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Automated Report

Technical Report for

REM 9615
Document 2527633

Renegade Oil & Gas

Bird State 32-1 Pit

SGS Accutest Job Number: D90141

Sampling Date: 12/29/16

Report to:

Renegade Oil & Gas
P.O. Box 460413
Aurora, CO 80046
jbcrog@aol.com

ATTN: JB Condill

Total number of pages in report: 41

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Cristina Araujo 303-425-6021

Certifications: CO (CO00049), ID (CO00049), NE (NE-OS-06-04), ND (R-027), NJ (CO007), OK (D9942) UT (NELAP CO00049), LA (LA150028), TX (T104704511), WY (8TMS-L)

Sections: 1 2 3 4 5 6 7 8 9 10

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Sample Summary

Renegade Oil & Gas

Bird State 32-1 Pit

Job No: D90141

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
D90141-1	12/29/16	17:00	CG	12/30/16	SO	Soil	SE CORNER PIT
D90141-1A	12/29/16	17:00	CG	12/30/16	SO	Soil	SE CORNER PIT

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Renegade Oil & Gas	**Job No**	D90141
Site:	Bird State 32-1 Pit	**Report Date**	1/16/2017 10:39:35 A

On 12/30/2016, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS Accutest Mountain States (SAMS) at a temperature of 9.6 °C. The samples were intact and properly preserved, unless noted below. An SAMS Job Number of D90141 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: SO **Batch ID:** V5V2270

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D90048-1MS, D90048-1MSD were used as the QC samples indicated.
- D90048-1MSD: Analysis performed past the recommended method holding time as per client instructions.
- D90048-1MS: Analysis performed past the recommended method holding time as per client instructions.

Volatiles by GC By Method SW846 8015B

Matrix: SO **Batch ID:** GGA1801

- All samples were analyzed within the recommended method holding time.
- Sample(s) D90048-1MS, D90048-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix: SO **Batch ID:** OP14507

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D90141-1MS, D90141-1MSD were used as the QC samples indicated.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- The matrix spike duplicate (MSD) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Probable cause due to matrix interference.

Metals By Method SW846 6010C

Matrix: AQ **Batch ID:** MP20676

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D90157-30MS, D90157-30MSD, D90157-30SDL were used as the QC samples for the metals analysis.

Wet Chemistry By Method SM2540G-2011 M

Matrix: SO **Batch ID:** GN37319

- The data for SM2540G-2011 M meets quality control requirements.

Wet Chemistry By Method SW846 9045D

Matrix:	SO	Batch ID:	GN37314

- The following samples were run outside of holding time for method SW846 9045D: D90141-1

Wet Chemistry By Method USDA HANDBOOK 60

Matrix:	SO	Batch ID:	MP20676

- D90141-1A for Sodium Adsorption Ratio: Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+(Mg meq/L)/2]

SAMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SAMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by SAMS indicated via signature on the report cover.

Summary of Hits

Job Number: D90141
Account: Renegade Oil & Gas
Project: Bird State 32-1 Pit
Collected: 12/29/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D90141-1	**SE CORNER PIT**					
TPH-DRO (C10-C28)		967	11	11	mg/kg	SW846-8015B
Specific Conductivity		890	1.0		umhos/cm	SM 2510B-2011 MOD
pH		8.72			su	SW846 9045D
D90141-1A	**SE CORNER PIT**					
Calcium		51.3	2.0		mg/l	SW846 6010C
Magnesium		7.44	1.0		mg/l	SW846 6010C
Sodium		114	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio [a]		3.93			ratio	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L) + (Mg meq/L)/2]

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
Method:	SW846 8260B	**Percent Solids:**	87.8
Project:	Bird State 32-1 Pit		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V40180.D	1	01/03/17	MB	n/a	n/a	V5V2270
Run #2							

	Initial Weight	Final Volume
Run #1	5.08 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.56	ug/kg	
108-88-3	Toluene	ND	2.2	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.2	0.56	ug/kg	
1330-20-7	Xylene (total)	ND	2.4	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	125%		70-130%
2037-26-5	Toluene-D8	106%		70-130%
460-00-4	4-Bromofluorobenzene	118%		65-142%
17060-07-0	1,2-Dichloroethane-D4	107%		70-130%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
Method:	SW846 8015B	**Percent Solids:**	87.8
Project:	Bird State 32-1 Pit		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA36435.D	1	01/06/17	MR	n/a	n/a	GGA1801
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	97%		60-140%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
Method:	SW846-8015B SW846 3546	**Percent Solids:**	87.8
Project:	Bird State 32-1 Pit		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI49571.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087
Run #2							

	Initial Weight	Final Volume
Run #1	20.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	967	11	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	104%		41-134%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
		Percent Solids:	87.8
Project:	Bird State 32-1 Pit		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	87.8		%	1	01/04/17	SWT	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	890	1.0	umhos/cm	1	01/05/17	TJ	SM 2510B-2011 MOD
pH	8.72		su	1	01/03/17 10:15	TB	SW846 9045D

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1A	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
		Percent Solids:	87.8
Project:	Bird State 32-1 Pit		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	51.3	2.0	mg/l	1	01/13/17	01/13/17	SB	SW846 6010C [1]	SW846 3010A/M [2]
Magnesium	7.44	1.0	mg/l	1	01/13/17	01/13/17	SB	SW846 6010C [1]	SW846 3010A/M [2]
Sodium	114	2.0	mg/l	1	01/13/17	01/13/17	SB	SW846 6010C [1]	SW846 3010A/M [2]

(1) Instrument QC Batch: MA8104
(2) Prep QC Batch: MP20676

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SE CORNER PIT		
Lab Sample ID:	D90141-1A	**Date Sampled:**	12/29/16
Matrix:	SO - Soil	**Date Received:**	12/30/16
		Percent Solids:	87.8
Project:	Bird State 32-1 Pit		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	3.93		ratio	1	01/13/17 12:36	SB	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L) + (Mg meq/L)/2]

RL = Reporting Limit

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS ACCUTEST — CHAIN OF CUSTODY

PAGE ___ OF ___

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL. 303-425-6021 FAX: 303-425-6854
www.accutest.com

FED-EX Tracking #: | Bottle Order Control #:
SGS Accutest Quote #: | SGS Accutest Job #: D90141

Client / Reporting Information

Company Name: Renegade Oil & Gas
Street Address: 6155 S Main St, Ste. 210
City: Aurora
Project Contact: JB Condill
Phone #: (303)680 4725 JBCROG@aol.com
Sampler(s) Name(s): Cody Baylis

Project Information

Project Name: Bird State P,t Retest
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City:
Attention:

Requested Analysis (see TEST CODE sheet)

XSAR, SGON, PH
B8015 DRO
V82COBTX, V8015GRO

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

SGS Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	LAB USE ONLY
	SE Corner Pit		12/29/16	5:00PM		SO	3									01

Turnaround Time (Business days)

- [ ] Std. 15 Business Days
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day Emergency
- [ ] 2 Day Emergency
- [ ] 1 Day Emergency
- [ ] Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Date Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] COMMBN
- [ ] COMMBN+
- [ ] State Forms Required
- [ ] Send Forms to State
- [ ] Report by Fax
- [ ] Report by PDF
- [ ] EDD Format

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial BN = Results/QC/Narrative (+ = chromatograms)

Comments / Special Instructions

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		9:10AM	1	2		2
3	Relinquished by Sampler:	Date Time:	Received By: 12/30/16 9:10	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 3	Custody Seal # MD	Intact / Not Intact	Preserved where applicable / On Ice / Cooler Temp. 9.6 IDEC

QA 065-00 Rev. 1 1/21/2016

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D90141: Chain of Custody
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SGS Accutest Sample Receipt Summary

Job Number: D90141 **Client:** RENEGADE OIL AND GAS **Project:** BIRD STATE PIT

Date / Time Received: 12/30/2016 9:10:00 AM **Delivery Method:** **Airbill #'s:** HD

Cooler Temps (Initial/Adjusted): #1: (9.6/9.6);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun;		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☐
2. Trip Blank listed on COC:	☐		☐	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☐

Comments

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

D90141: Chain of Custody
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GC/MS Volatiles

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QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V2270-MB	5V40158.D	1	01/03/17	MB	n/a	n/a	V5V2270

The QC reported here applies to the following samples: **Method:** SW846 8260B

D90141-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/kg	
108-88-3	Toluene	ND	2.0	1.0	ug/kg	
1330-20-7	Xylene (total)	ND	2.1	1.0	ug/kg	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	115%	70-130%
2037-26-5	Toluene-D8	104%	70-130%
460-00-4	4-Bromofluorobenzene	101%	65-142%
17060-07-0	1,2-Dichloroethane-D4	101%	70-130%

Blank Spike Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V2270-BS	5V40156.D	1	01/03/17	MB	n/a	n/a	V5V2270

The QC reported here applies to the following samples: **Method:** SW846 8260B

D90141-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	53.6	107	70-130
100-41-4	Ethylbenzene	50	56.4	113	70-130
108-88-3	Toluene	50	54.0	108	70-130
1330-20-7	Xylene (total)	150	170	113	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	111%	70-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	101%	65-142%
17060-07-0	1,2-Dichloroethane-D4	96%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D90048-1MS [a]	5V40160.D	1	01/03/17	MB	n/a	n/a	V5V2270
D90048-1MSD [a]	5V40161.D	1	01/03/17	MB	n/a	n/a	V5V2270
D90048-1 [a]	5V40159.D	1	01/03/17	MB	n/a	n/a	V5V2270

The QC reported here applies to the following samples: **Method:** SW846 8260B

D90141-1

CAS No.	Compound	D90048-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		54.4	45.7	84	53.7	43.9	82	4	43-135/30
100-41-4	Ethylbenzene	ND		54.4	48.1	88	53.7	45.4	85	6	30-144/30
108-88-3	Toluene	ND		54.4	46.0	85	53.7	44.5	83	3	27-144/30
1330-20-7	Xylene (total)	ND		163	147	90	161	139	86	6	13-154/30

CAS No.	Surrogate Recoveries	MS	MSD	D90048-1	Limits
1868-53-7	Dibromofluoromethane	117%	115%	116%	70-130%
2037-26-5	Toluene-D8	101%	102%	102%	70-130%
460-00-4	4-Bromofluorobenzene	103%	101%	100%	65-142%
17060-07-0	1,2-Dichloroethane-D4	106%	99%	107%	70-130%

(a) Analysis performed past the recommended method holding time as per client instructions.

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1801-MB	GA36409.D	1	01/05/17	MR	n/a	n/a	GGA1801

The QC reported here applies to the following samples: **Method:** SW846 8015B

D90141-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	9.9	5.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
120-82-1	1,2,4-Trichlorobenzene	98%	60-140%

Blank Spike Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1801-BS	GA36410.D	1	01/05/17	MR	n/a	n/a	GGA1801

The QC reported here applies to the following samples: **Method:** SW846 8015B

D90141-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	109	107	98	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	103%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D90048-1MS	GA36413.D	1	01/05/17	MR	n/a	n/a	GGA1801
D90048-1MSD	GA36414.D	1	01/05/17	MR	n/a	n/a	GGA1801
D90048-1 [a]	GA36412.D	1	01/05/17	MR	n/a	n/a	GGA1801

The QC reported here applies to the following samples: **Method:** SW846 8015B

D90141-1

CAS No.	Compound	D90048-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		131	114	87	131	114	87	0	70-131/30

CAS No.	Surrogate Recoveries	MS	MSD	D90048-1	Limits
120-82-1	1,2,4-Trichlorobenzene	102%	103%	96%	60-140%

(a) Analysis performed past the recommended method holding time as per client instructions.

* = Outside of Control Limits.

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14507-MB	FI49563.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087

The QC reported here applies to the following samples: **Method:** SW846-8015B

D90141-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	10	9.5	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	99%	41-134%

Blank Spike Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14507-BS	FI49565.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087

The QC reported here applies to the following samples: **Method:** SW846-8015B

D90141-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	250	203	81	35-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	119%	41-134%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D90141
Account: RENOGCOA Renegade Oil & Gas
Project: Bird State 32-1 Pit

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14507-MS	FI49567.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087
OP14507-MSD	FI49569.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087
D90141-1	FI49571.D	1	01/05/17	GN	01/05/17	OP14507	GFI2087

The QC reported here applies to the following samples: **Method:** SW846-8015B

D90141-1

CAS No.	Compound	D90141-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	967		285	927	-14* [a]	283	872	-34* [a]	6	10-171/30

CAS No.	Surrogate Recoveries	MS	MSD	D90141-1	Limits
84-15-1	o-Terphenyl	101%	103%	104%	41-134%

(a) Outside control limits due to high level in sample relative to spike amount.

* = Outside of Control Limits.

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	55	65		
Antimony	150	11	44		
Arsenic	130	19	60		
Barium	50	1	2		
Beryllium	50	4.5	8		
Boron	250	4	18		
Cadmium	50	1	4		
Calcium	2000	12	50	16.5	<2000
Chromium	50	1.5	3.5		
Cobalt	25	2.5	6		
Copper	50	4	19		
Iron	350	7.5	35		
Lead	250	11	25		
Lithium	25	2	3.5		
Magnesium	1000	34	200	7.5	<1000
Manganese	25	2.5	4.5		
Molybdenum	50	2	18		
Nickel	150	2.5	14		
Phosphorus	500	75	170		
Potassium	5000	500	360		
Selenium	250	36	50		
Silicon	250	24	42		
Silver	150	1.5	3		
Sodium	2000	37	70	-21	<2000
Strontium	25	.05	1.5		
Thallium	50	9	40		
Tin	250	60	60		
Titanium	50	.5	14		
Uranium	250	15	22		
Vanadium	50	2	3		
Zinc	150	2	18		

Associated samples MP20676: D90141-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	0.00	124000	125000	99.2	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	0.0	118000	125000	94.4	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	0.0	118000	125000	94.4	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP20676: D90141-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original MS	Spikelot ICPALL2	% Rec	QC Limits

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original MSD		Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	0.00	123000	125000	98.4	0.8	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	0.0	117000	125000	93.6	0.9	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	0.0	117000	125000	93.6	0.9	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP20676: D90141-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original MSD	Spikelot ICPALL2 % Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	124000	125000	99.2	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	119000	125000	95.2	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	119000	125000	95.2	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP20676: D90141-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	0.00	0.00	NC	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	0.00	0.00	NC	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	0.00	0.00	NC	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP20676: D90141-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

QC Batch ID: MP20676
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60
Units: ug/l

Prep Date: 01/13/17

Metal	D90157-30 Original SDL 1:5	%DIF	QC Limits

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D90141
Account: RENOGCOA - Renegade Oil & Gas
Project: Bird State 32-1 Pit

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP19545/GN37333			umhos/cm	998	1000	101.0	90-110%
pH	GN37314			su	8.00	8.00	100.0	99.1-100.9%

Associated Samples:
Batch GN37314: D90141-1
Batch GP19545: D90141-1
(*) Outside of QC limits