From: Austin Weyant
To: Billings, Bradford, EMNRD
Cc: Bratcher, Mike, EMNRD; Patterson, Heather, EMNRD
Subject: BKE Raw Files
Date: Wednesday, April 27, 2016 3:17:04 PM
Attachments: 2016-04-11_BKESWD_MW1-WR-Timestamped.pdf
2016-04-11_BKESWD_MW2-PR-Timestamped.pdf
2016-04-11_BKESWD_MW2-WR-Timestamped.pdf
TC82927.PDF
TC82928.PDF
TC82929.PDF

J. Austin Weyant
Project Scientist

Souder, Miller & Associates
Engineering t Environmental t Surveying
201 S Halagueno
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(575) 689-7040 (mobile)

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
C- 03941 POD-1 SITE MW-1	C- 03941
WELL OWNER NAME(S)	**PHONE (OPTIONAL)**
Key Energy Services, LLC c/o Souder, Miller & Associates	
WELL OWNER MAILING ADDRESS	**CITY / STATE / ZIP**
201 S. Halagueno	Carlsbad NM 88221

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	18	24.1	N
	LONGITUDE	104	8	18.3	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

NW of 1405 Roberson RD LOT 887-1 Loving, NM

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER			NAME OF WELL DRILLING COMPANY
1249	Jackie D. Atkins			Atkins Engineering Associates, Inc
DRILLING STARTED	**DRILLING ENDED**	**DEPTH OF COMPLETED WELL (FT)**	**BORE HOLE DEPTH (FT)**	**DEPTH WATER FIRST ENCOUNTERED (FT)**
03-22-16	03-22-16	36.7	36.8	24.45

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☑ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 19

DRILLING FLUID: ☐ AIR ☐ MUD ✓ ADDITIVES – SPECIFY: None

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow Stem Auger (HSA)

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	21.7	± 8	SCH 40 PVC	Flush Thread	2.0	0.154	---
21.7	36.7	± 8	SCH 40 PVC (Screen)	Flush Thread	2.0	0.154	0.010

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	2	± 8	5000 lb psi QuikCrete	± 0.55	Tremie
2	14.7	± 8	Neat Cement (5.2 gal/sack)	± 3.48	Tremie
14.7	19.7	± 8	Hole Plug	± 1.87	Through HSA
19.7	36.7	± 8	12-20 Silica Sand	± 6.37	Through HSA

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 10/29/15)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	14	14	Brown dry caliche	Y ✓N	
14	19	5	Brown sandy clay with some caliche	Y ✓N	
19	24	5	Brown and sandy clay	Y ✓N	
24	29	5	Brown and tan clay	✓Y N	
29	36.8	7.8	Brown, soft, clayey sand	✓Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

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METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☑ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0.00

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Lupe Leyba

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Jackie D. Atkins — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

April 6, 2016 — DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

PLUGGING RECORD

NOTE: **A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC**

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: C-03941 POD 2 BORING

Well owner: Key Energy Services, LLC c/o Souder, Miller & Associates Phone No.: N/A

Mailing address: 201 S. Halagueno

City: Carlsbad State: NM Zip code: 88221

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Atkins Engineering Associates, Inc.

2) New Mexico Well Driller License No.: 1249 Expiration Date: 04/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): Lupe Leyba

4) Date well plugging began: 04/25/16 Date well plugging concluded: 04/25/16

5) GPS Well Location: Latitude: 32 deg, 18 min, 23.7 sec
Longitude: -104 deg, 8 min, 16.7 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 32.1 ft below ground level (bgl),
by the following manner: Tremie

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: N/A

9) Were all plugging activities consistent with an approved plugging plan? No If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The boring was drilled to land well for ground water monitoring. Sticky clay was encountered which could have "mudded" off the boring. Water was not detected and the well was plugged before any casing material was set in place. Lower portion of the boring collapsed. Well was filled to land surface with 5.20 gallons per 94/lb sack of neat cement.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0' – 20'	5.20 gal per 94/lb sack Neat Cement	57.5	97.42	Tremie	Monitor well casing was not installed. Boring plugged.

0' 10' 20' 30' TD = 32.1' 40' 50'

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Jackie D. Atkins , say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller Date

e-Hardcopy 2.0
Automated Report

Technical Report for

Key Energy

BKE SWD

SGS Accutest Job Number: TC82927

Sampling Date: 03/22/16

Report to:

Key Energy
6 Desota Drvie Suite 4300
Midland, TX 79705
aramirez01@keyenergy.com

ATTN: Ana Ramirez

Total number of pages in report: 47

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.

Richard Rodriguez
Laboratory Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-16-24) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

Sections: 1 2 3 4 5 6 7

Table of Contents

Sample Summary

Key Energy

BKE SWD

Job No: TC82927

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC82927-1	03/22/16	09:00		03/30/16	SO	Soil	BKE1 4-6
TC82927-2	03/22/16	10:00		03/30/16	SO	Soil	BKE1 9-11
TC82927-3	03/22/16	11:00		03/30/16	SO	Soil	BKE1 14-16
TC82927-4	03/22/16	12:00		03/30/16	SO	Soil	BKE1 19-21
TC82927-5	03/22/16	13:00		03/30/16	SO	Soil	BKE1 24-26

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

Summary of Hits

Job Number: TC82927
Account: Key Energy
Project: BKE SWD
Collected: 03/22/16

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC82927-1	**BKE1 4-6**					
Chloride		316	18		mg/kg	EPA 300
TC82927-2	**BKE1 9-11**					
Chloride		623	37		mg/kg	EPA 300
TC82927-3	**BKE1 14-16**					
Chloride		450	17		mg/kg	EPA 300
TC82927-4	**BKE1 19-21**					
Chloride		196	6.8		mg/kg	EPA 300
TC82927-5	**BKE1 24-26**					
Chloride		202	6.8		mg/kg	EPA 300

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BKE1 4-6		
Lab Sample ID:	TC82927-1	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	69.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021655.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.21 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	9.1	6.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	98%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 4-6		
Lab Sample ID:	TC82927-1	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	69.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA161338.D	1	04/01/16	LT	n/a	n/a	GAA936
Run #2							

	Initial Weight	Final Volume
Run #1	5.18 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.6	1.4	ug/kg	
108-88-3	Toluene	ND	5.6	1.9	ug/kg	
100-41-4	Ethylbenzene	ND	5.6	1.4	ug/kg	
1330-20-7	Xylenes (total)	ND	17	4.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	93%		23-165%
98-08-8	aaa-Trifluorotoluene	105%		34-174%

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:	BKE1 4-6		
Lab Sample ID:	TC82927-1	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	69.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243402.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	4.8	1.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		41-123%

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:	BKE1 4-6		
Lab Sample ID:	TC82927-1	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	69.5
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	316	18	mg/kg	5	04/01/16 11:00	ES	EPA 300
Solids, Percent	69.5		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE1 9-11		
Lab Sample ID:	TC82927-2	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	67.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021656.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.50 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	9.2	6.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	98%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 9-11		
Lab Sample ID:	TC82927-2	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	67.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA161342.D	1	04/01/16	LT	n/a	n/a	GAA936
Run #2							

	Initial Weight	Final Volume
Run #1	5.70 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.2	1.3	ug/kg	
108-88-3	Toluene	ND	5.2	1.8	ug/kg	
100-41-4	Ethylbenzene	ND	5.2	1.3	ug/kg	
1330-20-7	Xylenes (total)	ND	16	4.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	105%		34-174%

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:	BKE1 9-11		
Lab Sample ID:	TC82927-2	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	67.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243403.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	5.0	1.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		41-123%

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:	BKE1 9-11		
Lab Sample ID:	TC82927-2	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	67.0
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	623	37	mg/kg	10	04/01/16 12:25	ES	EPA 300
Solids, Percent	67		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE1 14-16		
Lab Sample ID:	TC82927-3	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	74.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021657.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.31 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	8.0	5.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 14-16		
Lab Sample ID:	TC82927-3	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	74.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA161343.D	1	04/01/16	LT	n/a	n/a	GAA936
Run #2							

	Initial Weight	Final Volume
Run #1	5.23 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.1	1.3	ug/kg	
108-88-3	Toluene	ND	5.1	1.7	ug/kg	
100-41-4	Ethylbenzene	ND	5.1	1.3	ug/kg	
1330-20-7	Xylenes (total)	ND	15	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	103%		34-174%

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:	BKE1 14-16		
Lab Sample ID:	TC82927-3	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	74.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243404.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	4.5	1.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		41-123%

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:	BKE1 14-16		
Lab Sample ID:	TC82927-3	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	74.4
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	450	17	mg/kg	5	04/01/16 12:42	ES	EPA 300
Solids, Percent	74.4		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE1 19-21		
Lab Sample ID:	TC82927-4	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	73.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021658.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.39 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	8.2	5.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 19-21		
Lab Sample ID:	TC82927-4	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	73.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA161344.D	1	04/01/16	LT	n/a	n/a	GAA936
Run #2							

	Initial Weight	Final Volume
Run #1	5.50 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	1.3	ug/kg	
108-88-3	Toluene	ND	5.0	1.7	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	1.2	ug/kg	
1330-20-7	Xylenes (total)	ND	15	3.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	104%		34-174%

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:	BKE1 19-21		
Lab Sample ID:	TC82927-4	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	73.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243405.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	4.5	1.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		41-123%

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:	BKE1 19-21		
Lab Sample ID:	TC82927-4	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	73.0
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	196	6.8	mg/kg	2	04/01/16 12:59	ES	EPA 300
Solids, Percent	73		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE1 24-26		
Lab Sample ID:	TC82927-5	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	74.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021659.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.39 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	8.0	5.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 24-26		
Lab Sample ID:	TC82927-5	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	74.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161366.D	1	04/04/16	LT	n/a	n/a	GAA937
Run #2							

	Initial Weight	Final Volume
Run #1	5.59 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.8	1.2	ug/kg	
108-88-3	Toluene	ND	4.8	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	4.8	1.2	ug/kg	
1330-20-7	Xylenes (total)	ND	15	3.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	100%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE1 24-26		
Lab Sample ID:	TC82927-5	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	74.0
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243406.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	4.5	1.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	99%		41-123%

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:	BKE1 24-26		
Lab Sample ID:	TC82927-5	**Date Sampled:**	03/22/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	74.0
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	202	6.8	mg/kg	2	04/01/16 17:31	ES	EPA 300
Solids, Percent	74		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

PAGE 1 OF 1

SGS ACCUTEST

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking #: | Bottle Order Control #:
SGS Accutest Quote #: | SGS Accutest Job #: TC82927

Client / Reporting Information

Company Name: Key Energy Services
Street Address: 6 Desta Dr Suite 4200
City: Midland State: Tx Zip: 79705
Project Contact: Ana Ramirez E-mail:
Phone #: Fax #:
aramirez01@keyenergy.com
Sampler(s) Name(s): Lucas Mallet Phone #: 575 499 9268

Project Information

Project Name: BKE SWD
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analyses

SGS Accutest Sample #	Field ID / Point of Collection	Collection Date	Time	Sampled By	Matrix	# of bottles	Number of preserved Bottles	TPH 8015	BTEX 8021	Cl
1	BKE1 4-6	3-22-16	900	LM	Soil	1		X	X	X
2	BKE1 9-11		10					X	X	X
3	BKE1 14-16		11					X	X	X
4	BKE1 19-21		12					X	X	X
5	BKE1 24-26		1					X	X	X

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

LAB USE ONLY

TAGGED BY:

VERIFIED BY:

Turnaround Time (Business days)

- Standard
- 5 Day *RUSH*
- 4 Day *RUSH*
- 3 Day *RUSH*
- 2 Day *RUSH*
- 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULT1 (Level 3+4)
- REDT1 (Level 3+4)
- Commercial "C"
- TRRP
- EDD Format
- Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

Form: SM021-0

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
1		3-22-16				3/23/16		3/23/16
2	Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
3								
4	Relinquished by:	Date Time:	Received By:	Date Time:	Custody Seal #	Intact / Not Intact	Preserved where applicable	On Ice / Cooler Temp
5								

SGS Accutest Sample Receipt Summary

Job Number: TC82927 **Client:** KEY ENERGY SERVICES **Project:** BKE SWD

Date / Time Received: 3/30/2016 **Delivery Method:** **Airbill #'s:** 782697595918

No. Coolers: 1 **Therm ID:** IR-5; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (1.8/1.8);

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:			
3. Cooler media:	Ice (Bag)		

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

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:	☐		☐	☑

Comments

TC82927: Chain of Custody
Page 2 of 3

Sample Receipt Log

Job #: TC82927 **Date / Time Received:** 3/30/2016 9:55:00 AM **Initials:** EC

Client: KEY ENERGY SERVICES

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC82927-1	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82927-2	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82927-3	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82927-4	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82927-5	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8

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: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB1143-MB	BB0021654.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	3.4	mg/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	89%	53-130%
98-08-8	aaa-Trifluorotoluene	98%	67-126%

Method Blank Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA936-MB	AA161337.D	1	04/01/16	LT	n/a	n/a	GAA936

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-1, TC82927-2, TC82927-3, TC82927-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.99	ug/kg	
108-88-3	Toluene	ND	4.0	1.4	ug/kg	
1330-20-7	Xylenes (total)	ND	12	3.0	ug/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	86%	23-165%
98-08-8	aaa-Trifluorotoluene	100%	34-174%

Method Blank Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA937-MB	AA161365.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-5

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.99	ug/kg	
108-88-3	Toluene	ND	4.0	1.4	ug/kg	
1330-20-7	Xylenes (total)	ND	12	3.0	ug/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	86%	23-165%
98-08-8	aaa-Trifluorotoluene	97%	34-174%

Blank Spike Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB1143-BS	BB0021652.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.388	97	72-120

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	97%	53-130%
98-08-8	aaa-Trifluorotoluene	109%	67-126%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA936-BS	AA161335.D	1	04/01/16	LT	n/a	n/a	GAA936

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-1, TC82927-2, TC82927-3, TC82927-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	20	21.0	105	69-126
100-41-4	Ethylbenzene	20	21.9	110	64-128
108-88-3	Toluene	20	21.0	105	67-125
1330-20-7	Xylenes (total)	60	64.9	108	68-130

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	88%	23-165%
98-08-8	aaa-Trifluorotoluene	100%	34-174%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA937-BS	AA161363.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	20	20.9	105	69-126
100-41-4	Ethylbenzene	20	21.5	108	64-128
108-88-3	Toluene	20	20.7	104	67-125
1330-20-7	Xylenes (total)	60	64.4	107	68-130

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	102%	23-165%
98-08-8	aaa-Trifluorotoluene	110%	34-174%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82927-5MS	BB0021660.D	1	04/04/16	LT	n/a	n/a	GBB1143
TC82927-5MSD	BB0021661.D	1	04/04/16	LT	n/a	n/a	GBB1143
TC82927-5 [a]	BB0021659.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	TC82927-5 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		32.1	35.8	112	32.1	35.1	109	2	72-120/13

CAS No.	Surrogate Recoveries	MS	MSD	TC82927-5	Limits
460-00-4	4-Bromofluorobenzene	90%	90%	91%	53-130%
98-08-8	aaa-Trifluorotoluene	105%	105%	100%	67-126%

(a) Sample collected in bulk. All results are considered estimated values.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82927-1MS	AA161339.D	1	04/01/16	LT	n/a	n/a	GAA936
TC82927-1MSD	AA161340.D	1	04/01/16	LT	n/a	n/a	GAA936
TC82927-1	AA161338.D	1	04/01/16	LT	n/a	n/a	GAA936

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-1, TC82927-2, TC82927-3, TC82927-4

CAS No.	Compound	TC82927-1 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		27	27.0	100	26.7	25.5	96	6	69-126/36
100-41-4	Ethylbenzene	ND		27	27.9	103	26.7	26.1	98	7	64-128/38
108-88-3	Toluene	ND		27	26.8	99	26.7	25.3	95	6	67-125/38
1330-20-7	Xylenes (total)	ND		81.1	82.6	102	80.1	77.9	97	6	68-130/38

CAS No.	Surrogate Recoveries	MS	MSD	TC82927-1	Limits
460-00-4	4-Bromofluorobenzene	96%	96%	93%	23-165%
98-08-8	aaa-Trifluorotoluene	109%	109%	105%	34-174%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82928-1MS	AA161371.D	1	04/04/16	LT	n/a	n/a	GAA937
TC82928-1MSD	AA161372.D	1	04/04/16	LT	n/a	n/a	GAA937
TC82928-1 [a]	AA161370.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82927-5

CAS No.	Compound	TC82928-1 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		1390	1140	82	1390	1060	76	7	69-126/36
100-41-4	Ethylbenzene	ND		1390	2970	214*	1390	2770	200*	7	64-128/38
108-88-3	Toluene	ND		1390	1370	99	1390	1280	92	7	67-125/38
1330-20-7	Xylenes (total)	2550		4160	9670	147*	4160	8040	108	18	68-130/38

CAS No.	Surrogate Recoveries	MS	MSD	TC82928-1	Limits
460-00-4	4-Bromofluorobenzene	185%*	193%*	167%* [b]	23-165%
98-08-8	aaa-Trifluorotoluene	94%	98%	102%	34-174%

(a) Sample collected in bulk. All results are considered estimated values. Dilution required due to matrix interference.
(b) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

GC Semi-volatiles

6

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-MB	IB243445.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	3.3	1.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	106%	41-123%

Blank Spike Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-BS	IB243444.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C10-C28)	33.3	27.6	83	52-113

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	107%	41-123%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82927
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-MS	IB243448.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
OP40243-MSD	IB243449.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
TC82927-1	IB243402.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065

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

TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5

CAS No.	Compound	TC82927-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	ND		47.9	42.1	88	47.9	34.6	72	19	52-113/34

CAS No.	Surrogate Recoveries	MS	MSD	TC82927-1	Limits
84-15-1	o-Terphenyl	92%	98%	84%	41-123%

* = Outside of Control Limits.

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: TC82927
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP35785/GN72121	2.5	0.0	mg/kg	49.8	47.8	96.0	90-110%

Associated Samples:
Batch GP35785: TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82927
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP35785/GN72121	TC82927-1	mg/kg	316	318	0.6	0-20%
Solids, Percent	GN72086	TC82927-1	%	69.5	70.3	1.1	0-5%

Associated Samples:
Batch GN72086: TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5
Batch GP35785: TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82927
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP35785/GN72121	TC82927-1	mg/kg	316	71.4	320(a)	5.6(b)	80-120%

Associated Samples:
Batch GP35785: TC82927-1, TC82927-2, TC82927-3, TC82927-4, TC82927-5
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(a) Outside control limits due to matrix interference and/or sample nonhomogeneity.
(b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

e-Hardcopy 2.0
Automated Report

Technical Report for

Key Energy

BKE SWD

SGS Accutest Job Number: TC82928

Sampling Date: 03/23/16

Report to:

Key Energy
6 Desota Drvie Suite 4300
Midland, TX 79705
aramirez01@keyenergy.com

ATTN: Ana Ramirez

Total number of pages in report: **64**

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.

Richard Rodriguez
Laboratory Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-16-24) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

Sections: 1 2 3 4 5 6 7

Table of Contents

Sample Summary

Key Energy

BKE SWD

Job No: TC82928

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC82928-1	03/23/16	09:00		03/30/16	SO	Soil	BKE2-1
TC82928-2	03/23/16	09:00		03/30/16	SO	Soil	BKE2-4-6
TC82928-3	03/23/16	09:00		03/30/16	SO	Soil	BKE2-9-11
TC82928-4	03/23/16	09:00		03/30/16	SO	Soil	BKE2-14-16
TC82928-5	03/23/16	09:00		03/30/16	SO	Soil	BKE2-19-21
TC82928-6	03/23/16	09:00		03/30/16	SO	Soil	BKE2-24-26
TC82928-7	03/23/16	09:00		03/30/16	SO	Soil	BKE2-29-31
TC82928-8	03/23/16	09:00		03/30/16	SO	Soil	BKE2-34-36
TC82928-9	03/23/16	09:00		03/30/16	SO	Soil	BKE2-39-41

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

Summary of Hits

Job Number: TC82928
Account: Key Energy
Project: BKE SWD
Collected: 03/23/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC82928-1	**BKE2-1**					
TPH-GRO (C6-C10) [a]		425	69	47	mg/kg	SW846 8015
Xylenes (total) [b]		2550	830	210	ug/kg	SW846 8021B
TPH (C10-C28)		531	43	13	mg/kg	SW846 8015 M
Chloride		1900	160		mg/kg	EPA 300
TC82928-2	**BKE2-4-6**					
Ethylbenzene [c]		1.7 J	4.7	1.2	ug/kg	SW846 8021B
TPH (C10-C28)		10.2	4.3	1.3	mg/kg	SW846 8015 M
Chloride		8700	320		mg/kg	EPA 300
TC82928-3	**BKE2-9-11**					
Chloride		4340	310		mg/kg	EPA 300
TC82928-4	**BKE2-14-16**					
TPH (C10-C28)		6.43	4.1	1.3	mg/kg	SW846 8015 M
Chloride		2470	150		mg/kg	EPA 300
TC82928-5	**BKE2-19-21**					
TPH (C10-C28)		1.71 J	4.1	1.3	mg/kg	SW846 8015 M
Chloride		242	15		mg/kg	EPA 300
TC82928-6	**BKE2-24-26**					
Chloride		34.0	3.2		mg/kg	EPA 300
TC82928-7	**BKE2-29-31**					
TPH (C10-C28)		8.19	4.6	1.5	mg/kg	SW846 8015 M
Chloride		6.6	3.5		mg/kg	EPA 300
TC82928-8	**BKE2-34-36**					
TPH (C10-C28)		2.51 J	4.3	1.4	mg/kg	SW846 8015 M
Chloride		8.6	3.2		mg/kg	EPA 300
TC82928-9	**BKE2-39-41**					
TPH (C10-C28)		2.56 J	4.1	1.3	mg/kg	SW846 8015 M
Chloride		16.3	3.1		mg/kg	EPA 300

Summary of Hits

Job Number: TC82928
Account: Key Energy
Project: BKE SWD
Collected: 03/23/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

(a) Sample collected in bulk. All results are considered estimated values.
(b) Sample collected in bulk. All results are considered estimated values. Dilution required due to matrix interference. More than 40% RPD for detected concentrations between two GC columns.
(c) Sample collected in bulk. All results are considered estimated values. More than 40% RPD for detected concentrations between two GC columns.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BKE2-1		
Lab Sample ID:	TC82928-1	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	77.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021665.D	10	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.82 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	425	69	47	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		53-130%
98-08-8	aaa-Trifluorotoluene	98%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-1		
Lab Sample ID:	TC82928-1	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	77.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161370.D	1	04/04/16	LT	n/a	n/a	GAA937
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.82 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	280	70	ug/kg	
108-88-3	Toluene	ND	280	94	ug/kg	
100-41-4	Ethylbenzene	ND	280	69	ug/kg	
1330-20-7	Xylenes (total) [b]	2550	830	210	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	167% [c]		23-165%
98-08-8	aaa-Trifluorotoluene	102%		34-174%

(a) Sample collected in bulk. All results are considered estimated values. Dilution required due to matrix interference.
(b) More than 40% RPD for detected concentrations between two GC columns.
(c) Outside control limits due to matrix interference. Confirmed by MS/MSD.

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:	BKE2-1		
Lab Sample ID:	TC82928-1	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	77.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243437.D	10	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	531	43	13	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	119%		41-123%

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:	BKE2-1		
Lab Sample ID:	TC82928-1	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	77.9
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	1900	160	mg/kg	50	04/01/16 17:48	ES	EPA 300
Solids, Percent	77.9		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-4-6		
Lab Sample ID:	TC82928-2	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	78.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021677.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.28 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	7.4	5.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		53-130%
98-08-8	aaa-Trifluorotoluene	101%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-4-6		
Lab Sample ID:	TC82928-2	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	78.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161367.D	1	04/04/16	LT	n/a	n/a	GAA937
Run #2							

	Initial Weight	Final Volume
Run #1	5.49 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.7	1.2	ug/kg	
108-88-3	Toluene	ND	4.7	1.6	ug/kg	
100-41-4	Ethylbenzene [b]	1.7	4.7	1.2	ug/kg	J
1330-20-7	Xylenes (total)	ND	14	3.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	93%		23-165%
98-08-8	aaa-Trifluorotoluene	109%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.
(b) More than 40% RPD for detected concentrations between two GC columns.

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:	BKE2-4-6		
Lab Sample ID:	TC82928-2	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	78.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243438.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	10.2	4.3	1.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		41-123%

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:	BKE2-4-6		
Lab Sample ID:	TC82928-2	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	78.2
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	8700	320	mg/kg	100	04/01/16 18:05	ES	EPA 300
Solids, Percent	78.2		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-9-11		
Lab Sample ID:	TC82928-3	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	80.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021676.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.44 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	7.0	4.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-9-11		
Lab Sample ID:	TC82928-3	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	80.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161368.D	1	04/04/16	LT	n/a	n/a	GAA937
Run #2							

	Initial Weight	Final Volume
Run #1	5.40 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.6	1.2	ug/kg	
108-88-3	Toluene	ND	4.6	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	4.6	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	14	3.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		23-165%
98-08-8	aaa-Trifluorotoluene	102%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-9-11		
Lab Sample ID:	TC82928-3	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	80.2
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243415.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28) [a]	ND	4.2	1.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	83%		41-123%

(a) CCV recovery was above method acceptance criteria. This target analyte was not detected in the sample.

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:	BKE2-9-11		
Lab Sample ID:	TC82928-3	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	80.2
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	4340	310	mg/kg	100	04/01/16 18:22	ES	EPA 300
Solids, Percent	80.2		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-14-16		
Lab Sample ID:	TC82928-4	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	80.8
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021668.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.57 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.7	4.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-14-16		
Lab Sample ID:	TC82928-4	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	80.8
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161369.D	1	04/04/16	LT	n/a	n/a	GAA937
Run #2							

	Initial Weight	Final Volume
Run #1	5.63 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.4	1.1	ug/kg	
108-88-3	Toluene	ND	4.4	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	4.4	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	13	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	101%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-14-16		
Lab Sample ID:	TC82928-4	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	80.8
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243439.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	6.43	4.1	1.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	93%		41-123%

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:	BKE2-14-16		
Lab Sample ID:	TC82928-4	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	80.8
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	2470	150	mg/kg	50	04/01/16 18:39	ES	EPA 300
Solids, Percent	80.8		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-19-21		
Lab Sample ID:	TC82928-5	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	80.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021669.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.49 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.9	4.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-19-21		
Lab Sample ID:	TC82928-5	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	80.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161394.D	1	04/05/16	LT	n/a	n/a	GAA938
Run #2							

	Initial Weight	Final Volume
Run #1	5.48 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.5	1.1	ug/kg	
108-88-3	Toluene	ND	4.5	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	4.5	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	14	3.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	87%		23-165%
98-08-8	aaa-Trifluorotoluene	95%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-19-21		
Lab Sample ID:	TC82928-5	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	80.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243440.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	1.71	4.1	1.3	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	76%		41-123%

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:	BKE2-19-21		
Lab Sample ID:	TC82928-5	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	80.4
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	242	15	mg/kg	5	04/01/16 18:56	ES	EPA 300
Solids, Percent	80.4		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-24-26		
Lab Sample ID:	TC82928-6	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	78.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021670.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.24 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	7.5	5.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-24-26		
Lab Sample ID:	TC82928-6	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	78.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161390.D	1	04/05/16	LT	n/a	n/a	GAA938
Run #2							

	Initial Weight	Final Volume
Run #1	5.36 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.8	1.2	ug/kg	
108-88-3	Toluene	ND	4.8	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	4.8	1.2	ug/kg	
1330-20-7	Xylenes (total)	ND	14	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		23-165%
98-08-8	aaa-Trifluorotoluene	100%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-24-26		
Lab Sample ID:	TC82928-6	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	78.4
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243418.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28) [a]	ND	4.2	1.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		41-123%

(a) CCV recovery was above method acceptance criteria. This target analyte was not detected in the sample.

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:	BKE2-24-26		
Lab Sample ID:	TC82928-6	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	78.4
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	34.0	3.2	mg/kg	1	04/01/16 19:13	ES	EPA 300
Solids, Percent	78.4		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-29-31		
Lab Sample ID:	TC82928-7	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	71.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021671.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.37 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	8.4	5.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-29-31		
Lab Sample ID:	TC82928-7	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	71.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161391.D	1	04/05/16	LT	n/a	n/a	GAA938
Run #2							

	Initial Weight	Final Volume
Run #1	5.38 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.2	1.3	ug/kg	
108-88-3	Toluene	ND	5.2	1.7	ug/kg	
100-41-4	Ethylbenzene	ND	5.2	1.3	ug/kg	
1330-20-7	Xylenes (total)	ND	16	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	86%		23-165%
98-08-8	aaa-Trifluorotoluene	94%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-29-31		
Lab Sample ID:	TC82928-7	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	71.9
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243441.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	8.19	4.6	1.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	76%		41-123%

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:	BKE2-29-31		
Lab Sample ID:	TC82928-7	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	71.9
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	6.6	3.5	mg/kg	1	04/01/16 19:30	ES	EPA 300
Solids, Percent	71.9		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-34-36		
Lab Sample ID:	TC82928-8	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	77.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021672.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.46 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	7.4	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-34-36		
Lab Sample ID:	TC82928-8	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	77.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161392.D	1	04/05/16	LT	n/a	n/a	GAA938
Run #2							

	Initial Weight	Final Volume
Run #1	5.20 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	1.3	ug/kg	
108-88-3	Toluene	ND	5.0	1.7	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	1.2	ug/kg	
1330-20-7	Xylenes (total)	ND	15	3.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	85%		23-165%
98-08-8	aaa-Trifluorotoluene	92%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-34-36		
Lab Sample ID:	TC82928-8	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	77.5
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243442.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	2.51	4.3	1.4	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	95%		41-123%

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:	BKE2-34-36		
Lab Sample ID:	TC82928-8	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	77.5
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	8.6	3.2	mg/kg	1	04/01/16 19:47	ES	EPA 300
Solids, Percent	77.5		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BKE2-39-41		
Lab Sample ID:	TC82928-9	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015	**Percent Solids:**	81.1
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB0021673.D	1	04/04/16	LT	n/a	n/a	GBB1143
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.47 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.8	4.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-39-41		
Lab Sample ID:	TC82928-9	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	81.1
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	AA161393.D	1	04/05/16	LT	n/a	n/a	GAA938
Run #2							

	Initial Weight	Final Volume
Run #1	5.52 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.5	1.1	ug/kg	
108-88-3	Toluene	ND	4.5	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	4.5	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	13	3.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	88%		23-165%
98-08-8	aaa-Trifluorotoluene	97%		34-174%

(a) Sample collected in bulk. All results are considered estimated values.

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:	BKE2-39-41		
Lab Sample ID:	TC82928-9	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	81.1
Project:	BKE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB243443.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	2.56	4.1	1.3	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	93%		41-123%

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:	BKE2-39-41		
Lab Sample ID:	TC82928-9	**Date Sampled:**	03/23/16
Matrix:	SO - Soil	**Date Received:**	03/30/16
		Percent Solids:	81.1
Project:	BKE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	16.3	3.1	mg/kg	1	04/01/16 20:04	ES	EPA 300
Solids, Percent	81.1		%	1	03/31/16	DS	SM 2540 G

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS ACCUTEST

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking # | Bottle Order Control #

SGS Accutest Quote # | SGS Accutest Job # TC82928

Client / Reporting Information

Company Name: Key Energy Services
Street Address: 6 Desta Dr. Ste 4300
City: Midland State: Tx Zip: 79705
Project Contact: Ana Ramirez E-mail: aramirez01@keyenergy.com
Phone # Fax #
Sampler(s) Name(s): Lucas Mullen Phone #: 477-9224

Project Information

Project Name: BKE SWD
Street
City State
Project #
Client Purchase Order #
Project Manager

Billing Information (If different from Report to)

Company Name
Street Address
City State Zip
Attention:

Requested Analyses

SGS Accutest Sample #	Field ID / Point of Collection	Collection: Date	Time	Sampled By	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	ZnAc/NaOH	HNO3	H2SO4	NONE	DI Water	MeOH	TSP	NaHSO4	ENCORE	OTHER	8015B TPH	8021B BTEX	Cl	LAB USE ONLY
1	BKE 2 - 1	3-23-16	900	Lm	So.l	1													X	X	X	
2	BKE 2 - 4-6																		X	X	X	
3	BKE 2 - 9-11																		X	X	X	
4	BKE 2 - 14-16																		X	X	X	
5	BKE 2 - 19-21																		X	X	X	
6	BKE 2 - 24-26																		X	X	X	
7	BKE 2 - 29-31																		X	X	X	
8	BKE 2 - 34-36																		X	X	X	
9	BKE 2 - 39-41	↓	↓	↓	↓	↓													X	X	X	

TAGGED BY:

VERIFIED BY:

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

Turnaround Time (Business days)

- [x] Standard
- [ ] 5 Day *RUSH*
- [ ] 4 Day *RUSH*
- [ ] 3 Day *RUSH*
- [ ] 2 Day *RUSH*
- [ ] 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULT1 (Level 3+4)
- [ ] REDT1 (Level 3+4)
- [ ] Commercial "C"
- [ ] TRRP
- [ ] EDD Format
- [ ] Other _____

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Form: SM021-0

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
1		3-29-16				3-30-16		3-30-16
2								
3								
4								
5								

Custody Seal # | Intact | Not Intact | Preserved where applicable | On Ice | Cooler Temp. 1.8C

SGS Accutest Sample Receipt Summary

Job Number: TC82928 **Client:** KEY ENERGY SERVICES **Project:** BKE SWD

Date / Time Received: 3/30/2016 **Delivery Method:** **Airbill #'s:** 782697595918

No. Coolers: 1 **Therm ID:** IR-5; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (1.8/1.8);

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:			
3. Cooler media:	Ice (Bag)		

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

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:	☐		☐	☑

Comments

TC82928: Chain of Custody
Page 2 of 3

Sample Receipt Log

Job #: TC82928 **Date / Time Received:** 3/30/2016 9:55:00 AM **Initials:** EC

Client: KEY ENERGY SERVICES

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC82928-1	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-2	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-3	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-4	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-5	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-6	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-7	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-8	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82928-9	4oz	1	2-58	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8

TC82928: Chain of Custody
Page 3 of 3

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: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB1143-MB	BB0021654.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	3.4	mg/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	89%	53-130%
98-08-8	aaa-Trifluorotoluene	98%	67-126%

Method Blank Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA937-MB	AA161365.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-1, TC82928-2, TC82928-3, TC82928-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.99	ug/kg	
108-88-3	Toluene	ND	4.0	1.4	ug/kg	
1330-20-7	Xylenes (total)	ND	12	3.0	ug/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	86%	23-165%
98-08-8	aaa-Trifluorotoluene	97%	34-174%

Method Blank Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA938-MB	AA161389.D	1	04/05/16	LT	n/a	n/a	GAA938

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.99	ug/kg	
108-88-3	Toluene	ND	4.0	1.4	ug/kg	
1330-20-7	Xylenes (total)	ND	12	3.0	ug/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	82%	23-165%
98-08-8	aaa-Trifluorotoluene	88%	34-174%

Blank Spike Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB1143-BS	BB0021652.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.388	97	72-120

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	97%	53-130%
98-08-8	aaa-Trifluorotoluene	109%	67-126%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA937-BS	AA161363.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-1, TC82928-2, TC82928-3, TC82928-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	20	20.9	105	69-126
100-41-4	Ethylbenzene	20	21.5	108	64-128
108-88-3	Toluene	20	20.7	104	67-125
1330-20-7	Xylenes (total)	60	64.4	107	68-130

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	102%	23-165%
98-08-8	aaa-Trifluorotoluene	110%	34-174%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAA938-BS	AA161387.D	1	04/05/16	LT	n/a	n/a	GAA938

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	20	20.0	100	69-126
100-41-4	Ethylbenzene	20	20.8	104	64-128
108-88-3	Toluene	20	20.7	104	67-125
1330-20-7	Xylenes (total)	60	64.3	107	68-130

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	90%	23-165%
98-08-8	aaa-Trifluorotoluene	94%	34-174%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82927-5MS	BB0021660.D	1	04/04/16	LT	n/a	n/a	GBB1143
TC82927-5MSD	BB0021661.D	1	04/04/16	LT	n/a	n/a	GBB1143
TC82927-5 [a]	BB0021659.D	1	04/04/16	LT	n/a	n/a	GBB1143

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	TC82927-5 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		32.1	35.8	112	32.1	35.1	109	2	72-120/13

CAS No.	Surrogate Recoveries	MS	MSD	TC82927-5	Limits
460-00-4	4-Bromofluorobenzene	90%	90%	91%	53-130%
98-08-8	aaa-Trifluorotoluene	105%	105%	100%	67-126%

(a) Sample collected in bulk. All results are considered estimated values.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82928-1MS	AA161371.D	1	04/04/16	LT	n/a	n/a	GAA937
TC82928-1MSD	AA161372.D	1	04/04/16	LT	n/a	n/a	GAA937
TC82928-1 [a]	AA161370.D	1	04/04/16	LT	n/a	n/a	GAA937

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-1, TC82928-2, TC82928-3, TC82928-4

CAS No.	Compound	TC82928-1 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		1390	1140	82	1390	1060	76	7	69-126/36
100-41-4	Ethylbenzene	ND		1390	2970	214*	1390	2770	200*	7	64-128/38
108-88-3	Toluene	ND		1390	1370	99	1390	1280	92	7	67-125/38
1330-20-7	Xylenes (total)	2550		4160	9670	147*	4160	8040	108	18	68-130/38

CAS No.	Surrogate Recoveries	MS	MSD	TC82928-1	Limits
460-00-4	4-Bromofluorobenzene	185%*	193%*	167%* [b]	23-165%
98-08-8	aaa-Trifluorotoluene	94%	98%	102%	34-174%

(a) Sample collected in bulk. All results are considered estimated values. Dilution required due to matrix interference.
(b) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82928-5MS	AA161395.D	1	04/05/16	LT	n/a	n/a	GAA938
TC82928-5MSD	AA161396.D	1	04/05/16	LT	n/a	n/a	GAA938
TC82928-5 [a]	AA161394.D	1	04/05/16	LT	n/a	n/a	GAA938

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	TC82928-5 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		24.3	24.9	102	24.2	21.5	89	15	69-126/36
100-41-4	Ethylbenzene	ND		24.3	25.3	104	24.2	21.7	90	15	64-128/38
108-88-3	Toluene	ND		24.3	25.2	104	24.2	21.6	89	15	67-125/38
1330-20-7	Xylenes (total)	ND		73	76.5	105	72.7	66.0	91	15	68-130/38

CAS No.	Surrogate Recoveries	MS	MSD	TC82928-5	Limits
460-00-4	4-Bromofluorobenzene	94%	97%	87%	23-165%
98-08-8	aaa-Trifluorotoluene	100%	102%	95%	34-174%

(a) Sample collected in bulk. All results are considered estimated values.

* = Outside of Control Limits.

GC Semi-volatiles

6

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-MB	IB243445.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	3.3	1.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	106%	41-123%

Blank Spike Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-BS	IB243444.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C10-C28)	33.3	27.6	83	52-113

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	107%	41-123%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82928
Account: KEYETXM Key Energy
Project: BKE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP40243-MS	IB243448.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
OP40243-MSD	IB243449.D	1	04/06/16	RV	04/05/16	OP40243	GIB2066
TC82927-1	IB243402.D	1	04/05/16	RV	04/05/16	OP40243	GIB2065

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

TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9

CAS No.	Compound	TC82927-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	ND		47.9	42.1	88	47.9	34.6	72	19	52-113/34

CAS No.	Surrogate Recoveries	MS	MSD	TC82927-1	Limits
84-15-1	o-Terphenyl	92%	98%	84%	41-123%

* = Outside of Control Limits.

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: TC82928
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP35785/GN72121	2.5	0.0	mg/kg	49.8	47.8	96.0	90-110%

Associated Samples:
Batch GP35785: TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82928
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP35785/GN72121	TC82927-1	mg/kg	316	318	0.6	0-20%
Solids, Percent	GN72086	TC82927-1	%	69.5	70.3	1.1	0-5%

Associated Samples:
Batch GN72086: TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9
Batch GP35785: TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82928
Account: KEYETXM - Key Energy
Project: BKE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP35785/GN72121	TC82927-1	mg/kg	316	71.4	320(a)	5.6(b)	80-120%

Associated Samples:
Batch GP35785: TC82928-1, TC82928-2, TC82928-3, TC82928-4, TC82928-5, TC82928-6, TC82928-7, TC82928-8, TC82928-9
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(a) Outside control limits due to matrix interference and/or sample nonhomogeneity.
(b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

e-Hardcopy 2.0
Automated Report

Technical Report for

Key Energy

BFE SWD

SGS Accutest Job Number: TC82929

Sampling Date: 03/24/16

Report to:

Key Energy
6 Desota Drvie Suite 4300
Midland, TX 79705
aramirez01@keyenergy.com

ATTN: Ana Ramirez

Total number of pages in report: **19**

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.

Richard Rodriguez
Laboratory Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-16-24) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

Sections: 1 2 3 4 5 6

Table of Contents

Sample Summary

Key Energy

BFE SWD

Job No: TC82929

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC82929-1	03/24/16	15:40		03/30/16	AQ	Water	WBKF 2

Summary of Hits

Job Number: TC82929
Account: Key Energy
Project: BFE SWD
Collected: 03/24/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC82929-1	**WBKF 2**					
Chloride		2670	100		mg/l	EPA 300

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	WBKF 2		
Lab Sample ID:	TC82929-1	**Date Sampled:**	03/24/16
Matrix:	AQ - Water	**Date Received:**	03/30/16
Method:	SW846 8021B	**Percent Solids:**	n/a
Project:	BFE SWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TT025900.D	1	04/01/16	LT	n/a	n/a	GTT1122
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.17	ug/l	
108-88-3	Toluene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	0.48	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	93%		60-146%
98-08-8	aaa-Trifluorotoluene	78%		69-137%

(a) Sample analyzed beyond hold time. Sample was not preserved to a PH < 2

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:	WBKF 2		
Lab Sample ID:	TC82929-1	**Date Sampled:**	03/24/16
Matrix:	AQ - Water	**Date Received:**	03/30/16
		Percent Solids:	n/a
Project:	BFE SWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	2670	100	mg/l	200	03/31/16 19:10	ES	EPA 300

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS ACCUTEST

CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking # | Bottle Order Control #

SGS Accutest Quote # | SGS Accutest Job # TC82929

Client / Reporting Information

Company Name: Key Energy Services
Street Address: 6 Desta Dr Suite 4300
City: Midland State: Tx Zip: 79705
Project Contact: Ramiro E-mail:
Phone #: Fax #:
Client Purchase Order #:
Sampler(s) Name(s): Phone #: 575-499-9261
Project Manager:

Project Information

Project Name: BKE SWD
Street:
City: State:
Company Name:
Project #:
Street Address:
City: State: Zip:
Attention:

Billing Information (if different from Report to)

Requested Analyses

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

SGS Accutest Sample #	Field ID / Point of Collection	Collection: Date	Time	Sampled By	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	ZnAcNaOH	HNO3	H2SO4	NONE	DI Water	MEOH	TSP	NaHSO4	ENCORE	OTHER	TPH 8015B	BTEX 8021	Cl	LAB USE LEY ONLY
1	WBKE 2	3-24-16	340	LM	Water	4													X	X	X	

TAGGED BY:

VERIFIED BY:

Turnaround Time (Business days)

- Standard
- 5 Day *RUSH*
- 4 Day *RUSH*
- 3 Day *RUSH*
- 2 Day *RUSH*
- 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULT1 (Level 3+4)
- REDT1 (Level 3+4)
- Commercial "C"
- TRRP
- EDD Format
- Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

Form: SM021-0

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
	3-24-16	1		2	3/30/16	2	3/30/16
Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
		3		4		4	
Relinquished by:	Date Time:	Received By:	Date Time:	Custody Seal #	Intact / Not Intact	Preserved where applicable	On Ice / Cooler Temp.
		5					

TC82929: Chain of Custody
Page 1 of 3

SGS Accutest Sample Receipt Summary

Job Number: TC82929 **Client:** EY ENERGY SERVICES **Project:** BKE SWD

Date / Time Received: 3/30/2016 **Delivery Method:** **Airbill #'s:** 782697595918

No. Coolers: 1 **Therm ID:** IR-5; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (1.8/1.8);

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:			
3. Cooler media:	Ice (Bag)		

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

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:	☐		☐	☑

Comments

Sample Receipt Log

Job #: TC82929 **Date / Time Received:** 3/30/2016 9:55:00 AM **Initials:** EC

Client: EY ENERGY SERVICES

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC82929-1	A250	1	3M	N/P	Note #2 - Preservative check not applicable.	IR-5	1.8	0	1.8
1	TC82929-1	40ml	2	4PP	HCL	pH < 2	IR-5	1.8	0	1.8
1	TC82929-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR-5	1.8	0	1.8
1	TC82929-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR-5	1.8	0	1.8

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: TC82929
Account: KEYETXM Key Energy
Project: BFE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTT1122-MB	TT025899.D	1	04/01/16	LT	n/a	n/a	GTT1122

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82929-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.17	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.24	ug/l	
108-88-3	Toluene	ND	1.0	0.21	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	0.48	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	94%	60-146%
98-08-8	aaa-Trifluorotoluene	76%	69-137%

Blank Spike Summary

Job Number: TC82929
Account: KEYETXM Key Energy
Project: BFE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTT1122-BS	TT025898.D	1	04/01/16	LT	n/a	n/a	GTT1122

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82929-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	19.7	99	80-118
100-41-4	Ethylbenzene	20	20.8	104	79-118
108-88-3	Toluene	20	20.2	101	80-116
1330-20-7	Xylenes (total)	60	59.6	99	81-117

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	121%	60-146%
98-08-8	aaa-Trifluorotoluene	93%	69-137%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC82929
Account: KEYETXM Key Energy
Project: BFE SWD

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC82982-1MS	TT025903.D	5	04/01/16	LT	n/a	n/a	GTT1122
TC82982-1MSD	TT025904.D	5	04/01/16	LT	n/a	n/a	GTT1122
TC82982-1	TT025902.D	5	04/01/16	LT	n/a	n/a	GTT1122

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC82929-1

CAS No.	Compound	TC82982-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	61.6		100	172	110	100	171	109	1	80-118/22
100-41-4	Ethylbenzene	166		100	296	130*	100	295	129*	0	79-118/14
108-88-3	Toluene	549		100	673	124* [a]	100	667	118* [a]	1	80-116/22
1330-20-7	Xylenes (total)	784		300	1120	112	300	1140	119* [a]	2	81-117/16

CAS No.	Surrogate Recoveries	MS	MSD	TC82982-1	Limits
460-00-4	4-Bromofluorobenzene	185%*	172%*	168%* [b]	60-146%
98-08-8	aaa-Trifluorotoluene	81%	77%	79%	69-137%

(a) Outside control limits due to high level in sample relative to spike amount.
(b) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

General Chemistry

6

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: TC82929
Account: KEYETXM - Key Energy
Project: BFE SWD

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP35769/GN72080	0.50	0.0	mg/l	10	9.54	95.4	90-110%
Sulfate	GP35769/GN72080	0.50	0.0	mg/l	10	9.76	97.6	90-110%

Associated Samples:
Batch GP35769: TC82929-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82929
Account: KEYETXM - Key Energy
Project: BFE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP35769/GN72080	TC82893-1	mg/l	252	252	0.0	0-20%
Sulfate	GP35769/GN72080	TC82893-1	mg/l	325	359	9.9	0-20%

Associated Samples:
Batch GP35769: TC82929-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC82929
Account: KEYETXM - Key Energy
Project: BFE SWD

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP35769/GN72080	TC82893-1	mg/l	252	200	470	109.0	80-120%
Sulfate	GP35769/GN72080	TC82893-1	mg/l	325	200	567	121.0N	80-120%

Associated Samples:
Batch GP35769: TC82929-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
C- 03941 POD-2 SITE PROPOSED MW-2	C-03941
WELL OWNER NAME(S)	PHONE (OPTIONAL)
Key Energy Services, LLC c/o Souder, Milier & Associates	
WELL OWNER MAILING ADDRESS	CITY / STATE / ZIP
201 S. Halagueno	Carlsbad / NM / 88221

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	18	23.7	N
	LONGITUDE	104	8	16.7	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

NW of 1405 Roberson RD LOT 887-1 Loving, NM

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1249	Jackie D. Atkins	Atkins Engineering Associates. Inc

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
03-23-16	03-24-16	32.1	45	dry

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☑ SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): dry

DRILLING FLUID: ☐ AIR ☐ MUD ✓ ADDITIVES – SPECIFY: None

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow Stem Auger (HSA)

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)

2016 APR 11 PM 2:

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	32.1	± 8	Neat Cement (5.2 gal/sack)	± 7.65	Tremie

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 10/29/15)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	9	9	Brown and grey caliche	Y ✓ N	
9	14	5	Brown, dry sandy clay w/ some grey color	Y ✓ N	
14	19	5	Brown sandy clay	Y ✓ N	
19	29	10	Brown, hard sandy clay	Y ✓ N	
29	39	10	Brown sandy clay	Y ✓ N	
39	44	5	Brown, soft clayey sand	Y ✓ N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

2016 APR 11 PM 3:09

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☑ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0.00

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION: STICK CLAY ENCOUNTERED; possibly "mudded" off boring. BORING ABANDONED SEE SEPERATE PLUGGING RECORD

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Lupe Leyba

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Jackie D. Atkins — April 6, 2016

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2