



Thursday, March 26, 2020

Ross Talboom
EOG Resources
600 17th Street, Suite 1000N
Denver, CO 80202

Re: ALS Workorder: 2003352
Project Name: Simba 1-06 SWD February 12, 2020 Spill, After Additional Excavati
Project Number:

Dear Mr. Talboom:

Two soil samples were received from EOG Resources, on 3/19/2020. The samples were scheduled for the following analyses:

- GC/MS Volatiles
- Inorganics
- Total Extractable Petroleum Hydrocarbons (Diesel)
- Total Volatile Petroleum Hydrocarbons (Gasoline)

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



2003352

GC/MS Volatiles:

The samples were analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C.

All acceptance criteria were met.

GRO:

The samples were analyzed following the current revision of SOP 425 generally based on SW-846 Methods 8000C and 8015D. TVPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C6 to C10.

All acceptance criteria were met.

DRO:

The samples were analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All acceptance criteria were met.

Inorganics:

The samples were analyzed following USDA Handbook 60 Chapter 6 procedures for the current revision of the following SOP and method:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Electrical conductivity	USDA60	810 Draft
Sodium Adsorption Ratio	USDA60	810 Draft
Paste pH	USDA60	810 Draft

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2003352

Client Name: EOG Resources

Client Project Name: Simba 1-06 SWD February 12, 2020 Spill, After Additional Excav

Client Project Number:

Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Simba #2 - Next to Offload, RET	2003352-1		SOIL	18-Mar-20	15:47
Simba #3 - West Edge, RETEST	2003352-2		SOIL	18-Mar-20	15:59
Simba #2 - Next to Offload, RET	2003352-3		SatExtract	18-Mar-20	15:47
Simba #3 - West Edge, RETEST	2003352-4		SatExtract	18-Mar-20	15:59

Client: EOG Resources
Project: Simba 1-06 SWD February 12, 2020 Spill, After Additional
Sample ID: Simba #2 - Next to Offload, RETEST
Legal Location:
Collection Date: 3/18/2020 15:47

Date: 26-Mar-20
Work Order: 2003352
Lab ID: 2003352-1
Matrix: SOIL
Percent Moisture: 11.7

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Diesel Range Organics						
Diesel Range Organics	ND		SW8015M	8.9 MG/KG	1	Prep Date: 3/20/2020 PrepBy: CCL 3/23/2020 13:55
Surr: O-TERPHENYL	88			56-120 %REC	1	3/23/2020 13:55
Gasoline Range Organics						
GASOLINE RANGE ORGANICS	ND		SW8015	0.55 MG/KG	1	Prep Date: 3/20/2020 PrepBy: CCL 3/20/2020 15:01
Surr: 2,3,4-TRIFLUOROTOLUENE	93			80-120 %REC	1	3/20/2020 15:01
GC/MS Volatiles						
BENZENE	ND		SW8260	5.5 UG/KG	1	Prep Date: 3/24/2020 PrepBy: JJK 3/24/2020 15:18
TOLUENE	ND			5.5 UG/KG	1	3/24/2020 15:18
ETHYLBENZENE	ND			5.5 UG/KG	1	3/24/2020 15:18
M+P-XYLENE	ND			5.5 UG/KG	1	3/24/2020 15:18
O-XYLENE	ND			5.5 UG/KG	1	3/24/2020 15:18
TOTAL XYLENES	ND			5 UG/KG	1	3/24/2020 15:18
Surr: DIBROMOFLUOROMETHANE	111			77-125 %REC	1	3/24/2020 15:18
Surr: TOLUENE-D8	94			80-120 %REC	1	3/24/2020 15:18
Surr: 4-BROMOFLUOROBENZENE	86			71-121 %REC	1	3/24/2020 15:18
Sodium Adsorption Ratio						
PASTE PH	6.9		USDA60	0.1 pH	1	Prep Date: 3/25/2020 PrepBy: KJS 3/25/2020

Client: EOG Resources
Project: Simba 1-06 SWD February 12, 2020 Spill, After Additional
Sample ID: Simba #3 - West Edge, RETEST
Legal Location:
Collection Date: 3/18/2020 15:59

Date: 26-Mar-20
Work Order: 2003352
Lab ID: 2003352-2
Matrix: SOIL
Percent Moisture: 6.6

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Diesel Range Organics						
Diesel Range Organics	13	M	8.4	MG/KG	1	3/23/2020 15:00
Surr: O-TERPHENYL	88		56-120	%REC	1	3/23/2020 15:00
Gasoline Range Organics						
GASOLINE RANGE ORGANICS	ND		0.51	MG/KG	1	3/20/2020 15:23
Surr: 2,3,4-TRIFLUOROTOLUENE	93		80-120	%REC	1	3/20/2020 15:23
GC/MS Volatiles						
BENZENE	ND		5.3	UG/KG	1	3/24/2020 15:41
TOLUENE	ND		5.3	UG/KG	1	3/24/2020 15:41
ETHYLBENZENE	ND		5.3	UG/KG	1	3/24/2020 15:41
M+P-XYLENE	ND		5.3	UG/KG	1	3/24/2020 15:41
O-XYLENE	ND		5.3	UG/KG	1	3/24/2020 15:41
TOTAL XYLENES	ND		5	UG/KG	1	3/24/2020 15:41
Surr: DIBROMOFLUOROMETHANE	111		77-125	%REC	1	3/24/2020 15:41
Surr: TOLUENE-D8	95		80-120	%REC	1	3/24/2020 15:41
Surr: 4-BROMOFLUOROBENZENE	89		71-121	%REC	1	3/24/2020 15:41
Sodium Adsorption Ratio						
PASTE PH	7		0.1	pH	1	3/25/2020

Client: EOG Resources
Project: Simba 1-06 SWD February 12, 2020 Spill, After Additional
Sample ID: Simba #2 - Next to Offload, RETEST
Legal Location:
Collection Date: 3/18/2020 15:47

Date: 26-Mar-20
Work Order: 2003352
Lab ID: 2003352-3
Matrix: SATEXTRACT
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ICP Metals			USDA60		Prep Date: 3/23/2020	PrepBy: JML
CALCIUM	90		10	MG/L	10	3/24/2020 11:54
MAGNESIUM	12		10	MG/L	10	3/24/2020 11:54
SODIUM	13		10	MG/L	10	3/24/2020 11:54
Sodium Adsorption Ratio			USDA60		Prep Date: 3/25/2020	PrepBy: KJS
ELECTRICAL CONDUCTIVITY @ SATURATION	590		1	umhos/cm	1	3/25/2020
SODIUM ADSORPTION RATIO	0.33		0.54	NU	10	3/24/2020 11:54

Client: EOG Resources
Project: Simba 1-06 SWD February 12, 2020 Spill, After Additional
Sample ID: Simba #3 - West Edge, RETEST
Legal Location:
Collection Date: 3/18/2020 15:59

Date: 26-Mar-20
Work Order: 2003352
Lab ID: 2003352-4
Matrix: SATEXTRACT
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ICP Metals			USDA60		Prep Date: 3/23/2020	PrepBy: JML
CALCIUM	69		10	MG/L	10	3/24/2020 11:56
MAGNESIUM	10		10	MG/L	10	3/24/2020 11:56
SODIUM	32		10	MG/L	10	3/24/2020 11:56
Sodium Adsorption Ratio			USDA60		Prep Date: 3/25/2020	PrepBy: KJS
ELECTRICAL CONDUCTIVITY @ SATURATION	570		1	umhos/cm	1	3/25/2020
SODIUM ADSORPTION RATIO	0.94		0.54	NU	10	3/24/2020 11:56

Client: EOG Resources	Date: 26-Mar-20
Project: Simba 1-06 SWD February 12, 2020 Spill, After Additional	Work Order: 2003352
Sample ID: Simba #3 - West Edge, RETEST	Lab ID: 2003352-4
Legal Location:	Matrix: SATEXTRACT
Collection Date: 3/18/2020 15:59	Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- * - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- * - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- * - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
 - gasoline
 - JP-8
 - diesel
 - mineral spirits
 - motor oil
 - Stoddard solvent
 - bunker C

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Date: 3/26/2020 12:52

Client: EOG Resources

QC BATCH REPORT

Work Order: 2003352

Project: Simba 1-06 SWD February 12, 2020 Spill, Aft

Batch ID: **HC200320-61-1**

Instrument ID **FUELS-1**

Method: **SW8015**

LCS		Sample ID: HC200320-61		Units: MG/KG			Analysis Date: 3/20/2020 14:18				
Client ID:		Run ID: HC200320-6A			Prep Date: 3/20/2020			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	2.62	0.5	2.5		105	78-120				20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.474		0.5		95	80-120					

LCSD		Sample ID: HC200320-61		Units: MG/KG			Analysis Date: 3/20/2020 15:46				
Client ID:		Run ID: HC200320-6A			Prep Date: 3/20/2020			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	2.6	0.5	2.5		104	78-120		2.62	0	20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.465		0.5		93	80-120			2		

MB		Sample ID: HC200320-61		Units: MG/KG			Analysis Date: 3/20/2020 14:40				
Client ID:		Run ID: HC200320-6A			Prep Date: 3/20/2020			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	ND	0.5									
Surr: 2,3,4-TRIFLUOROTOLUENE	0.458				92	80-120					

The following samples were analyzed in this batch: 2003352-1 2003352-2

Client: EOG Resources
 Work Order: 2003352
 Project: Simba 1-06 SWD February 12, 2020 Spill, Afte

QC BATCH REPORT

Batch ID: **HC200320-82-1** Instrument ID **FUELS-1** Method: **SW8015M**

LCS		Sample ID: HC200320-82			Units: MG/KG		Analysis Date: 3/23/2020 13:11				
Client ID:		Run ID: HC200323-8A			Prep Date: 3/20/2020		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	65.9	8	62.5		106	75-124				20	
Surr: O-TERPHENYL	10.1		12.5		81	56-120					

LCSD		Sample ID: HC200320-82			Units: MG/KG		Analysis Date: 3/23/2020 13:33				
Client ID:		Run ID: HC200323-8A			Prep Date: 3/20/2020		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	65.7	8	62.5		105	75-124		65.9	0	20	
Surr: O-TERPHENYL	10		12.5		80	56-120			1		

MB		Sample ID: HC200320-82			Units: MG/KG		Analysis Date: 3/23/2020 12:49					
Client ID:		Run ID: HC200323-8A			Prep Date: 3/20/2020		DF: 1					
Analyte	Result	ReportLimit										Qual
Diesel Range Organics	ND	8										
Surr: O-TERPHENYL	10.2				82	56-120						

The following samples were analyzed in this batch: 2003352-1 2003352-2

Client: EOG Resources
 Work Order: 2003352
 Project: Simba 1-06 SWD February 12, 2020 Spill, Aft

QC BATCH REPORT

Batch ID: VL200324-2-1 Instrument ID: HPV2 Method: SW8260

LCS		Sample ID: VL200324-2			Units: UG/KG		Analysis Date: 3/24/2020 13:22				
Client ID:		Run ID: VL200324-2A			Prep Date: 3/24/2020		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BENZENE	40.5	5	40		101	70-129				30	
TOLUENE	35.4	5	40		88	68-125				30	
ETHYLBENZENE	35.6	5	40		89	70-123				30	
M+P-XYLENE	70.6	5	80		88	72-123				30	
O-XYLENE	35.5	5	40		89	73-121				30	
Surr: DIBROMOFLUOROMETHANE	53.3		50		107	77-125					
Surr: TOLUENE-D8	46.6		50		93	80-120					
Surr: 4-BROMOFLUOROBENZENE	48.3		50		97	71-121					

LCSD		Sample ID: VL200324-2			Units: UG/KG		Analysis Date: 3/24/2020 13:45				
Client ID:		Run ID: VL200324-2A			Prep Date: 3/24/2020		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BENZENE	44.2	5	40		111	70-129		40.5	9	30	
TOLUENE	37.1	5	40		93	68-125		35.4	5	30	
ETHYLBENZENE	38.2	5	40		96	70-123		35.6	7	30	
M+P-XYLENE	75.2	5	80		94	72-123		70.6	6	30	
O-XYLENE	38	5	40		95	73-121		35.5	7	30	
Surr: DIBROMOFLUOROMETHANE	53.7		50		107	77-125				1	
Surr: TOLUENE-D8	45.7		50		91	80-120				2	
Surr: 4-BROMOFLUOROBENZENE	47.6		50		95	71-121				2	

MB		Sample ID: VL200324-2			Units: UG/KG		Analysis Date: 3/24/2020 14:31				
Client ID:		Run ID: VL200324-2A			Prep Date: 3/24/2020		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BENZENE	ND	5									
TOLUENE	ND	5									
ETHYLBENZENE	ND	5									
M+P-XYLENE	ND	5									
O-XYLENE	ND	5									
TOTAL XYLENES	ND	5									
Surr: DIBROMOFLUOROMETHANE	54.2				108	77-125					
Surr: TOLUENE-D8	47.2				94	80-120					
Surr: 4-BROMOFLUOROBENZENE	46.9				94	71-121					

The following samples were analyzed in this batch: 2003352-1 2003352-2