

# Site Investigation Report & Corrective Action Plan

Annapurna 20 1H

Roosevelt County, New Mexico



*Prepared for:*

**Rockcliff Energy LLC**

**1301 McKinney Street**

**Suite 1300**

**Houston, Texas 77010**

*Prepared by:*

**KANE**

**Kane Environmental Engineering Inc.**

**8816 Big View Drive**

**Austin, Texas 78730**

**Project: 17-383**

**July 2017**

**INFORMATION ONLY**

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# Site Investigation Summary

## Introduction:

On June 15<sup>th</sup>, 2017 approximately 100 barrels of crude oil and produced water were release as a result of a produced water dump valve failure on the production separator. Approximately 100 barrels was recovered. The impacted area was estimated to be about 61,750 square feet (**Figure 1 and Appendix A**). A copy of the C-141 is provided as (**Figure 2**).

The Annapurna 20 1H well is located in rural Roosevelt County, near Milnesand, New Mexico. Groundwater, based on information provided the New Mexico Office of the State Engineer (**Appendix B**) is likely to be encountered at a depth of approximately 220 ft below ground surface (bgs). The distance to the nearest surface water is approximately 1642 feet, north of the facility.

## Site Evaluation Summary

1. Representatives of Kane Environmental (Kane) completed a New Mexico One Call (NM811) to verify clearance any utilities. Rockcliff operating personnel verified that these locations are clear of any underground equipment.
2. Kane personnel, Chris Elrod and Alan Kane, P.E., began the site investigation at 2:30pm on June 28<sup>th</sup>, 2017 (**Appendix D**). Photographs were taken of the impacted areas (**Appendix A**).
3. Kane personnel identified and collected five (6) samples (Sample S1A, S2A, S3A, S4A, S5A, and S6A) that were taken in each cardinal direction of the impacted area (**Figure 1**). Soils were collected at depths of 1 ft and 2 ft (bgs). The samples were placed in sealable plastic bags, allowed to reach temperature equilibrium and then screened for hydrocarbons using a MiniRae 2000 photoionization detector (PID). The samples were also screened for chlorides using a Spectrum Field Scout electrical conductivity (EC) meter. The results are provided in (**Table 1**) along with a description of the soils encountered. A composite background sample was also collected from the surface to a depth of 1 ft (bgs) from an area that based on historical aerial photographs has not been impacted (**Figure 3**). This soil was also screened using the PID and EC meter and the results are provided in (**Table 1**). A sample was also collected from the soil that had been excavated and placed on a plastic liner. The results are provided in (**Table 1**).

4. Kane personnel used an auger to collect each sample. After screening, each sample was then placed in appropriate containers, properly labeled, then put on ice in a cooler and delivered to the Cardinal Laboratory located in Hobbs, New Mexico for analysis. All samples were analyzed for the following constituents:  
  
Benzene, Toluene, Ethylbenzene and mixed isomer Xylenes (BTEX) – (EPA Method 8021).  
  
Total Petroleum Hydrocarbons; Gasoline Range Organics, Diesel Range Organics, and Oil Range Organics – (EPA Method 8105). Chlorides – (EPA Method 300 or equivalent).
5. The boreholes were backfilled with bentonite.
6. A summary of the analytical results for each sample is provided in **(Table 2)**.

## **Corrective Action Plan**

Based on the information obtained from the site investigation including the following;

- New Mexico State Engineers' Water Well information suggests that the depth to ground water in this area can be expected at depth of 220 ft (bgs).
- The analytical results of the soil samples.
- Observations made at the site regarding the size of the impacted area.
- The suggested appropriate cleanup criteria for the following contaminants;
  - Benzene - 10 ppm
  - BTEX - 50 ppm
  - TPH – 5,000 ppm
  - Chlorides - 600 ppm

Some of the analytical results indicate that there are soils impacted above the suggested cleanup levels that will require remediation. As a result, the suggested corrective action plan includes the following;

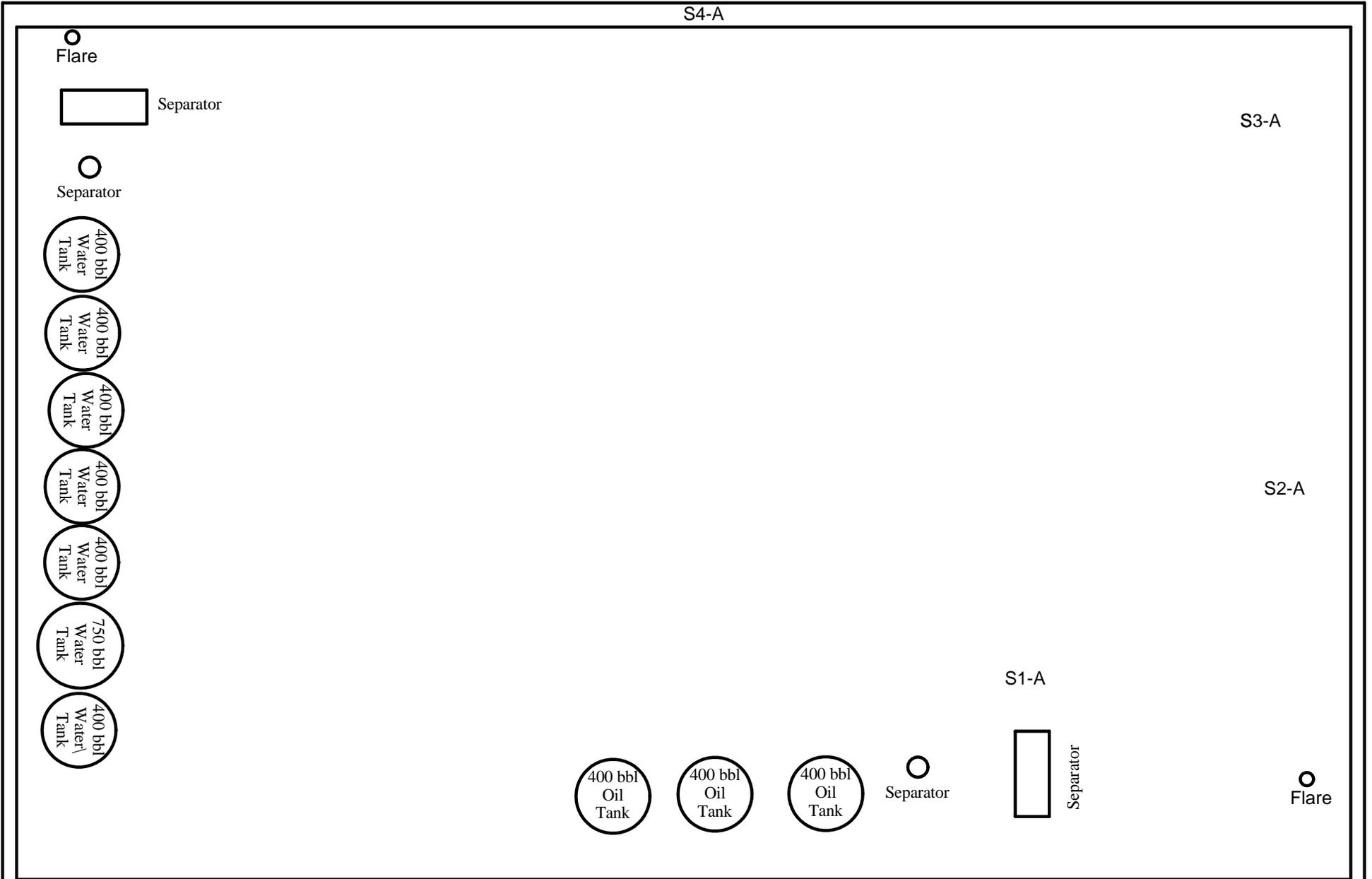
- For the impacted soils in the area of sample S1A, use a grader or dozer fitted with scarifying attachment to cultivate the soil to a depth of approximately 3 ft. Then use a rototiller to thoroughly mix the affected soil. Evenly apply approximately 25 barrels of fresh water to the area

- For the impacted soils in the area of sample S2A, use a grader or dozer fitted with scarifying attachment to cultivate the soil to a depth of approximately 3 ft. Use a rototiller to thoroughly mix the impacted soil. Evenly apply approximately 15 barrels of freshwater to the area.
- For the impacted soils in the area of sample S6A, use a grader or dozer fitted with scarifying attachment to cultivate the soil to a depth of approximately 3 ft. Then use the rototiller to thoroughly mix the impacted soil. Evenly apply approximately 15 barrels of freshwater to the area.

Photographs will be taken of the affected areas following completion of the remedial activities. A closure report will be prepared and submitted detailing the site activities.

**FIGURE 1**

**Impacted Area**



Not Drawn To Scale

S6-A

Rockcliff Energy, LLC  
Houston, Texas

Annapurna 20-1H & Kizer  
Common Facility

Roosevelt County  
New Mexico

BKG

**FIGURE 2**

**C-141 Form**

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

**HOBBS OCD**  
JUN 23 2017  
**RECEIVED**

Form C-141  
Revised April 3, 2017

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

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: <b>Rockcliff Operating New Mexico, LLC</b>	Contact: <b>Nicholas Koch</b>
Address: <b>1301 McKinney St. Suite 1300 Houston, TX 77010</b>	Telephone No: <b>(713)351-0549</b>
Facility Name: <b>Annapurna 20 1H</b>	Facility Type: <b>Well</b>
Surface Owner:	Mineral Owner:
API No: <b>30-041-20969</b>	

**LOCATION OF RELEASE**

Unit Letter <b>P</b>	Section <b>17</b>	Township <b>8S</b>	Range <b>34E</b>	Feet from the <b>170</b>	North/South Line <b>SOUTH</b>	Feet from the <b>355</b>	East/West Line <b>EAST</b>	County <b>Roosevelt</b>
-------------------------	----------------------	-----------------------	---------------------	-----------------------------	----------------------------------	-----------------------------	-------------------------------	----------------------------

Latitude: 33.614217 Longitude: -103.479567 NAD83

**NATURE OF RELEASE**

Type of Release: <b>Oil/Produced Water</b>	Volume of Release: <b>100bbls</b>	Volume Recovered: <b>100bbls</b>
Source of Release: <b>Separator</b>	Date and Hour of Occurrence: <b>6/15/17 @ 2:00am</b>	Date and Hour of Discovery: <b>6/15/17 @ 10:30am</b>
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? <b>Olivia Yu</b>	
By Whom? <b>Mike Martin</b>	Date and Hour: <b>6/15/17 @ 11:27am</b>	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. <b>N/A</b>	

**RECEIVED**  
By Olivia Yu at 11:56 am, Jun 26, 2017

If a Watercourse was Impacted, Describe Fully.\*  
**N/A**

Describe Cause of Problem and Remedial Action Taken.\*  
Water dump on the production separator cut out and spilled approximately 100 bbls of oil/produced water onto location and to the East side of the location. Well was immediately shut-in and clean up procedures started. Rockcliff is currently evaluating containment method to place around water dump with a float that will shut the well in.

Describe Area Affected and Cleanup Action Taken.\*  
Well was immediately shut-in and clean up procedures began. Spill was mainly contained on the location with a small portion affecting the area immediately to the East of the location. Vac trucks were called and all free fluid was recovered, affected dirt was gathered and taken to proper disposal facility. Kane Environmental will be handling the clean-up and remediation.

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:	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: <b>Nicholas Koch</b>	Approved by Environmental Specialist:	
Title: <b>Vice President - Operations</b>	Approval Date: <b>6/26/2017</b>	Expiration Date:
E-mail Address: <b>nkoch@rockcliffenergy.com</b>	Conditions of Approval:	
Date: <b>06/19/2017</b> Phone: <b>(713)351-0549</b>	<b>see attached directive</b>	Attached <input checked="" type="checkbox"/>

\* Attach Additional Sheets If Necessary

1RP-4737

nOY1717743266

pOY1717743561

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 6/23/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1RP-4737 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 7/26/2017. 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<sub>6</sub> thru C<sub>36</sub>), 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<sub>6</sub> thru C<sub>36</sub>), 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.**

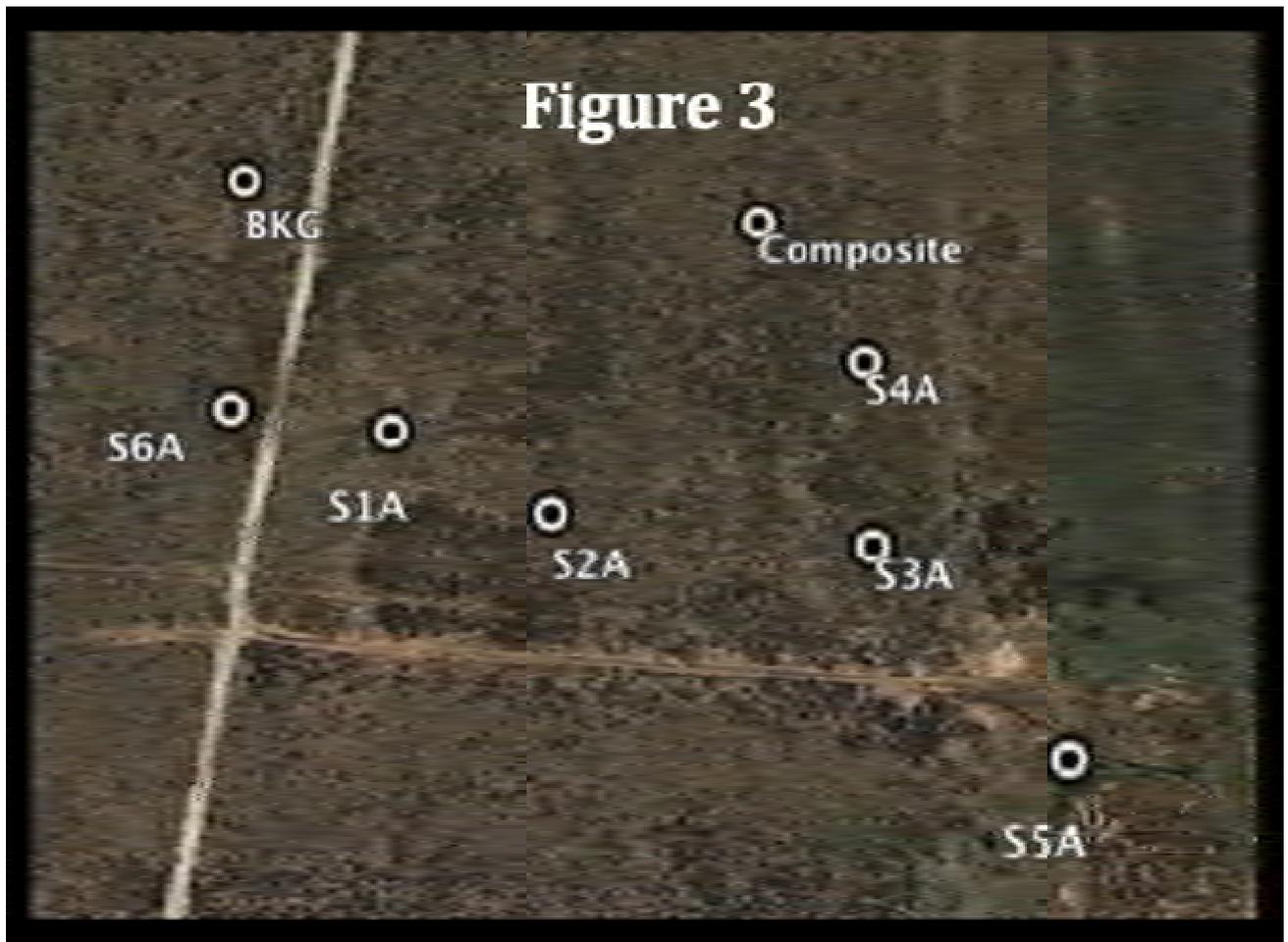
**Jim Griswold**

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

**FIGURE 3**

**Aerial Photograph**

Figure 3



**TABLE 1**

**Field Soil Screening Data**

**Table 1**

<b>Sample Point</b>	<b>EC</b>	<b>PID</b>
<b>BKG</b>	0.08	3.5
<b>S1A 1ft</b>	1.8	88.7
<b>S1A 2ft</b>	0.6	22.2
<b>S2A 1ft</b>	0.12	0.8
<b>S2A 2ft</b>	0.21	1
<b>Composite Sample</b>	9	126
<b>S3A 1ft</b>	0.12	0.6
<b>S3A 2ft</b>	0.29	0.12
<b>S4A 1ft</b>	0.52	1.6
<b>S4A 2ft</b>	0.56	2.3
<b>S5A 1ft</b>	0.1	3
<b>S5A 2ft</b>	0.44	2.2
<b>S5A 5ft</b>	0.39	1.2
<b>S6A 1ft</b>	0.14	3.6
<b>S6A 2ft</b>	0.52	19

**TABLE 2**

**Analytical Results Summary**

**Table 2**

Soil ID	Limits (ppm)	S1A 1ft	S1A 2ft	S2A 1ft	S2A 2ft	Composite	S3A 1ft	S3A 2ft	S4A 1ft	S4A 2ft	S5A 1ft	S5A 2ft	S5A 5ft	S6A 1ft	S6A 2ft	BKG
<b>Benzene</b>	<b>10</b>	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
<b>Touene</b>		<0.050	<0.050	<0.050	<0.050	0.683	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
<b>Ethylbenzene</b>		<0.050	<0.050	<0.050	<0.050	2.55	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
<b>Total Xylenes</b>		<0.150	<0.150	<0.150	<0.150	3.73	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150
<b>Total BTEX</b>	<b>50</b>	<0.300	<0.300	<0.300	<0.300	6.98	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
<b>Chlorides</b>	<b>600</b>	<b>1580</b>	<b>3430</b>	<b>4640</b>	281	<b>11100</b>	47.7	53.1	82.4	59.1	12.8	25.5	32	167	355	13.9
<b>(1) Chlorides</b>	<b>600</b>	<b>2240</b>	<b>3320</b>	<b>4080</b>	320	<b>12400</b>	160	128	240	144	64	96	96	272	448	80
<b>C6-C10</b>	<b>5000</b>	<10.0	<10.0	<10.0	<10.0	53.6	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
<b>C10-C28</b>	<b>5000</b>	<10.0	<10.0	<10.0	<10.0	4400	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0

\*TPH 8015M, SM4500CI-B, BTEX 8021B

**(1) Chlorides**

**Method SM4500CI-B**

## **APPENDICES**

## **APPENDIX A**

### **Impacted Area Photographs**

## **APPENDIX B**

### **Water Well Information**



# New Mexico Office of the State Engineer

## Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,  
O=orphaned,  
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q	Q	Q	Sec	Tws	Rng	X	Y	Distance	WellDepth	Average Depth to Water	Water Column
CC 02209	POD1		QU	4	3	3	19	08N	34E	647372	3862521	2293	325	220	105

Average Depth to Water: 220 feet

Minimum Depth: 220 feet

Maximum Depth: 220 feet

**Record Count:** 1

**UTMNAD83 Radius Search (in meters):**

Easting (X): 649515

Northing (Y): 3863337

Radius: 2500

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

6/19/17 11:40 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER



New Mexico Office of the State Engineer  
**Point of Diversion Summary**

(quarters are 1=NW 2=NE 3=SW 4=SE)  
(quarters are smallest to largest) (NAD83 UTM in meters)

POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
CC 02209 POD1	4	3	3	19	08N	34E	647372	3862521

---

<b>Driller License:</b> 487	<b>Driller Company:</b> CLOVIS PUMP	<b>Plug Date:</b>
<b>Driller Name:</b> RAY HAWTHORNE		
<b>Drill Start Date:</b> 02/14/1955	<b>Drill Finish Date:</b> 02/25/1955	<b>Source:</b> Shallow
<b>Log File Date:</b>	<b>PCW Rcv Date:</b>	<b>Estimated Yield:</b> 500 GPM
<b>Pump Type:</b>	<b>Pipe Discharge Size:</b>	<b>Depth Water:</b> 220 feet
<b>Casing Size:</b> 16.00	<b>Depth Well:</b> 325 feet	

---

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

6/19/17 11:41 AM

POINT OF DIVERSION SUMMARY

## **APPENDIX C**

### **Analytical Data**



July 14, 2017

ALAN KANE

KANE ENVIROMENTAL

8816 BIG VIEW DRIVE

AUSTIN, TX 78730

RE: ANNA PURNA 20-1H

Enclosed are the results of analyses for samples received by the laboratory on 06/29/17 15:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Mike Snyder". The signature is fluid and cursive.

Mike Snyder For Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S1 - 1' (H701717-01)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 105 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S1 - 1' (H701717-01)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1580</b>	50.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

Cardinal Laboratories

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S1 - 1' (H701717-01)**
**Chloride, SM4500Cl-B** **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>2240</b>	16.0	07/05/2017	ND	448	112	400	0.00	

**TPH 8015M** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/01/2017	ND	208	104	200	1.99	
DRO >C10-C28	<10.0	10.0	07/01/2017	ND	222	111	200	2.41	

*Surrogate: 1-Chlorooctane* 103 % 28.3-164
*Surrogate: 1-Chlorooctadecane* 104 % 34.7-157
**Sample ID: A-S1 - 2' (H701717-02)**
**BTEX 8021B** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

*Surrogate: 4-Bromofluorobenzene (PID)* 107 % 72-148

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S1 - 2' (H701717-02)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3430</b>	100	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S1 - 2' (H701717-02)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3320</b>	16.0	07/05/2017	ND	432	108	400	0.00	QM-07

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/01/2017	ND	208	104	200	1.99	
DRO >C10-C28	<10.0	10.0	07/01/2017	ND	222	111	200	2.41	

Surrogate: 1-Chlorooctane 98.0 % 28.3-164

Surrogate: 1-Chlorooctadecane 93.9 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S2 - 1' (H701717-03)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S2 - 1' (H701717-03)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>4640</b>	100	07/13/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S2 - 1' (H701717-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>4080</b>	16.0	07/05/2017	ND	432	108	400	0.00	
TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

<i>Surrogate: 1-Chlorooctane</i>	92.6 %	28.3-164
<i>Surrogate: 1-Chlorooctadecane</i>	89.8 %	34.7-157

**Sample ID: A-S2 - 2' (H701717-04)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	104 %	72-148
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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S2 - 2' (H701717-04)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>281</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S2 - 2' (H701717-04)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>320</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

Surrogate: 1-Chlorooctane 89.3 % 28.3-164

Surrogate: 1-Chlorooctadecane 88.8 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: SOIL SAMPLE ( COMPOSITE) (H701717-05)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	1.97	98.6	2.00	1.99	
<b>Toluene*</b>	<b>0.683</b>	0.050	07/03/2017	ND	1.91	95.4	2.00	0.490	
<b>Ethylbenzene*</b>	<b>2.55</b>	0.050	07/03/2017	ND	2.11	106	2.00	2.26	
<b>Total Xylenes*</b>	<b>3.73</b>	0.150	07/03/2017	ND	6.27	104	6.00	2.54	
<b>Total BTEX</b>	<b>6.98</b>	0.300	07/03/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 115 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: SOIL SAMPLE ( COMPOSITE) (H701717-05)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>11100</b>	250	07/13/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: SOIL SAMPLE ( COMPOSITE) (H701717-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>12400</b>	16.0	07/05/2017	ND	432	108	400	0.00		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>53.6</b>	50.0	07/03/2017	ND	179	89.6	200	3.68		
<b>DRO &gt;C10-C28</b>	<b>4400</b>	50.0	07/03/2017	ND	201	101	200	5.37		

Surrogate: 1-Chlorooctane	99.5 %	28.3-164
Surrogate: 1-Chlorooctadecane	179 %	34.7-157

**Sample ID: A-S3 - 1' (H701717-06)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99		
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490		
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26		
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54		
Total BTEX	<0.300	0.300	07/01/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID)	102 %	72-148
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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S3 - 1' (H701717-06)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>47.7</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S3 - 1' (H701717-06)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>160</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

Surrogate: 1-Chlorooctane 92.8 % 28.3-164

Surrogate: 1-Chlorooctadecane 90.3 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S3 - 2' (H701717-07)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 101 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S3 - 2' (H701717-07)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>53.1</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

 Received: 06/29/2017  
 Reported: 07/14/2017  
 Project Name: ANNA PURNA 20-1H  
 Project Number: 17-383  
 Project Location: ROCKCLIFF OPER. ROSEVELT CO.NM

 Sampling Date: 06/28/2017  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Tamara Oldaker

**Sample ID: A-S3 - 2' (H701717-07)**
**Chloride, SM4500Cl-B** **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>128</b>	16.0	07/05/2017	ND	432	108	400	0.00	

**TPH 8015M** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

*Surrogate: 1-Chlorooctane* 96.4 % 28.3-164
*Surrogate: 1-Chlorooctadecane* 98.5 % 34.7-157
**Sample ID: A-S4 - 1' (H701717-08)**
**BTEX 8021B** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

*Surrogate: 4-Bromofluorobenzene (PID)* 101 % 72-148

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S4 - 1' (H701717-08)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>82.4</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S4 - 1' (H701717-08)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>240</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

Surrogate: 1-Chlorooctane 109 % 28.3-164

Surrogate: 1-Chlorooctadecane 112 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S4 - 2' (H701717-09)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 102 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S4 - 2' (H701717-09)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>59.1</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S4 - 2' (H701717-09)**
**Chloride, SM4500Cl-B** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>144</b>	16.0	07/05/2017	ND	432	108	400	0.00	

**TPH 8015M** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

*Surrogate: 1-Chlorooctane* 104 % 28.3-164
*Surrogate: 1-Chlorooctadecane* 103 % 34.7-157
**Sample ID: A-S5 - 1' (H701717-10)**
**BTEX 8021B** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/01/2017	ND	1.97	98.6	2.00	1.99	
Toluene*	<0.050	0.050	07/01/2017	ND	1.91	95.4	2.00	0.490	
Ethylbenzene*	<0.050	0.050	07/01/2017	ND	2.11	106	2.00	2.26	
Total Xylenes*	<0.150	0.150	07/01/2017	ND	6.27	104	6.00	2.54	
Total BTEX	<0.300	0.300	07/01/2017	ND					

*Surrogate: 4-Bromofluorobenzene (PID)* 101 % 72-148

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 1' (H701717-10)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>12.8</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 1' (H701717-10)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>64.0</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

Surrogate: 1-Chlorooctane 103 % 28.3-164

Surrogate: 1-Chlorooctadecane 102 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 2' (H701717-11)**

Analyte	mg/kg		Analyzed By: MS						
	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	2.11	106	2.00	0.876	
Toluene*	<0.050	0.050	07/03/2017	ND	1.96	97.9	2.00	1.92	
Ethylbenzene*	<0.050	0.050	07/03/2017	ND	2.01	100	2.00	0.294	
Total Xylenes*	<0.150	0.150	07/03/2017	ND	5.94	98.9	6.00	0.505	
Total BTEX	<0.300	0.300	07/03/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 108 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 2' (H701717-11)**

Analyte	mg/kg wet		Analyzed By: JDA						
	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>25.5</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

 Received: 06/29/2017  
 Reported: 07/14/2017  
 Project Name: ANNA PURNA 20-1H  
 Project Number: 17-383  
 Project Location: ROCKCLIFF OPER. ROSEVELT CO.NM

 Sampling Date: 06/28/2017  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Tamara Oldaker

**Sample ID: A-S5 - 2' (H701717-11)**
**Chloride, SM4500Cl-B** **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>96.0</b>	16.0	07/05/2017	ND	432	108	400	0.00	

**TPH 8015M** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

*Surrogate: 1-Chlorooctane* 103 % 28.3-164
*Surrogate: 1-Chlorooctadecane* 105 % 34.7-157
**Sample ID: A-S5 - 5' (H701717-12)**
**BTEX 8021B** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	2.11	106	2.00	0.876	
Toluene*	<0.050	0.050	07/03/2017	ND	1.96	97.9	2.00	1.92	
Ethylbenzene*	<0.050	0.050	07/03/2017	ND	2.01	100	2.00	0.294	
Total Xylenes*	<0.150	0.150	07/03/2017	ND	5.94	98.9	6.00	0.505	
Total BTEX	<0.300	0.300	07/03/2017	ND					

*Surrogate: 4-Bromofluorobenzene (PID)* 106 % 72-148

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 5' (H701717-12)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>32.0</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S5 - 5' (H701717-12)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>96.0</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	07/03/2017	ND	179	89.6	200	3.68	
DRO >C10-C28	<10.0	10.0	07/03/2017	ND	201	101	200	5.37	

Surrogate: 1-Chlorooctane 102 % 28.3-164

Surrogate: 1-Chlorooctadecane 103 % 34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S6 - 1' (H701717-13)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	2.11	106	2.00	0.876	
Toluene*	<0.050	0.050	07/03/2017	ND	1.96	97.9	2.00	1.92	
Ethylbenzene*	<0.050	0.050	07/03/2017	ND	2.01	100	2.00	0.294	
Total Xylenes*	<0.150	0.150	07/03/2017	ND	5.94	98.9	6.00	0.505	
Total BTEX	<0.300	0.300	07/03/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 105 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S6 - 1' (H701717-13)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>167</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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\*=Accredited Analyte

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

 Received: 06/29/2017  
 Reported: 07/14/2017  
 Project Name: ANNA PURNA 20-1H  
 Project Number: 17-383  
 Project Location: ROCKCLIFF OPER. ROSEVELT CO.NM

 Sampling Date: 06/28/2017  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Tamara Oldaker

**Sample ID: A-S6 - 1' (H701717-13)**
**Chloride, SM4500Cl-B** **mg/kg** **Analyzed By: AC**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>272</b>	16.0	07/05/2017	ND	432	108	400	0.00	

**TPH 8015M** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/30/2017	ND	206	103	200	6.75	
DRO >C10-C28	<10.0	10.0	06/30/2017	ND	223	112	200	3.67	

*Surrogate: 1-Chlorooctane* 103 % 28.3-164
*Surrogate: 1-Chlorooctadecane* 109 % 34.7-157
**Sample ID: A-S6 - 2' (H701717-14)**
**BTEX 8021B** **mg/kg** **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	2.11	106	2.00	0.876	
Toluene*	<0.050	0.050	07/03/2017	ND	1.96	97.9	2.00	1.92	
Ethylbenzene*	<0.050	0.050	07/03/2017	ND	2.01	100	2.00	0.294	
Total Xylenes*	<0.150	0.150	07/03/2017	ND	5.94	98.9	6.00	0.505	
Total BTEX	<0.300	0.300	07/03/2017	ND					

*Surrogate: 4-Bromofluorobenzene (PID)* 104 % 72-148

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S6 - 2' (H701717-14)**

Chloride by IC	mg/kg wet		Analyzed By: JDA						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>355</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: A-S6 - 2' (H701717-14)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>448</b>	16.0	07/05/2017	ND	432	108	400	0.00	

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/30/2017	ND	206	103	200	6.75	
DRO >C10-C28	<10.0	10.0	06/30/2017	ND	223	112	200	3.67	

Surrogate: 1-Chlorooctane      99.9 %      28.3-164

Surrogate: 1-Chlorooctadecane      102 %      34.7-157

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: BKG (H701717-15)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	07/03/2017	ND	2.11	106	2.00	0.876	
Toluene*	<0.050	0.050	07/03/2017	ND	1.96	97.9	2.00	1.92	
Ethylbenzene*	<0.050	0.050	07/03/2017	ND	2.01	100	2.00	0.294	
Total Xylenes*	<0.150	0.150	07/03/2017	ND	5.94	98.9	6.00	0.505	
Total BTEX	<0.300	0.300	07/03/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 103 % 72-148

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

**Sample ID: BKG (H701717-15)**

Chloride by IC		mg/kg wet		Analyzed By: JDA					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>13.9</b>	10.0	07/12/2017	ND	245	97.9	250	1.31	

Received:	06/29/2017	Sampling Date:	06/28/2017
Reported:	07/14/2017	Sampling Type:	Soil
Project Name:	ANNA PURNA 20-1H	Sampling Condition:	Cool & Intact
Project Number:	17-383	Sample Received By:	Tamara Oldaker
Project Location:	ROCKCLIFF OPER. ROSEVELT CO.NM		

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 KANE ENVIROMENTAL  
 ALAN KANE  
 8816 BIG VIEW DRIVE  
 AUSTIN TX, 78730  
 Fax To:

 Received: 06/29/2017  
 Reported: 07/14/2017  
 Project Name: ANNA PURNA 20-1H  
 Project Number: 17-383  
 Project Location: ROCKCLIFF OPER. ROSEVELT CO.NM

 Sampling Date: 06/28/2017  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Tamara Oldaker

**Sample ID: BKG (H701717-15)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>80.0</b>	16.0	07/05/2017	ND	432	108	400	0.00	
TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	06/30/2017	ND	206	103	200	6.75	
DRO >C10-C28	<10.0	10.0	06/30/2017	ND	223	112	200	3.67	
<i>Surrogate: 1-Chlorooctane</i>	<i>88.4 %</i>	<i>28.3-164</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>89.6 %</i>	<i>34.7-157</i>							

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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report



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Mike Snyder For Celey D. Keene, Lab Director/Quality Manager



101 East Marland, Hobbs, NM 88240  
 (575) 393-2326 FAX (575) 393-2476

Page 2 of 2

**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

<b>Company Name:</b> Kane Environmental <b>Project Manager:</b> Alon Kane		<b>P.O. #:</b> Kane <b>Company:</b> Kane	
<b>Address:</b> State: Zip:		<b>City:</b> Address:	
<b>Phone #:</b> Fax #: Project #: 17-383 Project Owner: Bob Cliff		<b>City:</b> State: Zip:	
<b>Project Name:</b> AnnaPurna 20-14		<b>Phone #:</b> Fax #:	
<b>Project Location:</b>		<b>Sample Name:</b> CLASS EROD	
FOR LAB USE ONLY			
<b>Lab I.D.</b> H101119 10 ASS-1A 11 ASS-2A 12 ASS-5A 13 ASS-1A 14 ASS-2A 15 BSKG	(G)RAB OR (C)OMP. # CONTAINERS GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER:	MATRIX PRESERV:	SAMPLING DATE TIME
			6-28-17 4:00p 4:10p 4:10p 4:15p 4:25p 4:30p
			RECEIVED BY: [Signature] EX BALS T P H S O I S C h i o d e s
<b>Relinquished By:</b> [Signature] Date: 6-29-17 Time: 3:35pm		<b>Received By:</b> [Signature] Date: 6-29-17 Time: 3:35pm	
<b>Delivered By: (Circle One)</b> Sampler - UPS - Bus - Other: S.I.C.		<b>Sample Condition:</b> Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Relinquished By:</b> [Signature]		<b>Checked By:</b> [Signature]	
<b>Phone Result:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Fax Result:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No		<b>ADD'l Phone #:</b> <b>ADD'l Fax #:</b>	
<b>REMARKS:</b>			

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

## **APPENDIX D**

### **Field Notes**

## Annapurna #20 Release

6/28/17

2:30PM

- Arrived at site and photographed impacted area and soil pile (all soil) placed on plastic liner

2:45PM sample **S1A**

- 33 36.849            103 28.798
- Used hand auger calibrated EC & PID minirae 2000, spectrum field soot
- PID 88.7 PPM    1ft
- EC 1.8 mS/cm
- PID 22.2 PPM    2ft
- EC 0.6 mS/cm

Soil:

0-6 in aggregate

6-12 in brown silty sand

12-24 in brown silty sand

2:55 PM sample **S2A**

- 33 36.840    103 28.774
- PID 0.8 PPM    1ft
- EC 0.12 mS/cm
- PID 1.0 PPM    2ft
- EC 0.21 mS/cm

Soil:

0-6 in aggregate

6-12 in brown silty sand

12-24 in red/brown silty clay

3:15 PM

- 33 36.879    103 28.748
- Soil on plastic
- Composite sample
- PID 126 PPM
- EC 9.0 mS/cm

3:30 PM sample **S3A**

- 33 36.839    103 28.731
- PID 0.6 PPM    1ft
- EC 0.12 mS/cm
- PID 2.1 PPM    2ft
- EC 0.29 mS/cm

3:45 PM sample **S4A**

- 33 36.862 103 38.732
- PID 1.6 PPM 1ft
- EC 0.52 mS/cm
- PID 2.3 PPM 2ft
- EC 0.56 mS/cm

4:10 PM sample **S5A**

- 33 36.817 103 28.704
- PID 3.0 PPM 1ft
- EC 0.1 mS/cm
- PID 2.2 PPM 2ft
- EC 0.44 mS/cm
- PID 1.2 PPM 5ft
- EC 0.39 mS/cm

4:25 PM sample **S6A**

- 33 36.851 103 28.821
- PID 3.6 PPM 1ft
- EC 0.14 mS/cm
- PID 19 PPM 2ft
- EC 0.52 mS/cm

4:30 PM BKG

- 33 36.880 103 28.826
- PID 3.5 PPM
- EC 0.08 mS/cm













































TARGA  
WPP  
AIP  
RSE  
NOE  
INL  
NGI  
GAN  
SE

NO  
OPEN  
FLAME  
OR  
SMOKING  
HERE

TOTALFLOW













