Austin Weyant From: To: Billings, Bradford, EMNRD Bratcher, Mike, EMNRD; Patterson, Heather, EMNRD Cc: 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 Carlsbad, NM 88221 www.soudermiller.com (575) 689-7040 (mobile)

Notice of Confidentiality and Privileged Status: This electronic mail message, including all attachments, is for the sole use of the intended recipient(s) and may contain confidential and/or privileged information or otherwise may be protected from disclosure. Any unauthorized review, use, disclosure, distribution or actions which rely on the contents of this information is prohibited. If you are not the intended recipient, please contact the sender and delete the message and any attachment(s) from your system.

Statement on Viruses and Harmful Software: While the message and attachment(s) have been scanned with anti-virus software, SMA does not guarantee that this message or any attachment(s) is free of computer viruses or other harmful software. SMA does not accept liability for any damages c



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) C- 03941 POD-1 SITE MW-1 WELL OWNER NAME(S) Key Energy Services, LLC c/o Souder, idiller & Associates WELL OWNER MAILING ADDRESS 201 S. Halagueno WELL DEGREES MINUTES SECONDS							OSE FILE NUMBER(S) C- 03941 PHONE (OPTIONAL) CITY STATE ZIP Carlsbad NM 88221				ZIP
GENERAL AN	WELL LOCATION (FROM GPS)	D ATITUDE NIGITUDE	32 104	18 8	24. 18.3	N		Y REQUIRED: ONE TEN QUIRED: WGS 84	TH OF A SEC	COND	
1. GEI			NG WELL LOCATION TO SON RD LOT 887-1		SS AND COMMO	N LANDMA	RKS – PLS	S (SECTION, TO	WNSHJIP, RANGE) WH	IERE AVAIL	ABLE	
	LICENSE NUMBER NAME OF LICENSED DRILLER 1249 Jackie D. Atkins					NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc				-0		
-	DRILLING ST. 03-22-16	ARTED	DRILLING ENDED 03-22-16	BORE HOLE DEPTH (FT) 36.7 36.8			DEPTH WATER FIR 24.45 STATIC WATER LEV		No			
NOI	COMPLETED WELL IS: □ ARTESIAN □ DRY HOLE □ SHALLOW (UNCONFINED) DRILLING FLUID: □ AIR □ MUD ✓ ADDITIVES - SPECIFY: N						STATIC WATER LEVEL IN COMPLETED WELL (FT) 19					
2. DRILLING & CASING INFORMATION	DRILLING FL		air Rotary		✓ ADDITIV	ALC		one _{K – SPECIFY:} F	Iollow Stem Auger	r (HSA)	- <u>P</u>	10
	DEPTH (feet bgl) FROM TO DIAM (inches)		CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)		, and	CASING CONNECTION TYPE		CASING INSIDE DIAM. (inches)	CASING WAL THICKNESS (inches)		SLOT SIZE (inches)	
& CA	0	21.7	± 8	S	CH 40 PVC		Flus	h Thread	2.0	0.1	154	
2. DRHLLING	21.7	36.7	±8	SCH 4	0 PVC (Screen))	Flus	h Thread	2.0	0.1		0.010
3. ANNULAR MATERIAL	DEPTH (feet bgl) BORE HOLE DIAM. (inches) 0 2 ±8 2 14.7 ±8 14.7 19.7 ±8				LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERV. 5000 lb psi QuikCrete Neat Cement (5.2 gal/sack) Hole Plug				AMOUNT (cubic feet) ± 0.55 ± 3.48 ± 1.87 ± 6.37		METHOI PLACEM Tremi Tremi Through Through	ENT e e HSA
-	OSE INTERN				12-20 Silica Sand				0 WELL RECORD			

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 1 OF 2

	DEPTH (1	feet bgl) TO	THICKNESS (feet)	INCLUDE WATE	COLOR AND TYPE OF MATERIAL ENCOUNTERED - .UDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)				YII W BI	FIMATED ELD FOR ATER- EARING NES (gpm)
3	0	14	14		Brown dry caliche	-	Y	√ N		
	14	19	5	B	own sandy clay with some	caliche	Y	√ N		
D.	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 sar	nd	✓ Y	N		
							Y	N		
							Y	N		
							Y	N		
3							Y	N		
	-						Y	N		
		_					Y	N	70	
EQ							Y	N	T-	10
HIDROGEOFOGIC FOG OF WERE	-						Y	N	22	FIE
							Y	N		-
*							Y	N.	-0	= 4
-							Y	N	w.	i.
	5	-					Y	N	0	60 ×
							Y	N	10	1992.43
							Y	N		
Ŷ							Y	N		_
		1					Y	N		
	METHOD U	ISED TU E	STIMATE YIELD	OF WATER-BEARING	STRATA:		TOTAL ESTIN	ATED		
	PUM			BAILER OT	HER - SPECIFY:		WELL YIELD) (gpm):		0.00
	WELL TES	T STAI	RESULTS - ATTA RT TIME, END TIN FORMATION:	ACH A COPY OF DAT ME, AND A TABLE SH	A COLLECTED DURING OWING DISCHARGE AI	WELL TESTING, INC	LUDING DISC R THE TESTIN	HARGE	METH OD.	OD,
2. IE31	PRINT NAM		DRILL RIG SUPER	VISOR(S) THAT PRO	VIDED ONSITE SUPER V	ISION OF WELL CONS	STRUCTION O	THER TI	HAN L	ICENSEE
0. SIGNALUKE	THE UNDE	RSIGNED RECORD (PERMIT HO	of the above d older within 2 where D .	ESCRIBED HOLE AND O DAYS AFTER COMI Decking Jac	EST OF HIS OR HER KNO D THAT HE OR SHE WIL PLETION OF WELL DRII Skie D. Atkins	L FILE THIS WELL RI LLING:	EF, THE FORE ECORD WITH	THE STA	ATE EN	RUE AND
1	6	SIGNA	TURE OF DRILLE	R / PRINT SIGNEE	NAME			DATE		_
FOI	R OSE INTER	NAL USE			- 1		L RECORD &	LOG (Ve	ersion (06/08/201
FIL	E NUMBER				POD NUMBER	TRN NUMB	ER			1.11

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

	ENERAL / WELL OWNI								
	-		Phone No.:						
City:		State:		Zip code:					
<u>II. W</u>	ELL PLUGGING INFO	RMATION:							
1)	Name of well drilling c	ompany that plugged well:							
2)	New Mexico Well Driller License No.: Expiration Date:								
3)	Well plugging activities	s were supervised by the following well	driller(s)/rig superviso	r(s):					
4)	Date well plugging beg	an: Date w	vell plugging conclude	d:					
5)	GPS Well Location:	Latitude:deg, Longitude:deg,	min, min,	sec sec, WGS 84					
6)		d at initiation of plugging as:							
7)	Static water level measured	ured at initiation of plugging:	_ ft bgl						
8)	Date well plugging plan	n of operations was approved by the Stat	e Engineer:						
9)		ities consistent with an approved pluggin approved plugging plan and the well as							

Version: September 8, 2009 Page 1 of 2

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.

Depth (ft bgl)	Plugging <u>Material Used</u> (include any additives used)	Volume of <u>Material Placed</u> (gallons)	<u>Theoretical Volume</u> of Borehole/ Casing (gallons)	Placement <u>Method</u> (tremie pipe, other)	<u>Comments</u> ("casing perforated first", "open annular space also plugged", etc.)
-					
-					
_					
-					
-					
		MULTIPLY E cubic feet x 7.4	3Y AND OBTAIN 1805 = gallons		
II. SIGN	ATURE:	cubic yards x 201.9	97 = gallons		

For each interval plugged, describe within the following columns:

III. S

I, ______, 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



ACCUTEST

Gulf Coast

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY. 04/07/16

e-Hardcopy 2.0 Automated Report

SGS

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.

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)

This report shall not be reproduced, except in its entirety, without the written approval of SGS Accutest. Test results relate only to samples analyzed.

Gulf Coast • 10165 Harwin Drive • Suite 150 • Houston, TX 77036 • tel: 713-271-4700 • fax: 713-271-4770 • http://www.accutest.com



ACCUTEST TC82927

Table of Contents

N

ယ

4

S

6

7

-1-

Section 1: Sample Summary	3
Section 2: Summary of Hits	
Section 3: Sample Results	
3.1: TC82927-1: BKE1 4-6	
3.2: TC82927-2: BKE1 9-11	
3.3: TC82927-3: BKE1 14-16	
3.4: TC82927-4: BKE1 19-21	18
3.5: TC82927-5: BKE1 24-26	22
Section 4: Misc. Forms	
4.1: Chain of Custody	
Section 5: GC Volatiles - QC Data Summaries	
5.1: Method Blank Summary	
5.2: Blank Spike Summary	
5.3: Matrix Spike/Matrix Spike Duplicate Summary	
Section 6: GC Semi-volatiles - QC Data Summaries	
6.1: Method Blank Summary	
6.2: Blank Spike Summary	
6.3: Matrix Spike/Matrix Spike Duplicate Summary	
Section 7: General Chemistry - QC Data Summaries	
7.1: Method Blank and Spike Results Summary	
7.2: Duplicate Results Summary	
7.3: Matrix Spike Results Summary	



Sample Summary

Key Energy

BKE SWD

Job No: TC82927

Sample Number	Collected Date	Time By	Received	Matri Code		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

Page 1 of 1

Ν



4 of 47 ACCUTEST TC82927



ω Section 3

Sample Results

Report of Analysis



	Report of Analysis					1 age 1 01 1		
Client Sam Lab Samp Matrix: Method: Project:	e ID: TC82927-1 Date Sampled: 0 SO - Soil Date Received: 0					03/22/16 03/30/16 69.5		
	File ID	DF	Analyzed	By	Prep Da	ate	Prep Batch	Analytical Batch
Run #1 ^a Run #2	BB0021655.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.21 g	Final Vol 5.0 ml	ume	Methanol Ali 100 ul	quot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	-C10)	ND	9.1	6.2	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Limi	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		90% 98%		53-13 67-13			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



<u>ω</u>

ω

6 of 47

TC82927

E = Indicates value exceeds calibration range

Report of Analysis Pa									
Client Sa Lab Samj Matrix: Method: Project:	-	27-1 51 8021B			Da	···· · · · ·	3/22/16 3/30/16 9.5		
Run #1 Run #2	File ID AA161338.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936		
Run #1 Run #2	Initial Weight 5.18 g	Final V 5.0 ml	olume						
Purgeable	e Aromatics								

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	5.6 5.6 5.6 17	1.4 1.9 1.4 4.2	ug/kg ug/kg ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	93% 105%			65% 74%	

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



7 of 47 TC82927

ω

	Report of Analysis										
Client Sample ID: Lab Sample ID: Matrix: Method: Project:		BKE1 4 TC8292 SO - So SW846 BKE SV	27-1 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/22/16 /30/16 5	
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/05/16	By RV	Prep Date Prep Batch 04/05/16 OP40243			h	Analytical Batch GIB2065	
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	Volume							
CAS No.	Comp	oound		Result	RL	MDL	Units	Q			
	TPH ((C10-C28)	ND	4.8	1.5	mg/kg				
CAS No.	AS No. Surrogate Recoveries		overies	Run# 1	Run# 2	2 Limits					
84-15-1	4-15-1 o-Terphenyl			84%		41-12	23%				

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



8 of 47

TC82927

<u>ω</u>

			Repo	rt of An	alysis				Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE1 4-6 TC82927- SO - Soil					Date Sampled Date Received Percent Solids			
Project:	BKE SWE)					: 69		
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	1
Chloride Solids, Percent		316 69.5	18	mg/kg %	5 1	04/01/16 11:00 03/31/16	ES DS	EPA 300 SM 2540	

ω

3. .



			Repor	rt of An	alysis				Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:		27-2 il 8015				Date	Sampled: Received: ent Solids:	/22/16 /30/16 .0	
Run #1 ^a Run #2	File ID BB0021656.D	DF 1	Analyzed 04/04/16	By LT	Prep D n/a	ate	Prep Bate n/a	ch	Analytical Batch GBB1143
Run #1 Run #2	Initial Weight 5.50 g	Final Vo 5.0 ml		lethanol Al i)0 ul	iquot				
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	Lim	its			
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene		90% 98%		53-1 67-1	30% 26%			

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



3.2

10 of 47

TC82927

E = Indicates value exceeds calibration range

			Repo	ort of A	Analysis		Page 1 of 1
Client San Lab Sam Matrix: Method: Project:		27-2 il 8021B			Da	L	3/22/16 3/30/16 7.0
Run #1 Run #2	File ID AA161342.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936
Run #1 Run #2	Initial Weight 5.70 g	Final V 5.0 ml	olume				
Purgeable	e Aromatics						

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	5.2 5.2 5.2 16	1.3 1.8 1.3 4.0	ug/kg ug/kg ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	90% 105%			65% 74%	

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



11 of 47 TC82927

3.2

ω

				Repo	rt of An	alysis			Page 1 of 1				
Client Sam Lab Sample Matrix: Method: Project:	-	BKE1 9-11 TC82927-2 SO - Soil SW846 8015 M BKE SWD		SW846 3550B		Date Sampled: Date Received: Percent Solids:				03/22/16 03/30/16 67.0			
File ID Run #1 IB243403.D Run #2 IB243403.D		DF 1	Analyzed 04/05/16	By RV	-			Analytical Batch GIB2065					
Run #1 Run #2	Initial 30.0 g	Weight	Final V 1.0 ml	Volume									
CAS No.	Comp	ound		Result	RL	MDL	Units	Q					
	TPH (C10-C28)	ND	5.0	1.6	mg/kg						
CAS No.	Io. Surrogate Recoveries		Run# 1	Run# 2	Lim	its							
84-15-1	l o-Terphenyl			85%		41-1	23%						

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

3.2

ယ



			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE1 9-1 TC82927 SO - Soil	-2				Date Sampled Date Received Percent Solids	l: 03	/22/16 /30/16
Project:	BKE SW	D						
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		623 67	37	mg/kg %	10 1	04/01/16 12:25 03/31/16	ES DS	EPA 300 SM 2540 G

ယ

3.2



			Кер		u1 y 515			I age I OI I
Client San Lab Samp Matrix: Method: Project:	-	27-3 bil 8015	Date Received: 03/3					03/22/16 03/30/16 74.4
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batc	h Analytical Batch
Run #1 ^a Run #2	BB0021657.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1	Initial Weight 5.31 g	Final Vol 5.0 ml	ume	Methanol Al i 100 ul	iquot			
Run #2								
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	5-C10)	ND	8.0	5.5	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene		91% 100%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

ယ

ω .3

14 of 47

TC82927

E = Indicates value exceeds calibration range

			Repo	ort of A	Analysis		Page 1 of 1
Client San Lab Samj Matrix: Method: Project:	-	27-3 bil 8021B			Da	1	3/22/16 3/30/16 1.4
Run #1 Run #2	File ID AA161343.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936
Run #1 Run #2	Initial Weight 5.23 g	Final 5.0 ml	Volume				
Purgeable	e Aromatics						

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	5.1 5.1 5.1 15	1.3 1.7 1.3 3.9	ug/kg ug/kg ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	90% 103%			65% 74%	

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



15 of 47 TC82927

ယ ပ ω

				Repo	rt of An	alysis			Page 1 of 1				
Client Sam Lab Sampl Matrix: Method: Project:	-		27-3 il 8015 M	SW846 3550B		Date Sampled: Date Received: Percent Solids:				03/22/16 03/30/16 74.4			
File ID Run #1 IB24340 Run #2			DF 1	Analyzed 04/05/16	By RV	Prep Date Prep Bate 04/05/16 OP40243		h	Analytical Batch GIB2065				
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	Volume									
CAS No.	Comp	ound		Result	RL	MDL	Units	Q					
	TPH (C10-C28	5)	ND	4.5	1.4	mg/kg						
CAS No.	o. Surrogate Recoveries		Run# 1	Run# 2	Limi	its							
84-15-1	o-Terphenyl			73%		41-12	23%						

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

ယ သ

ω



			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE1 14 TC82927 SO - Soil	-3				Date Sampled Date Received Percent Solids	l: 03	/22/16 /30/16
Project:	BKE SW	D				2 02 00110 (5 0110)		
General Chemistry	•							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		450 74.4	17	mg/kg %	5 1	04/01/16 12:42 03/31/16	ES DS	EPA 300 SM 2540 G

ω

ເນ ເມ



			щ		ui y 516			1 age 1 of 1
Client San Lab Samp Matrix: Method: Project:	-	27-4 vil 8015				Date	Sampled: Received: ent Solids:	03/22/16 03/30/16 73.0
	File ID	DF	Analyzed	By	Prep D	ate	Prep Bato	ch Analytical Batch
Run #1 ^a Run #2	BB0021658.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.39 g	Final Vo 5.0 ml	lume	Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	-C10)	ND	8.2	5.6	mg/kg		
CAS No.	Surrogate Rec	overies	Run # 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		90% 99%			30% 26%		

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.4

ω



SGS

E = Indicates value exceeds calibration range

			Repo	ort of A	Analysis		Page 1 of 1
Client San Lab Sam Matrix: Method: Project:	-	27-4 il 8021B			Da	1	2/22/16 2/30/16 2.0
Run #1 Run #2	File ID AA161344.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936
Run #1 Run #2	Initial Weight 5.50 g	Final 5.0 ml	Volume				
Purgeable	e Aromatics						

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	5.0 5.0 5.0 15	1.3 1.7 1.2 3.8	ug/kg ug/kg ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	90% 104%			65% 74%	

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



3.4 ω

				Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	BKE1 1 TC8292 SO - So SW846 BKE SV	27-4 vil 8015 M	SW846 3550B			Date Sampled: Date Received: Percent Solids:	03/22/16 03/30/16 73.0
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/05/16	By RV	Prep Date 04/05/16	Prep Bate OP40243	Analytical Batch GIB2065
Run #1 Run #2	Initial 30.2 g	Weight	Final V 1.0 ml	Volume				
CAS No.	Comp	ound		Result	RL	MDL U	nits Q	
	TPH ((C10-C28	3)	ND	4.5	1.4 m	g/kg	
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Limits		
84-15-1	o-Terj	phenyl		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

3.4

ယ



			Repo	rt of An	alysis			Pag	e 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE1 19- TC82927- SO - Soil					Date Sampled Date Received Percent Solids	l: 03		
Project:	BKE SWI)							
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		196 73	6.8	mg/kg %	2 1	04/01/16 12:59 03/31/16	ES DS	EPA 300 SM 2540 G	

ω

3.4



			Rep		u1 y 515			rage 1 01 1
Client San Lab Samp Matrix: Method: Project:	-	27-5 oil 5 8015				Date	Received:	03/22/16 03/30/16 74.0
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batch	U
Run #1 ^a Run #2	BB0021659.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.39 g	Final Vo 5.0 ml	lume	Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C	6-C10)	ND	8.0	5.5	mg/kg		
CAS No.	Surrogate Re	coveries	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		91% 100%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.5

ယ



TC82927

E = Indicates value exceeds calibration range

			Repo	ort of A	nalysis		Page 1 of 1
Client Sar Lab Samp Matrix: Method: Project:		27-5 il 8021B			Da	te Received: 03	3/22/16 3/30/16 4.0
Run #1 ^a Run #2	File ID AA161366.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
Run #1 Run #2	Initial Weight 5.59 g	Final Vo 5.0 ml	olume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit:	s Q	

71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	4.8 4.8 4.8 15	1.2 1.6 1.2 3.7	ug/kg ug/kg ug/kg ug/kg
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Li	mits

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

SGS ACCUTEST

23 of 47 TC82927

3.5

ω

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:	-	BKE1 2 TC8292 SO - So SW846 BKE SV	27-5 61 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/22/16 /30/16 .0
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/05/16	By RV	Prep Da 04/05/10		Prep Batc OP40243	h	Analytical Batch GIB2065
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28	3)	ND	4.5	1.4	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Limi	ts			
84-15-1	o-Terj	phenyl		99%		41-12	23%			

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

ω 5

ω



			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE1 24 TC82927 SO - Soil	-5				Date Sampled Date Received Percent Solids	l: 03	/22/16 /30/16 .0
Project:	BKE SW	D						
General Chemistry	•							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		202 74	6.8	mg/kg %	2 1	04/01/16 17:31 03/31/16	ES DS	EPA 300 SM 2540 G

ω

ა 5





Section 4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody



	SGS		CCUT	rcc.	u.		CHAI							Y				F	ED-EX	Tracking	#			1	Bottle Or		GE		_ 0	FL
		<u>ц А</u>	660	I CO	2000		10165 Har TEL. 71	rwin Dr, S 3-271-470	te 150 H 0 FAX	oustor	n, TX -271-	(7703 -4770	36)							utest Qu					SGS Acc			70	1	00-1-
	Client / Reporting	Information					Project		tion	com												Requ	i e e f	- he	Ana			\exists	, <u>L</u>	Matrix Codes
Company	Name		2001000000000000000	Project No		l					000000		691319			DC DANKA	09//202	020000						Í		930	ľ	Т	Т	WALLIN CODES
Ke	Name Y Energy Bress Desta State ad Tx	Services	,		<u>b</u> 1	KE S	WD.	-																						DW - Drinking Water
Street Add	ness Nesta 1	or Suit	c 4BD	Street				Dilling	Informat					Baa				10905		21										GW - Ground Water WW - Water
City	State		Zip	City			State	Compar	y Name	1011 (1		eren	L HOH	пер	110					0										SW - Surface Water SO - Soil
Project Co	nd IX	79 E-mail	705	Project #				Street A	ddress									_	. ~	8						ĺ				SL- Sludge SED-Sediment
Ana	Kamir																		55							ĺ				OI - Oil LIQ - Other Liquid
Phone #			N GOT	Client Pur	chase (Order #		City					Sta	te		Z	.ip		100							ĺ				AIR - Air SOL - Other Solid
Sampler(s	MirezOll	<u>e reyener</u>	Hone #	Project Ma	anager			Attentior	n:										00	×						ĺ				WP - Wipe FB-Field Blank
Ling	s Middled	575 49	99260			Coller								of prese					~	í.	_									
SGS						Coller		T	<u> </u>	+		F	T	T.	T		5 2	ď	Чd	F	υ									
Accutest Sample #	Field ID /	Point of Collecti	on	Date		Time	Sampled By	Matrix	# of bottles	ЮH	NaOF	ZANaOH HN03	H2SO	NONE	MEOH	TSP	ENCORE	OTHE	ア	Q										LAB USE ONLY
Í	BKE1	4-G		3-2	2:46	900	Lon	Sel	1										X	<u>بر</u>	V									
2	BKE1	9-11		1		10	1												х	Х	X									
3	BKE1	14-11	6			11													Х	Х	х									
44	DREI	19-2	1			12													Х.	х	×							in the		
5	BKEI	24-2	6	f		1	L	J	12										X	X	×									
L-1									ļ	\square		_	\perp		_					-						<	K	l		
												_	1		L		_	\square		IA	\G	GEI	ΟB	١.	-		Ľ	$\underline{1}$		[
-									ļ								_													
	·····											_	\perp		-		_	\square				 				L	1×	A		_
+							ļ			\downarrow			_		1		_	$\left \right $		VE	R	FIE	DH	RA		Ļ	$\downarrow /$	P	<u> </u>	
194002003	Turnaround Time	(Rusiaana dawa)						P CON INNON	L									Ц				<u> </u>			•		1		tieneren	<u></u>
E	Standard	(busiless days)		Approved B	y (SGS	Accutest PM): / Date			Comme	rcial "				ble in		TRR	P	8	015451153					Comr	nents /	Specia	al Instru	Jotiona		
	5 Day RUSH							(<u> </u>	Comme				12)			EDI		mat												
] 4 Day RUSH] 3 Day RUSH								FULT1 (REDT1						L	Oth	er													
	2 Day RUSH	_							Comme																					
] 1 Day EMERGENC1 Emergency & Rush T/A		ablink											' = Re ' = Re			Sumn	arv												
	-				Sar	nple Custody,m	Form: SM021		elow ee		Com	merc	ial "C	" = Re	sults ·	+ QC	& Sur	rogate	Sumr		delly	(9-3	5			$\overline{\gamma}$		<u></u>	
Relingu	ished By Sampler:		Date Time: 21-2	916		Received By:	7~(Date Tim			R	elinqu	ishod a	n	5	ζ				20111	Date Time	201	11	Receive	yBy	1	1341658555	1999102555	Date Time:
	ished by Sampler:	/	Date Time:	ME		1 UCU Received By:	+ + - + - + - + - + - + - + - + - +		Date Tim			2		istied E	<u>.</u>		_/	<u>r</u>				Date Time	2	0	2	\Rightarrow	$\not \leq$		\mathcal{F}	Data Time:
3	ished by:		Date Time:			3						4				·									4	- ay.				
Relinqu 5	isneo by:		Date Time:			Received By: 5			Date Tin	10;		C	ustody	Seal #					ntact Iot intac	t	Preser	ved where a	applicabl	0			Strate A	•	¢3ple	Stemp.

TC82927: Chain of Custody Page 1 of 3



27 of 47 ACCUTEST TC82927

44

4

SGS Accutest Sample Receipt Summary

Page 1 of 2

4.1 **4**

Job Number: TC829	927	Client:	KEY ENER	GY SE	RVICES	Project: BKE SWD							
Date / Time Received: 3/30/2	016	-	Delivery N	lethod	:	Airbill #'s: 782697595918							
No. Coolers: 1	Therm ID:	IR-5;				Temp Adjustment Factor:);						
Cooler Temps (Initial/Adjusted	d): <u>#1: (1.8</u>	/1.8);											
Cooler Security Y 1. Custody Seals Present: ☑ 2. Custody Seals Intact: ☑	<u>or N</u> □ □ 4.	3. COC Pro		<u>Y</u> ✓	<u>or N</u>	Sample Integrity - Documentation 1. Sample labels present on bottles:	<u>Y</u> V						
Cooler Temperature	Y or N	<u>L</u>				 Container labeling complete: Sample container label / COC agree: 	 ✓ 						
1. Temp criteria achieved: 2. Cooler temp verification: 3. Cooler media:	Ice (Bag					Sample Integrity - Condition 1. Sample recvd within HT: 2. All containers accounted for:	<u>Y</u> V						
Quality Control Preservation	Y or I	N N/A	-	WTB	STB	3. Condition of sample:	V	Intact					
 Trip Blank present / cooler: Trip Blank listed on COC: Samples preserved properly: VOCs headspace free: 						Sample Integrity - Instructions 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:	<u>Y</u> V U U		N/A V V				
Comments													

TC82927: Chain of Custody Page 2 of 3



Sample Receipt Log

Page 2 of 2

44

4

Job #: TC82927

Date / Time Received: <u>3/30/2016</u> 9:55:00 AM

Initials: EC

Client: KEY ENERGY SERVICES

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	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

TC82927: Chain of Custody Page 3 of 3

29 of 47



Section 5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

S



Method Blank Summary Job Number: TC82927

Account: Project:	KEYETXM Key I BKE SWD	Energy						
Sample GBB1143-MB	File ID BB0021654.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GBB1143	
The QC reported here applies to the following samples:					Method: SW846 8015			
тс82927-1, тс	C82927-2, TC82927	'-3, TC82	2927-4, TC8292	27-5				

CAS No.	Compound	Result	RL	MDL	Units Q	
	TPH-GRO (C6-C10)	ND	5.0	3.4	mg/kg	
CAS No.	Surrogate Recoveries		Limits	5		

Page 1 of 1





Method Blank Summary Job Number: TC82927

Account: Project:	KEYETXM Key BKE SWD	Energy					
Sample GAA936-MB	File ID AA161337.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936
The QC report	ted here applies to	the follo	wing samples:			Method: SW84	6 8021B
ТС82927-1, ТС	C82927-2, TC82927	7-3, TC82	2927-4				

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

460-00-4	4-Bromofluorobenzene	86%	23-165%
98-08-8	aaa-Trifluorotoluene	100%	34-174%

Page 1 of 1





Method Blank Summary

Job Numbe Account: Project:	r: TC82927 KEYETXM Key E BKE SWD	Energy					
Sample GAA937-M	File ID B AA161365.D		•	Sy Pr LT n/a	ep Date 1	Prep Batch n/a	Analytical Batch GAA937
The QC rep TC82927-5	ported here applies to t	he following	samples:			Method: SW840	5 8021B
CAS No.	Compound	Resu	lt RL	MDL	Units	Q	
71-43-2 100-41-4 108-88-3 1330-20-7	Benzene Ethylbenzene Toluene Xylenes (total)	ND ND ND	4.0 4.0 4.0 12	1.0 0.99 1.4 3.0	ug/kg ug/kg ug/kg ug/kg		

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

5.1.3 **5**



Blank Spike Summary Job Number: TC82927

Job Number: Account: Project:	KEYETXM Key BKE SWD	Energy					
Sample GBB1143-BS	File ID BB0021652.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GBB1143
The QC report	ted here applies to	the follo	wing samples:			Method: SW84	5 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	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	97% 109%		.30% .26%	

SGS

Page 1 of 1

5.2.1 **5**

Blank Spike Summary

Job Number: Account: Project:	TC82927 KEYETXM Key BKE SWD	Energy					
Sample GAA936-BS	File ID AA161335.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA936
The QC report	ted here applies to	the follo	owing samples:			Method: SW84	5 8021B

34-174%

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

aaa-Trifluorotoluene

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	Lin	uits	
460-00-4	4-Bromofluorobenzene	88%	23-1	165%	

100%





98-08-8

5.2.2

G

Blank Spike Summary

Job Number Account: Project:	: TC82927 KEYETXM Key H BKE SWD	Energy					C
Sample GAA937-BS	File ID AA161363.D		alyzed /04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
The QC rep TC82927-5	orted here applies to p	the following s	amples:			Method: SW84	6 8021B
CAS No.	Compound	Spike ug/kg		BSP %	Limits		
	Benzene	20	20.9	105	69-126		

34-174%

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	Lim	iits	
460-00-4	4-Bromofluorobenzene	102%	23-1	65%	

110%



98-08-8

aaa-Trifluorotoluene

5.2.3

S

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	тса	82927-5	Limits				
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	90% 105%	90% 105%	91% 100		53-130% 67-126%	-			

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

Сл



^{5.3.1}

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
100-41-4 108-88-3	Ethylbenzene Toluene	ND ND	27 27	27.9 26.8	103 99	26.7 26.7	26.1 25.3	98 95	7 6	64-128/38 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	TC	82927-1	Limits				
460-00-4	4-Bromofluorobenzene	96%	96%	93%	, D	23-165%	6			
98-08-8	aaa-Trifluorotoluene	109%	109%	105	%	34-174%	6			

S



Page 1 of 1

Matrix Spike/Matrix Spike Duplicate Summary Job Number: TC82927

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batcl
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 follow	ving samples:]	Method: SW84	5 8021B
TC82927-5							

CAS No.	Compound	ug/kg Q	ug/kg	ug/kg	%	ug/kg	ug/kg	%	RPD	Rec/RPD
71-43-2 100-41-4	Benzene Ethylbenzene	ND ND	1390 1390	1140 2970	82 214*	1390 1390	1060 2770	76 200*	7 7	69-126/36 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	TC8	32928-1	Limits				
460-00-4	4-Bromofluorobenzene	185%*	193%*	1077	% * b	23-165%				
98-08-8	aaa-Trifluorotoluene	94%	98%	1029	//0	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.







Section 6

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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



6



Method Blank Summary

Job Number: Account: Project:	TC82927 KEYETXM Key BKE SWD	Energy					
Sample OP40243-MB	File ID IB243445.D		·	-	Prep Date 4/05/16	Prep Batch OP40243	Analytical Batch GIB2066
	rted here applies to	-	-	5		Method: SW84	6 8015 M
CAS No. (Compound	Res	ult RL	MDL	Units	Q	
Т	ГРН (С10-С28)	ND	3.3	1.0	mg/kg		
CAS No. S	Surrogate Recoveries	8	Lin	nits			
84-15-1 o	-Terphenyl	106	% 41-	123%			

Page 1 of 1

SGS



Blank Spike Summary

Job Number Account: Project:	: TC82927 KEYETXM Key I BKE SWD	Energy									
Sample OP40243-BS	File ID IB243444.D	DF 1	Anal 04/0	-	By RV	Prep Date 04/05/16	Prep Batch OP40243	Analytical Batch 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		pike 1g/kg	BSP mg/kg	BSP %	Limits					
-	TPH (C10-C28)	3	3.3	27.6	83	52-113					

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

Page 1 of 1



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	тса	82927-1	Limits				
84-15-1	o-Terphenyl	92%	98%	84%	, D	41-123%	, D			

Page 1 of 1

6.3.1





Section 7

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.





TC82927



ACCUTEST

Gulf Coast

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY. 04/07/16

e-Hardcopy 2.0 Automated Report

SGS

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.

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)

This report shall not be reproduced, except in its entirety, without the written approval of SGS Accutest. Test results relate only to samples analyzed.

Gulf Coast • 10165 Harwin Drive • Suite 150 • Houston, TX 77036 • tel: 713-271-4700 • fax: 713-271-4770 • http://www.accutest.com



ACCUTEST TC82928

Table of Contents

-1-

Section 1: Sample Summary	
Section 2: Summary of Hits	4
Section 3: Sample Results	6
3.1: TC82928-1: BKE2-1	7
3.2: TC82928-2: BKE2-4-6	11
3.3: TC82928-3: BKE2-9-11	15
3.4: TC82928-4: BKE2-14-16	19
3.5: TC82928-5: BKE2-19-21	23
3.6: TC82928-6: BKE2-24-26	27
3.7: TC82928-7: BKE2-29-31	31
3.8: TC82928-8: BKE2-34-36	35
3.9: TC82928-9: BKE2-39-41	39
Section 4: Misc. Forms	43
4.1: Chain of Custody	44
Section 5: GC Volatiles - QC Data Summaries	47
5.1: Method Blank Summary	48
5.2: Blank Spike Summary	51
5.3: Matrix Spike/Matrix Spike Duplicate Summary	54
Section 6: GC Semi-volatiles - QC Data Summaries	
6.1: Method Blank Summary	58
6.2: Blank Spike Summary	59
6.3: Matrix Spike/Matrix Spike Duplicate Summary	60
Section 7: General Chemistry - QC Data Summaries	61
7.1: Method Blank and Spike Results Summary	
7.2: Duplicate Results Summary	
7.3: Matrix Spike Results Summary	
-	



2 of 64 ACCUTEST TC82928

Sample Summary

Key Energy

BKE SWD

Sample Number	Collected Date	Time By	Received	Matri Code		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.

Job No:

TC82928

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



N

Summary of Hits

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

Lab Sample ID Client Sample ID	Result/				
Analyte	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.

5





ω Section 3

Sample Results

Report of Analysis



			Rep		I age I OI I			
Client Sam Lab Samp Matrix: Method: Project:	-	28-1 bil 8015				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 77.9
	File ID	DF	Analyzed	By	Prep Da	ate	Prep Batc	U
Run #1 ^a Run #2	BB0021665.D	10	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.82 g	Final Vo 5.0 ml		Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (Ce	5-C10)	425	69	47	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		92% 98%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

<u>ω</u>

ω



TC82928

SGS

E = Indicates value exceeds calibration range

			пер		lindiybib		1 age 1 of 1
Client San Lab Samp Matrix: Method: Project:	-	28-1 bil 8021B			Da	1	3/23/16 3/30/16 7.9
Run #1 ^a Run #2	File ID AA161370.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
Run #1 Run #2	Initial Weight 5.82 g	Final Vo 5.0 ml	lume	Methanol 100 ul	Aliquot		
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit	s Q	

Report of Analysis

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total) ^b	ND ND 2550	280 280 280 830	70 94 69 210	ug/kg ug/kg ug/kg ug/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	167% ^c 102%		23-1 34-1	65% 74%	

(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.

- J = Indicates an estimated value
- $B = \ Indicates \ analyte \ found \ in \ associated \ method \ blank$
- N = Indicates presumptive evidence of a compound



8 of 64

ACCUTEST TC82928

<u>ω</u>

ω

Page 1 of 1

SGS Accutest

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sample Matrix: Method: Project:	-	BKE2-1 TC8292 SO - So SW846 BKE SW	28-1 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/23/16 /30/16 9
Run #1 Run #2	File ID IB2434		DF 10	Analyzed 04/06/16	By RV	Prep D 04/05/1		Prep Bate OP40243	h	Analytical Batch GIB2066
Run #1 Run #2	Initial 30.2 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28)	531	43	13	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	ohenyl		119%		41-1	23%			

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

<u>ω</u>

ယ



SGS Accutest

			Repo	rt of An	alysis				Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-1 TC82928- SO - Soil	1				Date Sampled Date Received Percent Solids	l: 03	8/23/16 8/30/16 7.9	
Project:	BKE SWE)							
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	1
Chloride Solids, Percent		1900 77.9	160	mg/kg %	50 1	04/01/16 17:48 03/31/16	ES DS	EPA 300 SM 2540	

Page 1 of 1

ယ

<u>3</u>



			Repo	rt of Ana	alysis				Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:		28-2 iil 8015				Date	Sampled: Received: ent Solids:	03	//23/16 //30/16 9.2
Run #1 ^a Run #2	File ID BB0021677.D	DF 1	Analyzed 04/04/16	By LT	Prep D n/a	ate	Prep Bat n/a	ch	Analytical Batch GBB1143
Run #1 Run #2	Initial Weight 5.28 g	Final Vo 5.0 ml		lethanol Ali 00 ul	quot				
CAS No.	Compound		Result	RL	MDL	Units	Q		
	TPH-GRO (C6	-C10)	ND	7.4	5.1	mg/kg			
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its			
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto	c en le me	92% 101%		53-1 67-1				

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.2

ω



SGS

E = Indicates value exceeds calibration range

			Kepo	ort of A	liarysis		Page 1 of
Client San Lab Samp Matrix: Method: Project:		28-2 iil 8021B			Da	ate Received: 03	3/23/16 3/30/16 3.2
Run #1 ^a Run #2	File ID AA161367.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
Run #1 Run #2	Initial Weight 5.49 g	Final Vo 5.0 ml	olume				
Purgeable	Aromatics Compound		Result	RL	MDL Unit	s 0	

Report of Analysis

CAS NO.	Compound	Kesult	KL	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	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	93% 109%			65% 74%	

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

(b) More than 40% RPD for detected concentrations between two GC columns.

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



Page 1 of 1

SGS Accutest

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:	-	BKE2-4 TC8292 SO - So SW846 BKE SV	8-2 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:	03/2: 03/3 78.2	0/16
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	Prep Da 04/05/1		Prep Batc OP40243		Analytical Batch GIB2066
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	/olume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28)	10.2	4.3	1.3	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Limi	its			
84-15-1	o-Terj	ohenyl		78%		41-12	23%			

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

3.2

ယ

SGS

SGS Accutest

			Repo	rt of An	alysis			Page 1 of	1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-4-0 TC82928 SO - Soil	-2				Date Sampled Date Received Percent Solids	: 03	/23/16 /30/16	
Project:	BKE SW	D							
General Chemistry									
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		8700 78.2	320	mg/kg %	100 1	04/01/16 18:05 03/31/16	ES DS	EPA 300 SM 2540 G	

Page 1 of 1

ω

3.2



			Rep		u1 y 515			rage 1 01 1
Client San Lab Samp Matrix: Method: Project:	-	28-3 vil 8015				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 80.2
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batc	·
Run #1 ^a Run #2	BB0021676.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.44 g	Final Vol 5.0 ml	lume	Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (Ce	-C10)	ND	7.0	4.7	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		91% 99%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



ω .3

E = Indicates value exceeds calibration range

			Repo	ort of A	nalysis		Page 1 of 1
Client San Lab Samp Matrix: Method: Project:	1	28-3 il 8021B			Da	1	3/23/16 5/30/16 0.2
Run #1 ^a Run #2	File ID AA161368.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
Run #1 Run #2	Initial Weight 5.40 g	Final Vo 5.0 ml	lume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Units	s Q	

71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	4.6 4.6 4.6 14	1.2 1.6 1.1 3.5	ug/kg ug/kg ug/kg ug/kg
CAS No.	Surrogate Recoveries	D #1	D "A		•.
	Surrogate Recoveries	Run# 1	Run# 2	Lin	nits

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



ω :3 ω SGS Accutest

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sample Matrix: Method: Project:	-	BKE2-9 TC8292 SO - So SW846 BKE SV	28-3 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/23/16 /30/16 .2
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/05/16	By RV	Prep D 04/05/1		Prep Batc OP40243	h	Analytical Batch GIB2065
Run #1 Run #2	Initial 30.0 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28) a	ND	4.2	1.3	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	ohenyl		83%		41-1	23%			

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

ND = Not detected MDL = Method Detection Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

ယ ယ

ယ



RL = Reporting Limit

E = Indicates value exceeds calibration range

SGS Accutest

			Repo	rt of An	alysis			Page 1 of	1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-9-1 TC82928 SO - Soil	-3				Date Sampled Date Received Percent Solids	: 03	/23/16 /30/16	
Project:	BKE SW	D					• • • •		
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		4340 80.2	310	mg/kg %	100 1	04/01/16 18:22 03/31/16	ES DS	EPA 300 SM 2540 G	

Page 1 of 1

ω

ເນ ເມ



			пер		urybrb			Tage 1 of 1
Client San Lab Samp Matrix: Method: Project:	-				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 80.8	
	File ID	DF	Analyzed	By	Prep D	ate	Prep Bate	ch Analytical Batch
Run #1 ^a Run #2	BB0021668.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.57 g	Final Vol 5.0 ml	ume	Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	-C10)	ND	6.7	4.6	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		90% 99%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.4

ω



SGS

E = Indicates value exceeds calibration range

			Repo	ort of A	nalysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	28-4 vil 8021B			Da	te Received: 03	3/23/16 3/30/16).8
Run #1 ^a Run #2	File ID AA161369.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
Run #1 Run #2	Initial Weight 5.63 g	Final Vo 5.0 ml	lume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit:	s 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	Lin	nits	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lin	nits	
CAS No. 460-00-4	Surrogate Recoveries 4-Bromofluorobenzene	Run# 1 90%	Run# 2		nits 165%	
	0		Run# 2	23-		

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.4

ω



				Repo	Page 1 of 1					
Client Sam Lab Sample Matrix: Method: Project:	-	BKE2-14-16 TC82928-4 SO - Soil SW846 8015 M BKE SWD		SW846 3550B			Date Sampled: Date Received: Percent Solids:		03/30/16	
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	Prep D 04/05/1		Prep Batc OP40243	h	Analytical Batch GIB2066
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28)	6.43	4.1	1.3	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	ohenyl		93%		41-1	23%			

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

3.4

ယ

SGS

			Repo	rt of An	alysis			Pa	ige 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-14-1 TC82928-4 SO - Soil	-				Date Sampled Date Received Percent Solids	: 03	3/23/16 3/30/16	
Project:	BKE SWD						• • • •		
General Chemistry	7								
Analyte]	Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		2470 30.8	150	mg/kg %	50 1	04/01/16 18:39 03/31/16	ES DS	EPA 300 SM 2540 G	

ယ

3.4



			nep		aiy 515			Tage 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	le ID: TC8292 SO - So SW846	TC82928-5 SO - Soil SW846 8015 BKE SWD				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 80.4
	File ID	DF	Analyzed	By	Prep Da	ate	Prep Batc	h Analytical Batch
Run #1 ^a Run #2	BB0021669.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.49 g	Final Vol 5.0 ml		Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	5-C10)	ND	6.9	4.7	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene		91% 100%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



3.5

E = Indicates value exceeds calibration range

			Repo	ort of A	nalysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	28-5 il 8021B			Da	te Received: 03	3/23/16 3/30/16 0.4
Run #1 ^a Run #2	File ID AA161394.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
Run #1 Run #2	Initial Weight 5.48 g	Final Vo 5.0 ml	lume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit	s Q	

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



24 of 64 TC82928

3.5 ω

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:	-			SW846 3550B		Date Sampled: Date Received: Percent Solids:			03/23/16 03/30/16 80.4	
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	Prep D 04/05/1		Prep Batc OP40243	h	Analytical Batch GIB2066
Run #1 Run #2	Initial 30.0 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28	5)	1.71	4.1	1.3	mg/kg	J		
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	ohenyl		76%		41-1	23%			

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

ა 5

ယ



			Repo	rt of An	alysis			Page 1 of
Client Sample ID: Lab Sample ID: Matrix:	BKE2-19 TC82928 SO - Soil	-5				Date Sampled Date Received Percent Solids	: 03	/23/16 /30/16 .4
Project:	BKE SW	D				i ci cent sonus	• • • •	•••
General Chemistry	,							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		242 80.4	15	mg/kg %	5 1	04/01/16 18:56 03/31/16	ES DS	EPA 300 SM 2540 G

ω

ა 5



			Кер		u1 y 515			I age I OI I		
Client Sam Lab Samp Matrix: Method: Project:	-	28-6 bil 8015	Date Sampled: Date Received: Percent Solids:					03/23/16 03/30/16 78.4		
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batc	·		
Run #1 ^a Run #2	BB0021670.D	1	04/04/16	LT	n/a		n/a	GBB1143		
Run #1 Run #2	Initial Weight 5.24 g	Final Vol 5.0 ml	ume	Methanol Ali 100 ul	iquot					
CAS No.	Compound		Result	RL	MDL	Units	Q			
	TPH-GRO (Ce	-C10)	ND	7.5	5.1	mg/kg				
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its				
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene		92% 100%		53-1 67-1	30% 26%				

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



3.6

E = Indicates value exceeds calibration range

			Repo	ort of A	nalysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	28-6 il 8021B			Da	te Received: 03	3/23/16 3/30/16 3.4
Run #1 ^a Run #2	File ID AA161390.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
Run #1 Run #2	Initial Weight 5.36 g	Final Vo 5.0 ml	lume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit	s Q	

	I I I I I I I I I I I I I I I I I I I					•
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	Lin	nits	

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



28 of 64 TC82928

				Kepo		arysis				Page 1 of 1
Client San Lab Samp Matrix: Method: Project:		BKE2-2 TC8292 SO - So SW846 BKE SV	28-6 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/23/16 /30/16 4
Run #1 Run #2	File ID IB24341	18.D	DF 1	Analyzed 04/05/16	By RV	Prep D 04/05/1		Prep Batc OP40243	h	Analytical Batch GIB2065
Run #1 Run #2	Initial V 30.1 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28) ^a	ND	4.2	1.3	mg/kg			
CAS No.	Surrog	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	henyl		78%		41-1	23%			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.6

ယ



RL = Reporting Limit

E = Indicates value exceeds calibration range

			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-24 TC82928 SO - Soil	-6				Date Sampled Date Received Percent Solids	l: 03	/23/16 /30/16 .4
Project:	BKE SW	D				i ci cent bonu	. ,0	
General Chemistry	7							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		34.0 78.4	3.2	mg/kg %	1 1	04/01/16 19:13 03/31/16	ES DS	EPA 300 SM 2540 G

Page 1 of 1

ω

3.6



			Кер		u1 y 515			I age I OI I
Client Sam Lab Samp Matrix: Method: Project:	-	28-7 il 8015				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 71.9
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batc	h Analytical Batch
Run #1 ^a Run #2	BB0021671.D	1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weight 5.37 g	Final Vol 5.0 ml	ume	Methanol Al i 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6	-C10)	ND	8.4	5.7	mg/kg		
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto		91% 99%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.7

ယ



SGS

E = Indicates value exceeds calibration range

			Repo	rt of A	nalysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	28-7 il 8021B			Da	te Received: 03	3/23/16 3/30/16 1.9
Run #1 ^a Run #2	File ID AA161391.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
Run #1 Run #2	Initial Weight 5.38 g	Final Vo 5.0 ml	lume				
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Unit:	s Q	

	I the second sec					•
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	Lin	nits	

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



32 of 64 TC82928

3.7

ω

				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sample Matrix: Method: Project:	-	BKE2-2 TC8292 SO - So SW846 BKE SV	28-7 il 8015 M	SW846 3550B			Date Received:		/23/16 /30/16 .9	
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	-		-	h	Analytical Batch GIB2066
Run #1 Run #2	Initial 30.0 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28)	8.19	4.6	1.5	mg/kg			
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1 o-Terphenyl			76%		41-1	23%				

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

3.7

ω



			Repo	rt of An	alysis			Р	age 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-29 TC82928 SO - Soil	-7				Date Sampled Date Received Percent Solids	: 03		
Project:	BKE SW	D							
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		6.6 71.9	3.5	mg/kg %	1 1	04/01/16 19:30 03/31/16	ES DS	EPA 300 SM 2540 C	ĩ

Page 1 of 1

ယ



			Repor	rt of An	alysis				Page 1 of 1		
Client Sam Lab Sampl Matrix: Method: Project:		28-8 bil 8015	Date Sampled: Date Received: Percent Solids:						03/23/16 03/30/16 77.5		
Run #1 ^a Run #2	File ID BB0021672.D	DF 1	Analyzed 04/04/16	By LT	Prep D n/a	ate	Prep Bate n/a	ch	Analytical Batch GBB1143		
Run #1 Run #2	Initial Weight 5.46 g	Final Vo l 5.0 ml		lethanol Ali)0 ul	iquot						
CAS No.	Compound		Result	RL	MDL	Units	Q				
	TPH-GRO (C6	-C10)	ND	7.4	5.0	mg/kg					
CAS No.	Surrogate Rec	overies	Run# 1	Run# 2	Lim	its					
460-00-4 98-08-8	4-Bromofluoro aaa-Trifluoroto	e enilente	91% 99%		53-1 67-1	30% 26%					

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.8

ယ



E = Indicates value exceeds calibration range

			Repo	rt of A	nalysis		Page 1 of 1
Client Sar Lab Samp Matrix: Method: Project:	-	28-8 il 8021B			Da	I	8/23/16 8/30/16 7.5
Run #1 ^a Run #2	File ID AA161392.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
Run #1 Run #2	Initial Weight 5.20 g	Final Vo 5.0 ml	lume				
Purgeable CAS No.	Aromatics Compound		Result	RL	MDL Units	i Q	

01101101	Compound	ittouit			emus	×
71-43-2 108-88-3	Benzene Toluene	ND ND	5.0 5.0	1.3 1.7	ug/kg 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	Limi	ts	
460-00-4	4-Bromofluorobenzene	85%		23-16	55%	
98-08-8	aaa-Trifluorotoluene	92%		34-17	74%	
70-00-0	ada-1111dol'otolucile	12/0		54-17	/ - /0	

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound



36 of 64 TC82928

ω

				Repo	rt of An	alysis		Page 1 o				
Client Sam Lab Sampl Matrix: Method: Project:	-		SW846 3550B			Date	ate Sampled: 03/23/16 ate Received: 03/30/16 ercent Solids: 77.5					
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	Prep D 04/05/1		Prep Batch OP40243	Analytical Batch GIB2066			
Run #1 Run #2	Initial 30.0 g	Weight	Final V 1.0 ml	Volume								
CAS No.	Comp	ound		Result	RL	MDL	Units	Q				
	TPH (C10-C28	5)	2.51	4.3	1.4	mg/kg	J				
CAS No.	CAS No. Surrogate Recoveries		Run# 1	Run# 2	Lim	its						
84-15-1 o-Terphenyl			95%		41-1	23%						

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

သ .8

ω



			Repo	rt of An	alysis			Page	1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-34 TC82928 SO - Soil	-8				Date Sampled Date Received Percent Solids	l: 03	/23/16 /30/16 .5	
Project:	BKE SW	D							
General Chemistry	,								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride Solids, Percent		8.6 77.5	3.2	mg/kg %	1 1	04/01/16 19:47 03/31/16	ES DS	EPA 300 SM 2540 G	

ω

ა .8



			Kep		u1 y 515			rage 1 01 1
Client San Lab Samp Matrix: Method: Project:	le ID: TC82 SO - SW8	2-39-41 2928-9 Soil 46 8015 SWD				Date	Sampled: Received: ent Solids:	03/23/16 03/30/16 81.1
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batc	v
Run #1 ^a Run #2	BB0021673.D) 1	04/04/16	LT	n/a		n/a	GBB1143
Run #1 Run #2	Initial Weigh 5.47 g	t Final Vo 5.0 ml		Methanol Ali 100 ul	iquot			
CAS No.	Compound		Result	RL	MDL	Units	Q	
	TPH-GRO (C6-C10)	ND	6.8	4.6	mg/kg		
CAS No.	Surrogate R	lecoveries	Run# 1	Run# 2	Lim	its		
460-00-4 98-08-8	4-Bromofluc aaa-Trifluor		91% 100%		53-1 67-1			

Report of Analysis

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

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

3.9

ယ



E = Indicates value exceeds calibration range

			Repo	rt of A	nalysis		Page 1 of 1
Client Sam Lab Samp Matrix: Method: Project:	-	28-9 il 8021B			Da	ate Received: 03	3/23/16 3/30/16 1.1
Run #1 ^a Run #2	File ID AA161393.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
Run #1 Run #2	Initial Weight 5.52 g	Final Vo 5.0 ml	lume				
Purgeable CAS No.	Aromatics Compound		Result	RL	MDL Unit	ts Q	

71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	4.5 4.5 4.5 13	1.1 1.5 1.1 3.4	ug/kg ug/kg ug/kg ug/kg
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Lin	nits

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

ω



				Repo	rt of An	alysis				Page 1 of 1
Client Sam Lab Sample Matrix: Method: Project:	-	BKE2-3 TC8292 SO - So SW846 BKE SV	8-9 il 8015 M	SW846 3550B			Date	Sampled: Received: ent Solids:		/23/16 /30/16 .1
Run #1 Run #2	File ID IB2434		DF 1	Analyzed 04/06/16	By RV	Prep D 04/05/1		Prep Batc OP40243	h	Analytical Batch GIB2066
Run #1 Run #2	Initial 30.1 g	Weight	Final V 1.0 ml	Volume						
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
	TPH (C10-C28)	2.56	4.1	1.3	mg/kg	J		
CAS No.	Surro	gate Rec	overies	Run# 1	Run# 2	Lim	its			
84-15-1	o-Terp	ohenyl		93%		41-1	23%			

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

ယ

3.9 3.9

			Repo	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BKE2-39 TC82928 SO - Soil	-9				Date Sampled Date Received Percent Solids	l: 03	/23/16 /30/16
Project:	BKE SW	D					. 01	
General Chemistry								
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Chloride Solids, Percent		16.3 81.1	3.1	mg/kg %	1 1	04/01/16 20:04 03/31/16	ES DS	EPA 300 SM 2540 G

ω





Section 4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody



ccc				CHAI	N C)F (CU	ST	OI	ΟY												PA	GE		0	= <u>}</u>
	TEST	in and a state of the state of		10165 Ha												acking					Bottle Or					-
1				TEL. 71	3-271-470 www.	00 FAX accutest.		-271-43	770					SG	5 Accut	est Qui	ne #				SGS Act	cutest Jo	T	R	25	128
Client / Reporting Information	Project Nam				Inform	ation											F	۲eq	uest	e d	Ana	yse	ś			Matrix Codes
Company Name	Street	NYF	51	10																						
Street Address	Street	JAL									<u>enego</u> e	5,974	000000	1000												DW - Drinking Water GW - Ground Water
6 Desta Dr. Suit 430	City			State	Billing	Informat ty Name	ion (I	f differ	ent fro	m Rep	ort to)			'	3	~										WW - Water SW - Surface Water
Company Name Key Ended Street Addase City State M. d. And T. 74705 Projec Contact E-mail	City			State	Compar	iy Name									001513	0										SO - Soil SL- Sludge
Project Contact E-mail	Project #				Street A	ddress		·							00	Ŵ										SED-Sediment OI - Oil
An Ramiree Phone# D Fax#	Client Purch	ase Order#			City					tate			Zip	_	1											LIQ - Other Liquid AIR - Air
Sampler(s) Name(s)										tate			-ih													SOL - Other Solid WP - Wipe
Sampler(s) Name(s) Phone #	Project Man	lager			Attentio	n:									1	(C)										FB-Field Blank
Lula in the second			Colle	iction			T		Numbe	r of pres	erved B				24	~	\sim									
SG5 Accutest						# of		NaOH	8	IONE	OH	4	NaHSO4 ENCORE	1 OTHER		0	∇									
Sample # Field ID / Point of Collection	Date		Time	Sampled By		bottles	HCI	2 2	<u> </u>	<u> </u>	5 ¥	1SP	2 B													LAB USE ONLY
	3-27	5-10 -1	<u>00</u>	Ling	50.1	1.	+		++	++		$\left \cdot \right $	+	\vdash	4	싯	$\frac{x}{y}$									
2 BEF 2- 4-C 3 BEF 2- 7-11	┼──┼		+	+	++	+	+-		┢╌╟╴	++		$\left \cdot \right $	+		X	X	У X									
9 BKF 2-14-16			<u> </u>	+-/	++-	++-	+		$\left \cdot \right $	┼┼		$\left + \right $	+			$\frac{X}{Y}$	$\frac{1}{x}$									
5 BKE 2 - 19-21				+	++-	++-	+		++	++	+	+				$\frac{y}{x}$	$\frac{2}{\sqrt{2}}$									
6 BKE 2-24-26				+		+	+		+	╉╋		$\left + \right $			21	x							\vdash		Ć	
1 OFE 2 - 29-31				+	++-	1/	+		+	++		$\left \right $			X	Ţ	AG	GI	Ð	B	•	S		0		
8 BKE 2 - 34-34	+			+			+		++	++		$\left \right $			ŷ	x	Y						1.1.2.43			
6 MFE 2 - 31-41					1	6	+		++	++	+	H				X	Ŷ						6	R		
9		d	<i>,</i>	- <i>p</i>	+	<u></u>			$^{++}$	++	+	\mathbf{H}			+		ER	IF	FI	R	٧.		6	\triangleright		
	1			+	+	1				++	+	††	+-		+	-1								1		
Turnaround Time (Business days)								****		rable I										Com	nents /	Specia	al Instru	ictions		
- Standard 5 Day RUSH	Approved By	(SGS Accutes	t PM): / Date			Comme Comme						TRF	RP D Forr	mat												
4 Day RUSH			_			FULT1	(Leve	1 3+4)					ner													
3 Day RUSH						REDT1 Comme)																	
1 Day EMERGENCY			_					Comm		A* = R		-														
Emergency & Rush T/A data available VIA Lablink				Form: SM021				Comm	ercial "		esults ·	+ QC	& Surr	ogate S						_	-					an
Relinguished by Sampier: Date Time:		Sample C		wer be docur	mented b	Date Tir		ne sar		chang		5505	sion, li ≽	ncludi	ng co	urier		y. C	13	5	Receive	d-Bv:	A			Date Tippe:
1 An Man 3	-29-16	1	K	25	4				2 (Ł	e	2	>-	Ł					30-	16	\swarrow	_	K_		X_	3:3016
Relinquished by Sampler: Date Time: 3		Receive 3	d By:)		-	Date Tir	ne:		Relina	befisiug	By:						ľ	Date Tin	10;		Receive 4	d By:	-	(ノ	Date Time:
Relinquished by: Date Time: 5		Receive 5	d By:			Date Tir	10:		Custo	dy Seal	#			I Inti No			Preserve	d where	applica	ble			ogite N	"1	Chold	Temp.

TC82928: Chain of Custody Page 1 of 3 44

4

SGS Accutest Sample Receipt Summary

Page 1 of 2

4.1 **4**

Job Number: TC829	928	Client:	KEY ENEF	RGY SE	RVICES	Project: BKE SWD					
Date / Time Received: 3/30/2	2016	· · · · · · · · · · · · · · · · · · ·	Delivery M	lethod	:	Airbill #'s: 782697595918					
No. Coolers: 1	Therm ID:	IR-5;				Temp Adjustment Factor: 0	:tor: 0;				
Cooler Temps (Initial/Adjusted	d): <u>#1:(1.8</u>	/1.8);									
Cooler Security Y 1. Custody Seals Present: Image: Construct of the seal of the	<u>or N</u>	3. COC Pr Smpl Dates		<u> </u>	<u>or N</u>	Sample Integrity - Documentation 1. Sample labels present on bottles:	Y				
Cooler Temperature	<u>Y or N</u>	<u>L</u>				 Container labeling complete: Sample container label / COC agree: 	✓				
1. Temp criteria achieved: 2. Cooler temp verification: 3. Cooler media:	Ice (Bag					Sample Integrity - Condition 1. Sample recvd within HT: 2. All containers accounted for:	<u>Y</u> V				
Quality Control Preservation	Yor	<u>N N/A</u>		WTB	STB	3. Condition of sample:	V	Intact			
 Trip Blank present / cooler: Trip Blank listed on COC: Samples preserved properly: VOCs headspace free: 						Sample Integrity - Instructions 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:	Y V 0 V		<u>N/A</u>		
Comments						o, Fillening instructions clear.					

TC82928: Chain of Custody Page 2 of 3



Sample Receipt Log

Page 2 of 2

Job #: TC82928

Date / Time Received: <u>3/30/2016</u> 9:55:00 AM

Initials: EC

Client: KEY ENERGY SERVICES

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	рН	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



44

4





Section 5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

S



Method Blank Summary Job Number: TC82928

Account: Project:	KEYETXM Key I BKE SWD	Energy								
Sample GBB1143-MB	File ID BB0021654.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GBB1143			
The QC report	ted here applies to	the follow	ving 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		



Method Blank Summary Job Number: TC82928

Job Number: Account: Project:	KEYETXM Key BKE SWD	Energy					
Sample GAA937-MB	File ID AA161365.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937
	ted here applies to]	Method: SW84	5 8021B		

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

460-00-4	4-Bromofluorobenzene	86%	23-165%
98-08-8	aaa-Trifluorotoluene	97%	34-174%







Method Blank Summary Job Number: TC82928

98-08-8

Account: Project:	KEYETXM Key BKE SWD	Energy					
Sample GAA938-MB	File ID AA161389.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
The QC repor	ted here applies to	the follo	wing samples:		· · · · · · · · · · · · · · · · · · ·	Method: SW84	5 8021B

34-174%

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

aaa-Trifluorotoluene

CAS No.	Compound	Result	RL	MDL	Units Q
71-43-2 100-41-4 108-88-3 1330-20-7	Benzene Ethylbenzene Toluene Xylenes (total)	ND ND ND ND	4.0 4.0 4.0 12	1.0 0.99 1.4 3.0	ug/kg ug/kg ug/kg ug/kg
CAS No.	Surrogate Recoveries		Limits		
460-00-4	4-Bromofluorobenzene	82%	23-165	%	

88%

Page 1 of 1

5.1.3

G



Blank Spike Summary Job Number: TC82928

Account: Project:	KEYETXM Key I BKE SWD	Energy					
Sample GBB1143-BS	File ID BB0021652.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GBB1143
The QC repor	ted here applies to	the follow	wing samples:			Method: SW84	5 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	Lim	its	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	97% 109%		30% 26%	

Page 1 of 1



5.2.1 **5**



Blank Spike Summary

98-08-8

Job Number: Account: Project:	TC82928 KEYETXM Key BKE SWD	Energy						
Sample GAA937-BS	File ID AA161363.D	DF 1	Analyzed 04/04/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA937	
The QC repor	ted here applies to	the follo	wing samples:			Method: SW84	6 8021B	

34-174%

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

aaa-Trifluorotoluene

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	Lim	its	
460-00-4	4-Bromofluorobenzene	102%	23-1	65%	

110%





Blank Spike Summary

Job Number: Account: Project:	TC82928 KEYETXM Key BKE SWD	Energy					
Sample GAA938-BS	File ID AA161387.D	DF 1	Analyzed 04/05/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GAA938
The QC report	ted here applies to	the follo		Method: SW84	6 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	Lin	uits	
460-00-4	4-Bromofluorobenzene	90%	23-1	165%	
98-08-8	aaa-Trifluorotoluene	94%	34-2	174%	



5.2.3

G

SGS

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	TC	82927-5	Limits				
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	90% 105%	90% 105%	91% 100	-	53-130% 67-126%	-			

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

5.3.1

S





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
71-43-2 100-41-4 108-88-3	Benzene Ethylbenzene Toluene	ND ND ND	1390 1390 1390	1140 2970 1370	82 214* 99	1390 1390 1390	1060 2770 1280	76 200* 92	7 7 7	69-126/36 64-128/38 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	тс	82928-1	Limits				
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	185%* 94%	193%* 98%	167 102	2% * b 2%	23-165% 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.

S



* = 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	Bv	Prep Date	Prep Batch	Analytical Batch
TC82928-5MS	AA161395.D	1	04/05/16	LŤ	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

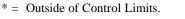
The QC reported here applies to the following samples:

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
71-43-2 100-41-4 108-88-3 1330-20-7	Benzene Ethylbenzene Toluene Xylenes (total)	ND ND ND ND	24.3 24.3 24.3 73	24.9 25.3 25.2 76.5	102 104 104 105	24.2 24.2 24.2 72.7	21.5 21.7 21.6 66.0	89 90 89 91	15 15 15 15	69-126/36 64-128/38 67-125/38 68-130/38
CAS No.	Surrogate Recoveries	MS	MSD	TC	82928-5	Limits				
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	94% 100%	97% 102%	87% 95%		23-1659 34-1749				

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







Section 6

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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



6



Method Blank Summary Job Number: TC82928

TPH (C10-C28)

Job Number: Account: Project:	KEYETXM Key BKE SWD	Energy							
Sample OP40243-MB	File ID IB243445.D	DF 1	Analyzed 04/06/16	By RV	Prep Date 04/05/16	Prep Batch OP40243	Analytical Batch 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. Co	ompound		Result R	L N	IDL Units	Q			

mg/kg

1.0

ND 3.3

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

Page 1 of 1



Blank Spike Summary Job Number: TC82928

Account: Project:	KEYETXM Key BKE SWD	Energy							
Sample OP40243-BS	File ID IB243444.D	DF 1	Analyzed 04/06/16	By RV	Prep Date 04/05/16	Prep Batch OP40243	Analytical Batch GIB2066		
The QC reported here applies to the following samples: Method: SW846 8015 M									
TC82928-1, TC	C82928-2, TC8292	8-3, TC82	2928-4, TC8292	28-5, TC	82928-6, TC829	28-7, 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	Lin	nits	
84-15-1	o-Terphenyl	107%	41-2	123%	

Page 1 of 1



Matrix Spike/Matrix Spike Duplicate Summary Job Number: TC82928

Account: Project:	KEYETXM Key BKE SWD	Energy					
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 OC report	ed here applies to	the follo	wing samples:			Method: SW84	6 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	TC	82927-1	Limits				
84-15-1	o-Terphenyl	92%	98%	84%	, D	41-123%	́о			

6.3.1 6





Section 7

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 GP72086: 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.



64 of 64

TC82928



ACCUTEST

Gulf Coast

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY. 04/06/16

e-Hardcopy 2.0 Automated Report

SGS

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.

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)

This report shall not be reproduced, except in its entirety, without the written approval of SGS Accutest. Test results relate only to samples analyzed.

Gulf Coast • 10165 Harwin Drive • Suite 150 • Houston, TX 77036 • tel: 713-271-4700 • fax: 713-271-4770 • http://www.accutest.com



ACCUTEST TC82929

Table of Contents

N

ယ

4

сл

6

-1-

Section 1: Sample Summary	3
Section 2: Summary of Hits	4
Section 3: Sample Results	5
3.1: TC82929-1: WBKF 2	6
Section 4: Misc. Forms	8
4.1: Chain of Custody	9
Section 5: GC Volatiles - QC Data Summaries	12
5.1: Method Blank Summary	13
5.2: Blank Spike Summary	14
5.3: Matrix Spike/Matrix Spike Duplicate Summary	15
Section 6: General Chemistry - QC Data Summaries	16
6.1: Method Blank and Spike Results Summary	
6.2: Duplicate Results Summary	18
6.3: Matrix Spike Results Summary	



Sample Summary

Key Energy

Job No: TC82929

BFE SWD

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



Summaryof HitsJob Number:TC82929Account:Key EnergyProject: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

Page 1 of 1

Ν





ω Section 3

Sample Results

Report of Analysis



			Repo		Page 1 of 1		
Client Sar Lab Samp Matrix: Method: Project:	ole ID: TC829 AQ - V	29-1 Vater 5 8021B			Da	1	3/24/16 3/30/16 a
Run #1 ^a Run #2	File ID TT025900.D	DF 1	Analyzed 04/01/16	By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GTT1122
Run #1 Run #2	Purge Volume 5.0 ml						
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	MDL Units	s Q	

71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	ND ND ND ND	$1.0 \\ 1.0 \\ 1.0 \\ 3.0$	0.17 0.21 0.24 0.48	ug/l ug/l ug/l ug/l
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 2 Limits	

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

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

ω

<u>ω</u>



SGS Accutest

			Repo	rt of An	alysis			Page 1 of 1	
Client Sample ID: Lab Sample ID:	WBKF 2 TC82929	-1				Date Sampled	: 03	/24/16	
Matrix:	AQ - Wa					Date Received Percent Solids	l: 03	/30/16	
Project:	BFE SWI	BFE SWD							
General Chemistry	7								
Analyte		Result	RL	Units	DF	Analyzed	By	Method	
Chloride		2670	100	mg/l	200	03/31/16 19:10	ES	EPA 300	

ω

ω -





Section 4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody



SGS .	OAUTEOT	C	HAIN	V O	FC	US	STO	DD	γ				1	ED-EX	Tracking					Bottle Or		GE		0	=
	CCUTEST		10165 Harw TEL, 713-:	271-4700	FAX: 1	713-21	FX 770 71-4770	36 0							utest Qu					SGS Accurest Job # 97979			7019		
Client / Reporting Information			Project Ir		cutest.co	m							6/25				Rec	ues	ted	Ana	lvse	}	$ \leq $	0	Matrix Codes
ompany Name	Project Name:								2000007	1000000			0.01234				T					[
Key Energy Service	CS Street	BFE :	Sh L	/		0001220	alaadie		4515524	0.000		Concessor	Bezini												DW - Drinking Water
6 Desta D Suite	4300				nformatio	n (if c	lifferen	nt fror	m Repo	ort to)				B	2										GW - Ground Water WW - Water SW - Surface Water
ty State Modbert Tx 7.	zip City 1705		State	Company	Name									S	80										SO - Soil SL- Sludge
oject Contact E-mail	Project #			Street Ad	dress									Ś	~										SED-Sediment OI - OII
the Kanirez	Client Purchase	Order #		City				64	ate				_	Ŵ											LIQ - Other Liquid AIR - Air
Fax# 1/amirezol@ Keyenogy ampler(s) Name(s)								30	ate			.ıp			4										SOL - Other Solid WP - Wipe FB-Field Blank
ampler(s) Name(s) (F	hone # Project Manager			Attention:	:									>	3										
Will of the store		Collection					N	umber	ofpres	irved E	lottles	- 1.0		2	m	\sim									
scs zutest mple # Field ID / Point of Collecti	on Date	Time S	Sampled By	Matrix	# of bottles	HCI	ANaO	N03	NONE	EOH	dS	NCOR	THER	ス	~										LAB USE ONLY
t WBKE 2	2-24-10	240 /		intre	4	1 4		+	2	1		2 10	††	X	χ	X		+				<u> </u>			
t wore c	32.0	<u> </u>		Vont			++	╈	++	+		╈	$^{++}$		~		10.1	\uparrow		-	<u> </u>				
							++	1	$\uparrow \uparrow$			T	$\uparrow \uparrow$					1							
																				(Z			
													ſ	A	ĠG	EI) B	Y:			Z	E	<u></u>	_	
											\square		ļĮ		ie.			ļ	<u> </u>	1. 7			ļ!		
									++	_						ļ		1		ļ	-/	A	ļ!		_
							++		++	_	$\left \cdot \right $			ान	or	FII	th	₿¥	-		17	\geq			
							++		++		┝╌┥		+	1 12			-	-	·		P	1	¹		<u> </u>
						$\left \right $	++		++		$\left \cdot \right $		+									+	╂		
Turnaround Time (Business days)		L					Data D	eliver	rable Ir	l	ation				1		1		Corr	ments	/ Spec	ial Instri	uctions		L
Standard	Approved By (SGS	Accutest PM): / Date:			Commerc Commerc] TRI		mat												
5 Day RUSH 4 Day RUSH					FULT1 (I			ei 2)		E	-	her_	mai												
3 Day RUSH 2 Day RUSH					REDT1 (Commerc											<u> </u>									
1 Day EMERGENCY						c	Comme				-					<u> </u>									
Emergency & Rush T/A data available VIA		Fo	orm: SM021-	0		c	omme omme	rcial *	C" = R	esults	+ QC	& Su	rrogat					-	\swarrow	Transferra				321.00.914	
Relinquished by Sampler:	Date Time:	mple Custody must Received By:	be docum		Date Time				chang ulshed		sses	sion,	inclu	ding	courie	r deliv	Date 1	Ime:	1	Receiv	od By:)	<u>nellestill</u>		Date Time:
le am	3-29-16	1	W7	4				2		4	L	\mathcal{L}	\geq	\rightarrow	$\underline{\nu}$		13	30	16	2	4		9	\propto	3-2-216
Relinquished by Sampler:	Date Time:	Received By: 1	·	1	Date Time			4	puished								Date	ime:		Receiv 4	ed By:		L	_	Date Time:
Relinquished by:	Date Time:	Received By: 5			Date Time			Custo	dy Seal	#				Intact Not inta	ct	Prese	rved who	are applic	able			0n k	0	Coole	r Temp.

TC82929: Chain of Custody Page 1 of 3



9 of 19 ACCUTEST TC82929

44

4

SGS Accutest Sample Receipt Summary

Page 1 of 2

4.1 **4**

Job Number: TC82929			lient: EY ENER	GY SEF	RVICES	Project: BKE SWD							
Date / Time Received: 3/30/2	016		Delivery I	Method	l:	Airbill #'s: 782697595918	Airbill #'s: 782697595918						
No. Coolers: 1	Therm	ID: IR-	5;			Temp Adjustment Factor: 0;							
Cooler Temps (Initial/Adjusted	d): <u>#1: (</u>	<u>1.8/1.8)</u>	<u>:</u>										
Cooler Security Y 1. Custody Seals Present: ☑ 2. Custody Seals Intact: ☑ Cooler Temperature 1. Temp criteria achieved:	<u>or N</u> □ <u>Y or</u> ☑	4. Smp	COC Present: ol Dates/Time OK	<u>Y</u> ⊻	or <u>N</u>	Sample Integrity - Documentation 1. Sample labels present on bottles: 2. Container labeling complete: 3. Sample container label / COC agree: Sample Integrity - Condition	Y V V Y						
2. Cooler temp verification:						1. Sample recvd within HT:	\checkmark						
3. Cooler media:		(Bag)	<u> </u>			2. All containers accounted for:	\checkmark						
Quality Control Preservation	Yo	r N	N/A	WTB	STB	3. Condition of sample:		Intact					
1. Trip Blank present / cooler:		\checkmark				Sample Integrity - Instructions	Y	or N	N/A				
2. Trip Blank listed on COC:		\checkmark				1. Analysis requested is clear:	\checkmark						
3. Samples preserved properly:	\checkmark					2. Bottles received for unspecified tests		\checkmark					
4. VOCs headspace free:						 Sufficient volume recvd for analysis: Compositing instructions clear: Filtering instructions clear: 			V				
Comments													

TC82929: Chain of Custody Page 2 of 3



Sample Receipt Log

Page 2 of 2

4.1

4

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	рН	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

TC82929:	Chain	of Custody
		Page 3 of 3





Section 5

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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



S



Method Blank Summary

Job Number: Account: Project:	TC82929 KEYETXM Key BFE SWD	Energy						
Sample GTT1122-MB	File ID TT025899.D	DF 1	Analyzed 04/01/16	By LT	Prej n/a	p Date	Prep Batch n/a	Analytical Batch GTT1122
The QC repo TC82929-1	rted here applies to	the followi	ng samples	:			Method: SW846	5 8021B
CAS No. C	ompound	R	esult	RL	MDL	Units	Q	
100-41-4 E 108-88-3 T	enzene thylbenzene oluene (ylenes (total)	N N	D D	1.0 1.0 1.0 3.0	0.17 0.24 0.21 0.48	ug/l ug/l ug/l ug/l		

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



5.1.1 5



13 of 19

Blank Spike Summary

1330-20-7 Xylenes (total)

Job Numb Account: Project:	er: TC82929 KEYETXM Key BFE SWD	Energy						
Sample GTT1122-	File ID BS TT025898.D	DF 1	Analyze 04/01/1		By LT	Prep Date n/a	Prep Batch n/a	Analytical Batch GTT1122
The QC re TC82929-1	eported here applies to	the followin	g sampl	es:			Method: SW846	5 8021B
CAS No.	Compound	Sp. ug		SP g/l	BSP %	Limits		
71-43-2 100-41-4 108-88-3	Benzene Ethylbenzene Toluene	20 20 20	2	9.7 0.8 0.2	99 104 101	80-118 79-118 80-116		

59.6

60

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.



SGS

14 of 19

ACCUTEST TC82929

Matrix Spike/Matrix Spike Duplicate Summary Job Number: TC82929

		KEYETXM K BFE SWD	Key Energy								
	Sample File ID TC82982-1MS TT025902 TC82982-1MSD TT025902 TC82982-1 TT025902		.D 5	Analy 04/01 04/01 04/01	/16 /16	LT LT	Prep Date n/a n/a n/a	Pre n/a n/a n/a		GTT GTT	lytical Batch 1122 1122 1122 1122
	The QC reported TC82929-1	l here applies	s to the follo	wing sam	ples:			Metho	od: SW84	46 80211	В
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 Recove	eries	MS	MSD	J	ГС82982-1	Limits				
460-00-4 98-08-8	4-Bromofluorober aaa-Trifluorotolue		185%* 81%	172%* 77%		.68% * ^b 79%	60-146% 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.

Page 1 of 1

5.3.1

* = Outside of Control Limits.





Section 6

General Chemistry

QC Data Summaries

Includes the following where applicable:

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



೧



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		mg/l	10	9.54	95.4	90-110%
Sulfate	GP35769/GN72080	0.50		mg/l	10	9.76	97.6	90-110%

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

6.1



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

2. DRILLING & CASING INFORMATION 1. GENERAL AND WELL LOCATION	WELL OWNER NAME(S) WELL OWNER MAILING ADDRESS 201 S. Halagueno WELL DEGREES MINUTES SECONDS LOCATION LATITUDE LOCATION LATITUDE (FROM GPS) LONGITUDE DEGREES MINUTES SECONDS LOCATION LATITUDE LONGITUDE 104 MELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS NW of 1405 Roberson RD LOT 887-1 Loving, NM LICENSE NUMBER 1249 NAME OF LICENSED DRILLER Jackie D. Atkins							SS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE NAME OF WELL DRILLING COMPANY Atkins Engineering Associates. Inc DLE DEPTH (FT) DEPTH WATER FIRST ENCOUNTERED (FT)				
	COMPLETED WELL IS: ARTESIAN DRY HOLE SHALLOW (UNCONFINED) dt y								L (FT)			
	DRILLING FLUID: □ AIR □ ✓ ADDITIVES - SPECIFY: None DRILLING METHOD: □ ROTARY □ HAMMER □ CABLE 100L ☑ OTHER - SPECIFY: Hollow Stem Auger (HSA)											
	DEPTH (feet bgl) BORE I FROM TO DIA		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)	AM. THICKNESS		SLOT SIZE (inches)
											2016 APR 11 PM 3. U	
T.	DEPTH (BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL				AMOUNT AL (cubic feet)		METHOD OF PLACEMENT		
ANNULAR MATERIAL	FROM 0	TO 32.1	± 8		GRAVEL PACK SIZE-RANGE BY INTER Neat Cement (5.2 gal/sack)				± 7.65		Tremi	
З.	OSE INTER							11/5	20 WELL RECORD	* LOC 02-	mion 10/20	0/15)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 1 OF 2
LOCATION			INGLI

	DEPTH (f	eet bgl) TO	THICKNESS (feet)	INCLUDE WATE	D TYPE OF MATERIAL E R-BEARING CAVITIES O plemental sheets to fully do	R FRACTURE ZONES	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)				
-	0	9	9		Brown and grey caliche		Y √N	Berrise (Bpin)				
and de	9	14	5	Brow	Y √N							
and a	14	19	5	Divi	vn, dry sandy clay w/ some Brown sandy clay	5.07 000	Y ✓N					
ATT'	19	29	10		Brown, hard sandy clay		Y ✓N					
T	29	39	10		Brown sandy clay		Y ✓N					
1	39	44	5		Brown, soft clayey sand	1	Y VN					
ELL	39	44	5		brown, solt endyey suit			20 201				
FW								4				
000		-	1				Y N	do la				
CLC							Y N					
OGI							Y N					
EOL							Y N	No.				
fog							Y N	~				
4. HYDROGEOLOGIC LOG OF WELL							Y N	Q 110				
4. H							Y N					
							Y N					
-							Y N					
							Y N					
							Y N					
1		1					Y N					
me -							Y N					
	METHOD U	100.200		OF WATER-BEARING	G STRATA: HER – SPECIFY:		AL ESTIMATED LL YIELD (gpm):	0.00				
N	WELL TES	TEST	RESULTS - ATT	ACH A COPY OF DAT	A COLLECTED DURING IOWING DISCHARGE AN	WELL TESTING, INCLUD D DRAWDOWN OVER TH	ING DISCHARGE M IE TESTING PERIO	IETHOD, D.				
TEST; RIG SUPERVISION	MISCELLA		FORMATION: ST		NTERED; possibly "mu							
5. TESI	PRINT NAM Lupe Leyba	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:										
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 Jackie D. Atkins Jackie D. Atkins Jackie D. Atkins DATE											
FOI	R OSE INTER	NAL USE				WR-20 WELL RI	ECORD & LOG (Ver	sion 06/08/2012)				
	E NUMBER	INE USE			POD NUMBER	TRN NUMBER						
LO	CATION							PAGE 2 OF 2				