylenes		<0.00399 0.00399	<0.00398 0.00398	<0.00398 0.00398	<0.00398 0.00398	<0.00398 0.00398	<0.00396 0.00396
o-Xylene		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
Total Xylenes		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
Total BTEX		<0.00200 0.00200	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 11:15	Oct-01-19 17:30
	<i>Analyzed:</i>	Oct-01-19 16:47	Oct-01-19 16:52	Oct-01-19 16:57	Oct-01-19 17:03	Oct-01-19 17:08	Oct-01-19 19:09
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		89.3 5.00	18.6 4.96	14.1 4.99	42.9 5.04	14.1 5.00	146 5.04
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-08-19 09:00	Oct-08-19 09:00	Oct-08-19 09:00	Oct-08-19 09:00	Oct-08-19 09:00	Oct-08-19 09:00
	<i>Analyzed:</i>	Oct-08-19 12:47	Oct-08-19 13:08	Oct-08-19 13:29	Oct-08-19 13:50	Oct-08-19 14:11	Oct-08-19 14:32
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8
Total TPH		<49.9 49.9	<50.0 50.0	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8

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Holly Taylor
Project Manager



Certificate of Analysis Summary 638428

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp,NEDU 922

Project Id: 19-012-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Sep-30-19 10:00 am
Report Date: 10-OCT-19
Project Manager: Holly Taylor

Analysis Requested	Lab Id:	638428-037					
	Field Id:	SP-6 (35')					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Sep-27-19 14:13					
BTEX by EPA 8021B	Extracted:	Oct-04-19 12:00					
	Analyzed:	Oct-05-19 17:46					
	Units/RL:	mg/kg RL					
Benzene		<0.00198 0.00198					
Toluene		<0.00198 0.00198					
Ethylbenzene		<0.00198 0.00198					
m,p-Xylenes		<0.00397 0.00397					
o-Xylene		<0.00198 0.00198					
Total Xylenes		<0.00198 0.00198					
Total BTEX		<0.00198 0.00198					
Chloride by EPA 300	Extracted:	Oct-01-19 17:30					
	Analyzed:	Oct-01-19 19:28					
	Units/RL:	mg/kg RL					
Chloride		39.2 4.96					
TPH by SW8015 Mod	Extracted:	Oct-08-19 09:00					
	Analyzed:	Oct-08-19 14:53					
	Units/RL:	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0					
Diesel Range Organics (DRO)		<50.0 50.0					
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0					
Total TPH		<50.0 50.0					

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Holly Taylor
Project Manager

Analytical Report 638428

for
Larson and Associates, Inc.

Project Manager: Mark Larson

Apache Corp,NEDU 922

19-012-22

10-OCT-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)



10-OCT-19

Project Manager: **Mark Larson**

Larson and Associates, Inc.

P. O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **638428**

Apache Corp, NEDU 922

Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 638428. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 638428 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Holly Taylor'.

Holly Taylor

Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 638428

Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-3 (5')	S	09-27-19 08:48		638428-001
SP-3 (10')	S	09-27-19 08:51		638428-002
SP-3 (15')	S	09-27-19 08:53		638428-003
SP-3 (20')	S	09-27-19 08:56		638428-004
SP-3 (25')	S	09-27-19 09:06		638428-005
SP-4 (5')	S	09-27-19 09:38		638428-006
SP-4 (10')	S	09-27-19 09:41		638428-007
SP-4 (15')	S	09-27-19 09:44		638428-008
SP-4 (20')	S	09-27-19 09:47		638428-009
SP-4 (25')	S	09-27-19 09:52		638428-010
SP-2 (5')	S	09-27-19 10:19		638428-011
SP-2 (10')	S	09-27-19 10:22		638428-012
SP-2 (15')	S	09-27-19 10:25		638428-013
SP-2 (20')	S	09-27-19 10:27		638428-014
SP-2 (25')	S	09-27-19 10:32		638428-015
SP-2 (30')	S	09-27-19 10:45		638428-016
SP-2 (35')	S	09-27-19 10:51		638428-017
SP-2 (40')	S	09-27-19 11:12		638428-018
SP-2 (45')	S	09-27-19 11:21		638428-019
SP-2 (50')	S	09-27-19 11:38		638428-020
SP-2 (55')	S	09-27-19 11:45		638428-021
SP-2 (60')	S	09-27-19 11:59		638428-022
SP-2 (65')	S	09-27-19 12:10		638428-023
SP-5 (5')	S	09-27-19 13:03		638428-024
SP-5 (10')	S	09-27-19 13:06		638428-025
SP-5 (15')	S	09-27-19 13:08		638428-026
SP-5 (20')	S	09-27-19 13:10		638428-027
SP-5 (25')	S	09-27-19 13:12		638428-028
SP-5 (30')	S	09-27-19 13:15		638428-029
SP-5 (35')	S	09-27-19 13:18		638428-030
SP-6 (5')	S	09-27-19 13:52		638428-031
SP-6 (10')	S	09-27-19 13:54		638428-032
SP-6 (15')	S	09-27-19 13:56		638428-033
SP-6 (20')	S	09-27-19 14:00		638428-034
SP-6 (25')	S	09-27-19 14:05		638428-035
SP-6 (30')	S	09-27-19 14:10		638428-036
SP-6 (35')	S	09-27-19 14:13		638428-037

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp, NEDU 922**Project ID: 19-012-22
Work Order Number(s): 638428Report Date: 10-OCT-19
Date Received: 09/30/2019**Sample receipt non conformances and comments:**

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3103060 Chloride by EPA 300

Samples re-analyzed due to hit in blank; re-analysis confirms original data.

Batch: LBA-3103523 TPH by SW8015 Mod

Gasoline Range Hydrocarbons (GRO) recovered above QC limits Analyte was not detected in any of the associated samples and therefore the data was accepted. Diesel Range Organics (DRO) recovered above QC limits in the Blank Spike and Duplicate. Analyte was not detected in any of the associated samples and therefore the data was accepted. Samples in the analytical batch are: 638428-017, -018, -019, -020. The MS/MSD shows recovery for the batch.

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687566-1-BKS, 7687566-1-BSD.

Batch: LBA-3103528 BTEX by EPA 8021B

Lab Sample ID 638428-032 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638428-032, -033, -034, -035, -036, -037.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3103530 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638336-001 S, 638336-001 SD, 638428-022, 638428-023.

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638336-001 SD, 638428-022.

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp, NEDU 922**Project ID: 19-012-22
Work Order Number(s): 638428Report Date: 10-OCT-19
Date Received: 09/30/2019

Batch: LBA-3103594 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3103596 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Lab Sample ID 638428-012 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638428-012, -013, -014, -015, -016, -017, -018, -019, -020, -021, -022, -023, -024, -025, -026, -027, -028, -029, -030, -031.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3103628 TPH by SW8015 Mod

Lab Sample ID 638428-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Diesel Range Organics (DRO) recovered above QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638428-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -024, -025, -026, -027.

The Laboratory Control Sample for Diesel Range Organics (DRO), Motor Oil Range Hydrocarbons (MRO) is within laboratory Control Limits, therefore the data was accepted.

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638428-001 S.

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638428-001 S, 638428-010, 638428-015.

Batch: LBA-3103768 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638428-033, 638428-028.



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-3 (5')**
Lab Sample Id: 638428-001

Matrix: Soil
Date Collected: 09.27.19 08.48

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	58.6	4.99	mg/kg	10.01.19 15.28		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 16.52	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 16.52	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 16.52	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 16.52	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	73	%	70-135	10.07.19 16.52		
o-Terphenyl	84-15-1	72	%	70-135	10.07.19 16.52		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-3 (5')**
Lab Sample Id: 638428-001

Matrix: Soil
Date Collected: 09.27.19 08.48

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.04.19 21.49	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.04.19 21.49	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.04.19 21.49		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.04.19 21.49		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-002

Date Collected: 09.27.19 08.51

Analytical Method: Chloride by EPA 300

Tech: SPC

% Moisture:

Analyst: CHE

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	0.654	0.500	mg/kg	10.02.19 09.54		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 17.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 17.56	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 17.56	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 17.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	70	%	70-135	10.07.19 17.56		
o-Terphenyl	84-15-1	70	%	70-135	10.07.19 17.56		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-002

Date Collected: 09.27.19 08.51

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.04.19 23.07	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.04.19 23.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	93	%	70-130	10.04.19 23.07		
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.04.19 23.07		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-3 (15')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-003

Date Collected: 09.27.19 08.53

Analytical Method: Chloride by EPA 300

Tech: SPC

% Moisture:

Analyst: CHE

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	0.827	0.500	mg/kg	10.02.19 10.01		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 18.17	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 18.17	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 18.17	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 18.17	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	75	%	70-135	10.07.19 18.17		
o-Terphenyl	84-15-1	77	%	70-135	10.07.19 18.17		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-3 (15')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-003

Date Collected: 09.27.19 08.53

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 23.27	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 23.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.04.19 23.27		
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 23.27		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-3 (20')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-004

Date Collected: 09.27.19 08.56

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	42.0	4.97	mg/kg	10.01.19 16.00		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.07.19 18.38	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.07.19 18.38	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.07.19 18.38	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.07.19 18.38	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	75	%	70-135	10.07.19 18.38	
o-Terphenyl	84-15-1	73	%	70-135	10.07.19 18.38	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-3 (20')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-004

Date Collected: 09.27.19 08.56

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.04.19 23.47	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.04.19 23.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.04.19 23.47		
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 23.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-3 (25')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-005

Date Collected: 09.27.19 09.06

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	125	4.96	mg/kg	10.01.19 16.07		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 18.59	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 18.59	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 18.59	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 18.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	77	%	70-135	10.07.19 18.59		
o-Terphenyl	84-15-1	76	%	70-135	10.07.19 18.59		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-3 (25')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-005

Date Collected: 09.27.19 09.06

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.05.19 00.08	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 00.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.05.19 00.08		
4-Bromofluorobenzene	460-00-4	115	%	70-130	10.05.19 00.08		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-4 (5')
Lab Sample Id: 638428-006

Matrix: Soil
Date Collected: 09.27.19 09.38

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	61.2	4.95	mg/kg	10.01.19 16.13		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 19.19	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 19.19	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 19.19	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 19.19	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	78	%	70-135	10.07.19 19.19	
o-Terphenyl	84-15-1	78	%	70-135	10.07.19 19.19	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-4 (5')**
Lab Sample Id: 638428-006

Matrix: Soil
Date Collected: 09.27.19 09.38

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 00.28	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 00.28	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.05.19 00.28		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.05.19 00.28		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-007

Date Collected: 09.27.19 09.41

Analytical Method: Chloride by EPA 300

Tech: SPC

% Moisture:

Analyst: CHE

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2.65	0.500	mg/kg	10.02.19 10.07		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 19.40	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 19.40	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 19.40	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 19.40	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	76	%	70-135	10.07.19 19.40		
o-Terphenyl	84-15-1	75	%	70-135	10.07.19 19.40		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-007

Date Collected: 09.27.19 09.41

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 00.48	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 00.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	93	%	70-130	10.05.19 00.48		
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.05.19 00.48		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-4 (15')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-008

Date Collected: 09.27.19 09.44

Analytical Method: Chloride by EPA 300

Tech: SPC

% Moisture:

Analyst: CHE

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<0.500	0.500	mg/kg	10.02.19 10.14	U	1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.07.19 20.01	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.07.19 20.01	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.07.19 20.01	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.07.19 20.01	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	77	%	70-135	10.07.19 20.01	
o-Terphenyl	84-15-1	79	%	70-135	10.07.19 20.01	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-4 (15')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-008

Date Collected: 09.27.19 09.44

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.05.19 01.08	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 01.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 01.08		
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.05.19 01.08		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-009

Date Collected: 09.27.19 09.47

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	20.3	5.02	mg/kg	10.02.19 10.20		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 20.22	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 20.22	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 20.22	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 20.22	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	73	%	70-135	10.07.19 20.22		
o-Terphenyl	84-15-1	74	%	70-135	10.07.19 20.22		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-009

Date Collected: 09.27.19 09.47

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 01.28	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 01.28	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.05.19 01.28		
4-Bromofluorobenzene	460-00-4	125	%	70-130	10.05.19 01.28		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-4 (25')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-010

Date Collected: 09.27.19 09.52

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	48.8	5.00	mg/kg	10.01.19 16.52		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 20.42	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 20.42	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 20.42	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 20.42	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	123	%	70-135	10.07.19 20.42		
o-Terphenyl	84-15-1	138	%	70-135	10.07.19 20.42	**	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-4 (25')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-010

Date Collected: 09.27.19 09.52

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.05.19 01.48	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 01.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	116	%	70-130	10.05.19 01.48		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 01.48		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (5')**
Lab Sample Id: 638428-011

Matrix: Soil
Date Collected: 09.27.19 10.19

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	46.8	4.96	mg/kg	10.01.19 16.58		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 21.24	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 21.24	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 21.24	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 21.24	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	129	%	70-135	10.07.19 21.24		
o-Terphenyl	84-15-1	133	%	70-135	10.07.19 21.24		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-2 (5')**
Lab Sample Id: 638428-011

Matrix: Soil
Date Collected: 09.27.19 10.19

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.02.19 13.00

Basis: Wet Weight

Seq Number: 3103594

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 02.08	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 02.08	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.05.19 02.08		
4-Bromofluorobenzene	460-00-4	115	%	70-130	10.05.19 02.08		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (10')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-012

Date Collected: 09.27.19 10.22

Analytical Method: Chloride by EPA 300

Tech: SPC

% Moisture:

Analyst: CHE

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1.43	0.500	mg/kg	10.02.19 10.26		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 21.45	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 21.45	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 21.45	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 21.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	77	%	70-135	10.07.19 21.45		
o-Terphenyl	84-15-1	78	%	70-135	10.07.19 21.45		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-2 (10')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-012

Date Collected: 09.27.19 10.22

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 05.26	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 05.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	93	%	70-130	10.05.19 05.26		
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.05.19 05.26		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (15')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-013

Date Collected: 09.27.19 10.25

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1680	49.8	mg/kg	10.01.19 17.24		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 22.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	155	49.9	mg/kg	10.07.19 22.06		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	86.9	49.9	mg/kg	10.07.19 22.06		1
Total TPH	PHC635	242	49.9	mg/kg	10.07.19 22.06		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	76	%	70-135	10.07.19 22.06		
o-Terphenyl	84-15-1	79	%	70-135	10.07.19 22.06		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-2 (15')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-013

Date Collected: 09.27.19 10.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 05.46	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 05.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.05.19 05.46		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 05.46		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (20')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-014

Date Collected: 09.27.19 10.27

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2450	50.0	mg/kg	10.01.19 17.31		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 22.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	139	49.9	mg/kg	10.07.19 22.27		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 22.27	U	1
Total TPH	PHC635	139	49.9	mg/kg	10.07.19 22.27		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	80	%	70-135	10.07.19 22.27	
o-Terphenyl	84-15-1	82	%	70-135	10.07.19 22.27	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (20')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-014

Date Collected: 09.27.19 10.27

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 06.07	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 06.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 06.07		
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.05.19 06.07		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-2 (25')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-015

Date Collected: 09.27.19 10.32

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5150	49.6	mg/kg	10.01.19 17.37		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 22.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 22.48	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 22.48	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 22.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	128	%	70-135	10.07.19 22.48		
o-Terphenyl	84-15-1	142	%	70-135	10.07.19 22.48	**	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-2 (25')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-015

Date Collected: 09.27.19 10.32

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.05.19 06.27	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.05.19 06.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.05.19 06.27		
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.05.19 06.27		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-016

Date Collected: 09.27.19 10.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	12700	99.8	mg/kg	10.01.19 17.43		20

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 23.09	U	1
Diesel Range Organics (DRO)	C10C28DRO	66.5	50.0	mg/kg	10.07.19 23.09		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 23.09	U	1
Total TPH	PHC635	66.5	50.0	mg/kg	10.07.19 23.09		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	85	%	70-135	10.07.19 23.09	
o-Terphenyl	84-15-1	92	%	70-135	10.07.19 23.09	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-016

Date Collected: 09.27.19 10.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 06.47	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 06.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.05.19 06.47		
4-Bromofluorobenzene	460-00-4	105	%	70-130	10.05.19 06.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-2 (35')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-017

Date Collected: 09.27.19 10.51

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	17800	101	mg/kg	10.01.19 17.50		20

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	112	%	70-135	10.05.19 04.44		
o-Terphenyl	84-15-1	120	%	70-135	10.05.19 04.44		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-2 (35')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-017

Date Collected: 09.27.19 10.51

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.05.19 07.07	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 07.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.05.19 07.07		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.05.19 07.07		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-018

Date Collected: 09.27.19 11.12

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 10.00

Basis: Wet Weight

Seq Number: 3103060

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	23700	250	mg/kg	10.01.19 17.56		50

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	109	%	70-135	10.05.19 05.05		
o-Terphenyl	84-15-1	113	%	70-135	10.05.19 05.05		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-018

Date Collected: 09.27.19 11.12

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.05.19 07.27	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.05.19 07.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 07.27		
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.05.19 07.27		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-2 (45')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-019

Date Collected: 09.27.19 11.21

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7770	50.1	mg/kg	10.01.19 15.12		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 05.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 05.26	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 05.26	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 05.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	106	%	70-135	10.05.19 05.26		
o-Terphenyl	84-15-1	113	%	70-135	10.05.19 05.26		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-2 (45')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-019

Date Collected: 09.27.19 11.21

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.05.19 07.47	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 07.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	124	%	70-130	10.05.19 07.47		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 07.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-2 50')
Lab Sample Id: 638428-020

Matrix: Soil
Date Collected: 09.27.19 11.38

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Tech: CHE

Analyst: CHE

Seq Number: 3103061

Prep Method: E300P

% Moisture:

Basis: Wet Weight

Date Prep: 10.01.19 11.15

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5290	49.6	mg/kg	10.01.19 15.17		10

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103523

Prep Method: SW8015P

% Moisture:

Basis: Wet Weight

Date Prep: 10.04.19 16.00

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 05.47	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 05.47	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 05.47	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 05.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	117	%	70-135	10.05.19 05.47		
o-Terphenyl	84-15-1	127	%	70-135	10.05.19 05.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 50')**
Lab Sample Id: 638428-020

Matrix: Soil
Date Collected: 09.27.19 11.38

Date Received:09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 08.07	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 08.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.05.19 08.07		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 08.07		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-2 (55')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-021

Date Collected: 09.27.19 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2170	25.2	mg/kg	10.01.19 15.33		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.05.19 14.33	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.05.19 14.33	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.05.19 14.33	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.05.19 14.33	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	114	%	70-135	10.05.19 14.33		
o-Terphenyl	84-15-1	125	%	70-135	10.05.19 14.33		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-2 (55')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-021

Date Collected: 09.27.19 11.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.05.19 08.27	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 08.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.05.19 08.27		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.05.19 08.27		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP2 (60')**
Lab Sample Id: 638428-022

Matrix: Soil
Date Collected: 09.27.19 11.59

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1500	25.0	mg/kg	10.01.19 15.38		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 14.54	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 14.54	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 14.54	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 14.54	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	138	%	70-135	10.05.19 14.54	**	
o-Terphenyl	84-15-1	150	%	70-135	10.05.19 14.54	**	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP2 (60')**
Lab Sample Id: 638428-022

Matrix: Soil
Date Collected: 09.27.19 11.59

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.05.19 09.46	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 09.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 09.46		
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.05.19 09.46		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (65')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-023

Date Collected: 09.27.19 12.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	661	4.97	mg/kg	10.01.19 15.43		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 15.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 15.14	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 15.14	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 15.14	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	135	%	70-135	10.05.19 15.14		
o-Terphenyl	84-15-1	145	%	70-135	10.05.19 15.14	**	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-2 (65')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-023

Date Collected: 09.27.19 12.10

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.05.19 10.06	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 10.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 10.06		
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.05.19 10.06		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (5')
Lab Sample Id: 638428-024

Matrix: Soil
Date Collected: 09.27.19 13.03

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	32.4	5.02	mg/kg	10.01.19 15.49		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.07.19 23.30	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.07.19 23.30	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.07.19 23.30	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.07.19 23.30	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	70	%	70-135	10.07.19 23.30		
o-Terphenyl	84-15-1	75	%	70-135	10.07.19 23.30		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-5 (5')
Lab Sample Id: 638428-024

Matrix: Soil
Date Collected: 09.27.19 13.03

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.05.19 10.26	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.05.19 10.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.05.19 10.26		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 10.26		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-5 (10')**
Lab Sample Id: 638428-025

Matrix: Soil
Date Collected: 09.27.19 13.06

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7.37	4.97	mg/kg	10.02.19 09.06		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.07.19 23.51	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.07.19 23.51	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.07.19 23.51	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.07.19 23.51	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	86	%	70-135	10.07.19 23.51		
o-Terphenyl	84-15-1	89	%	70-135	10.07.19 23.51		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-025

Date Collected: 09.27.19 13.06

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.05.19 10.46	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 10.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 10.46		
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.05.19 10.46		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (15')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-026

Date Collected: 09.27.19 13.08

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	26.4	4.98	mg/kg	10.01.19 15.59		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.08.19 00.12	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.08.19 00.12	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.08.19 00.12	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.08.19 00.12	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	84	%	70-135	10.08.19 00.12	
o-Terphenyl	84-15-1	90	%	70-135	10.08.19 00.12	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-5 (15')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-026

Date Collected: 09.27.19 13.08

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.05.19 11.06	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 11.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 11.06		
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.05.19 11.06		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (20')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-027

Date Collected: 09.27.19 13.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5.11	5.02	mg/kg	10.02.19 09.12		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.07.19 15.00

Basis: Wet Weight

Seq Number: 3103628

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 00.33	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 00.33	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 00.33	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 00.33	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	79	%	70-135	10.08.19 00.33	
o-Terphenyl	84-15-1	81	%	70-135	10.08.19 00.33	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-5 (20')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-027

Date Collected: 09.27.19 13.10

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 11.26	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 11.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 11.26		
4-Bromofluorobenzene	460-00-4	108	%	70-130	10.05.19 11.26		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (25')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-028

Date Collected: 09.27.19 13.12

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	13.8	5.05	mg/kg	10.01.19 16.20		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 11.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 11.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 11.02	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 11.02	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	69	%	70-135	10.08.19 11.02	**
o-Terphenyl	84-15-1	74	%	70-135	10.08.19 11.02	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (25')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-028

Date Collected: 09.27.19 13.12

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.05.19 11.47	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.05.19 11.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 11.47		
4-Bromofluorobenzene	460-00-4	105	%	70-130	10.05.19 11.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (30')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-029

Date Collected: 09.27.19 13.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9.49	5.05	mg/kg	10.01.19 16.36		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 12.04	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 12.04	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 12.04	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 12.04	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	71	%	70-135	10.08.19 12.04	
o-Terphenyl	84-15-1	78	%	70-135	10.08.19 12.04	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-5 (30')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-029

Date Collected: 09.27.19 13.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.05.19 12.07	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 12.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.05.19 12.07		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.05.19 12.07		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (35')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-030

Date Collected: 09.27.19 13.18

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	37.4	5.05	mg/kg	10.01.19 16.41		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.08.19 12.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.08.19 12.26	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.08.19 12.26	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.08.19 12.26	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	70	%	70-135	10.08.19 12.26	
o-Terphenyl	84-15-1	77	%	70-135	10.08.19 12.26	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-5 (35')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-030

Date Collected: 09.27.19 13.18

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 12.27	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 12.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.05.19 12.27		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 12.27		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (5')**
Lab Sample Id: 638428-031

Matrix: Soil
Date Collected: 09.27.19 13.52

Date Received: 09.30.19 10.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	89.3	5.00	mg/kg	10.01.19 16.47		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.08.19 12.47	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.08.19 12.47	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.08.19 12.47	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.08.19 12.47	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	70	%	70-135	10.08.19 12.47	
o-Terphenyl	84-15-1	76	%	70-135	10.08.19 12.47	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-6 (5')**
Lab Sample Id: 638428-031

Matrix: Soil
Date Collected: 09.27.19 13.52

Date Received: 09.30.19 10.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103596

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.05.19 12.47	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.05.19 12.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	104	%	70-130	10.05.19 12.47		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 12.47		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-032

Date Collected: 09.27.19 13.54

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	18.6	4.96	mg/kg	10.01.19 16.52		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 13.08	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 13.08	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 13.08	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 13.08	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	71	%	70-135	10.08.19 13.08	
o-Terphenyl	84-15-1	77	%	70-135	10.08.19 13.08	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-032

Date Collected: 09.27.19 13.54

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 16.05	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 16.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	99	%	70-130	10.05.19 16.05		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.05.19 16.05		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (15')**

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-033

Date Collected: 09.27.19 13.56

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14.1	4.99	mg/kg	10.01.19 16.57		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 13.29	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 13.29	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 13.29	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 13.29	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	67	%	70-135	10.08.19 13.29	**	
o-Terphenyl	84-15-1	72	%	70-135	10.08.19 13.29		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (15')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-033

Date Collected: 09.27.19 13.56

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 16.25	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 16.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 16.25		
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.05.19 16.25		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-6 (20')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-034

Date Collected: 09.27.19 14.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	42.9	5.04	mg/kg	10.01.19 17.03		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 13.50	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 13.50	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 13.50	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 13.50	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	70	%	70-135	10.08.19 13.50		
o-Terphenyl	84-15-1	76	%	70-135	10.08.19 13.50		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-6 (20')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-034

Date Collected: 09.27.19 14.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 16.45	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 16.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	99	%	70-130	10.05.19 16.45		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.05.19 16.45		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-6 (25')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-035

Date Collected: 09.27.19 14.05

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 10.01.19 11.15

Basis: Wet Weight

Seq Number: 3103061

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14.1	5.00	mg/kg	10.01.19 17.08		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.08.19 14.11	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.08.19 14.11	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.08.19 14.11	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.08.19 14.11	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	71	%	70-135	10.08.19 14.11		
o-Terphenyl	84-15-1	78	%	70-135	10.08.19 14.11		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: SP-6 (25')

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-035

Date Collected: 09.27.19 14.05

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.05.19 17.06	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.05.19 17.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.05.19 17.06		
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.05.19 17.06		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (30')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-036

Date Collected: 09.27.19 14.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: SPC

Date Prep: 10.01.19 17.30

Basis: Wet Weight

Seq Number: 3103063

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	146	5.04	mg/kg	10.01.19 19.09		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.08.19 14.32	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.08.19 14.32	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.08.19 14.32	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.08.19 14.32	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	73	%	70-135	10.08.19 14.32	
o-Terphenyl	84-15-1	80	%	70-135	10.08.19 14.32	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp, NEDU 922

Sample Id: **SP-6 (30')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-036

Date Collected: 09.27.19 14.10

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.05.19 17.26	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 17.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.05.19 17.26		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.05.19 17.26		



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: SP-6 (35')

Matrix: Soil

Date Received:09.30.19 10.00

Lab Sample Id: 638428-037

Date Collected: 09.27.19 14.13

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: SPC

Date Prep: 10.01.19 17.30

Basis: Wet Weight

Seq Number: 3103063

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	39.2	4.96	mg/kg	10.01.19 19.28		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.08.19 09.00

Basis: Wet Weight

Seq Number: 3103768

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.08.19 14.53	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.08.19 14.53	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.08.19 14.53	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.08.19 14.53	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	74	%	70-135	10.08.19 14.53	
o-Terphenyl	84-15-1	81	%	70-135	10.08.19 14.53	



Certificate of Analytical Results 638428



Larson and Associates, Inc., Midland, TX

Apache Corp,NEDU 922

Sample Id: **SP-6 (35')**

Matrix: Soil

Date Received: 09.30.19 10.00

Lab Sample Id: 638428-037

Date Collected: 09.27.19 14.13

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.04.19 12.00

Basis: Wet Weight

Seq Number: 3103528

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.05.19 17.46	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.05.19 17.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.05.19 17.46		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.05.19 17.46		



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Larson and Associates, Inc.
Apache Corp, NEDU 922

Analytical Method: Chloride by EPA 300

Seq Number: 3103060

MB Sample Id: 7687203-1-BLK

Matrix: Solid

LCS Sample Id: 7687203-1-BKS

Prep Method: E300P

Date Prep: 10.01.19

LCSD Sample Id: 7687203-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2.90	250	268	107	268	107	90-110	0	20	mg/kg	10.01.19 14:49	

Analytical Method: Chloride by EPA 300

Seq Number: 3103061

MB Sample Id: 7687204-1-BLK

Matrix: Solid

LCS Sample Id: 7687204-1-BKS

Prep Method: E300P

Date Prep: 10.01.19

LCSD Sample Id: 7687204-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	0.892	250	249	100	250	100	90-110	0	20	mg/kg	10.01.19 14:35	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

MB Sample Id: 7687206-1-BLK

Matrix: Solid

LCS Sample Id: 7687206-1-BKS

Prep Method: E300P

Date Prep: 10.01.19

LCSD Sample Id: 7687206-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	271	108	269	108	90-110	1	20	mg/kg	10.01.19 18:56	

Analytical Method: Chloride by EPA 300

Seq Number: 3103060

Parent Sample Id: 638417-005

Matrix: Soil

MS Sample Id: 638417-005 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638417-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	80.4	250	352	109	349	107	90-110	1	20	mg/kg	10.01.19 15:09	

Analytical Method: Chloride by EPA 300

Seq Number: 3103060

Parent Sample Id: 638428-009

Matrix: Soil

MS Sample Id: 638428-009 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638428-009 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	20.3	251	298	111	297	110	90-110	0	20	mg/kg	10.01.19 16:39	X

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp, NEDU 922

Analytical Method: Chloride by EPA 300

Seq Number: 3103061

Parent Sample Id: 638428-026

Matrix: Soil

MS Sample Id: 638428-026 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638428-026 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	26.4	249	274	99	275	100	90-110	0	20	mg/kg	10.01.19 16:05	

Analytical Method: Chloride by EPA 300

Seq Number: 3103061

Parent Sample Id: 638524-001

Matrix: Soil

MS Sample Id: 638524-001 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638524-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	15.4	252	273	102	273	102	90-110	0	20	mg/kg	10.01.19 14:50	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

Parent Sample Id: 638428-036

Matrix: Soil

MS Sample Id: 638428-036 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638428-036 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	146	252	418	108	418	108	90-110	0	20	mg/kg	10.01.19 19:15	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

Parent Sample Id: 638458-003

Matrix: Soil

MS Sample Id: 638458-003 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638458-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	36.8	248	305	108	306	109	90-110	0	20	mg/kg	10.01.19 20:46	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

MB Sample Id: 7687566-1-BLK

Matrix: Solid

LCS Sample Id: 7687566-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687566-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1380	138	1150	115	70-135	18	20	mg/kg	10.04.19 21:25	H
Diesel Range Organics (DRO)	<15.0	1000	1670	167	1450	145	70-135	14	20	mg/kg	10.04.19 21:25	H

Surrogate

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	99		176	**	153	**	70-135	%	10.04.19 21:25
o-Terphenyl	110		180	**	158	**	70-135	%	10.04.19 21:25

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



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Apache Corp, NEDU 922

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103530

MB Sample Id: 7687568-1-BLK

Matrix: Solid

LCS Sample Id: 7687568-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687568-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	924	92	1030	103	70-135	11	20	mg/kg	10.05.19 06:50	
Diesel Range Organics (DRO)	<15.0	1000	953	95	1080	108	70-135	12	20	mg/kg	10.05.19 06:50	
Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane	106		114		127		70-135	%	10.05.19 06:50			
o-Terphenyl	114		104		114		70-135	%	10.05.19 06:50			

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103628

MB Sample Id: 7687644-1-BLK

Matrix: Solid

LCS Sample Id: 7687644-1-BKS

Prep Method: SW8015P

Date Prep: 10.07.19

LCSD Sample Id: 7687644-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	958	96	917	92	70-135	4	20	mg/kg	10.07.19 16:10	
Diesel Range Organics (DRO)	<15.0	1000	888	89	861	86	70-135	3	20	mg/kg	10.07.19 16:10	
Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane	71		82		81		70-135	%	10.07.19 16:10			
o-Terphenyl	78		77		80		70-135	%	10.07.19 16:10			

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103768

MB Sample Id: 7687646-1-BLK

Matrix: Solid

LCS Sample Id: 7687646-1-BKS

Prep Method: SW8015P

Date Prep: 10.08.19

LCSD Sample Id: 7687646-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1060	106	917	92	70-135	14	20	mg/kg	10.08.19 10:18	
Diesel Range Organics (DRO)	<15.0	1000	1030	103	857	86	70-135	18	20	mg/kg	10.08.19 10:18	
Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date			
1-Chlorooctane	79		91		80		70-135	%	10.08.19 10:18			
o-Terphenyl	85		94		81		70-135	%	10.08.19 10:18			

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103628

Matrix: Solid
MB Sample Id: 7687644-1-BLK

Prep Method: SW8015P

Date Prep: 10.07.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.07.19 15:49	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



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Apache Corp, NEDU 922

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103768

Matrix: Solid

Prep Method: SW8015P

Date Prep: 10.08.19

MB Sample Id: 7687646-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.08.19 09:57	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

Matrix: Soil

Prep Method: SW8015P

Date Prep: 10.04.19

Parent Sample Id: 638334-008

MS Sample Id: 638334-008 S

MSD Sample Id: 638334-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	829	83	826	83	70-135	0	20	mg/kg	10.04.19 22:27	
Diesel Range Organics (DRO)	<15.0	997	1010	101	997	100	70-135	1	20	mg/kg	10.04.19 22:27	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	112		110		70-135	%	10.04.19 22:27
o-Terphenyl	119		119		70-135	%	10.04.19 22:27

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103530

Matrix: Soil

Prep Method: SW8015P

Date Prep: 10.04.19

Parent Sample Id: 638336-001

MS Sample Id: 638336-001 S

MSD Sample Id: 638336-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	911	91	1030	103	70-135	12	20	mg/kg	10.05.19 07:53	
Diesel Range Organics (DRO)	454	999	1810	136	2110	166	70-135	15	20	mg/kg	10.05.19 07:53	X

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	127		146	**	70-135	%	10.05.19 07:53
o-Terphenyl	140	**	161	**	70-135	%	10.05.19 07:53

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103628

Matrix: Soil

Prep Method: SW8015P

Date Prep: 10.07.19

Parent Sample Id: 638428-001

MS Sample Id: 638428-001 S

MSD Sample Id: 638428-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<14.9	996	1240	124	1230	123	70-135	1	20	mg/kg	10.07.19 17:13	
Diesel Range Organics (DRO)	<14.9	996	1420	143	1410	141	70-135	1	20	mg/kg	10.07.19 17:13	X

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	160	**	80		70-135	%	10.07.19 17:13
o-Terphenyl	157	**	79		70-135	%	10.07.19 17:13

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* |(C-E) / (C+E)|
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp, NEDU 922

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103768

Parent Sample Id: 638428-028

Matrix: Soil

MS Sample Id: 638428-028 S

Prep Method: SW8015P

Date Prep: 10.08.19

MSD Sample Id: 638428-028 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	915	92	936	94	70-135	2	20	mg/kg	10.08.19 11:23	
Diesel Range Organics (DRO)	<15.0	998	879	88	907	91	70-135	3	20	mg/kg	10.08.19 11:23	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	89		80		70-135	%	10.08.19 11:23
o-Terphenyl	79		80		70-135	%	10.08.19 11:23

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103594

MB Sample Id: 7687327-1-BLK

Matrix: Solid

LCS Sample Id: 7687327-1-BKS

Prep Method: SW5030B

Date Prep: 10.02.19

LCSD Sample Id: 7687327-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.107	107	0.111	111	70-130	4	35	mg/kg	10.04.19 16:48	
Toluene	<0.00200	0.100	0.101	101	0.106	106	70-130	5	35	mg/kg	10.04.19 16:48	
Ethylbenzene	<0.00200	0.100	0.107	107	0.114	114	70-130	6	35	mg/kg	10.04.19 16:48	
m,p-Xylenes	<0.00400	0.200	0.209	105	0.226	113	70-130	8	35	mg/kg	10.04.19 16:48	
o-Xylene	<0.00200	0.100	0.108	108	0.116	116	70-130	7	35	mg/kg	10.04.19 16:48	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		100		99		70-130	%	10.04.19 16:48
4-Bromofluorobenzene	99		104		110		70-130	%	10.04.19 16:48

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103528

MB Sample Id: 7687489-1-BLK

Matrix: Solid

LCS Sample Id: 7687489-1-BKS

Prep Method: SW5030B

Date Prep: 10.04.19

LCSD Sample Id: 7687489-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.114	114	0.100	100	70-130	13	35	mg/kg	10.05.19 14:05	
Toluene	<0.00200	0.100	0.106	106	0.0969	97	70-130	9	35	mg/kg	10.05.19 14:05	
Ethylbenzene	<0.00200	0.100	0.112	112	0.103	103	70-130	8	35	mg/kg	10.05.19 14:05	
m,p-Xylenes	<0.00400	0.200	0.219	110	0.205	103	70-130	7	35	mg/kg	10.05.19 14:05	
o-Xylene	<0.00200	0.100	0.114	114	0.107	107	70-130	6	35	mg/kg	10.05.19 14:05	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	96		100		99		70-130	%	10.05.19 14:05
4-Bromofluorobenzene	98		110		112		70-130	%	10.05.19 14:05

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* |(C-E) / (C+E)|
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp, NEDU 922

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103596

MB Sample Id: 7687486-1-BLK

Matrix: Solid

LCS Sample Id: 7687486-1-BKS

Prep Method: SW5030B

Date Prep: 10.04.19

LCSD Sample Id: 7687486-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.105	105	0.105	105	70-130	0	35	mg/kg	10.05.19 03:27	
Toluene	<0.00200	0.100	0.102	102	0.103	103	70-130	1	35	mg/kg	10.05.19 03:27	
Ethylbenzene	<0.00200	0.100	0.110	110	0.112	112	70-130	2	35	mg/kg	10.05.19 03:27	
m,p-Xylenes	<0.00400	0.200	0.217	109	0.223	112	70-130	3	35	mg/kg	10.05.19 03:27	
o-Xylene	<0.00200	0.100	0.112	112	0.117	117	70-130	4	35	mg/kg	10.05.19 03:27	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		96		99		70-130	%	10.05.19 03:27
4-Bromofluorobenzene	99		108		120		70-130	%	10.05.19 03:27

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103594

Parent Sample Id: 638335-023

Matrix: Soil

MS Sample Id: 638335-023 S

Prep Method: SW5030B

Date Prep: 10.02.19

MSD Sample Id: 638335-023 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0992	0.116	117	0.121	122	70-130	4	35	mg/kg	10.04.19 17:28	
Toluene	<0.00198	0.0992	0.112	113	0.115	116	70-130	3	35	mg/kg	10.04.19 17:28	
Ethylbenzene	<0.00198	0.0992	0.121	122	0.124	125	70-130	2	35	mg/kg	10.04.19 17:28	
m,p-Xylenes	<0.00397	0.198	0.205	104	0.214	108	70-130	4	35	mg/kg	10.04.19 17:28	
o-Xylene	<0.00198	0.0992	0.129	130	0.129	130	70-130	0	35	mg/kg	10.04.19 17:28	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	104		103		70-130	%	10.04.19 17:28
4-Bromofluorobenzene	124		112		70-130	%	10.04.19 17:28

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103528

Parent Sample Id: 638428-032

Matrix: Soil

MS Sample Id: 638428-032 S

Prep Method: SW5030B

Date Prep: 10.04.19

MSD Sample Id: 638428-032 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.0555	56	0.0497	50	70-130	11	35	mg/kg	10.05.19 14:46	X
Toluene	<0.00200	0.0998	0.0586	59	0.0536	54	70-130	9	35	mg/kg	10.05.19 14:46	X
Ethylbenzene	<0.00200	0.0998	0.0648	65	0.0605	61	70-130	7	35	mg/kg	10.05.19 14:46	X
m,p-Xylenes	<0.00399	0.200	0.124	62	0.116	58	70-130	7	35	mg/kg	10.05.19 14:46	X
o-Xylene	<0.00200	0.0998	0.0582	58	0.0532	53	70-130	9	35	mg/kg	10.05.19 14:46	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	100		100		70-130	%	10.05.19 14:46
4-Bromofluorobenzene	117		116		70-130	%	10.05.19 14:46

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200 * |(C-E) / (C+E)|
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp, NEDU 922

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103596

Parent Sample Id: 638428-012

Matrix: Soil

MS Sample Id: 638428-012 S

Prep Method: SW5030B

Date Prep: 10.04.19

MSD Sample Id: 638428-012 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.100	0.0482	48	0.0514	52	70-130	6	35	mg/kg	10.05.19 04:07	X
Toluene	<0.00201	0.100	0.0567	57	0.0535	54	70-130	6	35	mg/kg	10.05.19 04:07	X
Ethylbenzene	<0.00201	0.100	0.0620	62	0.0595	60	70-130	4	35	mg/kg	10.05.19 04:07	X
m,p-Xylenes	<0.00402	0.201	0.122	61	0.114	57	70-130	7	35	mg/kg	10.05.19 04:07	X
o-Xylene	<0.00201	0.100	0.0579	58	0.0528	53	70-130	9	35	mg/kg	10.05.19 04:07	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	98		100		70-130	%	10.05.19 04:07
4-Bromofluorobenzene	123		113		70-130	%	10.05.19 04:07

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

Varson & Associates, Inc.
Environmental Consultants
Rachel Owen /

507 N. Marlenfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 9/30/2019 PAGE 1 OF 3
PO#: 1038428
PROJECT LOCATION OR NAME: Apache Corp, NEDU 922
LAB WORK ORDER#: LA PROJECT # 19-0112-22
COLLECTOR: RN/EC

CHAIN-OF-CUSTODY

NO 0737

Data Reported to: Larry.baker@apachecorp.com		TRRP report? ☐ Yes ☒ No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		TIME ZONE: Time zone/State: MST		
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESERVED
SP-3 (5')		9/23/19	8:48	S	1					
SP-3 (10')			8:51							
SP-3 (15')			8:53							
SP-3 (20')			8:56							
SP-3 (25')			9:06							
SP-4 (5')			9:38							
SP-4 (10')			9:41							
SP-4 (15')			9:44							
SP-4 (20')			9:47							
SP-4 (25')			9:52							
SP-2 (5')			10:19							
SP-2 (10')			10:22							
SP-2 (15')			10:25							
SP-2 (20')			10:27							
SP-2 (25')			10:32							
TOTAL	15									

ANALYSES
 BTEX: MTBE ☐ TPH 1005 ☐ TPH 1006 ☐
 TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐
 GASOLINE MOD 8015 ☐ DIESEL - MOD 8015 ☐
 OIL - MOD 8015 ☐ VOC 8280 ☐ SVOC 8270 ☐
 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ HOLDPAH ☐
 8082 PCBs ☐ TBLP - METALS (RCRA) ☐ TCLP VOC ☐
 TCLP - METALS (RCRA) ☐ TCLP VOC ☐ Semi-VOC ☐
 TOTAL METALS (RCRA) ☐ OTHER LIST ☐ LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐
 TOX ☐ FLASHPOINT ☐ TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐
 PH ☐ HEXAVALENT CHROMIUM ☐ PCHLORATE ☐ EXPLOSIVES ☐ ANIONS ☐ ALKALINITY ☐
 CHLORIDES ☐ ANIONS ☐ ALKALINITY ☐
 FIELD NOTES

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	TURN AROUND TIME	LABORATORY USE ONLY
<u>Chadwick</u>	<u>9/30/19 10:00</u>	<u>gbl</u>	NORMAL ☒ 1 DAY ☐ 2 DAY ☐ OTHER ☐	RECEIVING TEMP: <u>26</u> THERM#: <u>26</u> CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED ☐ CARRIER BILL # <u> </u> ☐ HAND DELIVERED
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)		
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)		
LABORATORY: <u>X EYCO</u>				

Aarson &
associates, Inc.
Environmental Consulting

Midland, TX 79701

Environmental Consultants

Rachel Owen /

432-687-0901

Data Reported to:

larry.baker@apache.org

DATE: 9/30/2016
PO#: _____
PROJECT LOCATION _____
LAI PROJECT #: 19-

PO#

PROJECT LOCATION OR NAME

LA PROJECT #: 19-0112-22

COLLECTOR: RN/EC

LAB WORK ORDER#:

PAGE 2 OF 3

Final 1.000

0730



Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 09/30/2019 10:00:00 AM

Work Order #: 638428

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	.4
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Date: 09/30/2019

Checklist reviewed by:

Holly Taylor

Date: 09/30/2019

NEDU #928



Certificate of Analysis Summary 638334

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 928



Project Id: 19-0112-22
Contact: Mark Larson
Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm
Report Date: 08-OCT-19
Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638334-001	638334-002	638334-003	638334-004	638334-005	638334-006
	<i>Field Id:</i>	SP-2 (25')	SP-2 (30')	SP-2 (35')	SP-2 (40')	SP-4(5')	SP-4 (10')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-23-19 11:03	Sep-23-19 11:31	Sep-23-19 11:59	Sep-23-19 12:05	Sep-23-19 12:33	Sep-23-19 12:46
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00
	<i>Analyzed:</i>	Oct-03-19 18:58	Oct-03-19 19:18	Oct-03-19 19:39	Oct-03-19 19:59	Oct-03-19 20:19	Oct-03-19 20:39
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
Toluene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
m,p-Xylenes		<0.00398 0.00398	<0.00399 0.00399	<0.00397 0.00397	<0.00398 0.00398	<0.00402 0.00402	<0.00397 0.00397
o-Xylene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
Total BTEX		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00198 0.00198
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Sep-30-19 14:30	Sep-30-19 14:36	Sep-30-19 14:43	Sep-30-19 15:02	Sep-30-19 15:22	Sep-30-19 15:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		9440 50.4	6940 49.6	573 5.00	349 5.02	345 4.96	1020 5.00
TPH by SW8015 Mod	<i>Extracted:</i>	** ** *	** ** *	** ** *	** ** *	** ** *	** ** *
	<i>Analyzed:</i>	Oct-05-19 03:41	Oct-05-19 04:02	Oct-05-19 04:23	Oct-05-19 04:44	Oct-05-19 05:05	Oct-05-19 05:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0
Total TPH		<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.9 49.9	<50.0 50.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638334

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 928



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638334-007	638334-008	638334-009	638334-010	638334-011	638334-012
	<i>Field Id:</i>	SP-4 (15')	SP-4 (20')	SP-5 (5')	SP-5 (10')	SP-5 (15')	SP-5 (20')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-23-19 12:50	Sep-23-19 13:04	Sep-23-19 13:32	Sep-23-19 13:37	Sep-23-19 13:40	Sep-23-19 13:43
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00
	<i>Analyzed:</i>	Oct-03-19 20:59	Oct-03-19 21:19	Oct-03-19 21:39	Oct-03-19 21:59	Oct-03-19 23:18	Oct-03-19 23:38
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
Toluene		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
Ethylbenzene		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
m,p-Xylenes		<0.00399 0.00399	<0.00399 0.00399	<0.00398 0.00398	<0.00400 0.00400	<0.00403 0.00403	<0.00402 0.00402
o-Xylene		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
Total Xylenes		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
Total BTEX		<0.00200 0.00200	<0.00200 0.00200	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00201 0.00201
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Sep-30-19 15:34	Sep-30-19 15:41	Sep-30-19 15:47	Sep-30-19 15:54	Sep-30-19 16:13	Sep-30-19 16:20
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		5320 25.0	6810 50.2	176 4.98	248 5.05	726 4.96	601 5.04
TPH by SW8015 Mod	<i>Extracted:</i>	** ** *	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00	Oct-04-19 16:00
	<i>Analyzed:</i>	Oct-05-19 05:47	Oct-04-19 22:06	Oct-04-19 23:09	Oct-04-19 23:30	Oct-04-19 23:51	Oct-05-19 00:12
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.8 49.8
Diesel Range Organics (DRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.8 49.8
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<49.8 49.8	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.8 49.8
Total TPH		<49.9 49.9	<49.8 49.8	<49.9 49.9	<49.9 49.9	<50.0 50.0	<49.8 49.8

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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Version: 1.9%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638334

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 928



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638334-013	638334-014	638334-015	638334-016	638334-017	638334-018
	<i>Field Id:</i>	SP-3 (5')	SP-3 (10')	SP-3 (15')	SP-3 (20')	SP-6 (5')	SP-6 (10')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-23-19 13:50	Sep-23-19 13:54	Sep-23-19 13:52	Sep-23-19 13:55	Sep-23-19 14:47	Sep-23-19 14:50
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 12:00
	<i>Analyzed:</i>	Oct-03-19 23:58	Oct-04-19 00:18	Oct-04-19 00:38	Oct-04-19 00:58	Oct-04-19 01:18	Oct-04-19 01:38
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
Toluene		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
Ethylbenzene		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
m,p-Xylenes		<0.00398 0.00398	<0.00398 0.00398	<0.00398 0.00398	<0.00404 0.00404	<0.00398 0.00398	<0.00398 0.00398
o-Xylene		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
Total Xylenes		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
Total BTEX		<0.00199 0.00199	<0.00199 0.00199	<0.00199 0.00199	<0.00202 0.00202	<0.00199 0.00199	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00	Sep-30-19 11:00
	<i>Analyzed:</i>	Sep-30-19 16:39	Sep-30-19 16:45	Sep-30-19 16:52	Sep-30-19 16:58	Sep-30-19 17:05	Sep-30-19 17:11
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		45.1 4.97	1940 25.2	757 49.9	1420 25.0	94.4 5.00	149 5.00
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 16:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00
	<i>Analyzed:</i>	Oct-05-19 00:33	Oct-02-19 14:06	Oct-02-19 14:27	Oct-02-19 14:48	Oct-02-19 15:10	Oct-02-19 15:31
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0
Diesel Range Organics (DRO)		<50.0 50.0	<50.0 50.0	122 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0	<50.0 50.0	<49.9 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0
Total TPH		<50.0 50.0	<50.0 50.0	122 49.9	<50.0 50.0	<49.8 49.8	<50.0 50.0

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638334

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 928



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 08-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638334-019	638334-020	638334-021	638334-022	638334-023	638334-024
	<i>Field Id:</i>	SP-6 (15')	SP-6 (20')	SP-8 (5')	SP-8 (10')	SP-8 (15')	SP-8(20')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-23-19 14:55	Sep-23-19 14:58	Sep-24-19 08:00	Sep-24-19 09:00	Sep-24-19 09:05	Sep-24-19 09:10
BTEX by EPA 8021B	<i>Extracted:</i>	Sep-30-19 12:00	Sep-30-19 12:00	Sep-30-19 11:45	Sep-30-19 11:45	Sep-30-19 11:45	Sep-30-19 11:45
	<i>Analyzed:</i>	Oct-04-19 01:59	Oct-04-19 02:19	Oct-02-19 08:35	Oct-02-19 08:56	Oct-02-19 09:16	Oct-02-19 09:36
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Toluene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Ethylbenzene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
m,p-Xylenes		<0.00398 0.00398	<0.00397 0.00397	<0.00398 0.00398	<0.00403 0.00403	<0.00397 0.00397	<0.00398 0.00398
o-Xylene		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Total Xylenes		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Total BTEX		<0.00199 0.00199	<0.00198 0.00198	<0.00199 0.00199	<0.00202 0.00202	<0.00198 0.00198	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:00	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25	Sep-30-19 11:25
	<i>Analyzed:</i>	Sep-30-19 17:18	Sep-30-19 17:56	Sep-30-19 18:16	Sep-30-19 18:22	Sep-30-19 18:29	Sep-30-19 18:35
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		394 5.02	224 5.01	1570 25.0	955 5.02	398 5.05	260 4.96
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00	Oct-01-19 17:00
	<i>Analyzed:</i>	Oct-02-19 16:14	Oct-02-19 16:35	Oct-02-19 16:56	Oct-02-19 17:18	Oct-02-19 17:39	Oct-02-19 18:00
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Diesel Range Organics (DRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Total TPH		<49.9 49.9	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0

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Jessica Kramer

Jessica Kramer
Project Assistant

Analytical Report 638334

for
Larson and Associates, Inc.

Project Manager: Mark Larson

Apache Corp. NEDU 928

19-0112-22

08-OCT-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)



08-OCT-19

Project Manager: **Mark Larson**

Larson and Associates, Inc.

P. O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **638334**

Apache Corp. NEDU 928

Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 638334. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 638334 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'.

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 638334

Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-2 (25')	S	09-23-19 11:03		638334-001
SP-2 (30')	S	09-23-19 11:31		638334-002
SP-2 (35')	S	09-23-19 11:59		638334-003
SP-2 (40')	S	09-23-19 12:05		638334-004
SP-4(5')	S	09-23-19 12:33		638334-005
SP-4 (10')	S	09-23-19 12:46		638334-006
SP-4 (15')	S	09-23-19 12:50		638334-007
SP-4 (20')	S	09-23-19 13:04		638334-008
SP-5 (5')	S	09-23-19 13:32		638334-009
SP-5 (10')	S	09-23-19 13:37		638334-010
SP-5 (15')	S	09-23-19 13:40		638334-011
SP-5 (20')	S	09-23-19 13:43		638334-012
SP-3 (5')	S	09-23-19 13:50		638334-013
SP-3 (10')	S	09-23-19 13:54		638334-014
SP-3 (15')	S	09-23-19 13:52		638334-015
SP-3 (20')	S	09-23-19 13:55		638334-016
SP-6 (5')	S	09-23-19 14:47		638334-017
SP-6 (10')	S	09-23-19 14:50		638334-018
SP-6 (15')	S	09-23-19 14:55		638334-019
SP-6 (20')	S	09-23-19 14:58		638334-020
SP-8 (5')	S	09-24-19 08:00		638334-021
SP-8 (10')	S	09-24-19 09:00		638334-022
SP-8 (15')	S	09-24-19 09:05		638334-023
SP-8(20')	S	09-24-19 09:10		638334-024

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 928**Project ID: 19-0112-22
Work Order Number(s): 638334Report Date: 08-OCT-19
Date Received: 09/27/2019**Sample receipt non conformance and comments:**

None

Sample receipt non conformance and comments per sample:

None

Analytical non conformance and comments:

Batch: LBA-3103109 BTEX by EPA 8021B

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected.

Samples affected are: 638414-001 S, 638414-001 SD.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3103183 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638225-042 SD.

Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687303-1-BLK, 638334-016.

Batch: LBA-3103305 BTEX by EPA 8021B

Benzene, Ethylbenzene, Toluene, o-Xylene Relative Percent Difference (RPD) between matrix spike and duplicate were above quality control limits.

Samples in the analytical batch are: 638334-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020

Lab Sample ID 638334-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638334-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020.

The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 928**Project ID: 19-0112-22
Work Order Number(s): 638334Report Date: 08-OCT-19
Date Received: 09/27/2019

Batch: LBA-3103523 TPH by SW8015 Mod

Gasoline Range Hydrocarbons (GRO) recovered above QC limits Analyte was not detected in any of the associated samples and therefore the data was accepted. Diesel Range Organics (DRO) recovered above QC limits in the Blank Spike and Duplicate. Analyte was not detected in any of the associated samples and therefore the data was accepted. Samples in the analytical batch are: 638334-008, -009, -010, -011, -012, -013. The MS/MSD shows recovery for the batch.

Surrogate 1-Chlorooctane, Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7687566-1-BKS, 7687566-1-BSD.

Batch: LBA-3103538 TPH by SW8015 Mod

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638334-001, 638334-002, 638334-003, 638334-004, 638334-005, 638334-006, 638334-007.

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638334-002, 638334-003, 638334-004, 638334-005, 638334-006, 638334-007.



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-2 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-001

Date Collected: 09.23.19 11.03

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9440	50.4	mg/kg	09.30.19 14.30		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 03.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 03.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 03.41	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 03.41	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	149	%	70-135	10.05.19 03.41	**	
o-Terphenyl	84-15-1	135	%	70-135	10.05.19 03.41		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-2 (25')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-001

Date Collected: 09.23.19 11.03

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 18.58	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 18.58	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.03.19 18.58		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.03.19 18.58		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-002

Date Collected: 09.23.19 11.31

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6940	49.6	mg/kg	09.30.19 14.36		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 04.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 04.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 04.02	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 04.02	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	153	%	70-135	10.05.19 04.02	**	
o-Terphenyl	84-15-1	139	%	70-135	10.05.19 04.02	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-2 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-002

Date Collected: 09.23.19 11.31

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.03.19 19.18	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.03.19 19.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.03.19 19.18		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.03.19 19.18		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-2 (35')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-003

Date Collected: 09.23.19 11.59

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	573	5.00	mg/kg	09.30.19 14.43		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 04.23	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 04.23	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 04.23	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 04.23	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	159	%	70-135	10.05.19 04.23	**	
o-Terphenyl	84-15-1	144	%	70-135	10.05.19 04.23	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-2 (35')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-003

Date Collected: 09.23.19 11.59

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.03.19 19.39	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.03.19 19.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.03.19 19.39		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 19.39		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-004

Date Collected: 09.23.19 12.05

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	349	5.02	mg/kg	09.30.19 15.02		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 04.44	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	157	%	70-135	10.05.19 04.44	**	
o-Terphenyl	84-15-1	143	%	70-135	10.05.19 04.44	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-2 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-004

Date Collected: 09.23.19 12.05

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 19.59	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 19.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.03.19 19.59		
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.03.19 19.59		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4(5')**
Lab Sample Id: 638334-005

Matrix: Soil
Date Collected: 09.23.19 12.33

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	345	4.96	mg/kg	09.30.19 15.22		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 05.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	150	%	70-135	10.05.19 05.05	**	
o-Terphenyl	84-15-1	138	%	70-135	10.05.19 05.05	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4(5')**
Lab Sample Id: 638334-005

Matrix: Soil
Date Collected: 09.23.19 12.33

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.03.19 20.19	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.03.19 20.19	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.03.19 20.19		
4-Bromofluorobenzene	460-00-4	108	%	70-130	10.03.19 20.19		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-006

Date Collected: 09.23.19 12.46

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1020	5.00	mg/kg	09.30.19 15.28		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 05.26	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 05.26	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 05.26	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 05.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	168	%	70-135	10.05.19 05.26	**	
o-Terphenyl	84-15-1	151	%	70-135	10.05.19 05.26	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-006

Date Collected: 09.23.19 12.46

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.03.19 20.39	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.03.19 20.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.03.19 20.39		
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.03.19 20.39		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-007

Date Collected: 09.23.19 12.50

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5320	25.0	mg/kg	09.30.19 15.34		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 09.27.19 12.00

Basis: Wet Weight

Seq Number: 3103538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 05.47	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 05.47	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 05.47	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 05.47	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	160	%	70-135	10.05.19 05.47	**	
o-Terphenyl	84-15-1	144	%	70-135	10.05.19 05.47	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-007

Date Collected: 09.23.19 12.50

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.03.19 20.59	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.03.19 20.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.03.19 20.59		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 20.59		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-008

Date Collected: 09.23.19 13.04

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6810	50.2	mg/kg	09.30.19 15.41		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.04.19 22.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.04.19 22.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.04.19 22.06	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.04.19 22.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 22.06		
o-Terphenyl	84-15-1	123	%	70-135	10.04.19 22.06		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-4 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-008

Date Collected: 09.23.19 13.04

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.03.19 21.19	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.03.19 21.19	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.03.19 21.19		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 21.19		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-5 (5')
Lab Sample Id: 638334-009

Matrix: Soil
Date Collected: 09.23.19 13.32

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	176	4.98	mg/kg	09.30.19 15.47		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 23.09	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 23.09	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 23.09	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 23.09	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 23.09		
o-Terphenyl	84-15-1	120	%	70-135	10.04.19 23.09		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-5 (5')**
Lab Sample Id: 638334-009

Matrix: Soil
Date Collected: 09.23.19 13.32

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 21.39	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 21.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.03.19 21.39		
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.03.19 21.39		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-010

Date Collected: 09.23.19 13.37

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	248	5.05	mg/kg	09.30.19 15.54		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.04.19 23.30	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.04.19 23.30	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.04.19 23.30	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.04.19 23.30	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	110	%	70-135	10.04.19 23.30		
o-Terphenyl	84-15-1	120	%	70-135	10.04.19 23.30		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-010

Date Collected: 09.23.19 13.37

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.03.19 21.59	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.03.19 21.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.03.19 21.59		
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.03.19 21.59		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-5 (15')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-011

Date Collected: 09.23.19 13.40

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	726	4.96	mg/kg	09.30.19 16.13		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.04.19 23.51	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.04.19 23.51	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.04.19 23.51	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.04.19 23.51	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.04.19 23.51		
o-Terphenyl	84-15-1	123	%	70-135	10.04.19 23.51		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-5 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-011

Date Collected: 09.23.19 13.40

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.03.19 23.18	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.03.19 23.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.03.19 23.18		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.03.19 23.18		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: SP-5 (20')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-012

Date Collected: 09.23.19 13.43

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	601	5.04	mg/kg	09.30.19 16.20		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.05.19 00.12	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.05.19 00.12	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.05.19 00.12	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.05.19 00.12	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	111	%	70-135	10.05.19 00.12		
o-Terphenyl	84-15-1	122	%	70-135	10.05.19 00.12		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-5 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-012

Date Collected: 09.23.19 13.43

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.03.19 23.38	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.03.19 23.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.03.19 23.38		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.03.19 23.38		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (5')**
Lab Sample Id: 638334-013

Matrix: Soil
Date Collected: 09.23.19 13.50

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	45.1	4.97	mg/kg	09.30.19 16.39		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 16.00

Basis: Wet Weight

Seq Number: 3103523

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 00.33	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 00.33	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 00.33	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 00.33	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.05.19 00.33		
o-Terphenyl	84-15-1	124	%	70-135	10.05.19 00.33		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (5')**
Lab Sample Id: 638334-013

Matrix: Soil
Date Collected: 09.23.19 13.50

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.03.19 23.58	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.03.19 23.58	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.03.19 23.58		
4-Bromofluorobenzene	460-00-4	120	%	70-130	10.03.19 23.58		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-014

Date Collected: 09.23.19 13.54

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1940	25.2	mg/kg	09.30.19 16.45		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 14.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 14.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 14.06	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 14.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	123	%	70-135	10.02.19 14.06		
o-Terphenyl	84-15-1	132	%	70-135	10.02.19 14.06		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-014

Date Collected: 09.23.19 13.54

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 00.18	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 00.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 00.18		
4-Bromofluorobenzene	460-00-4	110	%	70-130	10.04.19 00.18		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-015

Date Collected: 09.23.19 13.52

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	757	49.9	mg/kg	09.30.19 16.52		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 14.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	122	49.9	mg/kg	10.02.19 14.27		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 14.27	U	1
Total TPH	PHC635	122	49.9	mg/kg	10.02.19 14.27		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	126	%	70-135	10.02.19 14.27	
o-Terphenyl	84-15-1	134	%	70-135	10.02.19 14.27	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-015

Date Collected: 09.23.19 13.52

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 00.38	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 00.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.04.19 00.38		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 00.38		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-016

Date Collected: 09.23.19 13.55

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1420	25.0	mg/kg	09.30.19 16.58		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 14.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 14.48	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 14.48	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 14.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	127	%	70-135	10.02.19 14.48		
o-Terphenyl	84-15-1	137	%	70-135	10.02.19 14.48	**	



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-3 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-016

Date Collected: 09.23.19 13.55

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.04.19 00.58	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.04.19 00.58	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.04.19 00.58		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.04.19 00.58		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (5')**
Lab Sample Id: 638334-017

Matrix: Soil
Date Collected: 09.23.19 14.47

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	94.4	5.00	mg/kg	09.30.19 17.05		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 15.10	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 15.10	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 15.10	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 15.10	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.02.19 15.10		
o-Terphenyl	84-15-1	127	%	70-135	10.02.19 15.10		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (5')**
Lab Sample Id: 638334-017

Matrix: Soil
Date Collected: 09.23.19 14.47

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 01.18	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 01.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 01.18		
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.04.19 01.18		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-018

Date Collected: 09.23.19 14.50

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	149	5.00	mg/kg	09.30.19 17.11		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 15.31	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 15.31	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 15.31	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 15.31	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	123	%	70-135	10.02.19 15.31		
o-Terphenyl	84-15-1	133	%	70-135	10.02.19 15.31		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-018

Date Collected: 09.23.19 14.50

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 01.38	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 01.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 01.38		
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.04.19 01.38		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-019

Date Collected: 09.23.19 14.55

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 09.30.19 11.00

Basis: Wet Weight

Seq Number: 3102924

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	394	5.02	mg/kg	09.30.19 17.18		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 16.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 16.14	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 16.14	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 16.14	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	124	%	70-135	10.02.19 16.14		
o-Terphenyl	84-15-1	134	%	70-135	10.02.19 16.14		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-019

Date Collected: 09.23.19 14.55

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.04.19 01.59	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.04.19 01.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.04.19 01.59		
1,4-Difluorobenzene	540-36-3	94	%	70-130	10.04.19 01.59		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-020

Date Collected: 09.23.19 14.58

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	224	5.01	mg/kg	09.30.19 17.56		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 16.35	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 16.35	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 16.35	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 16.35	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	124	%	70-135	10.02.19 16.35		
o-Terphenyl	84-15-1	134	%	70-135	10.02.19 16.35		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-6 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-020

Date Collected: 09.23.19 14.58

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 12.00

Basis: Wet Weight

Seq Number: 3103305

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.04.19 02.19	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.04.19 02.19	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	116	%	70-130	10.04.19 02.19		
1,4-Difluorobenzene	540-36-3	95	%	70-130	10.04.19 02.19		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (5)**
Lab Sample Id: 638334-021

Matrix: Soil
Date Collected: 09.24.19 08.00

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1570	25.0	mg/kg	09.30.19 18.16		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 16.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 16.56	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 16.56	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 16.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	122	%	70-135	10.02.19 16.56		
o-Terphenyl	84-15-1	131	%	70-135	10.02.19 16.56		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (5)**
Lab Sample Id: 638334-021

Matrix: Soil
Date Collected: 09.24.19 08.00

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 11.45

Basis: Wet Weight

Seq Number: 3103109

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 08.35	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 08.35	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	107	%	70-130	10.02.19 08.35		
4-Bromofluorobenzene	460-00-4	109	%	70-130	10.02.19 08.35		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-022

Date Collected: 09.24.19 09.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	955	5.02	mg/kg	09.30.19 18.22		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.02.19 17.18	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.02.19 17.18	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.02.19 17.18	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.02.19 17.18	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	122	%	70-135	10.02.19 17.18		
o-Terphenyl	84-15-1	133	%	70-135	10.02.19 17.18		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-022

Date Collected: 09.24.19 09.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 11.45

Basis: Wet Weight

Seq Number: 3103109

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.02.19 08.56	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.02.19 08.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.02.19 08.56		
4-Bromofluorobenzene	460-00-4	98	%	70-130	10.02.19 08.56		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-023

Date Collected: 09.24.19 09.05

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	398	5.05	mg/kg	09.30.19 18.29		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.02.19 17.39	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.02.19 17.39	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.02.19 17.39	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.02.19 17.39	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	115	%	70-135	10.02.19 17.39		
o-Terphenyl	84-15-1	127	%	70-135	10.02.19 17.39		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638334-023

Date Collected: 09.24.19 09.05

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 11.45

Basis: Wet Weight

Seq Number: 3103109

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 09.16	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 09.16	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	104	%	70-130	10.02.19 09.16		
4-Bromofluorobenzene	460-00-4	104	%	70-130	10.02.19 09.16		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8(20')**
Lab Sample Id: 638334-024

Matrix: Soil
Date Collected: 09.24.19 09.10

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.25

Basis: Wet Weight

Seq Number: 3102927

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	260	4.96	mg/kg	09.30.19 18.35		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: DVM

Date Prep: 10.01.19 17.00

Basis: Wet Weight

Seq Number: 3103183

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.02.19 18.00	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.02.19 18.00	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.02.19 18.00	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.02.19 18.00	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	124	%	70-135	10.02.19 18.00		
o-Terphenyl	84-15-1	134	%	70-135	10.02.19 18.00		



Certificate of Analytical Results 638334



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 928

Sample Id: **SP-8(20')**
Lab Sample Id: 638334-024

Matrix: Soil
Date Collected: 09.24.19 09.10

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 09.30.19 11.45

Basis: Wet Weight

Seq Number: 3103109

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 09.36	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 09.36	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	103	%	70-130	10.02.19 09.36		
1,4-Difluorobenzene	540-36-3	110	%	70-130	10.02.19 09.36		



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Larson and Associates, Inc.
Apache Corp. NEDU 928

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

MB Sample Id: 7687138-1-BLK

Matrix: Solid

LCS Sample Id: 7687138-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687138-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	266	106	267	107	90-110	0	20	mg/kg	09.30.19 13:58	

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

MB Sample Id: 7687139-1-BLK

Matrix: Solid

LCS Sample Id: 7687139-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687139-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	274	110	271	108	90-110	1	20	mg/kg	09.30.19 17:43	

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

Parent Sample Id: 638333-011

Matrix: Soil

MS Sample Id: 638333-011 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638333-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	592	250	861	108	861	108	90-110	0	20	mg/kg	09.30.19 14:17	

Analytical Method: Chloride by EPA 300

Seq Number: 3102924

Parent Sample Id: 638334-010

Matrix: Soil

MS Sample Id: 638334-010 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638334-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	248	253	510	104	512	104	90-110	0	20	mg/kg	09.30.19 16:00	

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

Parent Sample Id: 638334-020

Matrix: Soil

MS Sample Id: 638334-020 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638334-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	224	251	497	109	498	109	90-110	0	20	mg/kg	09.30.19 18:03	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 928

Analytical Method: Chloride by EPA 300

Seq Number: 3102927

Parent Sample Id: 638335-015

Matrix: Soil

MS Sample Id: 638335-015 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-015 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	93.6	251	370	110	367	109	90-110	1	20	mg/kg	09.30.19 19:33	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103183

MB Sample Id: 7687303-1-BLK

Matrix: Solid

LCS Sample Id: 7687303-1-BKS

Prep Method: SW8015P

Date Prep: 10.01.19

LCSD Sample Id: 7687303-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	941	94	1090	109	70-135	15	20	mg/kg	10.02.19 10:55	
Diesel Range Organics (DRO)	<15.0	1000	987	99	1180	118	70-135	18	20	mg/kg	10.02.19 10:55	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	129		103		132		70-135	%	10.02.19 10:55
o-Terphenyl	142	**	105		127		70-135	%	10.02.19 10:55

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

MB Sample Id: 7687566-1-BLK

Matrix: Solid

LCS Sample Id: 7687566-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687566-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1380	138	1150	115	70-135	18	20	mg/kg	10.04.19 21:25	H
Diesel Range Organics (DRO)	<15.0	1000	1670	167	1450	145	70-135	14	20	mg/kg	10.04.19 21:25	H

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	99		176	**	153	**	70-135	%	10.04.19 21:25
o-Terphenyl	110		180	**	158	**	70-135	%	10.04.19 21:25

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103183

Parent Sample Id: 638225-042

Matrix: Soil

MS Sample Id: 638225-042 S

Prep Method: SW8015P

Date Prep: 10.01.19

MSD Sample Id: 638225-042 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1160	116	1120	112	70-135	4	20	mg/kg	10.02.19 11:58	
Diesel Range Organics (DRO)	<15.0	999	1240	124	1190	119	70-135	4	20	mg/kg	10.02.19 11:58	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	129		140	**	70-135	%	10.02.19 11:58
o-Terphenyl	131		128		70-135	%	10.02.19 11:58

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 928

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103523

Parent Sample Id: 638334-008

Matrix: Soil

MS Sample Id: 638334-008 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638334-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	829	83	826	83	70-135	0	20	mg/kg	10.04.19 22:27	
Diesel Range Organics (DRO)	<15.0	997	1010	101	997	100	70-135	1	20	mg/kg	10.04.19 22:27	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	112		110		70-135	%	10.04.19 22:27
o-Terphenyl	119		119		70-135	%	10.04.19 22:27

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103109

MB Sample Id: 7687125-1-BLK

Matrix: Solid

LCS Sample Id: 7687125-1-BKS

Prep Method: SW5030B

Date Prep: 09.30.19

LCSD Sample Id: 7687125-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.106	106	0.101	101	70-130	5	35	mg/kg	10.02.19 10:56	
Toluene	<0.00200	0.100	0.113	113	0.110	110	70-130	3	35	mg/kg	10.02.19 10:56	
Ethylbenzene	<0.00200	0.100	0.105	105	0.0985	99	70-130	6	35	mg/kg	10.02.19 10:56	
m,p-Xylenes	<0.00400	0.200	0.207	104	0.192	96	70-130	8	35	mg/kg	10.02.19 10:56	
o-Xylene	<0.00200	0.100	0.0982	98	0.0987	99	70-130	1	35	mg/kg	10.02.19 10:56	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	94		101		108		70-130	%	10.02.19 10:56
4-Bromofluorobenzene	102		98		103		70-130	%	10.02.19 10:56

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103305

MB Sample Id: 7687126-1-BLK

Matrix: Solid

LCS Sample Id: 7687126-1-BKS

Prep Method: SW5030B

Date Prep: 09.30.19

LCSD Sample Id: 7687126-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.110	110	0.118	118	70-130	7	35	mg/kg	10.03.19 16:59	
Toluene	<0.00200	0.100	0.102	102	0.110	110	70-130	8	35	mg/kg	10.03.19 16:59	
Ethylbenzene	<0.00200	0.100	0.109	109	0.117	117	70-130	7	35	mg/kg	10.03.19 16:59	
m,p-Xylenes	<0.00400	0.200	0.214	107	0.229	115	70-130	7	35	mg/kg	10.03.19 16:59	
o-Xylene	<0.00200	0.100	0.108	108	0.117	117	70-130	8	35	mg/kg	10.03.19 16:59	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	96		100		101		70-130	%	10.03.19 16:59
4-Bromofluorobenzene	91		101		104		70-130	%	10.03.19 16:59

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 928

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103109

Parent Sample Id: 638414-001

Matrix: Soil

MS Sample Id: 638414-001 S

Prep Method: SW5030B

Date Prep: 09.30.19

MSD Sample Id: 638414-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	0.0115	0.0990	0.0827	72	0.0700	59	70-130	17	35	mg/kg	10.02.19 05:15	X
Toluene	0.786	0.0990	0.691	0	0.588	0	70-130	16	35	mg/kg	10.02.19 05:15	X
Ethylbenzene	0.220	0.0990	0.255	35	0.240	20	70-130	6	35	mg/kg	10.02.19 05:15	X
m,p-Xylenes	1.11	0.198	1.32	106	1.25	70	70-130	5	35	mg/kg	10.02.19 05:15	
o-Xylene	0.416	0.0990	0.483	68	0.482	66	70-130	0	35	mg/kg	10.02.19 05:15	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	115		109		70-130	%	10.02.19 05:15
4-Bromofluorobenzene	453	**	510	**	70-130	%	10.02.19 05:15

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103305

Parent Sample Id: 638334-001

Matrix: Soil

MS Sample Id: 638334-001 S

Prep Method: SW5030B

Date Prep: 09.30.19

MSD Sample Id: 638334-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.00151	2	0.00302	3	70-130	67	35	mg/kg	10.03.19 17:39	XF
Toluene	<0.00200	0.100	0.00167	2	0.00275	3	70-130	49	35	mg/kg	10.03.19 17:39	XF
Ethylbenzene	<0.00200	0.100	0.00179	2	0.00387	4	70-130	73	35	mg/kg	10.03.19 17:39	XF
m,p-Xylenes	<0.00401	0.200	0.00271	1	0.00231	1	70-130	16	35	mg/kg	10.03.19 17:39	X
o-Xylene	<0.00200	0.100	0.00188	2	0.00405	4	70-130	73	35	mg/kg	10.03.19 17:39	XF

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		100		70-130	%	10.03.19 17:39
4-Bromofluorobenzene	107		104		70-130	%	10.03.19 17:39

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

1038334

729

CHAIN-OF-CUSTODY

Nº 0774

Arison & Associates, Inc.
Environmental Consultants
507 N. Marientfield, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: **Bruce Baker (jerry.baker@apachecorp.com)**

DATE: **9/23/2019** PAGE **1** OF **2**
PO#: **729**
LAB WORK ORDER#: **APACHE CORP, NED4928**
PROJECT LOCATION OR NAME: **APACHE CORP, NED4928**
LAI PROJECT #: **19-0112-22** COLLECTOR: **PD/RN**

TRRP report?
☐ Yes ☒ No
TIME ZONE:
Time zone/State:
MST

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR OT=OTHER

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESSERVED	PRESERVATION	ANALYSES	FIELD NOTES
-------------------	-------	------	------	--------	-----------------	-----	------------------	---	-----	--------------	--------------	----------	-------------

SP-2 (25')		9-23-19	11:03	S	1							X	
SP-2 (30')			11:31									X	
SP-2 (35')			11:59									X	
SP-2 (40')			12:05									X	
SP-4 (5')			12:33									X	
SP-4 (10')			12:46									X	
SP-4 (15')			12:50									X	
SP-4 (20')			13:04									X	
SP-5 (5')			13:32									X	
SP-5 (10')			13:37									X	
SP-5 (15')			13:40									X	
SP-5 (20')			13:43									X	
SP-3 (5')			13:50									X	
SP-3 (10')			13:54									X	
SP-3 (15')			13:52									X	
TOTAL			15										

RELINQUISHED BY: (Signature) **Rachel Owen** DATE/TIME **9-23-19 11:30** RECEIVED BY: (Signature) **[Signature]**

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

LABORATORY: **WPCD**

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: **13.1** THERM#: **28**
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # ☐ HAND DELIVERED

Varson & Associates, Inc.
Environmental Consultants

507 N. Marlenfeld, Ste. 200

Midland, TX 79701

432-687-0901

Data Reported to: **Bruce Byker & Rachel Owen**

DATE: **9/27/2019**

PAGE **2** OF **2**

PO#: _____ LAB WORK ORDER#:

PROJECT LOCATION OR NAME: **Apache Corp, NEDM 928**

LAI PROJECT #: **19-0112-22** COLLECTOR: **PO/PA**

CHAIN-OF-CUSTODY

No 0775

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES		FIELD NOTES
SP-3 (20')		9/23/19	13:55	S	1						☒ BTEX ☒ MTBE ☐ TPH 1005 ☐ TPH 1006 ☐		
SP-6 (5')			14:44								☒ GASOLINE MOD 8015 ☒ DIESEL - MOD 8015 ☒ OIL - MOD 8015 ☒ VOC 8260 ☒ SVOC 8270 ☒ PAH 8270 ☒ HOLDPAH ☒ 8081 PESTICIDES ☒ 8151 HERBICIDES ☒ TBLP - PCBs ☒ TCLP - METALS (RCRA) ☒ TCLP VOC ☒ TOTAL METALS (RCRA) ☒ HERB ☒ Semi-VOC ☒ OTHER LIST ☒ LEAD - TOTAL ☒ D.W. 200.8 ☒ TCLP ☒ RCI ☒ TOX ☒ FLASHPOINT ☒ TDS ☒ TSS ☒ % MOISTURE ☒ CYANIDE ☒ pH ☒ HEXAVALENT CHROMIUM ☒ PETCHLORATE ☒ EXPLOSIVES ☒ PECHLORATE ☒ ALKALINITY ☒		
SP-6 (15')			14:50										
SP-6 (15')			14:55										
SP-6 (20')		9/24/19	8:55	S	1						☒ BTEX ☒ MTBE ☐ TPH 1005 ☐ TPH 1006 ☐		
SP-8 (5')			9:00								☒ GASOLINE MOD 8015 ☒ DIESEL - MOD 8015 ☒ OIL - MOD 8015 ☒ VOC 8260 ☒ SVOC 8270 ☒ PAH 8270 ☒ HOLDPAH ☒ 8081 PESTICIDES ☒ 8151 HERBICIDES ☒ TBLP - PCBs ☒ TCLP - METALS (RCRA) ☒ TCLP VOC ☒ TOTAL METALS (RCRA) ☒ HERB ☒ Semi-VOC ☒ OTHER LIST ☒ LEAD - TOTAL ☒ D.W. 200.8 ☒ TCLP ☒ RCI ☒ TOX ☒ FLASHPOINT ☒ TDS ☒ TSS ☒ % MOISTURE ☒ CYANIDE ☒ pH ☒ HEXAVALENT CHROMIUM ☒ PETCHLORATE ☒ EXPLOSIVES ☒ PECHLORATE ☒ ALKALINITY ☒		
SP-8 (15')			9:05										
SP-8 (20')			9:10										
TOTAL													



Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 09/27/2019 01:00:00 PM

Work Order #: 638334

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Date: 09/27/2019

Checklist reviewed by:

Holly Taylor

Date: 09/30/2019

NEDU #929



Certificate of Analysis Summary 638336

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 929

Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 07-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638336-001	638336-002	638336-003	638336-004	638336-005	638336-006
	<i>Field Id:</i>	SP-3 (5')	SP-3 (10')	SP-3 (15')	SP-3 (20')	SP-3 (25')	SP-3 (30')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-24-19 10:55	Sep-24-19 11:00	Sep-24-19 11:05	Sep-24-19 11:10	Sep-24-19 11:15	Sep-24-19 11:20
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15
	<i>Analyzed:</i>	Oct-01-19 20:26	Oct-01-19 20:46	Oct-01-19 21:06	Oct-01-19 21:26	Oct-01-19 21:46	Oct-01-19 22:07
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
Toluene		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
Ethylbenzene		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
m,p-Xylenes		<0.00398 0.00398	<0.00404 0.00404	<0.00399 0.00399	<0.00397 0.00397	<0.00396 0.00396	<0.00398 0.00398
o-Xylene		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
Total Xylenes		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
Total BTEX		<0.00199 0.00199	<0.00202 0.00202	<0.00200 0.00200	<0.00198 0.00198	<0.00198 0.00198	<0.00199 0.00199
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55
	<i>Analyzed:</i>	Sep-30-19 19:25	Sep-30-19 19:30	Sep-30-19 19:36	Sep-30-19 19:42	Sep-30-19 19:48	Sep-30-19 20:11
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		23500 250	20400 250	8020 50.0	9170 50.2	3460 25.0	3590 25.0
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00
	<i>Analyzed:</i>	Oct-05-19 07:32	Oct-05-19 08:35	Oct-05-19 08:56	Oct-05-19 09:17	Oct-05-19 09:38	Oct-05-19 09:59
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8	<50.0 50.0
Diesel Range Organics (DRO)		454 49.9	308 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8	<50.0 50.0
Total TPH		454 49.9	308 50.0	<50.0 50.0	<49.9 49.9	<49.8 49.8	<50.0 50.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638336

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 929



Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 07-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638336-007	638336-008	638336-009	638336-010	638336-011	638336-012
	<i>Field Id:</i>	SP-3 (35')	SP-3 (40')	SP-3 (45')	SP-3 (50')	SP-3 (55')	SP-1 (5')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-24-19 11:25	Sep-24-19 11:30	Sep-24-19 11:35	Sep-24-19 11:40	Sep-24-19 11:45	Sep-24-19 12:55
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15
	<i>Analyzed:</i>	Oct-01-19 22:27	Oct-01-19 23:45	Oct-02-19 00:05	Oct-02-19 00:25	Oct-02-19 00:45	Oct-02-19 01:06
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
Toluene		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
m,p-Xylenes		<0.00398 0.00398	<0.00400 0.00400	<0.00399 0.00399	<0.00397 0.00397	<0.00401 0.00401	<0.00399 0.00399
o-Xylene		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
Total BTEX		<0.00199 0.00199	<0.00200 0.00200	<0.00200 0.00200	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 11:55
	<i>Analyzed:</i>	Sep-30-19 20:17	Sep-30-19 20:34	Sep-30-19 20:40	Sep-30-19 20:46	Sep-30-19 20:52	Sep-30-19 20:58
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		3740 25.0	2040 24.8	1230 4.97	899 4.98	429 4.97	198 5.00
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00
	<i>Analyzed:</i>	Oct-05-19 10:20	Oct-05-19 10:41	Oct-05-19 11:02	Oct-05-19 11:23	Oct-05-19 12:06	Oct-05-19 12:27
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Diesel Range Organics (DRO)		<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0
Total TPH		<50.0 50.0	<50.0 50.0	<49.9 49.9	<49.9 49.9	<49.8 49.8	<50.0 50.0

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Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 638336

Larson and Associates, Inc., Midland, TX

Project Name: Apache Corp. NEDU 929

Project Id: 19-0112-22

Contact: Mark Larson

Project Location:

Date Received in Lab: Fri Sep-27-19 01:00 pm

Report Date: 07-OCT-19

Project Manager: Holly Taylor

<i>Analysis Requested</i>	<i>Lab Id:</i>	638336-013	638336-014	638336-015	638336-016	638336-017	
	<i>Field Id:</i>	SP-1(10')	SP-4 (5')	SP-4 (10')	SP-5 (5')	SP-5 (10')	
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	
	<i>Sampled:</i>	Sep-24-19 13:00	Sep-24-19 14:00	Sep-24-19 14:05	Sep-24-19 14:53	Sep-24-19 00:00	
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	Oct-01-19 14:15	
	<i>Analyzed:</i>	Oct-02-19 01:26	Oct-02-19 01:46	Oct-02-19 02:06	Oct-02-19 02:26	Oct-02-19 02:46	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Benzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
Toluene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
m,p-Xylenes		<0.00398 0.00398	<0.00400 0.00400	<0.00397 0.00397	<0.00402 0.00402	<0.00398 0.00398	
o-Xylene		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
Total BTEX		<0.00199 0.00199	<0.00200 0.00200	<0.00198 0.00198	<0.00201 0.00201	<0.00199 0.00199	
Chloride by EPA 300	<i>Extracted:</i>	Sep-30-19 11:55	Sep-30-19 11:55	Sep-30-19 12:55	Sep-30-19 12:55	Oct-01-19 17:30	
	<i>Analyzed:</i>	Sep-30-19 21:03	Sep-30-19 21:09	Sep-30-19 21:44	Sep-30-19 22:02	Oct-01-19 19:35	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Chloride		63.3 4.97	51.6 5.00	255 5.03	2630 50.0	6030 50.0	
TPH by SW8015 Mod	<i>Extracted:</i>	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	Oct-04-19 17:00	
	<i>Analyzed:</i>	Oct-05-19 12:48	Oct-05-19 13:09	Oct-05-19 13:30	Oct-05-19 13:51	Oct-05-19 14:12	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Gasoline Range Hydrocarbons (GRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	<50.0 50.0	<49.9 49.9	
Diesel Range Organics (DRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	409 50.0	95.8 49.9	
Motor Oil Range Hydrocarbons (MRO)		<50.0 50.0	<49.9 49.9	<50.0 50.0	124 50.0	<49.9 49.9	
Total TPH		<50.0 50.0	<49.9 49.9	<50.0 50.0	533 50.0	95.8 49.9	

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Jessica Kramer
Project Assistant

Analytical Report 638336

for
Larson and Associates, Inc.

Project Manager: Mark Larson

Apache Corp. NEDU 929

19-0112-22

07-OCT-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)



07-OCT-19

Project Manager: **Mark Larson**

Larson and Associates, Inc.

P. O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **638336**

Apache Corp. NEDU 929

Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 638336. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 638336 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'.

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 638336

Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SP-3 (5')	S	09-24-19 10:55		638336-001
SP-3 (10')	S	09-24-19 11:00		638336-002
SP-3 (15')	S	09-24-19 11:05		638336-003
SP-3 (20')	S	09-24-19 11:10		638336-004
SP-3 (25')	S	09-24-19 11:15		638336-005
SP-3 (30')	S	09-24-19 11:20		638336-006
SP-3 (35')	S	09-24-19 11:25		638336-007
SP-3 (40')	S	09-24-19 11:30		638336-008
SP-3 (45')	S	09-24-19 11:35		638336-009
SP-3 (50')	S	09-24-19 11:40		638336-010
SP-3 (55')	S	09-24-19 11:45		638336-011
SP-1 (5')	S	09-24-19 12:55		638336-012
SP-1(10')	S	09-24-19 13:00		638336-013
SP-4 (5')	S	09-24-19 14:00		638336-014
SP-4 (10')	S	09-24-19 14:05		638336-015
SP-5 (5')	S	09-24-19 14:53		638336-016
SP-5 (10')	S	09-24-19 00:00		638336-017

**CASE NARRATIVE****Client Name: Larson and Associates, Inc.****Project Name: Apache Corp. NEDU 929**Project ID: 19-0112-22
Work Order Number(s): 638336Report Date: 07-OCT-19
Date Received: 09/27/2019**Sample receipt non conformances and comments:**

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3103051 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3103530 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638336-001 S, 638336-001 SD, 638336-007, 638336-003, 638336-009, 638336-002.

Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 638336-001 SD.

Lab Sample ID 638336-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).

Diesel Range Organics (DRO) recovered above QC limits in the Matrix Spike and Matrix Spike

Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 638336-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017.

The Laboratory Control Sample for Diesel Range Organics (DRO) is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (5')**
Lab Sample Id: 638336-001

Matrix: Soil
Date Collected: 09.24.19 10.55

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102929

Prep Method: E300P

% Moisture:

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	23500	250	mg/kg	09.30.19 19.25		50

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103530

Prep Method: SW8015P

% Moisture:

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 07.32	U	1
Diesel Range Organics (DRO)	C10C28DRO	454	49.9	mg/kg	10.05.19 07.32		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 07.32	U	1
Total TPH	PHC635	454	49.9	mg/kg	10.05.19 07.32		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	109	%	70-135	10.05.19 07.32		
o-Terphenyl	84-15-1	123	%	70-135	10.05.19 07.32		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (5')**
Lab Sample Id: 638336-001

Matrix: Soil
Date Collected: 09.24.19 10.55

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.01.19 20.26	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.01.19 20.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.01.19 20.26		
4-Bromofluorobenzene	460-00-4	118	%	70-130	10.01.19 20.26		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-002

Date Collected: 09.24.19 11.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	20400	250	mg/kg	09.30.19 19.30		50

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 08.35	U	1
Diesel Range Organics (DRO)	C10C28DRO	308	50.0	mg/kg	10.05.19 08.35		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 08.35	U	1
Total TPH	PHC635	308	50.0	mg/kg	10.05.19 08.35		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	130	%	70-135	10.05.19 08.35	
o-Terphenyl	84-15-1	143	%	70-135	10.05.19 08.35	**



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-002

Date Collected: 09.24.19 11.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.01.19 20.46	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.01.19 20.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.01.19 20.46		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.01.19 20.46		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-003

Date Collected: 09.24.19 11.05

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	8020	50.0	mg/kg	09.30.19 19.36		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 08.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 08.56	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 08.56	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 08.56	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	131	%	70-135	10.05.19 08.56		
o-Terphenyl	84-15-1	138	%	70-135	10.05.19 08.56	**	



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (15')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-003

Date Collected: 09.24.19 11.05

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.01.19 21.06	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.01.19 21.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 21.06		
4-Bromofluorobenzene	460-00-4	108	%	70-130	10.01.19 21.06		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-004

Date Collected: 09.24.19 11.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9170	50.2	mg/kg	09.30.19 19.42		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 09.17	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 09.17	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 09.17	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 09.17	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	124	%	70-135	10.05.19 09.17	
o-Terphenyl	84-15-1	134	%	70-135	10.05.19 09.17	



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (20')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-004

Date Collected: 09.24.19 11.10

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.01.19 21.26	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.01.19 21.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 21.26		
4-Bromofluorobenzene	460-00-4	114	%	70-130	10.01.19 21.26		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-005

Date Collected: 09.24.19 11.15

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3460	25.0	mg/kg	09.30.19 19.48		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.05.19 09.38	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.05.19 09.38	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.05.19 09.38	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.05.19 09.38	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	117	%	70-135	10.05.19 09.38		
o-Terphenyl	84-15-1	124	%	70-135	10.05.19 09.38		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (25')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-005

Date Collected: 09.24.19 11.15

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	10.01.19 21.46	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.01.19 21.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 21.46		
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.01.19 21.46		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: SP-3 (30')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-006

Date Collected: 09.24.19 11.20

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3590	25.0	mg/kg	09.30.19 20.11		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 09.59	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 09.59	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 09.59	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 09.59	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	124	%	70-135	10.05.19 09.59		
o-Terphenyl	84-15-1	133	%	70-135	10.05.19 09.59		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (30')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-006

Date Collected: 09.24.19 11.20

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.01.19 22.07	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.01.19 22.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.01.19 22.07		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 22.07		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (35')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-007

Date Collected: 09.24.19 11.25

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3740	25.0	mg/kg	09.30.19 20.17		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 10.20	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 10.20	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 10.20	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 10.20	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	129	%	70-135	10.05.19 10.20		
o-Terphenyl	84-15-1	136	%	70-135	10.05.19 10.20	**	



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (35')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-007

Date Collected: 09.24.19 11.25

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.01.19 22.27	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.01.19 22.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.01.19 22.27		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.01.19 22.27		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-008

Date Collected: 09.24.19 11.30

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2040	24.8	mg/kg	09.30.19 20.34		5

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 10.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 10.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 10.41	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 10.41	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	123	%	70-135	10.05.19 10.41		
o-Terphenyl	84-15-1	133	%	70-135	10.05.19 10.41		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (40')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-008

Date Collected: 09.24.19 11.30

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.01.19 23.45	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.01.19 23.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.01.19 23.45		
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.01.19 23.45		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (45')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-009

Date Collected: 09.24.19 11.35

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1230	4.97	mg/kg	09.30.19 20.40		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 11.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 11.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 11.02	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 11.02	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	131	%	70-135	10.05.19 11.02		
o-Terphenyl	84-15-1	141	%	70-135	10.05.19 11.02	**	



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (45')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-009

Date Collected: 09.24.19 11.35

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 00.05	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 00.05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	108	%	70-130	10.02.19 00.05		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 00.05		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-010

Date Collected: 09.24.19 11.40

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	899	4.98	mg/kg	09.30.19 20.46		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 11.23	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 11.23	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 11.23	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 11.23	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	116	%	70-135	10.05.19 11.23		
o-Terphenyl	84-15-1	127	%	70-135	10.05.19 11.23		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (50')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-010

Date Collected: 09.24.19 11.40

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 00.25	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 00.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	109	%	70-130	10.02.19 00.25		
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.02.19 00.25		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: SP-3 (55')

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-011

Date Collected: 09.24.19 11.45

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	429	4.97	mg/kg	09.30.19 20.52		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	10.05.19 12.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	10.05.19 12.06	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.05.19 12.06	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.05.19 12.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	120	%	70-135	10.05.19 12.06		
o-Terphenyl	84-15-1	129	%	70-135	10.05.19 12.06		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-3 (55')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-011

Date Collected: 09.24.19 11.45

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	10.02.19 00.45	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 00.45	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	118	%	70-130	10.02.19 00.45		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.02.19 00.45		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-1 (5')**
Lab Sample Id: 638336-012

Matrix: Soil
Date Collected: 09.24.19 12.55

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102929

Prep Method: E300P

% Moisture:

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	198	5.00	mg/kg	09.30.19 20.58		1

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103530

Prep Method: SW8015P

% Moisture:

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 12.27	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 12.27	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 12.27	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 12.27	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	129	%	70-135	10.05.19 12.27		
o-Terphenyl	84-15-1	135	%	70-135	10.05.19 12.27		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-1 (5')**
Lab Sample Id: 638336-012

Matrix: Soil
Date Collected: 09.24.19 12.55

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	10.02.19 01.06	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 01.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 01.06		
4-Bromofluorobenzene	460-00-4	116	%	70-130	10.02.19 01.06		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-1(10')**
Lab Sample Id: 638336-013

Matrix: Soil
Date Collected: 09.24.19 13.00

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	63.3	4.97	mg/kg	09.30.19 21.03		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 12.48	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 12.48	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 12.48	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 12.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	117	%	70-135	10.05.19 12.48		
o-Terphenyl	84-15-1	125	%	70-135	10.05.19 12.48		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-1(10')**
Lab Sample Id: 638336-013

Matrix: Soil
Date Collected: 09.24.19 13.00

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 01.26	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 01.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 01.26		
4-Bromofluorobenzene	460-00-4	122	%	70-130	10.02.19 01.26		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-4 (5')**
Lab Sample Id: 638336-014

Matrix: Soil
Date Collected: 09.24.19 14.00

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 11.55

Basis: Wet Weight

Seq Number: 3102929

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	51.6	5.00	mg/kg	09.30.19 21.09		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 13.09	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.05.19 13.09	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 13.09	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.05.19 13.09	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	120	%	70-135	10.05.19 13.09		
o-Terphenyl	84-15-1	127	%	70-135	10.05.19 13.09		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-4 (5')**
Lab Sample Id: 638336-014

Matrix: Soil
Date Collected: 09.24.19 14.00

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/kg	10.02.19 01.46	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
Total BTEX		<0.00200	0.00200	mg/kg	10.02.19 01.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	123	%	70-130	10.02.19 01.46		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.02.19 01.46		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-015

Date Collected: 09.24.19 14.05

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SPC

% Moisture:

Analyst: SPC

Date Prep: 09.30.19 12.55

Basis: Wet Weight

Seq Number: 3102932

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	255	5.03	mg/kg	09.30.19 21.44		1

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 13.30	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.05.19 13.30	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.05.19 13.30	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.05.19 13.30	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	119	%	70-135	10.05.19 13.30		
o-Terphenyl	84-15-1	130	%	70-135	10.05.19 13.30		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-4 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-015

Date Collected: 09.24.19 14.05

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.02.19 02.06	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.02.19 02.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	120	%	70-130	10.02.19 02.06		
1,4-Difluorobenzene	540-36-3	99	%	70-130	10.02.19 02.06		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-5 (5')**
Lab Sample Id: 638336-016

Matrix: Soil
Date Collected: 09.24.19 14.53

Date Received: 09.27.19 13.00

Analytical Method: Chloride by EPA 300

Tech: SPC

Analyst: SPC

Seq Number: 3102932

Prep Method: E300P

% Moisture:

Date Prep: 09.30.19 12.55

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2630	50.0	mg/kg	09.30.19 22.02		10

Analytical Method: TPH by SW8015 Mod

Tech: DVM

Analyst: ARM

Seq Number: 3103530

Prep Method: SW8015P

% Moisture:

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.05.19 13.51	U	1
Diesel Range Organics (DRO)	C10C28DRO	409	50.0	mg/kg	10.05.19 13.51		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	124	50.0	mg/kg	10.05.19 13.51		1
Total TPH	PHC635	533	50.0	mg/kg	10.05.19 13.51		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	131	%	70-135	10.05.19 13.51		
o-Terphenyl	84-15-1	134	%	70-135	10.05.19 13.51		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-5 (5')**
Lab Sample Id: 638336-016

Matrix: Soil
Date Collected: 09.24.19 14.53

Date Received: 09.27.19 13.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.02.19 02.26	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.02.19 02.26	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.02.19 02.26		
1,4-Difluorobenzene	540-36-3	97	%	70-130	10.02.19 02.26		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-017

Date Collected: 09.24.19 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: SPC

Date Prep: 10.01.19 17.30

Basis: Wet Weight

Seq Number: 3103063

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6030	50.0	mg/kg	10.01.19 19.35		10

Analytical Method: TPH by SW8015 Mod

Prep Method: SW8015P

Tech: DVM

% Moisture:

Analyst: ARM

Date Prep: 10.04.19 17.00

Basis: Wet Weight

Seq Number: 3103530

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.05.19 14.12	U	1
Diesel Range Organics (DRO)	C10C28DRO	95.8	49.9	mg/kg	10.05.19 14.12		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.05.19 14.12	U	1
Total TPH	PHC635	95.8	49.9	mg/kg	10.05.19 14.12		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	123	%	70-135	10.05.19 14.12		
o-Terphenyl	84-15-1	126	%	70-135	10.05.19 14.12		



Certificate of Analytical Results 638336



Larson and Associates, Inc., Midland, TX

Apache Corp. NEDU 929

Sample Id: **SP-5 (10')**

Matrix: Soil

Date Received: 09.27.19 13.00

Lab Sample Id: 638336-017

Date Collected: 09.24.19 00.00

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: KTL

% Moisture:

Analyst: KTL

Date Prep: 10.01.19 14.15

Basis: Wet Weight

Seq Number: 3103051

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.02.19 02.46	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.02.19 02.46	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	122	%	70-130	10.02.19 02.46		
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.02.19 02.46		



Flagging Criteria



- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation



Larson and Associates, Inc.
Apache Corp. NEDU 929

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

MB Sample Id: 7687141-1-BLK

Matrix: Solid

LCS Sample Id: 7687141-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687141-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	245	98	244	98	90-110	0	20	mg/kg	09.30.19 18:21	

Analytical Method: Chloride by EPA 300

Seq Number: 3102932

MB Sample Id: 7687142-1-BLK

Matrix: Solid

LCS Sample Id: 7687142-1-BKS

Prep Method: E300P

Date Prep: 09.30.19

LCSD Sample Id: 7687142-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	245	98	243	97	90-110	1	20	mg/kg	09.30.19 21:33	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

MB Sample Id: 7687206-1-BLK

Matrix: Solid

LCS Sample Id: 7687206-1-BKS

Prep Method: E300P

Date Prep: 10.01.19

LCSD Sample Id: 7687206-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	271	108	269	108	90-110	1	20	mg/kg	10.01.19 18:56	

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

Parent Sample Id: 638335-016

Matrix: Soil

MS Sample Id: 638335-016 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-016 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	11.3	248	261	101	260	100	90-110	0	20	mg/kg	09.30.19 18:38	

Analytical Method: Chloride by EPA 300

Seq Number: 3102929

Parent Sample Id: 638335-020

Matrix: Soil

MS Sample Id: 638335-020 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638335-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	54.1	248	299	99	296	98	90-110	1	20	mg/kg	09.30.19 19:59	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 929

Analytical Method: Chloride by EPA 300

Seq Number: 3102932

Parent Sample Id: 638336-015

Matrix: Soil

MS Sample Id: 638336-015 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638336-015 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	255	252	486	92	493	94	90-110	1	20	mg/kg	09.30.19 21:50	

Analytical Method: Chloride by EPA 300

Seq Number: 3102932

Parent Sample Id: 638351-002

Matrix: Soil

MS Sample Id: 638351-002 S

Prep Method: E300P

Date Prep: 09.30.19

MSD Sample Id: 638351-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	422	251	656	93	654	92	90-110	0	20	mg/kg	09.30.19 23:11	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

Parent Sample Id: 638428-036

Matrix: Soil

MS Sample Id: 638428-036 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638428-036 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	146	252	418	108	418	108	90-110	0	20	mg/kg	10.01.19 19:15	

Analytical Method: Chloride by EPA 300

Seq Number: 3103063

Parent Sample Id: 638458-003

Matrix: Soil

MS Sample Id: 638458-003 S

Prep Method: E300P

Date Prep: 10.01.19

MSD Sample Id: 638458-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	36.8	248	305	108	306	109	90-110	0	20	mg/kg	10.01.19 20:46	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103530

MB Sample Id: 7687568-1-BLK

Matrix: Solid

LCS Sample Id: 7687568-1-BKS

Prep Method: SW8015P

Date Prep: 10.04.19

LCSD Sample Id: 7687568-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	924	92	1030	103	70-135	11	20	mg/kg	10.05.19 06:50	
Diesel Range Organics (DRO)	<15.0	1000	953	95	1080	108	70-135	12	20	mg/kg	10.05.19 06:50	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	106		114		127		70-135	%	10.05.19 06:50
o-Terphenyl	114		104		114		70-135	%	10.05.19 06:50

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 $\text{Log Diff.} = \text{Log}(\text{Sample Duplicate}) - \text{Log}(\text{Original Sample})$

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Larson and Associates, Inc.
Apache Corp. NEDU 929

Analytical Method: TPH by SW8015 Mod

Seq Number: 3103530

Parent Sample Id: 638336-001

Matrix: Soil

MS Sample Id: 638336-001 S

Prep Method: SW8015P

Date Prep: 10.04.19

MSD Sample Id: 638336-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	911	91	1030	103	70-135	12	20	mg/kg	10.05.19 07:53	
Diesel Range Organics (DRO)	454	999	1810	136	2110	166	70-135	15	20	mg/kg	10.05.19 07:53	X

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	127		146	**	70-135	%	10.05.19 07:53
o-Terphenyl	140	**	161	**	70-135	%	10.05.19 07:53

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103051

MB Sample Id: 7687273-1-BLK

Matrix: Solid

LCS Sample Id: 7687273-1-BKS

Prep Method: SW5030B

Date Prep: 10.01.19

LCSD Sample Id: 7687273-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.114	114	0.118	118	70-130	3	35	mg/kg	10.01.19 17:26	
Toluene	<0.00200	0.100	0.104	104	0.109	109	70-130	5	35	mg/kg	10.01.19 17:26	
Ethylbenzene	<0.00200	0.100	0.109	109	0.116	116	70-130	6	35	mg/kg	10.01.19 17:26	
m,p-Xylenes	<0.00400	0.200	0.214	107	0.227	114	70-130	6	35	mg/kg	10.01.19 17:26	
o-Xylene	<0.00200	0.100	0.109	109	0.117	117	70-130	7	35	mg/kg	10.01.19 17:26	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	99		102		103		70-130	%	10.01.19 17:26
4-Bromofluorobenzene	96		103		108		70-130	%	10.01.19 17:26

Analytical Method: BTEX by EPA 8021B

Seq Number: 3103051

Parent Sample Id: 638524-001

Matrix: Soil

MS Sample Id: 638524-001 S

Prep Method: SW5030B

Date Prep: 10.01.19

MSD Sample Id: 638524-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.100	0.0861	86	0.0842	85	70-130	2	35	mg/kg	10.01.19 18:06	
Toluene	<0.00201	0.100	0.0789	79	0.0781	79	70-130	1	35	mg/kg	10.01.19 18:06	
Ethylbenzene	<0.00201	0.100	0.0823	82	0.0821	83	70-130	0	35	mg/kg	10.01.19 18:06	
m,p-Xylenes	<0.00402	0.201	0.159	79	0.159	80	70-130	0	35	mg/kg	10.01.19 18:06	
o-Xylene	<0.00201	0.100	0.0809	81	0.0807	81	70-130	0	35	mg/kg	10.01.19 18:06	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	102		100		70-130	%	10.01.19 18:06
4-Bromofluorobenzene	107		103		70-130	%	10.01.19 18:06

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

Varson & Associates, Inc.
Environmental Consultants
rachelowen@varson.com

507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: amy.baker@opaldatacorp.com

DATE: 9/27/2019

PO#:

LAB WORK ORDER#:

PROJECT LOCATION OR NAME: Apache Corp, NEDU 929

LAI PROJECT #: 19-0112-22

COLLECTOR: RN/EC

PAGE 1 OF 2

CHAIN-OF-CUSTODY

Nº 0776

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES		FIELD NOTES
						HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESERVED	OTHER	
SP-3 (5')		9/24/19	10:55	S	1							
SP-3 (10')			11:00									
SP-3 (15')			11:05									
SP-3 (20')			11:10									
SP-3 (25')			11:15									
SP-3 (30')			11:20									
SP-3 (35')			11:25									
SP-3 (40')			11:30									
SP-3 (45')			11:35									
SP-3 (50')			11:40									
SP-3 (55')			11:45									
SP-1 (5')			12:55									
SP-1 (10')			13:00									
SP-4 (5')			14:00									
SP-4 (10')			14:05									
TOTAL			15									

RELINQUISHED BY: (Signature) Rachel Owen DATE/TIME 9-27-19/13:00

RELINQUISHED BY: (Signature) _____ DATE/TIME _____

RELINQUISHED BY: (Signature) _____ DATE/TIME _____

LABORATORY: Varson

RECEIVED BY: (Signature) [Signature]

RECEIVED BY: (Signature) _____

RECEIVED BY: (Signature) _____

TURN AROUND TIME
NORMAL ☒ 1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 13.11 THERM#: 28

CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED

☐ CARRIER BILL # _____

☐ HAND DELIVERED

Larson & Associates, Inc.
Environmental Consultants

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 9/23/2019 PAGE 2 OF 2
PO#: 186330
PROJECT LOCATION OR NAME: Apache Corp, NEBU 929
LAI PROJECT #: 19-012-22 COLLECTOR: RV/EC

LAB WORK ORDER#:

TRRP report?
☐ Yes ☒ No

S=SOIL
W=WATER
A=AIR
P=PAINT
SL=SLUDGE
OT=OTHER

TIME ZONE:
Time zone/State:

MS-T

Field
Sample I.D.

Lab #

Date

Time

Matrix

of Containers

HCl

HNO₃H₂SO₄ ☐ NaOH ☐

ICE

UNPRESERVED

ANALYSES
BTEX ☒ MTBE ☐
TRPH 418.1 ☐ TPH 1005 ☒ TPH 1006 ☐
GASOLINE MOD 8015 ☒
DIESEL - MOD 8015 ☒
OIL - MOD 8015 ☒
VOC 8260 ☒
SVOC 8270 ☒
8081 PESTICIDES ☐ PAH 8270 ☐ HOLDPAH ☐
8082 PCBS ☐ 8151 HERBICIDES ☐
TCLP - METALS (RCRA) ☐ TCLP VOC ☐
TCLP - PEST ☐ HERB ☐ Semi-VOC ☐
TOTAL METALS (RCRA) ☐ OTHER LIST ☐
LEAD - TOTAL ☐ P.W. 200.8 ☐ TCLP ☐
RCI ☐ TOX ☐ FLASHPOINT ☐
TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐
PH ☐ HEXAVALENT CHROMIUM ☐
EXPLOSIVES ☐ PECHLORATE ☐
CHLORIDES ☐ ANIONS ☐ ALKALINITY ☐
7300

FIELD NOTES

SP-5 (5')
SP-5 (10')

9/24/19 14:33
9/24/19

S

1

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

TOTAL

RELINQUISHED BY: (Signature) Rachelle Owen DATE/TIME 9-23-19/13:00

RECEIVED BY: (Signature) [Signature]

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

LABORATORY: YENCO

TURN AROUND TIME

NORMAL ☒1 DAY ☐2 DAY ☐OTHER ☐

LABORATORY USE ONLY

RECEIVING TEMP: 1311THERM#: DECUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED

CARRIER BILL #

HAND DELIVERED

No 07771

CHAIN-OF-CUSTODY



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 09/27/2019 01:00:00 PM

Work Order #: 638336

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist**Comments**

#1 *Temperature of cooler(s)?	1.1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by:

Brianna Teel

Date: 09/27/2019

Checklist reviewed by:

Holly Taylor

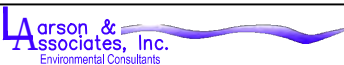
Date: 09/27/2019

Appendix C

Boring Logs

NEDU #829

BORING RECORD																			
GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS	
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY		DEPTH
					2	4	6	8	10	12	14	16	18						
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																1	
	5	Silty Sand with Caliche Clasts, 5YR, 6/3 to 6/4, Poorly Sorted, Light Reddish Brown, Fine Grained Quartz Sand																5	
	10		SM															10	
	15																	15	
	20	Caliche, 5YR, 8/4, Poorly Sorted, Pink, Fine Grained Quartz Sand	Caliche															20	
	25	TD: 25'																25	
	30																	30	
	35																	35	
	40																	40	

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 829 / Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>9-26-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-6</u>		

BORING RECORD																						
GEOLOGIC UNIT	DEPTH	Start: 8:51 Finish: 11:04 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16	18									
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Fine Grained Quartz Sand, Moderately Sorted	SM																			
	5																					
	10																					
	15																					
	20	7.5YR, 7/6, Reddish Yellow, Fine Grained Quartz Sand, Moderately Sorted	Caliche																			
	25																					
	30																					
	35	Caliche, 7.5YR, 8/4, Pink, Poorly Sorted, Fine Grained Quartz Sand	SM																			
	40																					
	45																					
	50	Silty Sand, 7.5YR, 8/6 to 7/6, Reddish Yellow, Fine Grained Quartz Sand, Well Sorted	SM																			
	55																					
	60																					
		5YR, 5/4 to 5/3, Reddish Brown, Fine Grained Quartz Sand, Moderately Sorted																				
		TD: 60'																		60		

	ONE CONTINUOUS AUGER SAMPLER		WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
	UNDISTURBED SAMPLE		PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 829 / Eunice, NM</u>
	WATER TABLE (24 HRS)		NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>

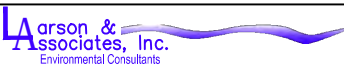
	DRILL DATE :	BORING NUMBER :	DRILLING CONTRACTOR :
	9-26-2019	SP- 1	SDC
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD																				
GEOLOGIC UNIT	DEPTH	Start: 11:15 Finish: 11:43 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY		DEPTH	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 6/3 to 6/4, Light Reddish Brown, Fine Grained Quartz Sand, Poorly Sorted, 2-10mm Clasts Fragments																		
	10	Caliche, 5YR, 8/4, Fine Grained Quartz Sand, Poorly Sorted	Caliche																10	
	15																			15
	20	Silty Sand, 5YR, 6/3 to 6/4, Light Reddish Brown, Poorly Sorted, 2-10mm Clast Fragments, Fine Grained Quartz Sand	SM																20	
	25	TD:20																		25
	30																		30	
	35																		35	

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 829 / Eunice, NM</u>
WATER TABLE (24 HRS)	NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>

	DRILL DATE : <u>9-26-2019</u>	BORING NUMBER : <u>SP-4</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD																				
GEOLOGIC UNIT	DEPTH	Start: 12:00 Finish: 12:28 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING									SAMPLE			REMARKS			
					PPM X <u>1</u>									NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING		
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																		
	5		SM																	
	10	5YR, 6/3 to 6/4, Poorly Sorted, 2-10mm Clasts Fragments, Light Reddish Brown																		
	15	Caliche, 5YR, 8/4, Poorly Sorted, Pink, Fine Grained Quartz Sand	Caliche																	
	20	Silty Sand, 5YR, 6/5 to 6/4, Light Reddish Brown, Poorly Sorted, 2-10mm Clasts Fragments, Fine Grained Quartz Sand	SM																	
	25	TD: 25'																		
	30																			
	35																			
	40																			

 ONE CONTINUOUS AUGER SAMPLER	 WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
 STANDARD PENETRATION TEST	 LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
 UNDISTURBED SAMPLE	 PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 829 / Eunice, NM</u>
 WATER TABLE (24 HRS)	 NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>
		DRILL DATE : <u>9-26-2019</u> BORING NUMBER : <u>SP-5</u>
		DRILLING CONTRACTOR : <u>SDC</u> DRILLING METHOD : <u>Air Rotary</u>

NEDU #830

Larson & Associates, Inc.
Environmental Consultants

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																	5	
	10	TD: 10'																	10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	

☐ ONE CONTINUOUS AUGER SAMPLER

☐ STANDARD PENETRATION TEST

☐ UNDISTURBED SAMPLE

☐ WATER TABLE (24 HRS)

WATER TABLE (TIME OF BORING)

LABORATORY TEST LOCATION

PENETROMETER (TONS/ SQ. FT)

NR NO RECOVERY

JOB NUMBER : Apache Corp. /19-0112-22HOLE DIAMETER : 2"LOCATION : NEDU 830 / Eunice, NMLAI GEOLOGIST : E. ChavezDRILLING CONTRACTOR : SDCDRILLING METHOD : Air Rotary

Larson &
Associates, Inc.
Environmental Consultants

 DRILL DATE :
9-26-2019

 BORING NUMBER :
SP-4

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																	5	
	10	TD: 10'																	10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	

☐ ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 830 / Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>

	DRILL DATE : <u>9-26-2019</u>	BORING NUMBER : <u>SP-5</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																	5	
	10	TD: 10'																	10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	

☐ ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 830 / Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>

	DRILL DATE : <u>9-26-2019</u>	BORING NUMBER : <u>SP-6</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

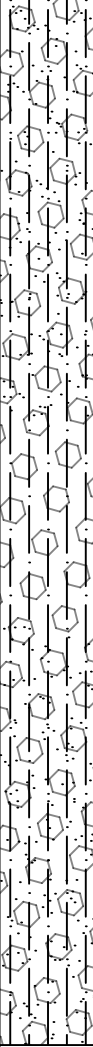
BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																	5	
	10	TD: 10'																	10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	

☐ ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 830 / Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>

 Larson & Associates, Inc. Environmental Consultants	DRILL DATE : 9-26-2019	BORING NUMBER : SP-7	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16	18									
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted with Caliche Clasts	SM																0	SOIL : _____ PPM SOIL : _____ PPM		
	5																				5	
	10	5YR, 6/3 to 6/4, Light Reddish Brown, Fine Grained Quartz Sand, Poorly Sorted			SM																10	
	15																			15		
	20																			20		
	25																			25		
	30																			30		
	35																		35			
	TD: 25'																					

☐ ONE CONTINUOUS AUGER SAMPLER	 WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	 LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	 PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 830 / Eunice, NM</u>
 WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>

	DRILL DATE : <u>9-26-2019</u>	BORING NUMBER : <u>SP-7</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD

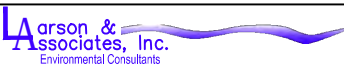
GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS		
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18							
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM
	5	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																	5	
	10	TD: 10'																	10	
	15																		15	
	20																		20	
	25																		25	
	30																		30	
	35																		35	

☐ ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 830 / Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>

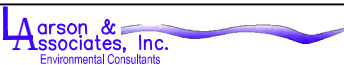
	DRILL DATE : <u>9-26-2019</u>	BORING NUMBER : <u>SP-8</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

NEDU #922

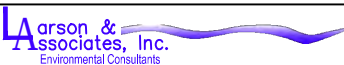
BORING RECORD																			
GEOLOGIC UNIT	DEPTH	Start: 10:15 Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS	
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING
					2	4	6	8	10	12	14	16	18						
	0																		
	5	Silty Sand, 5YR, 5/8, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted																1	
	10																	5	
	15	5YR, 5/4, Reddish Brown, Fine Grained Quartz Sand, Poorly Sorted w/ 1-2 mm Caliche																10	
	20	Clasts 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted w/ 1-2mm Caliche																15	
	25	Clasts Yellowish Red, Fine Grained Quartz Sand, Well Sorted																20	
	30	5YR, 6/4, Yellowish Red, Fine Grained Quartz Sand, Well Sorted																25	
	35																	30	
	40	5YR, 8/3, Pink, Fine Grained Quartz Sand, Poorly Sorted w/ Caliche Fragments																35	
	45																	40	
	50	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted w/ Caliche Fragments																45	
	55	Fine Grained Quartz Sand, Well Sorted																50	
	60																		
	65	TD: 65'																	

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp./19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 922 - Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>9-27-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-2</u>		

BORING RECORD																			
GEOLOGIC UNIT	DEPTH	Start: 8:45 Finish: 9:21 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS	
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING
					2	4	6	8	10	12	14	16	18						
	0	Silty Sand, 5YR, 5/6, Fine Grained Quartz Sand, Well Sorted																1	
	5		SM															5	
	10	5YR, 7/6, Fine Grained Quartz Sand, Poorly Sorted																10	
	15		SM															15	
	20																	20	
	25	TD: 25'																25	
	30																	30	
	35																	35	
	40																	40	

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 922 / Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>9-27-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-3</u>		

BORING RECORD																			
GEOLOGIC UNIT	DEPTH	Start: 9:35 Finish: 10:00 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING									SAMPLE			REMARKS		
					PPM X <u>1</u>									NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18						
	0	Silty Sand, 5YR, 5/6, Fine Grained Quartz Sand, Well Sorted, Yellowish Red																1	
	5		SM															5	
	10	5YR, 5/6, Fine Grained Quartz Sand, Poorly Sorted with Caliche Clast 1-2mm Long (Yellowish Red)																10	
	15	Caliche, 5YR, 8/4, Pink, Fine Grained Quartz Sand, Poorly Sorted	Caliche															15	
	20	TD: 20'																20	
	25																	25	
	30																	30	
	35																	35	
	40																	40	

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 922 / Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>9-27-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-4</u>		

BORING RECORD																		
GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING								SAMPLE		REMARKS			
					PPM X <u>1</u>								NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM	
					2	4	6	8	10	12	14	16						18
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted with Large (1-6mm) Caliche Clasts																
	5																5	
	10	5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted	SM														10	
	15																15	
	20																20	
	25	5YR, 8/6, Pink, Fine Grained Quartz Sand, Poorly Sorted with 1-2mm Caliche Clasts															25	
	30	Caliche, 5YR, 8/6, Pink, Medium Grained Quartz Sand, Poorly Sorted	Caliche														30	
	35	TD: 35'															35	
	40																40	

☐

 ONE CONTINUOUS AUGER SAMPLER

WATER TABLE (TIME OF BORING)

☐

 STANDARD PENETRATION TEST

L

 LABORATORY TEST LOCATION

☐

 UNDISTURBED SAMPLE

+

 PENETROMETER (TONS/ SQ. FT)

WATER TABLE (24 HRS)

NR

 NO RECOVERY

DRILL DATE :
9-27-2019

BORING NUMBER :
SP-5

JOB NUMBER : Apache Corp. /19-0112-22
 HOLE DIAMETER : 2"
 LOCATION : NEDU 922 / Eunice, NM
 LAI GEOLOGIST : E. Chavez
 DRILLING CONTRACTOR : SDC
 DRILLING METHOD : Air Rotary

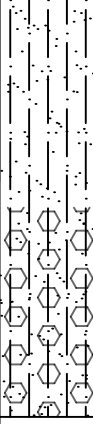
BORING RECORD																						
GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY		DEPTH			
					2	4	6	8	10	12	14	16	18									
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Fine Grained Quartz Sand, Poorly Sorted with Large (1-6mm) Caliche Clasts																	1			
	5																					5
	10																					10
	15																					15
	20																					20
	25	Caliche, 5YR, 8/6, Pink, Coarse Grained, Poorly Sorted	Caliche																25			
	30	5YR, 8/6, Pink, Coarse Grained, Well Sorted																		30		
	35	TD: 35'																		35		
	40																		40			

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 922 / Eunice, NM</u>
WATER TABLE (24 HRS)	NO RECOVERY	LAI GEOLOGIST : <u>E. Chavez</u>

	DRILL DATE : <u>9-27-2019</u>	BORING NUMBER : <u>SP-6</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

NEDU #928

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: Finish: DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16	18									
	0	Silty Sand, 5YR, 5/3 to 5/4, Reddish Brown, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM		
	5	Fine Grained Quartz Sand, Well Sorted, 1-4mm Clasts Subangular																			5	
	10	TD: 10'																			10	
	15																			15		
	20																			20		
	25																			25		
	30																			30		
	35																			35		

☐ ONE CONTINUOUS AUGER SAMPLER

☐ STANDARD PENETRATION TEST

☐ UNDISTURBED SAMPLE

☐ WATER TABLE (24 HRS)

 WATER TABLE (TIME OF BORING)

 LABORATORY TEST LOCATION

 PENETROMETER (TONS/ SQ. FT)

 NR NO RECOVERY
JOB NUMBER : Apache Corp. /19-0112-22HOLE DIAMETER : 2"LOCATION : NEDU 928 / Eunice, NMLAI GEOLOGIST : E. ChavezDRILLING CONTRACTOR : SDCDRILLING METHOD : Air Rotary

DRILL DATE :
9-24-2019BORING NUMBER :
SP-1

BORING RECORD																				
GEOLOGIC UNIT	DEPTH	Start: 10:41 Finish: 12:05 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING								SAMPLE		REMARKS					
					PPM X <u>1</u>								NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16						18		
	0	Silty Sand, 5YR, 4/6, Yellowish Red, Well Sorted	SM																	
	5																			
	10																			
	15																			
	20	Silty Sand with Subangular Clast Inclusions 4mm-20mm in Diameter, 7.5YR, 6/4, Light Brown, Well Sorted	SM																	
	25																			
	30																			
	35																			
	40																			
		TD: 40'																		

ONE CONTINUOUS AUGER SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HRS)

WATER TABLE (TIME OF BORING)

L

LABORATORY TEST LOCATION

+

PENETROMETER (TONS/ SQ. FT)

NR

NO RECOVERY

JOB NUMBER : Apache Corp./ 19-0112-22

HOLE DIAMETER : 2"

LOCATION : NEDU 928 - Eunice, NM

LAI GEOLOGIST : R. Owen

DRILLING CONTRACTOR :

DRILLING METHOD : Air Rotary

DRILL DATE :

09-23-2019

BORING NUMBER :

SP-2

BORING RECORD																						
GEOLOGIC UNIT	DEPTH	Start: 13:40 Finish: 13:55 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16	18									
Liner @20	0	Silty Sand with Subangular Clast Inclusions 1-4mm in Diameter, 5YR, 5/6, Yellowish Red	SM																0			
																						5
	10	Silt, 7.5YR, 5/6, Slight Brown, Well Sorted	ML																10			
																					15	
	15	Caliche, 7.5YR, 7/4, Pink, 1-10mm in Diamter Subangular Clast Inclusions	Caliche																20			
																					25	
	20	TD:20																	30			
																					35	
	25																					
	30																					
	35																					

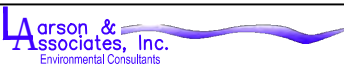
	ONE CONTINUOUS AUGER SAMPLER		WATER TABLE (TIME OF BORING)
	STANDARD PENETRATION TEST		LABORATORY TEST LOCATION
	UNDISTURBED SAMPLE		PENETROMETER (TONS/ SQ. FT)
	WATER TABLE (24 HRS)		NR NO RECOVERY

 Larson & Associates, Inc. Environmental Consultants	DRILL DATE :	BORING NUMBER :	JOB NUMBER : <u>Apache Corp./ 19-0112-22</u>
	<u>09-23-2019</u>	<u>SP-3</u>	HOLE DIAMETER : <u>2"</u>
			LOCATION : <u>NEDU 928 - Eunice, NM</u>
			LAI GEOLOGIST : <u>R. Owen</u>
			DRILLING CONTRACTOR : <u>SDI</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 12:15 Finish: 13:04 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS	
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING
					2	4	6	8	10	12	14	16	18						
	0	Silt, 5YR, 5/6, Yellowish Red, Well Sorted	ML															0	SOIL : _____ PPM SOIL : _____ PPM
	5																	5	
	10	Clayey Silt, 5YR, 5/6, Yellowish Red	CL															10	
	15																	15	
	20	Silty Sand, 1-3mm Subrounded Clasts, 7.5YR, 7/4, Pink	SM															20	
	25	TD:20																25	
	30																	30	
	35																	35	

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp./ 19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 928 - Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>R. Owen</u>

	DRILL DATE : <u>09-23-2019</u>	BORING NUMBER : <u>SP-5</u>	DRILLING CONTRACTOR : _____
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 13:15 Finish: 13:43 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS			
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING		
					2	4	6	8	10	12	14	16	18								
	0	Silty Sand, 5YR, 5/6, Yellowish Red, Well Sorted	ML																0	SOIL : _____ PPM SOIL : _____ PPM	
	5																		5		
	10																			10	
	15																			15	
	15	Caliche, 7.5YR, 7/4, Pink	Caliche																20		
	20																		25		
	25																		30		
	30																		35		
		TD:20																			

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp./ 19-0112-22</u>
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 928 - Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>R. Owen</u>
		DRILLING CONTRACTOR : <u>SDI</u>
DRILL DATE : <u>09-23-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-5</u>		

BORING RECORD																					
GEOLOGIC UNIT	DEPTH	Start: 14:00 Finish: 14:30 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS			
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING		
					2	4	6	8	10	12	14	16	18								
	0	Silty, 5YR, 5/6, Yellowish Red, Well Sorted	ML																0	SOIL : _____ PPM SOIL : _____ PPM	
	5																			5	
	10	Silty, 1-3mm, Subangular Clast Inclusions, 5YR, Yellowish Red, Well Sorted																		10	
	15	Caliche, 1-6mm Subangular Clasts	Caliche																15		
	20																		20		
	25																		25		
	30	TD:20																30			
	35																	35			

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp./ 19-0112-22</u>
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 928 - Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>R. Owen</u>
		DRILLING CONTRACTOR : <u>SDI</u>
DRILL DATE : <u>09-23-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-6</u>		

BORING RECORD																				
GEOLOGIC UNIT	DEPTH	Start: 14:50 Finish: 15:22 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING								SAMPLE		REMARKS					
					PPM X <u>1</u>								NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16						18		
Liner @15	0	Silty, 5YR, 5/6, Yellowish Red, 1-10mm Clast Inclusions, Subangular	ML															0		
	5	1-6mm Clast Inclusions, 5YR, 5/6, Yellowish Red																	5	
	10																		10	
	15	7.5YR, 6/4, Light Brown																		15
20	TD:20																20			
25																	25			
30																	30			
																	35			

ONE CONTINUOUS AUGER SAMPLER

STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

WATER TABLE (24 HRS)

WATER TABLE (TIME OF BORING)

L

LABORATORY TEST LOCATION

+

PENETROMETER (TONS/ SQ. FT)

NR

NO RECOVERY

JOB NUMBER : Apache Corp./ 19-0112-22

HOLE DIAMETER : 2"

LOCATION : NEDU 928 - Eunice, NM

LAI GEOLOGIST : R. Owen

DRILLING CONTRACTOR : SDI

DRILLING METHOD : Air Rotary

DRILL DATE : 09-23-2019

BORING NUMBER : SP-7

BORING RECORD

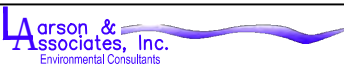
GEOLOGIC UNIT	DEPTH	Start: 8:42 Finish: 9:18 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS			
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING		
					2	4	6	8	10	12	14	16	18								
	0	Silty Sand, 5YR, 4/3 to 6/4, Reddish Brown, Fine Grained Quartz Sand, Well Sorted	SM																0	SOIL : _____ PPM SOIL : _____ PPM	
	5																			5	
	10																			10	
	15	7.5YR, 8/3 to 8/4, Fine Grained Quartz Sand, Well Sorted, 2-6mm Clasts Fragments																		15	
	20	8/3 to 8/6, Pink to Reddish Yellow, 6mm Clasts Fragments	SM																20		
	25																		25		
	30																		30		
	35	TD: 25'																	35		

☐ ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 928 / Eunice, NM</u>
WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>

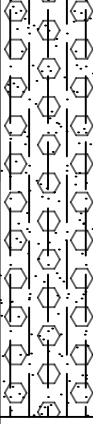
	DRILL DATE : <u>9-24-2019</u>	BORING NUMBER : <u>SP-8</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

NEDU #929

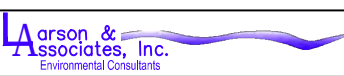
BORING RECORD																		
GEOLOGIC UNIT	DEPTH	Start: 12:00 CST Finish: 12:51 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING									SAMPLE			REMARKS	
					PPM X <u>1</u>									NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING
					2	4	6	8	10	12	14	16	18					
	0	Silty Sand, 5YR, 5/3 to 5/4, Reddish Brown, Fine Grained Quartz Sand, Well Sorted, Clasts Fragments 2-10mm, Subangular 5YR, 4/6, Well Sorted																12:00
	5																	
	10	7.5YR, 6/3 to 6/4, Light Brown, Well Sorted, Fine Grained Quartz Sand, Well Sorted	SM															
	15	Subangular Clasts Fragments 2-10mm in Diameter																
	20																	
	25	7.5YR, 7/6, Reddish Yellow, Subangular, Clasts Fragments 2-10mm																
	30	6/3 to 6/4, Light Brown, Moderately Sorted, Subangular, Clasts Fragments 0.5-4mm	SM															
	35																	
	40	Reddish Yellow, Subangular, Clasts Fragments 6-10mm																
	45																	
		TD: 45'																

☐ ONE CONTINUOUS AUGER SAMPLER	☐ WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	☐ LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	☐ PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>NEDU 929 / Eunice, NM</u>
☐ WATER TABLE (24 HRS)	☐ NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>9-24-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>SP-3</u>		

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 13:55 Finish: 14:15 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING										SAMPLE			REMARKS				
					PPM X <u>1</u>										NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING			
					2	4	6	8	10	12	14	16	18									
	0	Silty Sand, 7.5YR, 6/4, Light Brown, Fine Grained Quartz Sand, Well Sorted, Subangular, 2-6mm Clast Fragments	SM																0	SOIL : _____ PPM SOIL : _____ PPM		
	5																			5		
	10																				10	
	15																				15	
	20	TD: 10'																		20		
	25																			25		
	30																			30		
	35																			35		

☐ ONE CONTINUOUS AUGER SAMPLER	 WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Apache Corp. /19-0112-22</u>
☐ STANDARD PENETRATION TEST	 LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
☐ UNDISTURBED SAMPLE	 PENETROMETER (TONS/ SQ. FT.)	LOCATION : <u>NEDU 929 / Eunice, NM</u>
 WATER TABLE (24 HRS)	NR NO RECOVERY	LAI GEOLOGIST : <u>R. Nelson</u>

	DRILL DATE : <u>9-24-2019</u>	BORING NUMBER : <u>SP-4</u>	DRILLING CONTRACTOR : <u>SDC</u>
			DRILLING METHOD : <u>Air Rotary</u>

BORING RECORD																			
GEOLOGIC UNIT	DEPTH	Start: 10:15 Finish: 10:35 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING									SAMPLE			REMARKS		
					PPM X <u>1</u>									NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18						
	0	Gravelly Sand, 10YR, 5/6, Yellowish Brown, Medium to Fine Grained Quartz Sand	SP															0	SOIL : _____ PPM SOIL : _____ PPM
	5																	5	
	10	Silty Sand, 10YR, 8/2, Very Pale Brown, Well Sorted	SM															10	
	15	Subrounded, Caliche Clasts, 1-4mm in Diameter																15	
	20	Caliche, 10YR, 8/1, White	Caliche															20	
	25	TD: 20'																25	
	30																	30	
	35																	35	

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE (TIME OF BORING)	JOB NUMBER : <u>Legacy/ 18-0138-10</u>
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : <u>2"</u>
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT)	LOCATION : <u>Lea #10 - Hobbs, NM</u>
WATER TABLE (24 HRS)	NO RECOVERY	LAI GEOLOGIST : <u>R. Owen</u>
		DRILLING CONTRACTOR : <u>SDC</u>
DRILL DATE : <u>10-01-2019</u>		DRILLING METHOD : <u>Air Rotary</u>
BORING NUMBER : <u>HA-3</u>		

Appendix D
Photographs

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #829 Well Sign

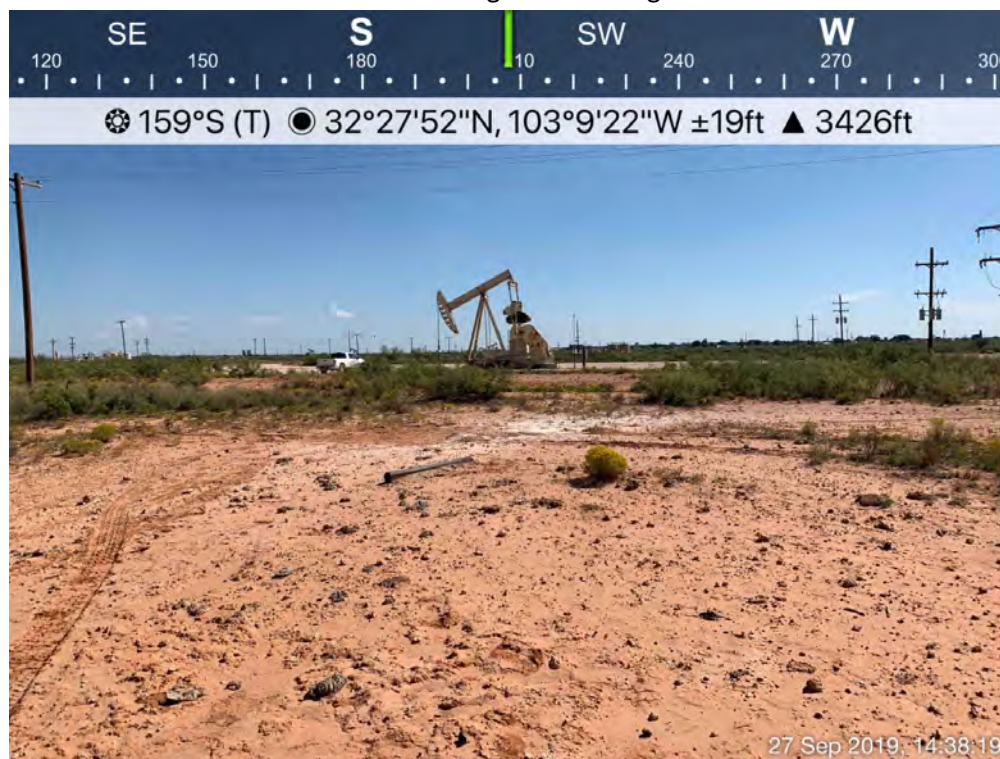


NEDU Well #829 Boring SP-5 Viewing Northwest

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #829 Boring SP-6 Viewing Northwest

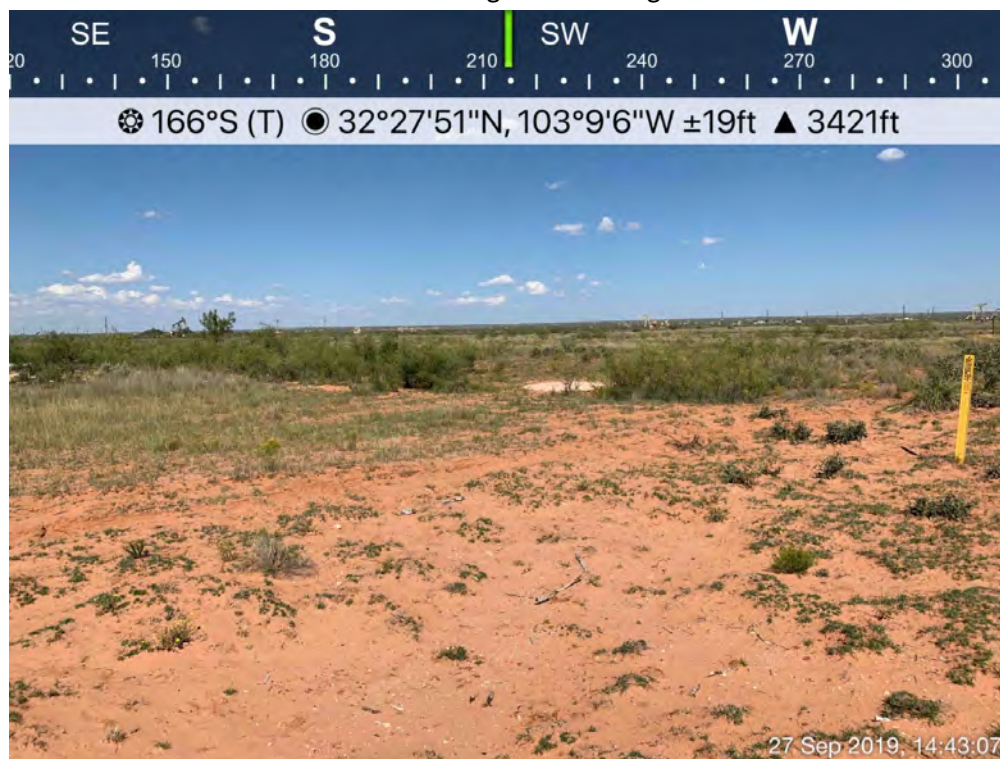


NEDU Well #829 Boring SP-7 Viewing South

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico

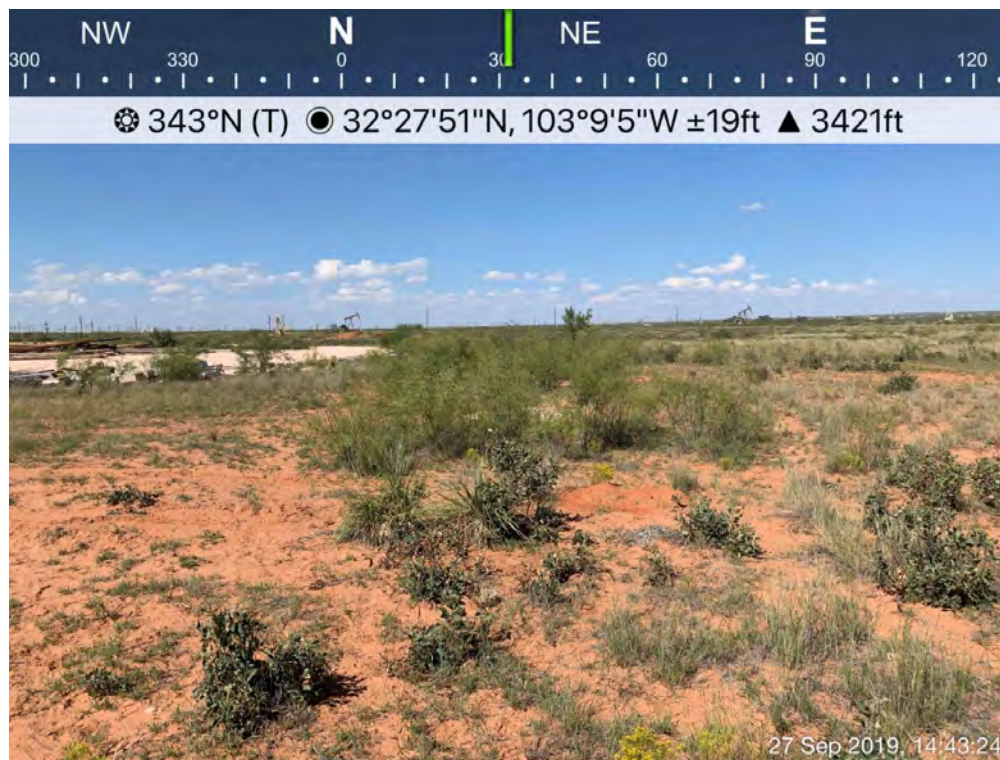


NEDU Well #829 Boring SP-4 Viewing Northwest



NEDU Well #829 Boring SP-1 Viewing South

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico

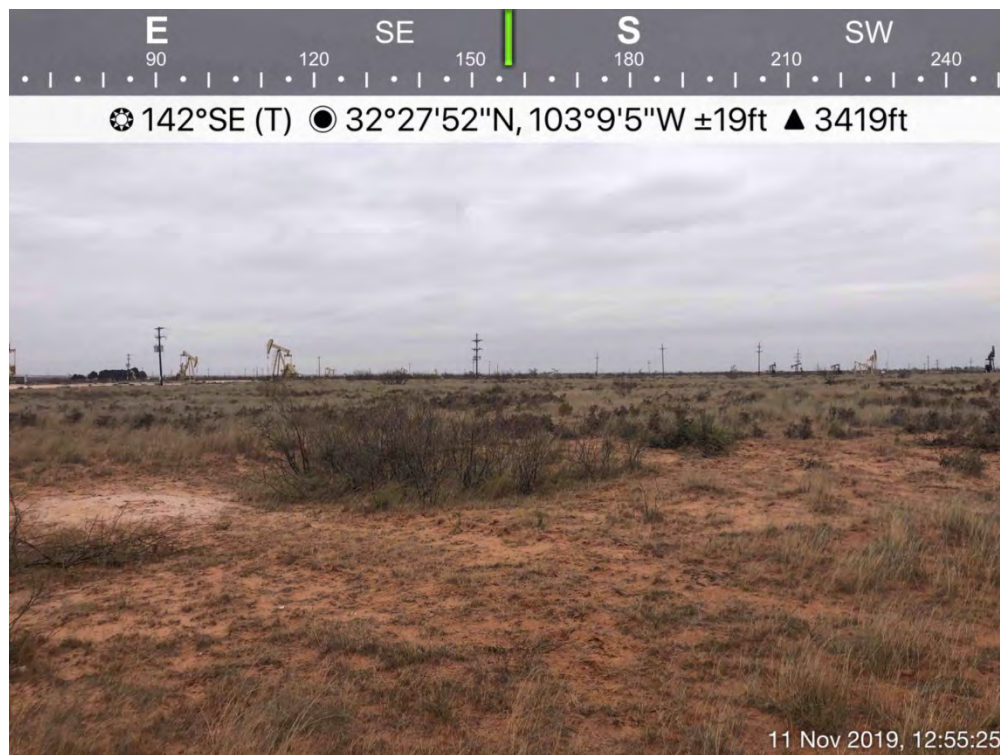


NEDU Well #829 Boring SP-1 Viewing North

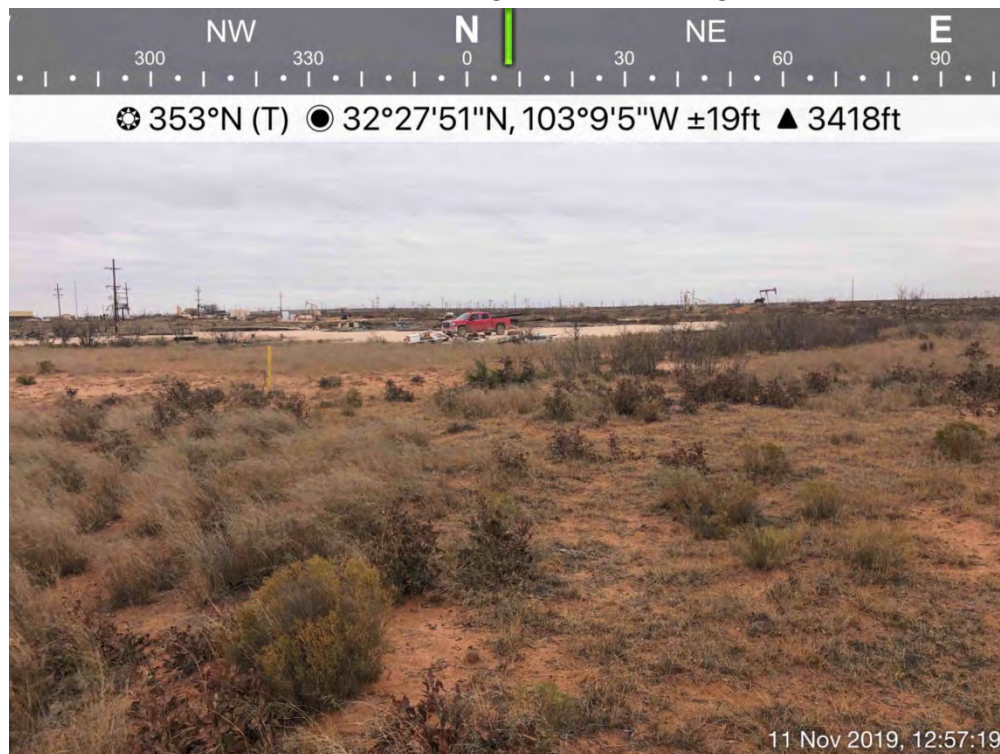


NEDU Well #830 Sign

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico

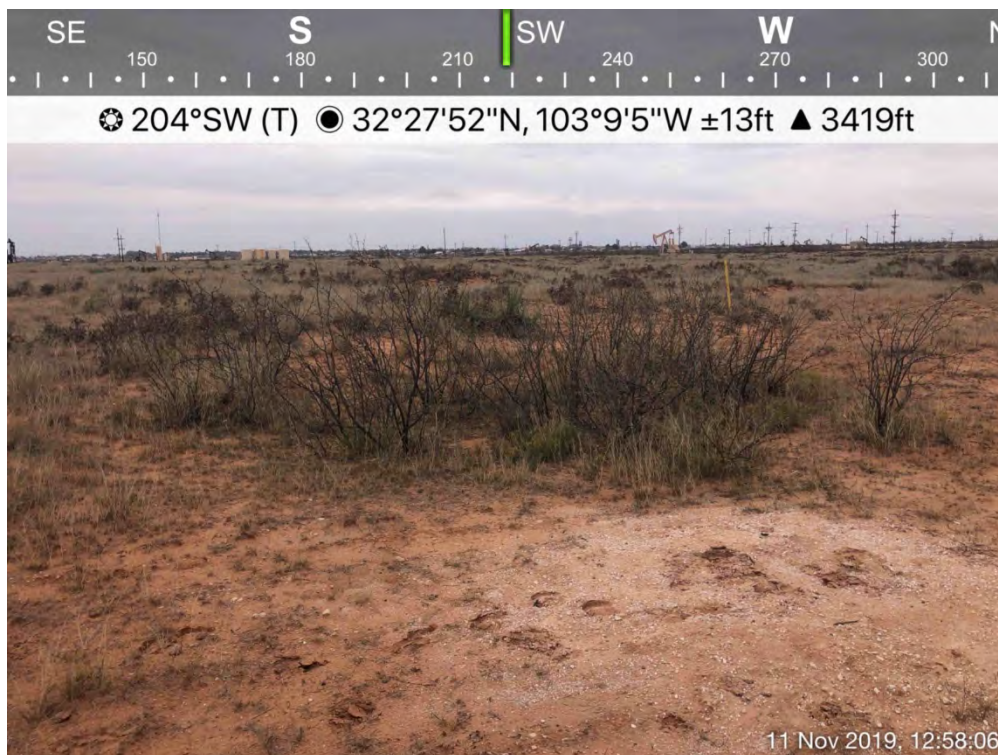


NEDU Well #830 Investigation Area Viewing South

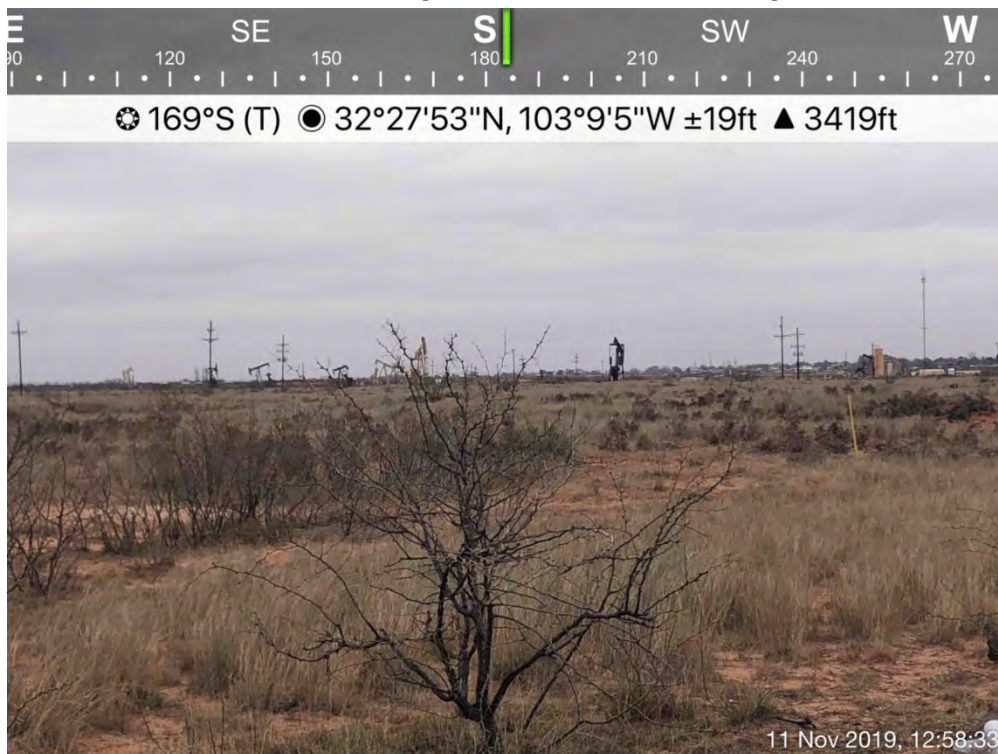


NEDU Well #830 Investigation Area Viewing North

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #830 Borings SP-2, SP-4 and SP-5 Viewing South

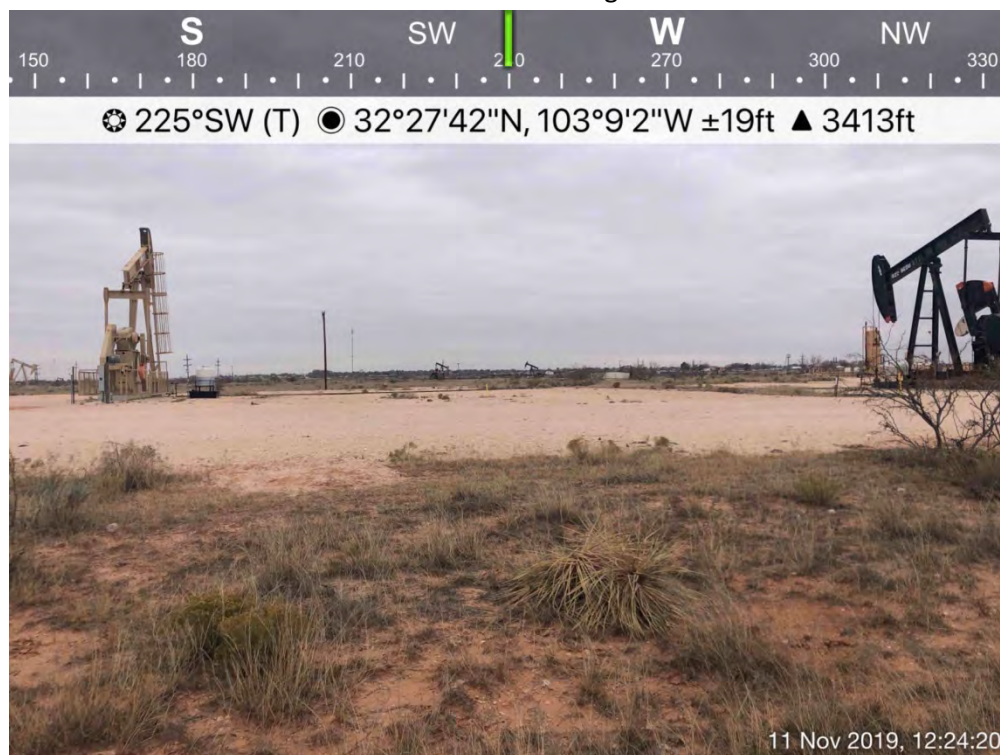


NEDU Well #830 Borings SB-7 and SB-8 Viewing South

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #922 Sign



NEDU Well #922 Investigation Area Viewing South

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #922 Investigation Area Viewing South

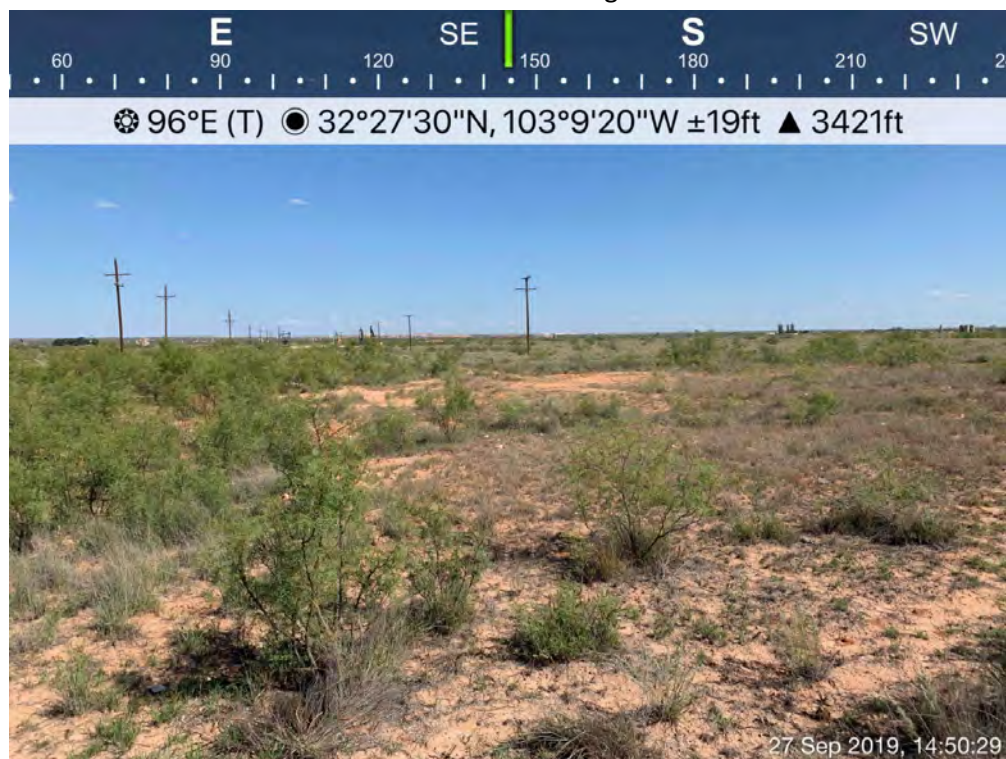


NEDU Well #922 Investigation Area Viewing East

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #928 Sign

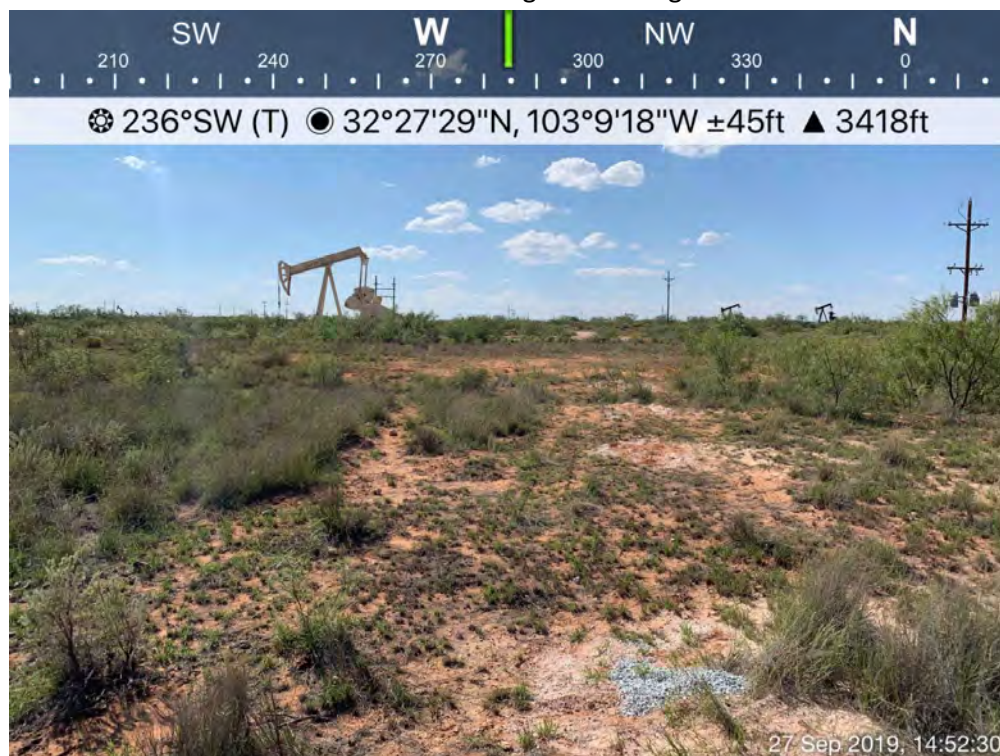


NEDU Well #928 Boring S-2 Viewing Southeast

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico

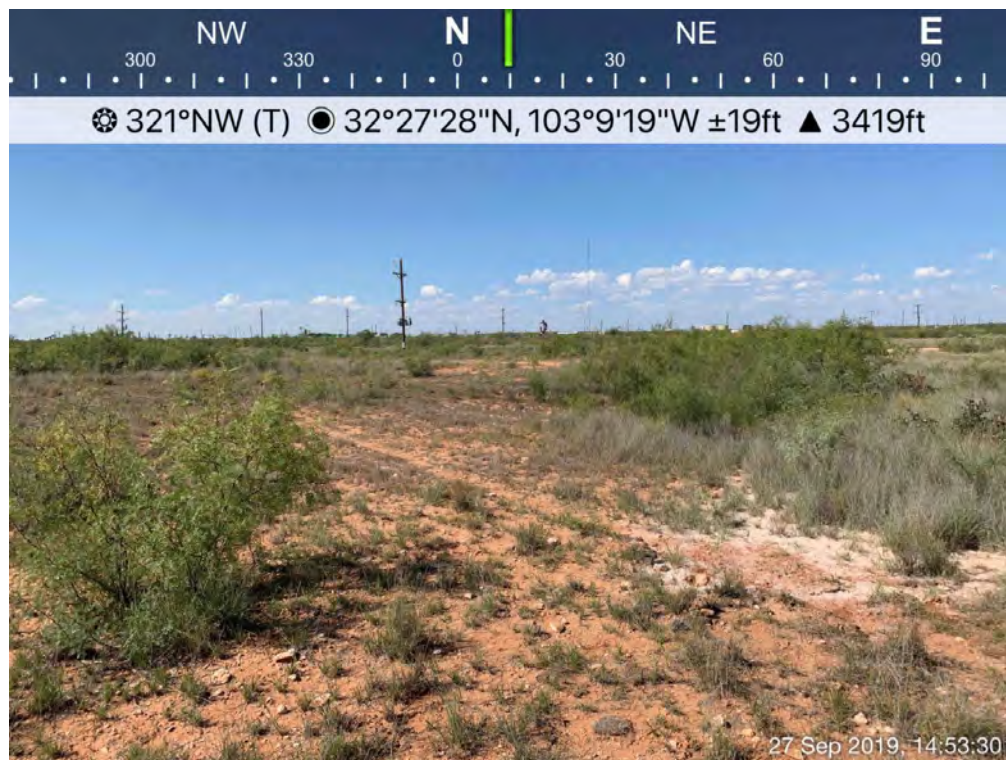


NEDU Well #928 Boring S-1 Viewing South



NEDU Well #928 Boring S-2 Viewing West

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico

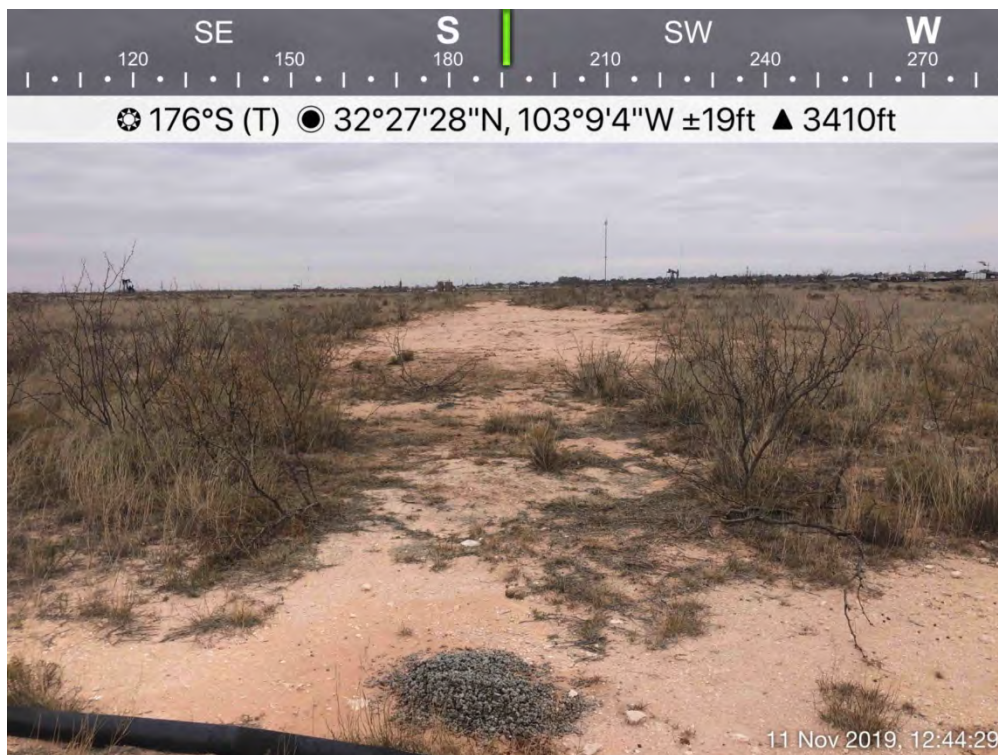


NEDU Well #928 Boring S-2 Viewing North

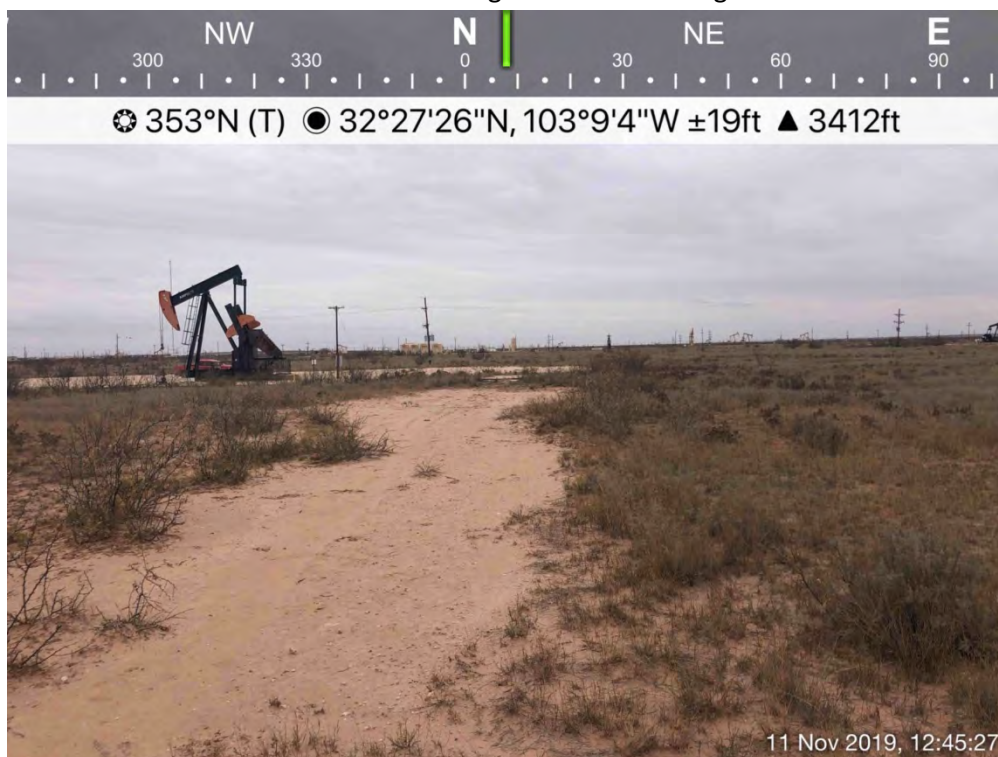


NEDU Well #929 Sign

1RP-313
Delineation Report and Remediation Plan
NEDU Drilling Pit Trenches
Lea County, New Mexico



NEDU Well #929 Investigation Area Viewing South



NEDU Well #929 Investigation Area Viewing North

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 10932

CONDITIONS OF APPROVAL

Operator: #1000 APACHE CORPORATION Midland, TX79705		303 Veterans Airpark Ln	OGRID: 873	Action Number: 10932	Action Type: C-141
OCD Reviewer	Condition				
bbillings	Using new Rule make sure sidewall data and bottom data are correct. Requested variances for excavation and liner are approved. Get pre-approval for Monitor Well locations on map before installations.				