July 31, 2017

Ms. Olivia Yu
Environmental Specialist
New Mexico Oil Conservation Division
Hobbs District 1 Office
1625 French Drive
Hobbs, New Mexico 88240

SUBMITTED VIA EMAIL
Olivia.Yu@state.nm.us

Re: Release Characterization Report and Proposed Remediation Work Plan
Yates State #2 Tank Battery
NMOCD Case No. 1R-4587
Lea County, New Mexico

INFORMATION ONLY

Dear Ms. Yu:

Enviro Clean Cardinal, LLC (ECC) has been retained by RAM Energy Resources (RAM) to conduct a release characterization at RAM's Yates State #2 Tank Battery (Site) located in Unit H, Section 16, Township 12 South, Range 38 East of Lea County, New Mexico (geographical coordinates 33.2793N, 103.0945W) and to prepare a proposed work plan to remediate the Site. The Site is approximately two miles west of the New Mexico/Texas state line and 13 miles east-northeast of Tatum, New Mexico. The Site location and topographical features are shown on the attached **Figure 1**. The Yates State #2 wellhead and tank battery are collocated on the Site as shown on the photograph below and **Figure 2** (photographs taken from southeast corner and east side of tank battery, respectively).

This ***Release Characterization Report*** and **Proposed Remediation Work Plan** discuss the details of the produced fluids release, ECC's delineation of the chloride and hydrocarbon impacts to Site soils, presents the laboratory analytical results for the soil samples collected, the applicable regulatory levels used for screening these results, and provides a proposed strategy to remediate Site soils to levels acceptable to the New Mexico Oil Conservation Division (NMOCD). RAM's objective is to obtain NMOCD approval to implement this proposed remediation work plan.

7060 South Yale Avenue, Suite 603 ▪ Tulsa, Oklahoma ▪ 918.794.7828 ▪ fax 918.794.7836
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Property Ownership

The Site surface is owned by 07-Ranch Limited Partnership located in Plains, Texas. RAM's *Surface Damage Agreement and Release* document for access to the lease lists Mr. Tommy Burris as a representative of 07-Ranch Limited Partnership.

The mineral ownership of the Site is the State of New Mexico and is managed by the New Mexico State Land Office (NMSLO).

Site Characteristics

The Site is located within the Gladiola Oil Field at an elevation of approximately 3,835 feet above mean sea level. The land surface slopes slightly towards the southeast and the Sulphur Springs Draw. Land use in the area is primarily for livestock grazing coupled with significant oilfield development. The area is semiarid with an annual precipitation of 17.05 inches and a net annual average precipitation/evaporation loss of approximately 73 inches. Watercourses in the area are dry except during infrequent flows following major precipitation events.

The United States Department of Agriculture, Natural Resources Conservation Service, Soil Survey for Lea County, New Mexico indicates that the soils surrounding the production pad site are classified as "Kh" (Kimbrough-Lea complex), and these soils are primarily a petrocalcic calciustoll. This indicates a loamy, mixed thermic soil that is well drained and is derived from calcareous alluvium and/or eolian deposits of sedimentary rocks.

The United States Geological Survey indicates that the surface or near-surface geologic unit is Quaternary-aged sand deposits "Qsu" that are described as windblown deposits, sand sheets and dunes, undivided. Underlying these recent deposits are the Neogene-age Ogallala Formation which is comprised of alluvial and eolian deposits and petrocalcic soils of the southern High Plains.

Site Hydrogeology

As stated above, the Site is located on Quaternary-aged sand deposits that overlay the Neogene-aged Ogallala Formation. Locally the uppermost groundwater saturations occur within these formations. An online search of the New Mexico Water Rights Reporting System, as provided by the New Mexico Office of State Engineer (NMOSE) (http://nmwrrs.ose.state.nm.us/nmwrrs/watercolumn.html), produced a *Water Column Report* showing 7 water well records that fell within a 2,000-meter search radius of the Site. These wells had a minimum depth to groundwater of 25 feet, a maximum depth to groundwater of 50 feet, and an average depth to groundwater of 38 feet below ground level (BGL). The *ChevronTexaco Lea County Depth to Ground Water* trend maps (Wayne Johnson, March 9, 2005) indicate that the depth to groundwater at the Site is less than 25 feet BGL with two wells posted in Section 16 with depth to groundwater levels of 22 and 24 feet BGL.

Previous Release

A previous release occurred at this Site in March 2012 under a different operator, Chaparral Energy LLC. This earlier release, NMOCD Case No. 1RP-2781, was closed in July 2013 (Earth Technologies of New Mexico Inc., Closure Report, Chaparral Energy LLC, Yates State #2 Leak, March 22, 2012). This incident involved the release of approximately 5 net barrels (bbls) of produced water outside and north of the containment berm, affecting approximately 1,200 square feet of the Site. At that time the NMOCD approved a chloride cleanup level of 1,500 mg/kg for the Site soils. The remedial response was to remove the affected soils exceeding 1,500 mg/kg chlorides, as determined by field titration screening methodologies, installing a geo-synthetic

bentonite liner, and backfilling the Site. This area of past remediation lies north of the tank battery up to the wellhead.

Description of Current Release

The current release was discovered by the surface landowner, Mr. Tommy Burris, on the morning of January 27, 2017. Approximately 37 bbls of produced water were released from a water storage tank located inside the secondary containment berm. Approximately 1 bbl of water was released outside the berm.

Initial Response Actions

Initial response actions consisted of source elimination by shutting in production and closing tank valves. A majority of the release was contained within the berm of the tanks, and only a small amount flowed out onto the Site pad. The pad site and tank battery secondary containment are secured by barbed wire fencing and a locked gate. The release was verbally reported to the NMOCD on January 27, 2017, the date of the release. RAM's *Release Notification and Corrective Action Form*, C-141, was submitted to the NMOCD on February 7, 2017, and states 37 bbls of produced water were released from a water tank of which 36 bbls were retained within the earthen secondary containment berm and 1 bbl flowed outside the berm. Approximately 37 bbls of fluid were reportedly recovered by vacuum truck. A copy of this C-141 and the NMOCD's response is provided in **Attachment A**.

In response to the C-141 filing, the NMOCD required RAM to submit a release characterization work plan on or before March 7, 2017. RAM submitted this work plan to the NMOCD on March 6, 2017. The NMOCD approved the release characterization plan on March 10, 2017, with the following conditions:

1. The maximum limit of permissible chloride levels for soils in release areas, where depth to groundwater is < 50 feet, is 250 mg/kg.
2. Complete vertical delineation within soils means obtaining 250 mg/kg chlorides and maintaining this level for an additional 10 feet below.
3. Establish a baseline sample point outside of release area.
4. As the minerals are owned by the State of New Mexico, like approval from Amber Groves (State Land Office) is required.
5. Inform NMOCD and NMSLO of soil sampling witnessing opportunities.

RAM began field implementation of the release characterization work plan on April 11, 2017. These field activities and the results of this assessment follow.

Applicable Regulatory Levels

The NMOCD has established *Recommended Remediation Action Levels* (RRAL) for soils contaminated with petroleum hydrocarbons through a site ranking process provided in their document titled *Guidelines for Remediation of Leaks, Spills and Releases,* dated August 1993. The ranking criteria is based on numeric scores to determine the appropriate soil remediation action level for relative threats to public health, fresh water, and the environment. The following three site characteristics are evaluated as part of this ranking process:

- **Depth to groundwater** (Vertical distance from ground surface to seasonal high water level)
  - If less than 50 feet BGL = 20 points ←
  - If 50 to 99 feet BGL = 10 points
  - If greater than 100 feet = 0 points

- **Wellhead Protection Areas** (All water sources including private and domestic sources. Sources are defined as wells, springs or other sources of fresh water extraction)
  - If less than 1,000 feet from a water source, or less than 200 feet from a private domestic water source = 20 points ←
  - If greater than 1,000 feet from a water source, or greater than 200 feet from a private domestic water source = 0 points

- **Distance to Nearest Surface Water Body**
  - If less than 200 horizontal feet = 20 points
  - If 200 to 1,000 horizontal feet = 10 points
  - If greater than 1,000 horizontal feet = 0 points ←

The NMOSE Water Column Report and ChevronTexaco Lea County Depth to Ground Water trend map collectively indicate that the depth to groundwater near the Site should range between 22 and 50 feet BGL. So, for the depth to water element of the NMOCD site assessment criteria the Site would be assigned 20 points. The NMOSE's water well records show that four water sources exist less than 1,000 feet from the Site, and three water sources exist less than 200 feet of the Site. So, for the wellhead protection areas element of the NMOCD site assessment criteria the Site would be assigned 20 points. The nearest surface water body is greater than 1,000 feet. So, for the surface water body element of the NMOCD site assessment criteria the Site would be assigned 0 points. Therefore, the Site would have a total score of **40 points**.

Based upon the NMOCD's RRAL ranking criteria, the most protective hydrocarbon cleanup levels are assigned to sites with a total ranking score greater than 19. So, the soil RRALs for this Site are as follows:

- Benzene = 10 ppm,
- Total benzene, toluene, ethylbenzene and toluene (collectively BTEX) = 50 ppm, and
- Total petroleum hydrocarbons (TPH) = 100 ppm.

In addition to these hydrocarbon clean-up values for soil, the NMOCD has developed an assessment level for chloride impacts to soil of 250 mg/kg. This assessment level relies indirectly upon the New Mexico Water Quality Control Commission's (WQCC's) Standards for groundwaters having a TDS concentration of 10,000 mg/L or less found in 20.6.2.3103 NMAC. The WQCC Standard for chloride in groundwater of 250 ppm. Based upon the high solubility of chloride, the NMOCD assumes that all chloride salts could leach to groundwater and have set the chloride assessment level in soils at 250 mg/kg. Therefore, lateral and vertical delineation of chloride in soils to 250 mg/kg is required at sites under NMOCD jurisdiction. Based upon site conditions the NMOCD may use this assessment level also as a clean-up level, although higher cleanup levels can be approved by NMOCD when appropriate. The NMOCD has already stated that the soil cleanup level of 250 mg/kg will be used for this Site.

Boring Installations and Soil Sample Collection

On April 11, 2017 and June 7, 2017, ECC installed a total of eight borings at the Site utilizing both hand-auger and air rotary drilling methodologies to characterize the horizontal and vertical extents

of chloride, TPH and BTEX impacts to Site soils. The locations of these borings are shown on the attached **Figure 2**.

On April 11, 2017, four borings, HA-1 through HA-4, were drilled/sampled inside the tank battery's earthen-berm secondary containment to a depth of 1 foot BGL where a resistant caliche layer was encountered. Discrete soil samples were collected from these hand-auger borings on ½-foot depth intervals and submitted to the analytical laboratory, XENCO Laboratories, Midland, Texas, for BTEX analysis by EPA Method 8021B, TPH analysis by EPA Method SW8015 Modified, and chloride analyses by EPA Method 300.

Also on April 11, 2017, three borings, WSB-1, ESB-2 and SSB-3, were drilled/sampled directly outside of the secondary containment berm (within 10 to 15 feet) on the west, east, and south sides of the tank battery, respectively. It should be noted that a boring was not installed outside the containment berm on the north side because of the presence of an existing permeability liner that was placed as part of 2012-13 remediation event described above. Samples were collected every 5-feet to a depth of 25 feet for field and laboratory analyses. Sampled intervals from the deep borings were described using the Unified Soil Classification System, Munsell color, and observed physical characteristics, such as grain size distribution, grain shape, and other diagnostic features, as applicable. Soil samples were field screened using a conductivity pen for chlorides, and a photoionization detector (PID) for hydrocarbons. Discrete soil samples were collected from these borings at the following intervals for field screening with a chloride meter and an organic vapor meter (OVM): 0, 5, 10, 15, 20 and 25 feet BGL. A representative aliquot of the surface soil sample (from 0-foot) was collected and submitted to the laboratory for BTEX, TPH and chloride analyses. Representative aliquots of soil from the remaining depth (from 5, 10, 15, 20 and 25 feet BGL) were submitted to the laboratory for chloride analyses only.

On April 18, 2017, a background sample (BG-1) was collected using a hand auger of the native soils outside the pad site at a location approximately 30 feet south of the southwest corner of the containment berm. This sample was submitted for chloride analyses only.

On June 7, 2017, a boring was drilled/sampled at the previous HA-2 location inside the northeast corner of the secondary containment berm using air-rotary methods. This boring was drilled to a depth of 20 feet BGL to better delineate deeper vertical impacts within the secondary containment area. Discrete soil samples were collected from the HA-2 location at depths of 3, 5, 7, 10, 15 and 20 feet BGL and submitted to the analytical laboratory for chloride analyses. On this same date, soil samples were re-collected at the SSB-3 boring location from the depths of 0 and 5 feet to resolve inconsistencies in the analytical results observed during the first round of sampling (i.e., samples taken at 0 and 5 feet appear to have been switched). The data generated from the second round of soil sampling at the SSB-3 location will be utilized for comparison to the regulatory screening levels and proposed remediation.

Lithologic descriptions and field screening results from the deeper borings WSB-1, ESB-2, SSB-3, and HA-2 are included in **Attachment B**. Laboratory analytical results are shown on **Tables 1** and **2,** and graphically presented on **Figure 2**. Laboratory reports and chain-of-custody documentation are included in **Attachment C**.

Laboratory Analytical Results and Regulatory Screening

The laboratory analytical results obtained from the soil samples collected at the Site were screened against the RRALs (organic analyses) and the chloride assessment and remediation level described above. These site-specific screening levels are as follows:

- Benzene – 10 mg/kg
- BTEX – 50 mg/kg
- TPH – 100 mg/kg
- Chlorides – 250 mg/kg

Referring to **Table 1** and **Figure 2**, laboratory analyses indicate that soil samples collected from inside of the containment berm exceed the regulatory levels for TPH (except HA-2) and chloride. Exceedances are shown in red bolded text. Soil samples collected from the upper 3 feet of the soil horizon at boring locations HA-1, HA-2, HA-3 and HA-4 appear to contain the greatest concentrations of TPH and chloride. Deeper chloride impacts are indicated in the HA-2 boring at depths of 10 and 15 feet. All soil samples analyzed for BTEX were below the RRAL of 10 mg/kg for benzene and 50 mg/kg for BTEX with concentrations ranging from less than the method detection limit to 0.00929 mg/kg in HA-3, 0.5 to 1.0 feet BGL. These results are consistent with a produced water release that lacks significant petroleum hydrocarbons. As BTEX was not detected in any of the soil samples taken from inside the containment berm at concentrations that exceed the RRALs, these results are not shown on **Figure 2**.

Again, referring to **Table 2** and **Figure 2**, laboratory analyses indicate that soil samples collected from outside of the containment berm on the west and east sides exceed the regulatory level for chloride. Soil samples from the WSB-1 boring location exceed the regulatory level for chloride at the surface, but only slightly exceed this level at depths of 20 and 25 feet BGL. Soil samples from the ESB-2 boring location exceed the regulatory level for chloride at the surface, but only slightly exceed this level in one sample taken at a depth of 10 feet BGL. None of soil samples taken from the SSB-3 boring exceed the regulatory level for chloride. Chloride delineation concentrations met the 10-foot separation requirement in the WSB-1 boring at 5 feet BGL (54.9 mg/kg), in the ESB-2 boring at 15 feet BGL (90.2 mg/kg), and in the HA-2 boring at 5 feet BGL (42.5 mg/kg). TPH and BTEX concentrations were not detected at levels that exceed the regulatory levels in any of the soil samples collected from outside of the containment area.

Proposed Soil Remediation

The constituent that is the driver for soil remediation is chloride. Since chloride cannot be reduced using degradation processes, the proposed remedial option is the excavation of impacted media coupled with off-site disposal. ECC recommends the removal and replacement of Site soils that exceed the RRALs and the chloride cleanup level. The proposed remediation areas are shown on **Figure 3**.

ECC proposes that the upper 3 feet of soil within the secondary containment area be excavated from the inside toe of the berm to the bases of the existing tanks and ancillary equipment. A "pedestal" of soil will be left in place beneath the tanks and equipment in a manner that will provide stability. The areal extent of this remediation area measures 2,327 square feet. An estimated volume of 259 cubic yards (in-situ) is expected to be removed. A synthetic liner will then be installed at the base of the excavation. The excavation will then be backfilled with clean fill from an acceptable source and compacted to existing grade.

ECC also proposes removal of the upper 1 foot of soil from an area on the east side of the tank battery outside of the containment area. The areal extent of this remediation area measures 647 square feet. An estimated volume of 24 cubic yards (in-situ) is expected to be removed. The excavation will then be backfilled with clean fill from an acceptable source and compacted to existing grade.

ECC hopes the NMOCD will find this Release Characterization Report and Proposed Remediation Work Plan responsive to their C-141 response, and will approve the remediation work proposed herein. If you have questions regarding this document, please do not hesitate to contact Mr. Matt Patterson at RAM at 918-947-6301, or myself at 918-210-8128.

Sincerely,
Enviro Clean Cardinal, LLC

George H. (Buddy) Richardson, P.G.
Manager Hydrogeology

Attachments: Table 1 - Summary of Laboratory Analytical Results, Soil Samples Inside Berm
Table 2 - Summary of Laboratory Analytical Results, Soil Samples Outside Berm
Figure 1 - Site Location and Topographic Features
Figure 2 - Soil Sample Locations with Related Data
Figure 3 - Proposed Limits of Excavation
Attachment A - Form C-141
Attachment B - Boring Records
Attachment C - Laboratory Analytical Reports

ATTACHMENTS

TABLES

Table 1 : Summary of Laboratory Analytical Results for Soil Samples Collected Inside Berm
RAM Energy Resources, Yates State #2, NMOCD # 1R-4587
Lea County, New Mexico

Parameters	Sample ID:	BG-1 0-6"	HA-1 0-6"	HA-1 6-12"
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***			
Benzene	mg/kg	---	<0.00500	<0.00150
Toluene	mg/kg	---	<0.00667	<0.00200
Ethylbenzene	mg/kg	---	<0.00667	<0.00200
m,p-Xylenes	mg/kg	---	<0.00667	<0.00200
o-Xylene	mg/kg	---	<0.0100	<0.00301
Xylenes, Total	mg/kg	---	<0.00667	<0.00200
Total BTEX	mg/kg	---	<0.00500	<0.00150
Total Petroleum Hydrocarbons (TPH)	***Units***			
C6 - C10	mg/kg	---	<15.0	<15.0
C10 - C28	mg/kg	---	**1,900**	**872**
C28 - C35	mg/kg	---	**354**	**122**
Total TPH	mg/kg	---	**2,250**	**994**
General Chemistry	***Units***			
Chloride	mg/kg	<4.94	**11,100**	**4,170**
Field Measurements	***Units***			
Chloride	mg/kg	---	7,526	3,098

Parameters	Sample ID:	BG-1 0-6"	HA-2 0-6"	HA-2 6-12"	Yates #2 HA-2 3'	Yates #2 HA-2 5'	Yates #2 HA-2 7'	Yates #2 HA-2 10'	Yates #2 HA-2 15'	Yates #2 HA-2 20'
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17	7-Jun-17	7-Jun-17	7-Jun-17	7-Jun-17	7-Jun-17	7-Jun-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***									
Benzene	mg/kg	---	<0.00152	<0.00258	---	---	---	---	---	---
Toluene	mg/kg	---	<0.00203	<0.00344	---	---	---	---	---	---
Ethylbenzene	mg/kg	---	<0.00203	<0.00344	---	---	---	---	---	---
m,p-Xylenes	mg/kg	---	<0.00203	<0.00344	---	---	---	---	---	---
o-Xylene	mg/kg	---	<0.00304	<0.00515	---	---	---	---	---	---
Xylenes, Total	mg/kg	---	<0.00203	<0.00344	---	---	---	---	---	---
Total BTEX	mg/kg	---	<0.00152	<0.00258	---	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)	***Units***									
C6 - C10	mg/kg	---	<15.0	<14.9	---	---	---	---	---	---
C10 - C28	mg/kg	---	<15.0	<14.9	---	---	---	---	---	---
C28 - C35	mg/kg	---	<15.0	<14.9	---	---	---	---	---	---
Total TPH	mg/kg	---	<15.0	<14.9	---	---	---	---	---	---
General Chemistry	***Units***									
Chloride	mg/kg	<4.94	**23,000**	**15,900**	**1,970**	42.5	93.8	**255**	**689**	98.0
Field Measurements	***Units***									
Chloride	mg/kg	---	>10,000	9,032	---	---	---	---	---	---

Notes:

1. mg/kg : milligrams per kilogram.
2. < : Analyte not detected at the laboratory reporting limit (RL).
3. Blue shaded block denotes sample results greater than the laboratory RL.
4. --- : Not Analyzed.
5. Bold red font denotes a sample volume above the applicable Action Level.

Table 1 : Summary of Laboratory Analytical Results for Soil Samples Collected Inside Berm
RAM Energy Resources, Yates State #2, NMOCD # 1R-4587
Lea County, New Mexico

Parameters	Sample ID:	BG-1 0-6"	HA-3 0-6"	HA-3 6-9"
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***			
Benzene	mg/kg	---	<0.00152	0.00199
Toluene	mg/kg	---	<0.00202	<0.00199
Ethylbenzene	mg/kg	---	<0.00202	0.00360
m,p-Xylenes	mg/kg	---	<0.00202	0.00370
o-Xylene	mg/kg	---	<0.00303	<0.00299
Xylenes, Total	mg/kg	---	<0.00202	0.00370
Total BTEX	mg/kg	---	<0.00152	0.00929
Total Petroleum Hydrocarbons (TPH)	***Units***			
C6 - C10	mg/kg	---	84.7	<74.9
C10 - C28	mg/kg	---	**6,220**	**1,640**
C28 - C35	mg/kg	---	**1,180**	**151**
Total TPH	mg/kg	---	**7,480**	**1,790**
General Chemistry	***Units***			
Chloride	mg/kg	<4.94	**4,540**	**2,200**
Field Measurements	***Units***			
Chloride	mg/kg	---	4,045	1,872

Parameters	Sample ID:	BG-1 0-6"	HA-4 0-6"	HA-4 6-12"
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***			
Benzene	mg/kg	---	<0.00148	0.0892
Toluene	mg/kg	---	<0.00198	0.147
Ethylbenzene	mg/kg	---	<0.00198	0.0984
m,p-Xylenes	mg/kg	---	<0.00198	0.373
o-Xylene	mg/kg	---	<0.00296	0.178
Xylenes, Total	mg/kg	---	<0.00198	0.551
Total BTEX	mg/kg	---	<0.00148	0.886
Total Petroleum Hydrocarbons (TPH)	***Units***			
C6 - C10	mg/kg	---	<74.9	1,640
C10 - C28	mg/kg	---	**1,520**	**14,100**
C28 - C35	mg/kg	---	**142**	**1,980**
Total TPH	mg/kg	---	**1,660**	**17,700**
General Chemistry	***Units***			
Chloride	mg/kg	<4.94	**8,840**	**3,490**
Field Measurements	***Units***			
Chloride	mg/kg	---	6,715	1,716

Notes:

1. mg/kg : milligrams per kilogram.
2. < : Analyte not detected at the laboratory reporting limit (RL).
3. Blue shaded block denotes sample results greater than the laboratory RL.
4. --- : Not Analyzed.
5. Bold red font denotes a sample volume above the applicable Action Level.

Table 2 : Summary of Laboratory Analytical Results for Soil Samples Collected Outside of Berm
RAM Energy Resources, Yates State #2, NMOCD # 1R-4587
Lea County, New Mexico

Parameters	Sample ID:	BG-1 0-6"	WSB-1 0'	WSB-1 5'	WSB-1 10'	WSB-1 15'	WSB-1 20'	WSB-1 25'
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***							
Benzene	mg/kg	---	<0.00150	---	---	---	---	---
Toluene	mg/kg	---	<0.00200	---	---	---	---	---
Ethylbenzene	mg/kg	---	<0.00200	---	---	---	---	---
m,p-Xylenes	mg/kg	---	<0.00200	---	---	---	---	---
o-Xylene	mg/kg	---	<0.00301	---	---	---	---	---
Xylenes, Total	mg/kg	---	<0.00200	---	---	---	---	---
Total BTEX	mg/kg	---	<0.00150	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)	***Units***							
C6 - C10	mg/kg	---	<15.0	---	---	---	---	---
C10 - C28	mg/kg	---	41.9	---	---	---	---	---
C28 - C35	mg/kg	---	18.7	---	---	---	---	---
Total TPH	mg/kg	---	60.6	---	---	---	---	---
General Chemistry	***Units***							
Chloride	mg/kg	<4.94	**1,000**	54.9	41.8	112	**269**	**373**
Field Measurements	***Units***							
Chloride	mg/kg	---	916	42	60.5	99.1	276	277

Parameters	Sample ID:	BG-1 0-6"	ESB-2 0'	ESB-2 5'	ESB-2 10'	ESB-2 15'	ESB-2 20'	ESB-2 25'
	Sample Date:	18-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***							
Benzene	mg/kg	---	<0.00149	---	---	---	---	---
Toluene	mg/kg	---	<0.00199	---	---	---	---	---
Ethylbenzene	mg/kg	---	<0.00199	---	---	---	---	---
m,p-Xylenes	mg/kg	---	<0.00199	---	---	---	---	---
o-Xylene	mg/kg	---	<0.00299	---	---	---	---	---
Xylenes, Total	mg/kg	---	<0.00199	---	---	---	---	---
Total BTEX	mg/kg	---	<0.00149	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)	***Units***							
C6 - C10	mg/kg	---	<15.0	---	---	---	---	---
C10 - C28	mg/kg	---	26.2	---	---	---	---	---
C28 - C35	mg/kg	---	<15.0	---	---	---	---	---
Total TPH	mg/kg	---	26.2	---	---	---	---	---
General Chemistry	***Units***							
Chloride	mg/kg	<4.94	**3,390**	157	**325**	90.2	6.05	238
Field Measurements	***Units***							
Chloride	mg/kg	---	2,641	202	268	77.1	37.6	213

Notes:

1. mg/kg : milligrams per kilogram.
2. < : Analyte not detected at the laboratory reporting limit (RL).
3. Blue shaded block denotes sample results greater than the laboratory RL.
4. --- : Not Analyzed.
5. Bold red font denotes a sample volume above the applicable Action Level.

Table 2 : Summary of Laboratory Analytical Results for Soil Samples Collected Outside of Berm
RAM Energy Resources, Yates State #2, NMOCD # 1R-4587
Lea County, New Mexico

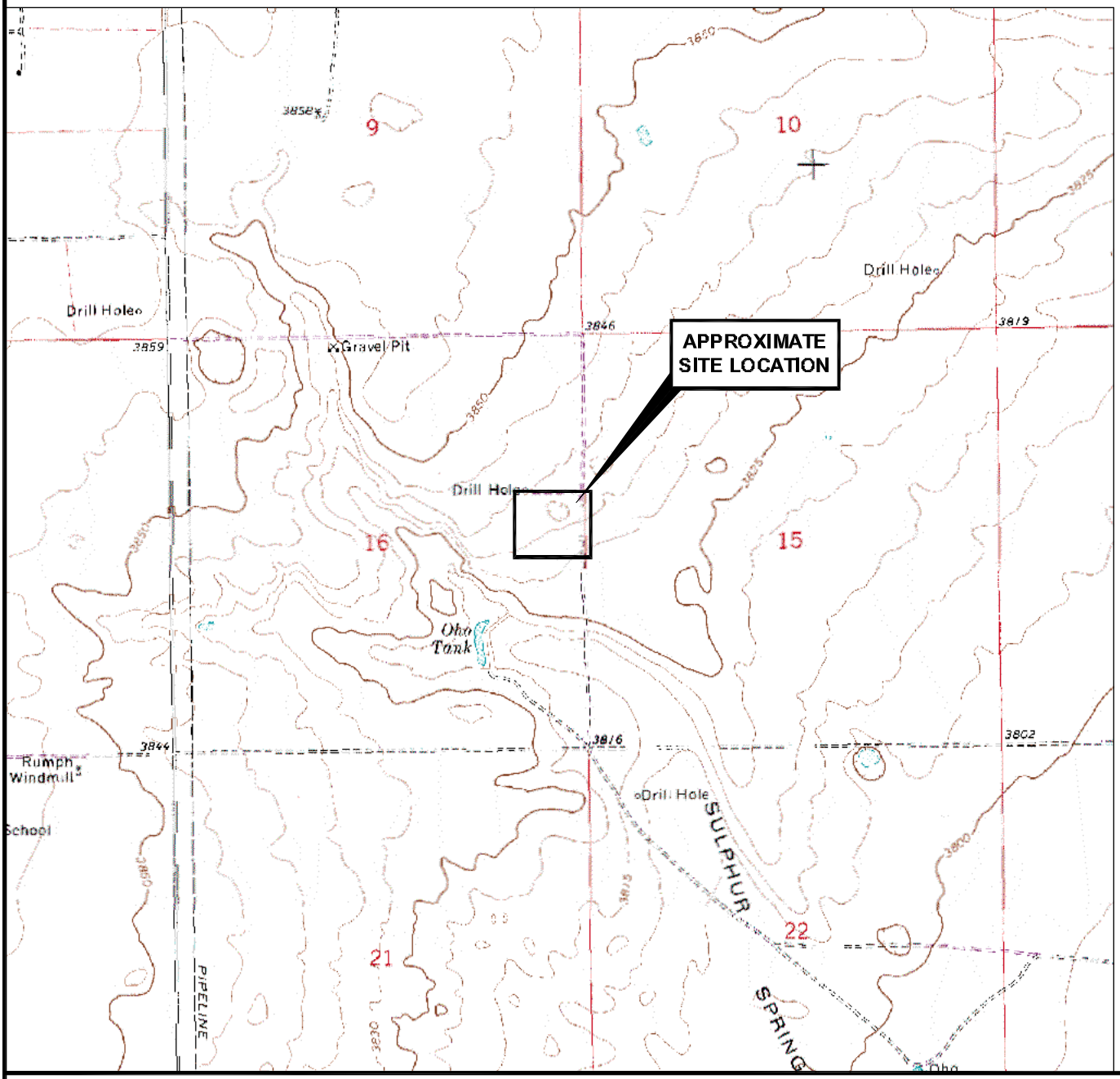
Parameters	Sample ID:	BG-1 0-6"	SSB-3 0'	Yates #2 SSB-3 0'	SSB-3 5'	Yates #2 SSB-3 5'	SSB-3 10'	SSB-3 15'	SSB-3 20'	SSB-3 25'
	Sample Date:	18-Apr-17	11-Apr-17	7-Jun-17	11-Apr-17	7-Jun-17	11-Apr-17	11-Apr-17	11-Apr-17	11-Apr-17
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	***Units***									
Benzene	mg/kg	---	<0.00150	---	---	---	---	---	---	---
Toluene	mg/kg	---	<0.00200	---	---	---	---	---	---	---
Ethylbenzene	mg/kg	---	<0.00200	---	---	---	---	---	---	---
m,p-Xylenes	mg/kg	---	<0.00200	---	---	---	---	---	---	---
o-Xylene	mg/kg	---	<0.00299	---	---	---	---	---	---	---
Xylenes, Total	mg/kg	---	<0.00200	---	---	---	---	---	---	---
Total BTEX	mg/kg	---	<0.00150	---	---	---	---	---	---	---
Total Petroleum Hydrocarbons (TPH)	***Units***									
C6 - C10	mg/kg	---	<15.0	---	---	---	---	---	---	---
C10 - C28	mg/kg	---	29.3	---	---	---	---	---	---	---
C28 - C35	mg/kg	---	<15.0	---	---	---	---	---	---	---
Total TPH	mg/kg	---	29.3	---	---	---	---	---	---	---
General Chemistry	***Units***									
Chloride	mg/kg	<4.94	**628**	67.5	**2,100**	<4.97	31.8	29.5	6.52	102
Field Measurements	***Units***									
Chloride	mg/kg	---	559	---	70.3	---	49.0	---	26.4	127

Notes:

1. mg/kg : milligrams per kilogram.
2. < : Analyte not detected at the laboratory reporting limit (RL).
3. Blue shaded block denotes sample results greater than the laboratory RL.
4. --- : Not Analyzed.
5. Bold red font denotes a sample volume above the applicable Action Level.

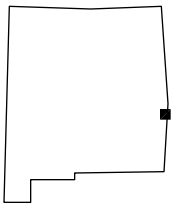
FIGURES

R 38 E



SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE
LITTLE AXE, OKLAHOMA 1975

NEW MEXICO



N

SCALE
0 1/2 1 MILE

CLIENT RAM ENERGY RESOURCES TULSA, OKLAHOMA	FIGURE TITLE *SITE LOCATION AND TOPOGRAPHIC FEATURES*
LOCATION YATES STATE #2 LEASE SEC. 16, T12S R38E, LEA COUNTY, NEW MEXICO	DOCUMENT TITLE SOIL INVESTIGATON REPORT

ENVIRO CLEAN CARDINAL

Enviro Clean Cardinal, LLC
7060 South Yale Avenue, Suite 603
Tulsa, Oklahoma 74136
918.794.7828
www.ECGRP.com

		DESIGNED BY	GHR
DATE	7/13/2017	APPROVED BY	GHR
SCALE	AS SHOWN	DRAWN BY	SKG
PROJECT NUMBER		FIGURE NUMBER	
RAMRNM0002		1	

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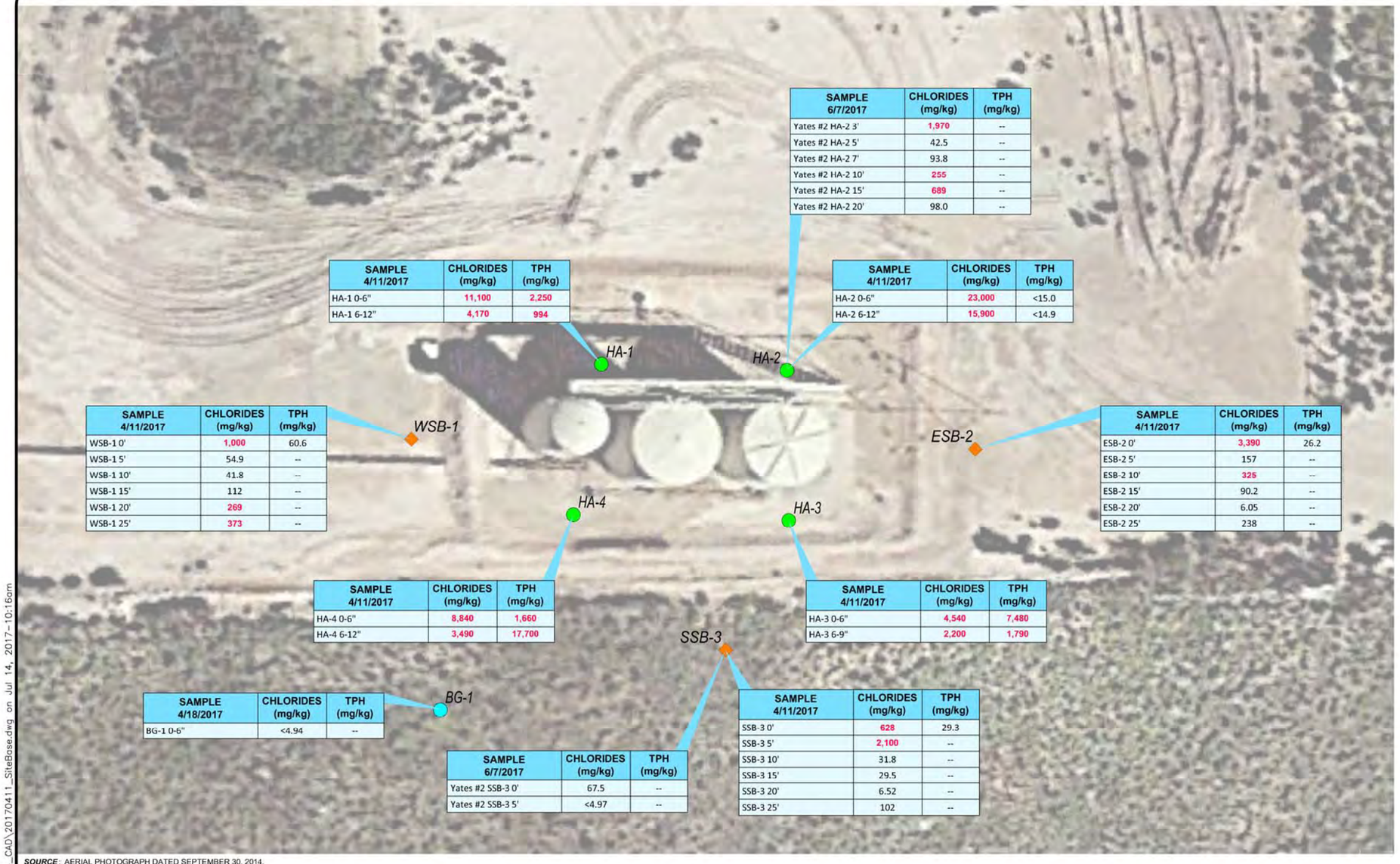


SAMPLE 6/7/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
Yates #2 HA-2 3'	1,970	--
Yates #2 HA-2 5'	42.5	--
Yates #2 HA-2 7'	93.8	--
Yates #2 HA-2 10'	255	--
Yates #2 HA-2 15'	689	--
Yates #2 HA-2 20'	98.0	--

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
HA-1 0-6"	11,100	2,250
HA-1 6-12"	4,170	994

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
HA-2 0-6"	23,000	<15.0
HA-2 6-12"	15,900	<14.9

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
WSB-1 0'	1,000	60.6
WSB-1 5'	54.9	--
WSB-1 10'	41.8	--
WSB-1 15'	112	--
WSB-1 20'	269	--
WSB-1 25'	373	--

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
ESB-2 0'	3,390	26.2
ESB-2 5'	157	--
ESB-2 10'	325	--
ESB-2 15'	90.2	--
ESB-2 20'	6.05	--
ESB-2 25'	238	--

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
HA-4 0-6"	8,840	1,660
HA-4 6-12"	3,490	17,700

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
HA-3 0-6"	4,540	7,480
HA-3 6-9"	2,200	1,790

SAMPLE 4/18/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
BG-1 0-6"	<4.94	--

SAMPLE 6/7/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
Yates #2 SSB-3 0'	67.5	--
Yates #2 SSB-3 5'	<4.97	--

SAMPLE 4/11/2017	CHLORIDES (mg/kg)	TPH (mg/kg)
SSB-3 0'	628	29.3
SSB-3 5'	2,100	--
SSB-3 10'	31.8	--
SSB-3 15'	29.5	--
SSB-3 20'	6.52	--
SSB-3 25'	102	--

LEGEND

- HA-1 — LOCATION OF SOIL BORING SAMPLE
- SSB-3 — LOCATION OF HAND AUGERED SAMPLE
- BG-1 — LOCATION OF BACKGROUND SOIL SAMPLE

SOURCE: AERIAL PHOTOGRAPH DATED SEPTEMBER 30, 2014, GOOGLE EARTH PRO SCREEN CAPTURE

N

10 0 10 20
SCALE FEET

D:\Projects\RamEnergy\RAMRNM0002_YatesState2\04_CAD\20170411_SiteBase.dwg on Jul 14, 2017 - 10:16am

ENVIRO CLEAN CARDINAL
Enviro Clean Cardinal, LLC
7060 South Yale Avenue, Suite 603
Tulsa, Oklahoma 74136
918.794.7828
www.ECCGRP.com

DOCUMENT TITLE: SOIL INVESTIGATION REPORT

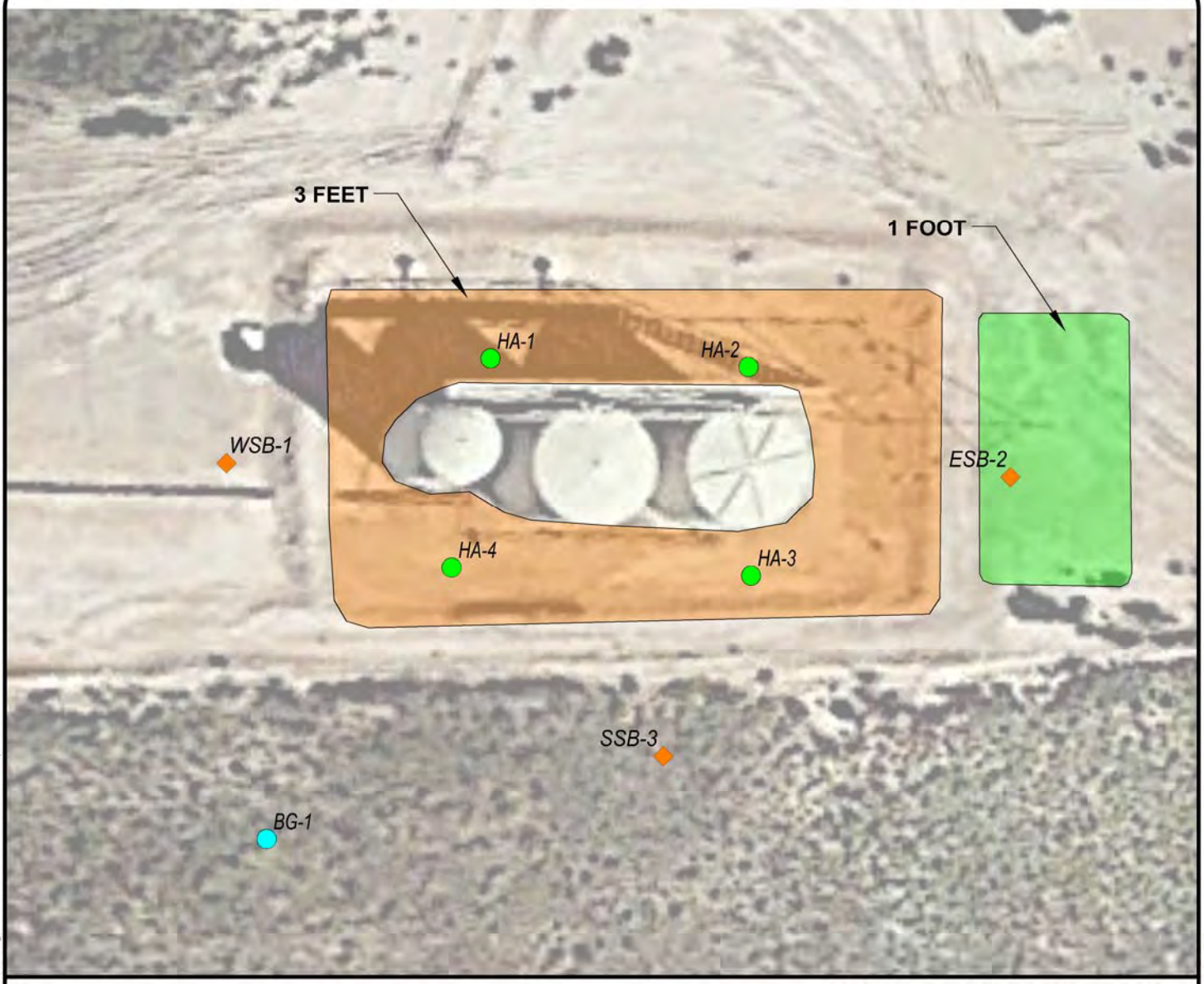
FIGURE TITLE: ***SAMPLE LOCATIONS WITH RELATED DATA***

CLIENT: RAM ENERGY RESOURCES, TULSA, OKLAHOMA

LOCATION: YATES STATE #2, SEC. 16, T12S R38E, LEA COUNTY, NEW MEXICO

DESIGNED BY	MNM\GHR		
APPROVED BY	GHR	SCALE	1"= 20'
DRAWN BY	SKG	DATE	7/13/2017

PROJECT NUMBER	FIGURE NUMBER
RAMRNM0002	2



SOURCE: AERIAL PHOTOGRAPH DATED SEPTEMBER 30, 2014, GOOGLE EARTH PRO SCREEN CAPTURE

LEGEND

HA-1 — LOCATION OF SOIL BORING SAMPLE

SSB-3 — LOCATION OF HAND AUGERED SAMPLE

BG-1 — LOCATION OF BACKGROUND SOIL SAMPLE

EXCAVATION TO 3 FEET IN DEPTH = 2327.37 SQ.FT., 258.60 CUBIC YARDS

EXCAVATION TO 1 FOOT IN DEPTH. = 646.51 SQ.FT., 23.95 CUBIC YARDS

10 0 10 20
SCALE FEET

N

CLIENT: RAM ENERGY RESOURCES TULSA, OKLAHOMA	FIGURE TITLE: ***PROPOSED LIMITS OF EXCAVATION***
LOCATION: YATES STATE #2 SEC. 16 T12S R38E, LEA COUNTY, NEW MEXICO	DOCUMENT TITLE: SOIL INVESTIGATION REPORT

ENVIRO CLEAN CARDINAL

Enviro Clean Cardinal, LLC
7060 South Yale Ave, Suite 603
Tulsa, Oklahoma 74136
918.794.7828
www.ECCGRP.com

		DESIGNED BY	MNM\GHR
DATE	7/13/2017	APPROVED BY	GHR
SCALE	1"= 20'	DRAWN BY	SKG
PROJECT NUMBER		FIGURE NUMBER	
RAMRNM0002		3	

D:\Projects\RamEnergy\RAMRNM0002_YatesState2\04_CAD\20170411_SiteBase.dwg on Jul 13, 2017 - 3:30pm

ATTACHMENT A

FORM C-141

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	RAM ENERGY LLC	Contact	Matt Patterson
Address	5100 E Skelly Drive, Suite 600, Tulsa, OK 74135	Telephone No.	(918) 638-7054
Facility Name	Yates State #2 Tank Battery	Facility Type	Wellsite location

Surface Owner Tom Burris (575) 370-3309	Mineral Owner	API No. 30-025-30255

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
H	16	12S	38E	2310	North	330	East	Lea

RECEIVED
By OCD Dr Oberding at 2:20 pm, Feb 07, 2017

Latitude _____ Longitude _____

NATURE OF RELEASE

Type of Release Saltwater	Volume of Release 37 bbls	Volume Recovered 37 bbls
Source of Release Water tank	Date and Hour of Occurrence 1/27/17	Date and Hour of Discovery 1/27/17 a.m.
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? George at OCD	
By Whom? Tom Burris	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

Personnel error.

Describe Area Affected and Cleanup Action Taken.*

36 bbls contained within the dike. 1 bbl water outside dike area. Vacuum truck picked up liquid. Waiting on OCD for instruction on cleaning spill inside dike.

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

Signature: CSwan	OIL CONSERVATION DIVISION
Printed Name: Connie Swan	Approved by ~~Environmental Specialist~~: Hydrologist
Title: Regulatory Administrator	Approval Date: 02/07/2017 Expiration Date: ///
E-mail Address: csswan@swanderlandok.com	Conditions of Approval: See attached CoA Attached ☐ 1R-4587
Date: 2/1/2017 Phone: (918) 621-6533	

* Attach Additional Sheets If Necessary

pTO1703852546

nTO1703852711

Operator/Responsible Party,

The OCD has received the form C-141 you provided on __02/07/2017____ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number __1R-_4587_____ has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before __03/07/2017__. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

- Nominal detection limits for field and laboratory analyses must be provided.

- Composite sampling is not generally allowed.

- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

•Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

• If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

• Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

ATTACHMENT B

BORING RECORDS

BORING RECORD

Start: 09:58
Stop: 10:38

GROUND SURFACE: CALICHE–GRAVEL

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION
	0		
	1.0	SILTY SAND: LIGHT BROWN, 7.5YR 6/3, SIEVE NO. 40, 60, 120 & 200 (APPROX. 25% EACH), SUBANGULAR–SUBROUND, CALCAREOUS, CHLORIDE 916 ppm	SM
		NOT SAMPLED: APPROX. 2 FOOT CLAY LAYER, PER WHITE DRILLING	
	5		
	6.0	SAND: WHITE, 10YR 8/1, INDURATED WELL GRADED SANDS, 10% FINES, ANGULAR–SUBROUND, CALCITIC, CHLORIDE 42 ppm	SW
		NOT SAMPLED:	
	10		
	11.0	SAND: PINK, 7.5YR 7/4, INDURATED, SIEVE NO. 40, 60 & 200 (30% EACH), CLEAN SAND, SUBROUND–ROUND, NO FINES, CALCITIC, CHLORIDE 60.5 ppm	SP
		NOT SAMPLED:	
	15		
	16.0	SILTY SAND: PINK 7.5YR 7/3, INDURATED, SIEVE NO. 60 & 120 (45% EACH), 10% FINES, SAND–SILT, CALCAREOUS, SUBROUNDED–WELL ROUNDED, CHLORIDE 99.1 ppm	SM
		NOT SAMPLED:	
	20		
	21.0	SILTY SAND: LIGHT BROWN 7.5YR 6/4, SIEVE NO. 60 & 120 (45% EACH), 10% FINES, CALCAREOUS, SAND–SILT, SUBROUNDED–WELL ROUNDED, CHLORIDE 276 ppm	SM
		NOT SAMPLED:	
	24.0		
	25	SAND: LIGHT BROWN, 7.5YR 6/4, SLIGHTLY MOIST, SIEVE NO. 40 (90%), NO FINES, CLEAN SAND, CALCAREOUS, SUBROUND–ROUND, CHLORIDE 277 ppm	SP
		TOTAL DEPTH: 25.0 FEET	
	30		
	35		

GRAPHIC LOG

OVM SOIL GAS
PPM X 2.0
2 4 6 8 10 12 14 16 18

SAMPLE NUMBER	OVM READING	RECOVERY	DEPTH
1	2.1	1.0 / NS	2.0 / 5.0
2	0.2	1.0 / NS	6.0 / 10.0
3	13.7	1.0 / NS	11.0 / 15.0
4	10.3	1.0 / NS	16.0 / 20.0
5	2	5.0 / NS	21.0 / 24.0
6	11.8	1.0	25.0

REMARKS

BACKGROUND
OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

AIR RETURNS SAMPLES

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NS: NOT SAMPLED

RAM ENERGY RESOURCES

JOB NAME/NUMBER *RAMRNM0002*

BORING NUMBER *WSB–1*

ENVIRO CLEAN CARDINAL
2405 East County Road 123 ▪ Midland, Texas 79706 ▪ 432-301-0209
www.ECCGRP.com

DATE DRILLED 4/11/2017
DRILLING METHOD AIR ROTARY
DRILLED BY WHITE DRILLING
LOGGED BY K. HUCKABA
CHECKED BY K. HUCKABA
DRAWING NO. WSB–1_BORE
DRAWN BY: S. GRAUE
PAGE 1 OF 1

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BORING RECORD

Start: 11:35
Stop: 12:14

GROUND SURFACE: CALICHE–GRAVEL

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG
	0			
	1.0	SAND: LIGHT BROWN, 7.5YR 6/4, SIEVE NO. 40, 60, 120 & 200 (20% EACH), 10% FINES, WELL GRADED, CLEAN SAND, GRAVEL–SAND–SILT MIX, CALCAREOUS, CHLORIDE 2,641ppm NOT SAMPLED:	SW	
	5			
	6.0	SAND: WHITE, 10YR 8/1, INDURATED SIEVE NO. 60 & 120 (45% EACH), 10% FINES, SUBROUND–WELL ROUND CALCAREOUS, CHLORIDE 202 ppm NOT SAMPLED:	SP	
	10			
	11.0	SAND: PINK, 7.5YR 7/4, INDURATED SIEVE NO. 60 & 120 (45% EACH), POORLY GRADED FINE–LITTLE OR NO FINES, V. FINE SAND, CLEAN SAND, SUBROUND–ROUND, CALCAREOUS, CHLORIDE 268 ppm NOT SAMPLED:	SP	
	15			
	16.0	SAND: PINK, 7.5YR 7/4, TOP 4" CLEAN SAND, POORLY GRADED, SIEVE NO. 60 & 120 (45% EACH), LITTLE OR NO FINES, SAME AS ABOVE, CHLORIDE 77.1 ppm SAND: WHITE, 10YR 8/1, LOWER 8" INDURATED, CLEAN SAND, CALCAREOUS	SP	
	20			
	21.0	SILTY SAND: LIGHT BROWN, 7.5YR 6/4, SIEVE NO. 40 & 60 (45% EACH), 10% FINES, SAND WITH FINES, CALCAREOUS, SUBROUND–ROUND, CHLORIDE 37.6 ppm NOT SAMPLED:	SM	
	24.0			
	25	SAND: LIGHT BROWN, 7.5YR 6/4, SLIGHTLY MOIST, SIEVE NO. 40 & 60 (45% EACH), <5% FINES, POORLY GRADED, CLEAN SANDS, CALCAREOUS, SUBROUND–ROUND, CHLORIDE 213 ppm TOTAL DEPTH: 25.0 FEET	SP	
	30			
	35			

OVM SOIL GAS PPM X 2.0 — 2 4 6 8 10 12 14 16 18

SAMPLE NUMBER	OVM READING	RECOVERY	DEPTH
1	9.2	1.0	1.0
		NS	5.0
2	10.1	1.0	6.0
		NS	10.0
3	8.5	1.0	11.0
		NS	15.0
4	11.4	1.0	16.0
		4.0	20.0
5	13.1	1.0	21.0
		NS	24.0
6	6.5	1.0	25.0

REMARKS

BACKGROUND OVM READING:
SOIL: _____ PPM
AIR: _____ PPM

AIR RETURNS SAMPLES

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NS: NOT SAMPLED

RAM ENERGY RESOURCES

JOB NAME/NUMBER ***RAMRNM0002***

BORING NUMBER ***ESB–2***

ENVIRO CLEAN CARDINAL
2405 East County Road 123 ▪ Midland, Texas 79706 ▪ 432-301-0209
www.ECCGRP.com

DATE DRILLED 4/11/2017
DRILLING METHOD AIR ROTARY
DRILLED BY WHITE DRILLING
LOGGED BY K. HUCKABA
CHECKED BY K. HUCKABA
DRAWING NO. ESB–2_BORE
DRAWN BY: S. GRAUE
PAGE 1 OF 1

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BORING RECORD

GEOLOG. UNIT	DEPTH (FEET)	LITHOLOGIC DESCRIPTION	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	OVM SOIL GAS PPM X 2.0 (2 4 6 8 10 12 14 16 18)	SAMPLE NUMBER	SAMPLE OVM READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS
		Start: 13:11 Stop: 13:41 GROUND SURFACE: NATIVE GRASSES								BACKGROUND OVM READING: SOIL: _____ PPM AIR: _____ PPM
	0	SILTY, GRAVELLY SAND: BROWN, 7.5YR 5/4, SOME GRAVEL, SIEVE NO. 4, 10, 40, 60, & 120 (20% EACH) AND FINES, GRAVEL WITH FINES, WELL SORTED, ANGULAR–ROUNDED, CALCAREOUS, CHLORIDE 559 ppm	GM			1	5.6	1.0	1.0	
	1.0	NOT SAMPLED:						NS	5.0	
	5	SAND: V. PALE BROWN, 10YR 8/3, INDURATED, SIEVE NO. 60 & 120 (45% EACH), LITTLE FINES, CLEAN SAND, SUBROUND–ROUND, CALCAREOUS, CHLORIDE 70.3 ppm	SP			2	6.3	1.0	6.0	
	6.0	NOT SAMPLED:						NS	10.0	
	10	SAND: PINK, 7.5YR 7/4, SIEVE NO. 60 & 120 (45% EACH), NO FINES–LITTLE FINES, INDURATED, CLEAN SAND, SUBROUND–ROUND, CALCAREOUS, CHLORIDE 49.0 ppm	SP			3	11.6	1.0	11.0	
	11.0	NOT SAMPLED:						NS	15.0	
	15	SAND: PINK, 7.5YR 7/4, SIEVE NO. 60 & 120 (45% EACH), LITTLE FINES, INDURATED, CLEAN SAND, SUBROUND–ROUND, CALCAREOUS, CHLORIDE 55.7 ppm	SP			4	11.5	1.0	16.0	
	16.0	NOT SAMPLED:						NS	20.0	
	20	SILTY SAND: LIGHT BROWN, 7.5YR 6/4, SIEVE NO. 60 & 120 (45% EACH), 10% FINES, SAND WITH FINES, SUBROUND–ROUND, CALCAREOUS, CHLORIDE 26.4 ppm	SM			5	12.6	1.0	21.0	
	21.0	NOT SAMPLED:						NS	24.0	
	24.0	SAND: LIGHT BROWN, 7.5YR 6/4, SLIGHTLY MOIST, SIEVE NO. 40 & 60 (45% EACH), <5% FINES, POORLY GRADED CLEAN S.S., SUBROUND–ROUND, CALCAREOUS, CHLORIDE 127 ppm	SP			6	9.3	1.0	25.0	
	25	TOTAL DEPTH: 25.0 FEET								
	30									
	35									

AIR RETURNS SAMPLES

WATER TABLE (24 HOURS)

WATER TABLE (TIME OF BORING)

NS: NOT SAMPLED

RAM ENERGY RESOURCES

JOB NAME/NUMBER ***RAMRNM0002***

BORING NUMBER ***SSB-3***

ENVIRO CLEAN CARDINAL

2405 East County Road 123 ▪ Midland, Texas 79706 ▪ 432-301-0209

www.ECCGRP.com

DATE DRILLED 4/11/2017

DRILLING METHOD AIR ROTARY

DRILLED BY WHITE DRILLING

LOGGED BY K. HUCKABA

CHECKED BY K. HUCKABA

DRAWING NO. SSB-3_BORE

DRAWN BY: S. GRAUE

PAGE 1 OF 1

D:\Projects\RamEnergy\RAMRNM0002_YatesState2\04_CAD\SSB-3_BORE.dwg on Jul 06, 2017-10:18am

BORING RECORD

Start: 10:00
Finish: 10:35

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING (PPM X ____)	SAMPLE NUMBER	SAMPLE PID READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS BACKGROUND PID READING
	0	F. Grained Sand, Loosely Consolidated, Reddish Yellow, 7.5YR, 6/6, Gravel 20-40mm	GP			1			0	
									1	10:00
						2			3	10:10
		Mildly Consolidated Silty Sand, White	SM						4	
	5					3			5	10:12
		F. Grained Indurated Sand, Very Pale Brown, 10YR, 8/3	SP						6	
						4			7	10:15
		F. Grained Indurated Sand, Very Pale Brown, 10YR, 8/3							8	
	10	Caliche Interbedded In Fine Grained Sand, Very Pale Brown, 10YR, 7/4, Caliche Up to 2cm							10	10:21
									11	
	15	Fine Grained Sand (Pink), 7.5YR, 7/4, w/ Caliche Nodules (5cm)							15	10:25
		Not Sampled							16	
			SP							
	20	Indurated F. Grained Sand, Pink, 7.5YR, 7/4							20	10:30
						5			21	
	25									
	30									
	35									
	40									

PID READING scale: 2 4 6 8 10 12 14 16 18

SOIL : _____ PPM
SOIL : _____ PPM

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 : 17-0155-01
HOLE DIAMETER : _____
LOCATION : Ram Yates St #2 NM
LAI GEOLOGIST : B. Sullivan
DRILLING CONTRACTOR : Scarbrough Drilling
DRILLING METHOD : AR

Larson & Associates, Inc.
Environmental Consultants

DRILL DATE : 6-7-2017

BORING NUMBER : Yates #2 HA-2

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS

Analytical Report 550773

for

Enviroclean- Midland

Project Manager: BILL GREEN

RAMRNM002

08-MAY-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

08-MAY-17

Project Manager: **BILL GREEN**
Enviroclean- Midland
2405 ECR 123
Midland, TX 79706

Reference: XENCO Report No(s): **550773**
RAMRNM002
Project Address: Yates State #2

BILL GREEN:

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) 550773. 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. 550773 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 550773

Enviroclean- Midland, Midland, TX

RAMRNM002

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
WSB-1	S	04-11-17 09:58	N/A	550773-001
WSB-1	S	04-11-17 10:10	- 5 ft	550773-002
WSB-1	S	04-11-17 10:13	- 10 ft	550773-003
WSB-1	S	04-11-17 10:16	- 15 ft	550773-004
WSB-1	S	04-11-17 10:22	- 20 ft	550773-005
WSB-1	S	04-11-17 10:38	- 25 ft	550773-006
ESB-2	S	04-11-17 11:35	N/A	550773-007
ESB-2	S	04-11-17 11:44	- 5 ft	550773-008
ESB-2	S	04-11-17 11:47	- 10 ft	550773-009
ESB-2	S	04-11-17 11:50	- 15 ft	550773-010
ESB-2	S	04-11-17 11:56	- 20 ft	550773-011
ESB-2	S	04-11-17 12:14	- 25 ft	550773-012
SSB-3	S	04-11-17 13:11	N/A	550773-013
SSB-3	S	04-11-17 13:25	- 5 ft	550773-014
SSB-3	S	04-11-17 13:28	- 10 ft	550773-015
SSB-3	S	04-11-17 13:31	- 15 ft	550773-016
SSB-3	S	04-11-17 13:34	- 20 ft	550773-017
SSB-3	S	04-11-17 13:41	- 25 ft	550773-018
HA-1	S	04-11-17 14:39	0 - 6 In	550773-019
HA-1	S	04-11-17 14:44	6 - 12 In	550773-020
HA-2	S	04-11-17 14:50	0 - 6 In	550773-021
HA-2	S	04-11-17 14:55	6 - 12 In	550773-022
HA-3	S	04-11-17 15:00	0 - 6 In	550773-023
HA-3	S	04-11-17 15:04	6 - 9 In	550773-024
HA-4	S	04-11-17 15:08	0 - 6 In	550773-025
HA-4	S	04-11-17 15:12	6 - 12 In	550773-026

Client Name: Enviroclean- Midland
Project Name: RAMRNM002

Project ID:
Work Order Number(s): *550773*

Report Date: *08-MAY-17*
Date Received: *04/12/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3015080 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3015083 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3015178 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 550773

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-12-17 09:23 am
Report Date: 08-MAY-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	550773-001		550773-002		550773-003		550773-004		550773-005		550773-006	
	Field Id:	WSB-1		WSB-1		WSB-1		WSB-1		WSB-1		WSB-1	
	Depth:			5 ft		10 ft		15 ft		20 ft		25 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-11-17 09:58		Apr-11-17 10:10		Apr-11-17 10:13		Apr-11-17 10:16		Apr-11-17 10:22		Apr-11-17 10:38	
BTEX by EPA 8021B	***Extracted:***	Apr-14-17 10:30											
	Analyzed:	Apr-14-17 14:06											
	Units/RL:	mg/kg	RL										
Benzene		ND	0.00150										
Toluene		ND	0.00200										
Ethylbenzene		ND	0.00200										
m,p-Xylenes		ND	0.00200										
o-Xylene		ND	0.00301										
Total Xylenes		ND	0.00200										
Total BTEX		ND	0.00150										
Inorganic Anions by EPA 300	***Extracted:***	Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		May-06-17 13:00		May-06-17 13:00	
	Analyzed:	Apr-17-17 14:08		Apr-17-17 14:33		Apr-17-17 14:41		Apr-17-17 14:49		May-06-17 18:31		May-06-17 18:54	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1000	4.90	54.9	4.98	41.8	4.99	112	4.90	269	4.97	373	4.95
TPH by SW8015 Mod	***Extracted:***	Apr-13-17 17:00											
	Analyzed:	Apr-14-17 03:16											
	Units/RL:	mg/kg	RL										
C6-C10 Gasoline Range Hydrocarbons		ND	15.0										
C10-C28 Diesel Range Organics		41.9	15.0										
C28-C35 Oil Range Hydrocarbons		18.7	15.0										
Total TPH		60.6	15.0										

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 550773

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-12-17 09:23 am
Report Date: 08-MAY-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	550773-007		550773-008		550773-009		550773-010		550773-011		550773-012	
	Field Id:	ESB-2		ESB-2		ESB-2		ESB-2		ESB-2		ESB-2	
	Depth:			5 ft		10 ft		15 ft		20 ft		25 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-11-17 11:35		Apr-11-17 11:44		Apr-11-17 11:47		Apr-11-17 11:50		Apr-11-17 11:56		Apr-11-17 12:14	
BTEX by EPA 8021B	***Extracted:***	Apr-14-17 10:30											
	Analyzed:	Apr-14-17 14:27											
	Units/RL:	mg/kg	RL										
Benzene		ND	0.00149										
Toluene		ND	0.00199										
Ethylbenzene		ND	0.00199										
m,p-Xylenes		ND	0.00199										
o-Xylene		ND	0.00299										
Total Xylenes		ND	0.00199										
Total BTEX		ND	0.00149										
Inorganic Anions by EPA 300	***Extracted:***	Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-20-17 13:00	
	Analyzed:	Apr-17-17 14:57		Apr-17-17 15:21		Apr-17-17 15:29		Apr-17-17 15:37		Apr-17-17 16:02		Apr-20-17 17:27	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		3390	24.5	157	4.95	325	4.97	90.2	4.89	6.05	4.94	238	5.00
TPH by SW8015 Mod	***Extracted:***	Apr-13-17 17:00											
	Analyzed:	Apr-14-17 03:35											
	Units/RL:	mg/kg	RL										
C6-C10 Gasoline Range Hydrocarbons		ND	15.0										
C10-C28 Diesel Range Organics		26.2	15.0										
C28-C35 Oil Range Hydrocarbons		ND	15.0										
Total TPH		26.2	15.0										

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 550773

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-12-17 09:23 am
Report Date: 08-MAY-17
Project Manager: Kelsey Brooks

Analysis Requested	*Lab Id:*	550773-013		550773-014		550773-015		550773-016		550773-017		550773-018	
	Field Id:	SSB-3		SSB-3		SSB-3		SSB-3		SSB-3		SSB-3	
	Depth:			5 ft		10 ft		15 ft		20 ft		25 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-11-17 13:11		Apr-11-17 13:25		Apr-11-17 13:28		Apr-11-17 13:31		Apr-11-17 13:34		Apr-11-17 13:41	
BTEX by EPA 8021B	*Extracted:*	Apr-15-17 08:00											
	Analyzed:	Apr-15-17 17:28											
	Units/RL:	mg/kg	RL										
Benzene		ND	0.00150										
Toluene		ND	0.00200										
Ethylbenzene		ND	0.00200										
m,p-Xylenes		ND	0.00200										
o-Xylene		ND	0.00299										
Total Xylenes		ND	0.00200										
Total BTEX		ND	0.00150										
Inorganic Anions by EPA 300	*Extracted:*	Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 13:00		May-06-17 13:00	
	Analyzed:	Apr-17-17 15:46		Apr-17-17 15:54		Apr-17-17 16:26		Apr-17-17 16:34		Apr-17-17 16:58		May-06-17 19:01	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		628	4.88	2100	24.9	31.8	4.94	29.5	4.93	6.52	4.88	102	4.94
TPH by SW8015 Mod	*Extracted:*	Apr-13-17 17:00											
	Analyzed:	Apr-14-17 03:55											
	Units/RL:	mg/kg	RL										
C6-C10 Gasoline Range Hydrocarbons		ND	15.0										
C10-C28 Diesel Range Organics		29.3	15.0										
C28-C35 Oil Range Hydrocarbons		ND	15.0										
Total TPH		29.3	15.0										

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 550773

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-12-17 09:23 am
Report Date: 08-MAY-17
Project Manager: Kelsey Brooks

Analysis Requested	*Lab Id:*	550773-019		550773-020		550773-021		550773-022		550773-023		550773-024	
	Field Id:	HA-1		HA-1		HA-2		HA-2		HA-3		HA-3	
	Depth:	0-6 In		6-12 In		0-6 In		6-12 In		0-6 In		6-9 In	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-11-17 14:39		Apr-11-17 14:44		Apr-11-17 14:50		Apr-11-17 14:55		Apr-11-17 15:00		Apr-11-17 15:04	
BTEX by EPA 8021B	*Extracted:*	Apr-17-17 07:30		Apr-15-17 08:00		Apr-15-17 08:00		Apr-17-17 07:30		Apr-14-17 10:30		Apr-14-17 10:30	
	Analyzed:	Apr-17-17 10:06		Apr-15-17 18:01		Apr-15-17 18:17		Apr-17-17 10:23		Apr-14-17 17:33		Apr-14-17 18:06	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		ND	0.00500	ND	0.00150	ND	0.00152	ND	0.00258	ND	0.00152	0.00199	0.00149
Toluene		ND	0.00667	ND	0.00200	ND	0.00203	ND	0.00344	ND	0.00202	ND	0.00199
Ethylbenzene		ND	0.00667	ND	0.00200	ND	0.00203	ND	0.00344	ND	0.00202	0.00360	0.00199
m,p-Xylenes		ND	0.00667	ND	0.00200	ND	0.00203	ND	0.00344	ND	0.00202	0.00370	0.00199
o-Xylene		ND	0.0100	ND	0.00301	ND	0.00304	ND	0.00515	ND	0.00303	ND	0.00299
Total Xylenes		ND	0.00667	ND	0.00200	ND	0.00203	ND	0.00344	ND	0.00202	0.00370	0.00199
Total BTEX		ND	0.00500	ND	0.00150	ND	0.00152	ND	0.00258	ND	0.00152	0.00929	0.00149
Inorganic Anions by EPA 300	*Extracted:*	Apr-17-17 13:00		Apr-17-17 13:00		Apr-17-17 16:50		Apr-17-17 16:50		Apr-17-17 16:50		Apr-17-17 16:50	
	Analyzed:	Apr-17-17 17:06		Apr-17-17 17:15		Apr-17-17 18:27		Apr-17-17 18:36		Apr-17-17 18:44		Apr-17-17 18:52	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		11100	97.1	4170	24.9	23000	243	15900	246	4540	49.2	2200	24.8
TPH by SW8015 Mod	*Extracted:*	Apr-13-17 17:00		Apr-13-17 17:00		Apr-13-17 17:00		Apr-13-17 17:00		Apr-13-17 17:00		Apr-13-17 17:00	
	Analyzed:	Apr-14-17 07:19		Apr-14-17 04:34		Apr-14-17 04:54		Apr-14-17 05:14		Apr-14-17 05:35		Apr-14-17 05:57	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C10 Gasoline Range Hydrocarbons		ND	15.0	ND	15.0	ND	15.0	ND	14.9	84.7	74.8	ND	74.9
C10-C28 Diesel Range Organics		1900	15.0	872	15.0	ND	15.0	ND	14.9	6220	74.8	1640	74.9
C28-C35 Oil Range Hydrocarbons		354	15.0	122	15.0	ND	15.0	ND	14.9	1180	74.8	151	74.9
Total TPH		2250	15.0	994	15.0	ND	15.0	ND	14.9	7480	74.8	1790	74.9

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 550773

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-12-17 09:23 am
Report Date: 08-MAY-17
Project Manager: Kelsey Brooks

Analysis Requested									
	Lab Id:	550773-025		550773-026					
	Field Id:	HA-4		HA-4					
	Depth:	0-6 In		6-12 In					
	Matrix:	SOIL		SOIL					
	Sampled:	Apr-11-17 15:08		Apr-11-17 15:12					
BTEX by EPA 8021B	***Extracted:***	Apr-14-17 10:30		Apr-14-17 10:30					
	Analyzed:	Apr-14-17 17:49		Apr-14-17 18:22					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Benzene		ND	0.00148	0.0892	0.00150				
Toluene		ND	0.00198	0.147	0.00200				
Ethylbenzene		ND	0.00198	0.0984	0.00200				
m,p-Xylenes		ND	0.00198	0.373	0.00200				
o-Xylene		ND	0.00296	0.178	0.00299				
Total Xylenes		ND	0.00198	0.551	0.00200				
Total BTEX		ND	0.00148	0.886	0.00150				
Inorganic Anions by EPA 300	***Extracted:***	Apr-17-17 16:50		Apr-17-17 16:50					
	Analyzed:	Apr-17-17 19:16		Apr-17-17 19:24					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Chloride		8840	48.9	3490	24.3				
TPH by SW8015 Mod	***Extracted:***	Apr-13-17 17:00		Apr-13-17 17:00					
	Analyzed:	Apr-14-17 06:19		Apr-14-17 06:59					
	Units/RL:	mg/kg	RL	mg/kg	RL				
C6-C10 Gasoline Range Hydrocarbons		ND	74.9	1640	74.9				
C10-C28 Diesel Range Organics		1520	74.9	14100	74.9				
C28-C35 Oil Range Hydrocarbons		142	74.9	1980	74.9				
Total TPH		1660	74.9	17700	74.9				

Kelsey Brooks
Project Manager

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

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015031 **Sample:** 550773-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 03:16

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.8	111	70-135	
o-Terphenyl	55.7	49.9	112	70-135	

Lab Batch #: 3015031 **Sample:** 550773-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 03:35

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.0	99.8	96	70-135	
o-Terphenyl	49.7	49.9	100	70-135	

Lab Batch #: 3015031 **Sample:** 550773-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 03:55

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.3	99.7	95	70-135	
o-Terphenyl	47.1	49.9	94	70-135	

Lab Batch #: 3015031 **Sample:** 550773-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 04:34

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.0	99.7	94	70-135	
o-Terphenyl	47.9	49.9	96	70-135	

Lab Batch #: 3015031 **Sample:** 550773-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 04:54

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.8	99.8	92	70-135	
o-Terphenyl	48.3	49.9	97	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015031 **Sample:** 550773-022 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 05:14

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.6	99.6	96	70-135	
o-Terphenyl	50.0	49.8	100	70-135	

Lab Batch #: 3015031 **Sample:** 550773-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 05:35

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.7	110	70-135	
o-Terphenyl	51.0	49.9	102	70-135	

Lab Batch #: 3015031 **Sample:** 550773-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 05:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.4	99.9	86	70-135	
o-Terphenyl	44.5	50.0	89	70-135	

Lab Batch #: 3015031 **Sample:** 550773-025 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 06:19

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.2	99.8	88	70-135	
o-Terphenyl	46.9	49.9	94	70-135	

Lab Batch #: 3015031 **Sample:** 550773-026 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 06:59

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.1	99.8	91	70-135	
o-Terphenyl	56.2	49.9	113	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015031 **Sample:** 550773-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 07:19

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.9	99.9	95	70-135	
o-Terphenyl	39.8	50.0	80	70-135	

Lab Batch #: 3015080 **Sample:** 550773-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 14:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0255	0.0300	85	80-120	

Lab Batch #: 3015080 **Sample:** 550773-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 14:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0250	0.0300	83	80-120	

Lab Batch #: 3015080 **Sample:** 550773-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 17:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

Lab Batch #: 3015080 **Sample:** 550773-025 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 17:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0345	0.0300	115	80-120	
4-Bromofluorobenzene	0.0326	0.0300	109	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015080 **Sample:** 550773-024 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 18:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3015080 **Sample:** 550773-026 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 18:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0349	0.0300	116	80-120	
4-Bromofluorobenzene	0.0320	0.0300	107	80-120	

Lab Batch #: 3015083 **Sample:** 550773-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/17 17:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0346	0.0300	115	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 3015083 **Sample:** 550773-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/17 18:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0344	0.0300	115	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	80-120	

Lab Batch #: 3015083 **Sample:** 550773-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/17 18:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0346	0.0300	115	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015178 **Sample:** 550773-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/17 10:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0357	0.0300	119	80-120	
4-Bromofluorobenzene	0.0323	0.0300	108	80-120	

Lab Batch #: 3015178 **Sample:** 550773-022 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/17 10:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3015031 **Sample:** 723140-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 02:18

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.4	100	95	70-135	
o-Terphenyl	50.6	50.0	101	70-135	

Lab Batch #: 3015080 **Sample:** 723176-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 13:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0348	0.0300	116	80-120	
4-Bromofluorobenzene	0.0326	0.0300	109	80-120	

Lab Batch #: 3015083 **Sample:** 723183-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/15/17 17:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0360	0.0300	120	80-120	
4-Bromofluorobenzene	0.0324	0.0300	108	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015178 **Sample:** 723245-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/17/17 09:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0351	0.0300	117	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3015031 **Sample:** 723140-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 02:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.6	100	95	70-135	
o-Terphenyl	46.2	50.0	92	70-135	

Lab Batch #: 3015080 **Sample:** 723176-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 11:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0339	0.0300	113	80-120	
4-Bromofluorobenzene	0.0287	0.0300	96	80-120	

Lab Batch #: 3015083 **Sample:** 723183-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/15/17 15:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	80-120	

Lab Batch #: 3015178 **Sample:** 723245-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/17/17 07:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0345	0.0300	115	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015031 **Sample:** 723140-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 02:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	125	100	125	70-135	
o-Terphenyl	62.3	50.0	125	70-135	

Lab Batch #: 3015080 **Sample:** 723176-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/17 11:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 3015083 **Sample:** 723183-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/15/17 16:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0320	0.0300	107	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3015178 **Sample:** 723245-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/17/17 07:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 3015031 **Sample:** 550773-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 09:50

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	118	99.6	118	70-135	
o-Terphenyl	57.5	49.8	115	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015080 **Sample:** 550692-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 12:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

Lab Batch #: 3015083 **Sample:** 550773-013 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/17 16:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	80-120	
4-Bromofluorobenzene	0.0345	0.0300	115	80-120	

Lab Batch #: 3015178 **Sample:** 550869-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/17 08:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0356	0.0300	119	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

Lab Batch #: 3015031 **Sample:** 550773-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 14:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.5	99.8	98	70-135	
o-Terphenyl	43.6	49.9	87	70-135	

Lab Batch #: 3015080 **Sample:** 550692-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/17 20:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0312	0.0300	104	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: RAMRNM002

Work Orders : 550773,

Project ID:

Lab Batch #: 3015083 **Sample:** 550773-013 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/17 16:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0328	0.0300	109	80-120	
4-Bromofluorobenzene	0.0354	0.0300	118	80-120	

Lab Batch #: 3015178 **Sample:** 550869-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/17 08:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0349	0.0300	116	80-120	
4-Bromofluorobenzene	0.0292	0.0300	97	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: RAMRNM002

Work Order #: 550773 **Project ID:**

Analyst: ALJ **Date Prepared:** 04/14/2017 **Date Analyzed:** 04/14/2017

Lab Batch ID: 3015080 **Sample:** 723176-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00151	0.101	0.112	111	0.100	0.114	114	2	70-130	35	
Toluene	<0.00202	0.101	0.123	122	0.100	0.127	127	3	70-130	35	
Ethylbenzene	<0.00202	0.101	0.120	119	0.100	0.128	128	6	71-129	35	
m,p-Xylenes	<0.00202	0.202	0.235	116	0.201	0.248	123	5	70-135	35	
o-Xylene	<0.00302	0.101	0.120	119	0.100	0.129	129	7	71-133	35	

Analyst: ALJ **Date Prepared:** 04/15/2017 **Date Analyzed:** 04/15/2017

Lab Batch ID: 3015083 **Sample:** 723183-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00150	0.100	0.0981	98	0.0998	0.0908	91	8	70-130	35	
Toluene	<0.00200	0.100	0.103	103	0.0998	0.0946	95	9	70-130	35	
Ethylbenzene	<0.00200	0.100	0.103	103	0.0998	0.0915	92	12	71-129	35	
m,p-Xylenes	<0.00200	0.200	0.202	101	0.200	0.180	90	12	70-135	35	
o-Xylene	<0.00301	0.100	0.106	106	0.0998	0.0961	96	10	71-133	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: RAMRNM002

Work Order #: 550773 **Project ID:**

Analyst: ALJ **Date Prepared:** 04/17/2017 **Date Analyzed:** 04/17/2017

Lab Batch ID: 3015178 **Sample:** 723245-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00150	0.100	0.0887	89	0.101	0.0946	94	6	70-130	35	
Toluene	<0.00200	0.100	0.106	106	0.101	0.102	101	4	70-130	35	
Ethylbenzene	<0.00200	0.100	0.104	104	0.101	0.100	99	4	71-129	35	
m,p-Xylenes	<0.00200	0.200	0.206	103	0.202	0.196	97	5	70-135	35	
o-Xylene	<0.00301	0.100	0.122	122	0.101	0.100	99	20	71-133	35	

Analyst: MGO **Date Prepared:** 04/17/2017 **Date Analyzed:** 04/17/2017

Lab Batch ID: 3015173 **Sample:** 723207-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.97	249	253	102	249	250	100	1	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: RAMRNM002

Work Order #: 550773 **Project ID:**

Analyst: MGO **Date Prepared:** 04/17/2017 **Date Analyzed:** 04/17/2017

Lab Batch ID: 3015179 **Sample:** 723217-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.91	246	246	100	246	248	101	1	90-110	20	

Analyst: MGO **Date Prepared:** 04/20/2017 **Date Analyzed:** 04/20/2017

Lab Batch ID: 3015441 **Sample:** 723387-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.97	249	272	109	249	270	108	1	90-110	20	

Analyst: MGO **Date Prepared:** 05/06/2017 **Date Analyzed:** 05/06/2017

Lab Batch ID: 3016700 **Sample:** 724187-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	251	100	250	253	101	1	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: RAMRNM002

Work Order #: 550773 **Project ID:**

Analyst: ARM **Date Prepared:** 04/13/2017 **Date Analyzed:** 04/14/2017

Lab Batch ID: 3015031 **Sample:** 723140-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	938	94	1000	988	99	5	70-135	35	
C10-C28 Diesel Range Organics	<15.0	1000	946	95	1000	1060	106	11	70-135	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS Recoveries

Project Name: RAMRNM002

Work Order #: 550773

Lab Batch #: 3015173 **Project ID:**

Date Analyzed: 04/17/2017 **Date Prepared:** 04/17/2017 **Analyst:** MGO

QC- Sample ID: 550773-001 S **Batch #:** 1 **Matrix:** Soil

Reporting Units: mg/kg

	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Inorganic Anions by EPA 300 **Analytes**	**Parent Sample Result [A]**	**Spike Added [B]**	**Spiked Sample Result [C]**	**%R [D]**	**Control Limits %R**	**Flag**
Chloride	1000	245	1230	94	90-110	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: RAMRNM002

Work Order # : 550773 **Project ID:**

Lab Batch ID: 3015080 **QC- Sample ID:** 550692-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/14/2017 **Date Prepared:** 04/14/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00151	0.101	0.0803	80	0.100	0.0817	82	2	70-130	35	
Toluene	<0.00201	0.101	0.0875	87	0.100	0.0816	82	7	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0750	74	0.100	0.0731	73	3	71-129	35	
m,p-Xylenes	<0.00201	0.201	0.151	75	0.200	0.146	73	3	70-135	35	
o-Xylene	<0.00302	0.101	0.0844	84	0.100	0.0801	80	5	71-133	35	

Lab Batch ID: 3015083 **QC- Sample ID:** 550773-013 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/15/2017 **Date Prepared:** 04/15/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00151	0.101	0.0903	89	0.100	0.0757	76	18	70-130	35	
Toluene	<0.00202	0.101	0.0830	82	0.100	0.0829	83	0	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0776	77	0.100	0.0820	82	6	71-129	35	
m,p-Xylenes	<0.00202	0.202	0.149	74	0.201	0.159	79	6	70-135	35	
o-Xylene	<0.00302	0.101	0.0834	83	0.100	0.0941	94	12	71-133	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: RAMRNM002

Work Order # : 550773 **Project ID:**

Lab Batch ID: 3015178 **QC- Sample ID:** 550869-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/17/2017 **Date Prepared:** 04/17/2017 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00270	0.180	0.0844	47	0.183	0.0827	45	2	70-130	35	X
Toluene	<0.00360	0.180	0.0664	37	0.183	0.0598	33	10	70-130	35	X
Ethylbenzene	<0.00360	0.180	0.0482	27	0.183	0.0542	30	12	71-129	35	X
m,p-Xylenes	<0.00360	0.360	0.0856	24	0.366	0.0872	24	2	70-135	35	X
o-Xylene	<0.00540	0.180	0.0498	28	0.183	0.0494	27	1	71-133	35	X

Lab Batch ID: 3015173 **QC- Sample ID:** 550773-011 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/17/2017 **Date Prepared:** 04/17/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	6.05	247	251	99	247	244	96	3	90-110	20	

Lab Batch ID: 3015179 **QC- Sample ID:** 550795-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/17/2017 **Date Prepared:** 04/17/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.96	248	256	103	248	255	103	0	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: RAMRNM002

Work Order # : 550773 **Project ID:**

Lab Batch ID: 3015179 **QC- Sample ID:** 550864-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/17/2017 **Date Prepared:** 04/17/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	61.4	245	304	99	245	310	101	2	90-110	20	

Lab Batch ID: 3015441 **QC- Sample ID:** 551283-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/20/2017 **Date Prepared:** 04/20/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.86	243	306	126	243	306	126	0	90-110	20	X

Lab Batch ID: 3016700 **QC- Sample ID:** 552429-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 05/06/2017 **Date Prepared:** 05/06/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	933	245	1140	84	245	1140	84	0	90-110	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: RAMRNM002

Work Order # : 550773 **Project ID:**

Lab Batch ID: 3015031 **QC- Sample ID:** 550773-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/14/2017 **Date Prepared:** 04/13/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<14.9	996	1060	106	998	993	99	7	70-135	35	
C10-C28 Diesel Range Organics	41.9	996	1060	102	998	1070	103	1	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ENVIRO CLEAN SERVICES, LLC

CHAIN OF CUSTODY

COC 1 of 3

No. M00132

Enviro Clean / Midland Texas	Project Name/Number: RAMRNM0002
2405 E. County Rd. 123 Midland, TX 79706	Project Location: Yates State #2
Email: bill.green@eccgrp.com wendy.north@eccgrp.com khuckaba@eccgrp.com	Phone No: 432.301.0209
Project Contact: William Green	Invoice To: ap@eccgrp.com Enviro Clean P O Box 721090 Oklahoma City, OK 73172-1090
Sampler's Name: Kimberly Huckaba	PO Number:

Matrix Codes
S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
WW = Waste Water
P = Product/Oil
SW = Surface water
SL = Sludge
OW = Ocean Water
W = Wipe
O = Other
A = Air

550773

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottle	Preservative Used: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	ICE	Analytical Information: Texas TPH - TX 1005	New Mexico TPH - 8015M	BTEX	Chlorides	PAH	Glycol	RCRA Metals	VOCs	SVOCs	Hold	Field Comments
1	WSB-1	0'	4-11-17	958	S	1								X		X	X	X							
2	WSB-1	5'	4-11-17	1010	S	1								X				X							
3	WSB-1	10'	4-11-17	1013	S	1								X				X							
4	WSB-1	15'	4-11-17	1016	S	1								X				X							
5	WSB-1	20'	4-11-17	1022	S	1								X									X		
6	WSB-1	25'	4-11-17	1038	S	1								X									X		
7	ESB-2	0'	4-11-17	1135	S	1								X		X	X	X							
8	ESB-2	5'	4-11-17	1144	S	1								X				X							
9	ESB-2	10'	4-11-17	1147	S	1								X				X							
10	ESB-2	15'	4-11-17	1150	S	1								X				X							
11	ESB-2	20'	4-11-17	1156	S	1								X				X							
12	ESB-2	25'	4-11-17	1214	S	1								X									X		

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☒ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- ☒ Level II Std QC
- ☐ Level III Std QC+ Forms
- ☐ Level 3 (CLP Forms)
- ☐ TRRP Checklist
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ TRRP Level IV
- ☐

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler: 1 K Huckaba	Date Time: 4-11-17 19:00	Received By: 1	Relinquished By: 2	Date Time:	Received By: 2 K Huckaba
Relinquished by: 3 K Huckaba	Date Time: 4-12-17 9:23	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒

Temp: 0.3 IR ID:R-8
CF: +0.1
Corrected Temp: 0.4

Final 1.002

ENVIRO CLEAN SERVICES, LLC

CHAIN OF CUSTODY

COC 2 of 3

No. M 00133

Enviro Clean / Midland Texas	Project Name/Number: RAMRNM0002
2405 E. County Rd. 123 Midland, TX 79706	Project Location: YatesState#2
Email: bill.green@eccgrp.com wendy.north@eccgrp.com khuckaba@eccgrp.com	Phone No: 432.301.0209
Project Contact: William Green	Invoice To: ap@eccgrp.com Enviro Clean P O Box 721090 Oklahoma City, OK 73172-1090
Sampler's Name: Kimberly Huckaba	PO Number:

Analytical Information

Matrix Codes: S = Soil/Sed/Solid; GW = Ground Water; DW = Drinking Water; WW = Waste Water; P = Product/Oil; SW = Surface water; SL = Sludge; OW = Ocean Water; W = Wipe; O = Other; A = Air

550773

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottle	Preservative Used: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	ICE	Texas TPH - TX 1005	New Mexico TPH - 8015M	BTEX	Chlorides	PAH	Glycol	RCRA Metals	VOCs	SVOCs	Hold	Field Comments
1	SSB-3	0'	4-11-17	1311	S	1								X		X	X	X							
2	SSB-3	5'	4-11-17	1325	S	1								X				X							
3	SSB-3	10'	4-11-17	1328	S	1								X				X							
4	SSB-3	15'	4-11-17	1331	S	1								X				X							
5	SSB-3	20'	4-11-17	1334	S	1								X				X							
6	SSB-3	25'	4-11-17	1341	S	1								X	KH									X	
7	HA-1	0-6"	4-11-17	1439	S	1								X	X	X	X	X							No TX1005, run NM 8015M
8	HA-1	6-12"	4-11-17	1444	S	1								X		X	X	X							
9	HA-2	0-6"	4-11-17	1450	S	1								X		X	X	X							
10	HA-2	6-12"	4-11-17	1455	S	1								X		X	X	X							
11	HA-3	0-6"	4-11-17	1500	S	1								X		X	X	X							
12	HA-3	6-9"	4-11-17	1504	S	1								X		X	X	X							

Turnaround Time (Business days)

- [ ] Same Day TAT
- [X] 5 Day TAT
- [ ] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [ ] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- [X] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ]
- [ ] TRRP Checklist

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	K Huckaba	4-11-17 19:00		2		2 K Huckaba
3	Relinquished by: K Huckaba	Date Time: 4-12-17 9:23	Received By:	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice

Temp: 10.3 IR ID:R-8
CF: +0.1
Corrected Temp: 0.4

Final 1.002

ENVIRO CLEAN SERVICES, LLC

CHAIN OF CUSTODY

COC 3 of 3

No. M 00134

Enviro Clean / Midland Texas	Project Name/Number: RAMRNM 0002
2405 E. County Rd. 123 Midland, TX 79706	Project Location: Yates State #2
Email: bill.green@eccgrp.com wendy north@eccgrp.com khuckaba@eccgrp.com	Phone No: 432.301.0209
	Invoice To: ap@eccgrp.com Enviro Clean P O Box 721090 Oklahoma City, OK 73172-1090
Project Contact: William Green	PO Number:
Sampler's Name: Kimberly Huckaba	

Analytical Information

Matrix Codes

S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
WW = Waste Water
P = Product/Oil
SW = Surface water
SL = Sludge
OW = Ocean Water
W = Wipe
O = Other
A = Air

550773

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottle	Preservative Used: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	ICE	Texas TPH - TX 1005	New Mexico TPH - 8015M	BTEX	Chlorides	PAH	Glycol	RCRA Metals	VOCs	SVOCs	Hold	Field Comments
1	HA-4	0-6"	4-11-17	1508	S	1								X		X	X	X							
2	HA-4	6-12"	4-11-17	1512	S	1								X		X	X	X							
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12									KH																

Turnaround Time (Business days) | Data Deliverable Information | Notes:

- ☐ Same Day TAT
- ☒ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY
- ☒ Level II Std QC
- ☐ Level III Std QC+ Forms
- ☐ Level 3 (CLP Forms)
- ☐ TRRP Checklist
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ TRRP Level IV
- ☐

TAT Starts Day received by Lab, if received by 3:00 pm

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	K Huckaba	4-11-17 19:00				K Huckaba
2						
3	K Huckaba	4-12-17 9:23	Beamer			
4						
5						

Custody Seal # | Preserved where applicable ☐ | On Ice ☒

Temp: 0.3
CF: +0.1
Corrected Temp: 0.4

IR ID:R-8

Final 1.002

Page 31 of 32

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Enviroclean- Midland

Date/ Time Received: 04/12/2017 09:23:00 AM

Work Order #: 550773

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 Seal present on shipping container/ cooler?	**N/A**
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**
#6 Custody Seals intact on sample bottles?	**N/A**
#7 *Custody Seals Signed and dated?	**N/A**
#8 *Chain of Custody present?	**Yes**
#9 Sample instructions complete on Chain of Custody?	**Yes**
#10 Any missing/extra samples?	**No**
#11 Chain of Custody signed when relinquished/ received?	**Yes**
#12 Chain of Custody agrees with sample label(s)?	**Yes**
#13 Container label(s) legible and intact?	**Yes**
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#15 Samples in proper container/ bottle?	**Yes**
#16 Samples properly preserved?	**Yes**
#17 Sample container(s) intact?	**Yes**
#18 Sufficient sample amount for indicated test(s)?	**Yes**
#19 All samples received within hold time?	**Yes**
#20 Subcontract of sample(s)?	**N/A**
#21 VOC samples have zero headspace?	**N/A**
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer
Jessica Kramer
Date: 04/12/2017

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks
Date: 04/12/2017

Analytical Report 551226

for

Enviroclean- Midland

Project Manager: BILL GREEN

RAMRNM0002

24-APR-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

24-APR-17

Project Manager: **BILL GREEN**
Enviroclean- Midland
2405 ECR 123
Midland, TX 79706

Reference: XENCO Report No(s): **551226**
RAMRNM0002
Project Address: Yates State #2

BILL GREEN:

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) 551226. 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. 551226 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 551226

Enviroclean- Midland, Midland, TX

RAMRNM0002

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BG-1	S	04-18-17 13:54	0 - 6 In	551226-001

CASE NARRATIVE

Client Name: Enviroclean- Midland
Project Name: RAMRNM0002

Project ID:
Work Order Number(s): *551226*

Report Date: *24-APR-17*
Date Received: *04/19/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 551226

Enviroclean- Midland, Midland, TX

Project Name: RAMRNM0002

Project Id:
Contact: BILL GREEN
Project Location: Yates State #2

Date Received in Lab: Wed Apr-19-17 08:00 am
Report Date: 24-APR-17
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	551226-001					
	Field Id:	BG-1					
	Depth:	0-6 In					
	Matrix:	SOIL					
	Sampled:	Apr-18-17 13:54					
Inorganic Anions by EPA 300	***Extracted:***	Apr-20-17 13:00					
	Analyzed:	Apr-20-17 16:06					
	Units/RL:	mg/kg RL					
Chloride		ND 4.94					

Kelsey Brooks
Project Manager

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

+ NELAC certification not offered for this compound.

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

	Phone	Fax
4147 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(602) 437-0330	

BS / BSD Recoveries

Project Name: RAMRNM0002

Work Order #: 551226 **Project ID:**

Analyst: MGO **Date Prepared:** 04/20/2017 **Date Analyzed:** 04/20/2017

Lab Batch ID: 3015441 **Sample:** 723387-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.97	249	272	109	249	270	108	1	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: RAMRNM0002

Work Order # : 551226 **Project ID:**

Lab Batch ID: 3015441 **QC- Sample ID:** 551283-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/20/2017 **Date Prepared:** 04/20/2017 **Analyst:** MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.86	243	306	126	243	306	126	0	90-110	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ENVIRO CLEAN SERVICES, LLC

CHAIN OF CUSTODY

COC 1 of 1

No. M 00109

Enviro Clean / Midland Texas	Project Name/Number: RAMRNM0002
2405 E. County Rd. 123 Midland, TX 79706	Project Location: Yates State #2
Email: bill.green@eccgrp.com wendy north@eccgrp.com khuckaba@eccgrp.com	Phone No: 432.301.0209
Project Contact: William Green	Invoice To: ap@eccgrp.com Enviro Clean P O Box 721090 Oklahoma City, OK 73172-1090
Sampler's Name: Kimberly Huckaba	PO Number:

Matrix Codes

S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
WW = Waste Water
P = Product/Oil
SW = Surface water
SL = Sludge
OW = Ocean Water
W = Wipe
O = Other
A = Air

551226

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottle	Preservative Used: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	ICE	Analytical Information: Texas TPH - TX 1005	New Mexico TPH - 8015M	BTEX	Chlorides	PAH	Glycol	RCRA Metals	VOCs	SVOCs	Field Comments
1	BG-1	0-6"	4-18-17	13:54	S	1								X				X						
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11									KH															
12																								

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☒ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 3:00 pm

Data Deliverable Information

- ☒ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐
- ☐ TRRP Checklist

Notes:

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler	Date Time	Received By	Relinquished By	Date Time	Received By
1	KHuckaba	4-19-17 8:00	1 JRAMEK	2		2
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒

Temp: 9.8 IR ID:R-8
CF: +0.1
Corrected Temp: -9.7

Final 1.000

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Enviroclean- Midland

Date/ Time Received: 04/19/2017 08:00:00 AM

Work Order #: 551226

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)?	-9.7
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**N/A**
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**
#6 Custody Seals intact on sample bottles?	**N/A**
#7 *Custody Seals Signed and dated?	**N/A**
#8 *Chain of Custody present?	**Yes**
#9 Sample instructions complete on Chain of Custody?	**Yes**
#10 Any missing/extra samples?	**No**
#11 Chain of Custody signed when relinquished/ received?	**Yes**
#12 Chain of Custody agrees with sample label(s)?	**Yes**
#13 Container label(s) legible and intact?	**Yes**
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#15 Samples in proper container/ bottle?	**Yes**
#16 Samples properly preserved?	**Yes**
#17 Sample container(s) intact?	**Yes**
#18 Sufficient sample amount for indicated test(s)?	**Yes**
#19 All samples received within hold time?	**Yes**
#20 Subcontract of sample(s)?	**N/A**
#21 VOC samples have zero headspace?	**N/A**
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer
Jessica Kramer
Date: 04/19/2017

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks
Date: 04/19/2017

Certificate of Analysis Summary 555003

Larson and Associates, Inc., Midland, TX

Project Name: Enviroclean/RAM Yates State #2

Project Id: 17-155-01
Contact: Mark Larson
Project Location: NM

Date Received in Lab: Thu Jun-08-17 11:09 am
Report Date: 13-JUN-17
Project Manager: Liz Givens

Analysis Requested													
	Lab Id:	555003-002		555003-003		555003-004		555003-005		555003-006		555003-007	
	Field Id:	Yates #2 HA-2 3'		Yates #2 HA-2 5'		Yates #2 HA-2 7'		Yates #2 HA-2 10'		Yates #2 HA-2 15'		Yates #2 HA-2 20'	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Jun-07-17 10:10		Jun-07-17 10:12		Jun-07-17 10:15		Jun-07-17 10:21		Jun-07-17 10:25		Jun-07-17 10:30	
Chloride by EPA 300	***Extracted:***	Jun-12-17 15:50		Jun-12-17 15:50		Jun-12-17 15:50		Jun-12-17 15:50		Jun-12-17 15:50		Jun-12-17 15:50	
	Analyzed:	Jun-12-17 17:28		Jun-12-17 17:05		Jun-12-17 17:36		Jun-12-17 17:43		Jun-12-17 17:51		Jun-12-17 18:14	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1970	24.8	42.5	4.93	93.8	4.88	255	4.88	689	4.93	98.0	4.97

Brandi Ritcherson
Project Manager

Certificate of Analysis Summary 555003

Larson and Associates, Inc., Midland, TX

Project Name: Enviroclean/RAM Yates State #2

Project Id: 17-155-01
Contact: Mark Larson
Project Location: NM

Date Received in Lab: Thu Jun-08-17 11:09 am
Report Date: 13-JUN-17
Project Manager: Liz Givens

Analysis Requested									
	Lab Id:	555003-008		555003-009					
	Field Id:	Yates #2 SSB-3 0'		Yates #2 SSB-3 5'					
	Depth:								
	Matrix:	SOIL		SOIL					
	Sampled:	Jun-07-17 10:36		Jun-07-17 10:45					
Chloride by EPA 300	***Extracted:***	Jun-12-17 15:50		Jun-12-17 15:50					
	Analyzed:	Jun-12-17 18:21		Jun-12-17 18:29					
	Units/RL:	mg/kg	RL	mg/kg	RL				
Chloride		67.5	4.96	<4.97	4.97				

Brandi Ritcherson
Project Manager

Analytical Report 555003

for

Larson and Associates, Inc.

Project Manager: Mark Larson

Enviroclean/RAM Yates State #2

17-155-01

13-JUN-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

13-JUN-17

Project Manager: **Mark Larson**
Larson and Associates, Inc.
P. O. Box 50685
Midland, TX 79710

Reference: XENCO Report No(s): **555003**
Enviroclean/RAM Yates State #2
Project Address: NM

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) 555003. 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. 555003 will be filed for 60 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,

Brandi Ritcherson
Project Manager

Sample Cross Reference 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Yates #2 HA-2 3'	S	06-07-17 10:10		555003-002
Yates #2 HA-2 5'	S	06-07-17 10:12		555003-003
Yates #2 HA-2 7'	S	06-07-17 10:15		555003-004
Yates #2 HA-2 10'	S	06-07-17 10:21		555003-005
Yates #2 HA-2 15'	S	06-07-17 10:25		555003-006
Yates #2 HA-2 20'	S	06-07-17 10:30		555003-007
Yates #2 SSB-3 0'	S	06-07-17 10:36		555003-008
Yates #2 SSB-3 5'	S	06-07-17 10:45		555003-009
Yates #2 HA-2 0'	S	06-07-17 10:00		Not Analyzed

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 3'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-002	Date Collected:	06.07.17 10.10		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1970**	24.8	mg/kg	06.12.17 17.28		5

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 5'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-003	Date Collected:	06.07.17 10.12		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**42.5**	4.93	mg/kg	06.12.17 17.05		1

Final 1.000

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 7'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-004	Date Collected:	06.07.17 10.15		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**93.8**	4.88	mg/kg	06.12.17 17.36		1

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 10'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-005	Date Collected:	06.07.17 10.21		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**255**	4.88	mg/kg	06.12.17 17.43		1

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 15'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-006	Date Collected:	06.07.17 10.25		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**689**	4.93	mg/kg	06.12.17 17.51		1

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 HA-2 20'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-007	Date Collected:	06.07.17 10.30		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**98.0**	4.97	mg/kg	06.12.17 18.14		1

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 SSB-3 0'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-008	Date Collected:	06.07.17 10.36		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**67.5**	4.96	mg/kg	06.12.17 18.21		1

Certificate of Analytical Results 555003

Larson and Associates, Inc., Midland, TX

Enviroclean/RAM Yates State #2

Sample Id:	**Yates #2 SSB-3 5'**	Matrix:	Soil	Date Received:	06.08.17 11.09
Lab Sample Id:	555003-009	Date Collected:	06.07.17 10.45		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MGO			% Moisture:	
Analyst:	MGO	Date Prep:	06.12.17 15.50	Basis:	Wet Weight
Seq Number:	3019514				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.97	4.97	mg/kg	06.12.17 18.29	U	1

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

+ NELAC certification not offered for this compound.

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

QC Summary 555003

Larson and Associates, Inc.

Enviroclean/RAM Yates State #2

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3019514 Matrix: Solid Date Prep: 06.12.17
MB Sample Id: 725971-1-BLK LCS Sample Id: 725971-1-BKS LCSD Sample Id: 725971-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<2.50	125	127	102	125	100	90-110	2	20	mg/kg	06.12.17 16:02	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3019514 Matrix: Soil Date Prep: 06.12.17
Parent Sample Id: 555003-003 MS Sample Id: 555003-003 S MSD Sample Id: 555003-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	42.5	247	297	103	296	103	90-110	0	20	mg/kg	06.12.17 17:13	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3019514 Matrix: Soil Date Prep: 06.12.17
Parent Sample Id: 555004-002 MS Sample Id: 555004-002 S MSD Sample Id: 555004-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.89	245	255	104	254	104	90-110	0	20	mg/kg	06.12.17 18:59	

555003

CHAIN-OF-CUSTODY

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

Data Reported to: MARK LARSON - BLAIR SULLIVAN

DATE: 6-8-17 PAGE 1 OF 1

PO #: _____ LAB WORK ORDER #: _____

PROJECT LOCATION OR NAME: ENVIROCLEAN / RAM YATES STATE #2

LAI PROJECT #: 17-155-01 COLLECTOR: ML/BS

TRRP report? ☐ Yes ☑ No

TIME ZONE: Time zone/State: NM

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

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESERVED

ANALYSES: BTEX ☐ MTBE ☐ | TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☐ | DIESEL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ | 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TCLP - 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 ☐ PECHLORATE ☐ | CHLORIDE ✓ ANIONS ☐ ALKALINITY ☐ | METHOD 300 | HOLD

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	H_2SO_4 NaOH	ICE	UNPRESERVED	METHOD 300	HOLD	FIELD NOTES
YATES #2 HA-2 0'		6/7/17	10:00	S	1				✓			✓	
3		↓	10:10	↓	1				✓		✓		
5			10:12		1				✓		✓		
7			10:15		1				✓		✓		
10			10:21		1				✓		✓		
15			10:25		1				✓		✓		
20			10:30		1				✓		✓		
YATES #2 SSB-3 0'			10:36		1				✓		✓		
5'		↓	10:45	↓	1				✓		✓		
TOTAL													

Temp: 5.4 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.2

RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
Blair Sullivan	6/8/17	MLM 6/8/17 11:09
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)

XENCO - BILL DIRECT TO ENVIROCLEAN CARDINAL / ATTN: JULIE

TURN AROUND TIME
NORMAL ☑
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: _____ THERM #: _____
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☑ HAND DELIVERED

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 06/08/2017 11:09:00 AM

Work Order #: 555003

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)?	5.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**N/A**
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**
#6 Custody Seals intact on sample bottles?	**N/A**
#7 *Custody Seals Signed and dated?	**N/A**
#8 *Chain of Custody present?	**Yes**
#9 Sample instructions complete on Chain of Custody?	**Yes**
#10 Any missing/extra samples?	**No**
#11 Chain of Custody signed when relinquished/ received?	**Yes**
#12 Chain of Custody agrees with sample label(s)?	**Yes**
#13 Container label(s) legible and intact?	**Yes**
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#15 Samples in proper container/ bottle?	**Yes**
#16 Samples properly preserved?	**Yes**
#17 Sample container(s) intact?	**Yes**
#18 Sufficient sample amount for indicated test(s)?	**Yes**
#19 All samples received within hold time?	**Yes**
#20 Subcontract of sample(s)?	**N/A**
#21 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: Jessica Kramer Date: 06/09/2017
Jessica Kramer

Checklist reviewed by: Holly Taylor Date: 06/09/2017
Holly Taylor