

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



e-Hardcopy 2.0
Automated Report

Technical Report for

Mull Drilling Company Inc.

MUSF #5 Flowline Crude Oil Spill

SGS Accutest Job Number: D87393

Sampling Date: 10/03/16

Report to:

**Mull Drilling Company Inc.
PO Box 393
Cheyenne Wells, CO 80810
csmalley@mulldrilling.com**

ATTN: Carl D. Smalley

Total number of pages in report: 23



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

**Scott Heideman
Laboratory Director**

Client Service contact: Cristina Araujo 303-425-6021

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

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

Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	5
Section 4: Sample Results	6
4.1: D87393-1: EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA	7
Section 5: Misc. Forms	10
5.1: Chain of Custody	11
Section 6: GC Volatiles - QC Data Summaries	13
6.1: Method Blank Summary	14
6.2: Blank Spike Summary	16
6.3: Matrix Spike/Matrix Spike Duplicate Summary	18
Section 7: GC Semi-volatiles - QC Data Summaries	20
7.1: Method Blank Summary	21
7.2: Blank Spike Summary	22
7.3: Matrix Spike/Matrix Spike Duplicate Summary	23

1

2

3

4

5

6

7



Sample Summary

Mull Drilling Company Inc.

Job No: D87393

MUSF #5 Flowline Crude Oil Spill

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D87393-1	10/03/16	09:00	CDS 10/04/16	SO	Soil	EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA

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

CASE NARRATIVE / CONFORMANCE SUMMARY

2

Client: Mull Drilling Company Inc.

Job No D87393

Site: MUSF #5 Flowline Crude Oil Spill

Report Date 10/17/2016 3:37:29 P

On 10/04/2016, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 5.4 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D87393 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

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

Volatiles by GC By Method SW846 8015B

Matrix: SO	Batch ID: GGA1759
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D87414-1MS, D87414-1MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8021B

Matrix: SO	Batch ID: GTA1762
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D87308-93MS, D87308-93MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix: SO	Batch ID: OP14159
-------------------	--------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D87414-1MS, D87414-1MSD were used as the QC samples indicated.

Wet Chemistry By Method SM2540G-2011 M

Matrix: SO	Batch ID: GN36282
-------------------	--------------------------

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

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

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

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

Monday, October 17, 2016

Page 1 of 1

Summary of Hits

Job Number: D87393
Account: Mull Drilling Company Inc.
Project: MUSF #5 Flowline Crude Oil Spill
Collected: 10/03/16



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

D87393-1 EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA		
Lab Sample ID:	D87393-1	Date Sampled:	10/03/16
Matrix:	SO - Soil	Date Received:	10/04/16
Method:	SW846 8015B	Percent Solids:	94.6
Project:	MUSF #5 Flowline Crude Oil Spill		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA35047.D	1	10/06/16	AK	n/a	n/a	GGA1759
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	11	5.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	93%		60-140%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

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

4.1
4

Report of Analysis

Client Sample ID:	EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA		
Lab Sample ID:	D87393-1	Date Sampled:	10/03/16
Matrix:	SO - Soil	Date Received:	10/04/16
Method:	SW846 8021B	Percent Solids:	94.6
Project:	MUSF #5 Flowline Crude Oil Spill		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA35137.D	1	10/12/16	AK	n/a	n/a	GTA1762
Run #2							

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

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	56	37	ug/kg	
108-88-3	Toluene	ND	110	56	ug/kg	
100-41-4	Ethylbenzene	ND	110	56	ug/kg	
1330-20-7	Xylenes (total)	ND	110	110	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	95%		60-140%

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

4.1
4

Report of Analysis

Client Sample ID:	EXCAVATED SOILS IMPACTED BY CRUDE OIL SPILL(INSIDE SPILLAREA		
Lab Sample ID:	D87393-1	Date Sampled:	10/03/16
Matrix:	SO - Soil	Date Received:	10/04/16
Method:	SW846-8015B SW846 3546	Percent Solids:	94.6
Project:	MUSF #5 Flowline Crude Oil Spill		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI45528.D	1	10/07/16	CH	10/05/16	OP14159	GFI1966
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	11	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	73%		41-134%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

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

4.1
 4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS Accutest Sample Receipt Summary

Job Number: D87393

Client: MULL DRILLING CO

Project: MUSF#5 FLOWLINE CRUDE OIL SPILL

Date / Time Received: 10/4/2016 10:05:00 AM

Delivery Method: _____

Airbill #'s: UPS

Cooler Temps (Initial/Adjusted): #1: (5.4/5.4):

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | <u>IR Gun;</u> | |
| 3. Cooler media: | <u>Ice (Bag)</u> | |
| 4. No. Coolers: | <u>1</u> | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments

Sample Integrity - Documentation

Y or N

- | | | |
|----------------------------------------|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | <u>Intact</u> | |

Sample Integrity - Instructions

Y or N

N/A

- | | | | |
|-------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

5.1
5

D87393: Chain of Custody

Page 2 of 2

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D87393
Account: MULLCOCW Mull Drilling Company Inc.
Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1759-MB	GA35034.D	1	10/06/16	AK	n/a	n/a	GGA1759

The QC reported here applies to the following samples:

Method: SW846 8015B

D87393-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	96% 60-140%

6.1.1
6

Method Blank Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1762-MB	TA35132.D	1	10/12/16	AK	n/a	n/a	GTA1762

The QC reported here applies to the following samples:

Method: SW846 8021B

D87393-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	33	ug/kg	
100-41-4	Ethylbenzene	ND	100	50	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylenes (total)	ND	100	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	93% 60-140%

Blank Spike Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA1759-BS	GA35035.D	1	10/06/16	AK	n/a	n/a	GGA1759

The QC reported here applies to the following samples:

Method: SW846 8015B

D87393-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	125	114	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	106%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1762-BS	TA35133.D	1	10/12/16	AK	n/a	n/a	GTA1762

The QC reported here applies to the following samples:

Method: SW846 8021B

D87393-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	1360	1450	107	70-130
100-41-4	Ethylbenzene	2280	2490	109	70-130
108-88-3	Toluene	10600	10300	97	70-130
1330-20-7	Xylenes (total)	10800	11800	109	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	116%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D87414-1MS	GA35037.D	1	10/06/16	AK	n/a	n/a	GGA1759
D87414-1MSD	GA35038.D	1	10/06/16	AK	n/a	n/a	GGA1759
D87414-1	GA35036.D	1	10/06/16	AK	n/a	n/a	GGA1759

The QC reported here applies to the following samples:

Method: SW846 8015B

D87393-1

CAS No.	Compound	D87414-1 mg/kg	Spike Q mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	150	162	108	150	170	113	5	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D87414-1	Limits
120-82-1	1,2,4-Trichlorobenzene	94%	102%	99%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D87308-93MS	TA35135.D	1	10/12/16	AK	n/a	n/a	GTA1762
D87308-93MSD	TA35136.D	1	10/12/16	AK	n/a	n/a	GTA1762
D87308-93	TA35134.D	1	10/12/16	AK	n/a	n/a	GTA1762

The QC reported here applies to the following samples:

Method: SW846 8021B

D87393-1

CAS No.	Compound	D87308-93 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	1620	1620	100	1620	1590	98	2	70-130/30
100-41-4	Ethylbenzene	ND	2710	2840	105	2710	2720	100	4	70-130/30
108-88-3	Toluene	ND	12600	11800	94	12600	11300	90	4	70-130/30
1330-20-7	Xylenes (total)	ND	12800	13400	104	12800	12800	100	5	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D87308-93	Limits
120-82-1	1,2,4-Trichlorobenzene	115%	117%	99%	60-140%

* = Outside of Control Limits.

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14159-MB	F145456.D	1	10/06/16	CH	10/05/16	OP14159	GFI1964

The QC reported here applies to the following samples:

Method: SW846-8015B

D87393-1

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

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

7.1.1
7

Blank Spike Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14159-BS	F145458.D	1	10/06/16	CH	10/05/16	OP14159	GFI1964

The QC reported here applies to the following samples:

Method: SW846-8015B

D87393-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	250	149	60	35-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	85%	41-134%

7.2.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D87393
 Account: MULLCOCW Mull Drilling Company Inc.
 Project: MUSF #5 Flowline Crude Oil Spill

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14159-MS	FI45460.D	1	10/06/16	CH	10/05/16	OP14159	GFI1964
OP14159-MSD	FI45462.D	1	10/06/16	CH	10/05/16	OP14159	GFI1964
D87414-1	FI45464.D	1	10/06/16	CH	10/05/16	OP14159	GFI1964

The QC reported here applies to the following samples:

Method: SW846-8015B

D87393-1

CAS No.	Compound	D87414-1 mg/kg	Spike Q	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	294	162	55	294	146	50	10	10-171/30

CAS No.	Surrogate Recoveries	MS	MSD	D87414-1	Limits
84-15-1	o-Terphenyl	74%	69%	59%	41-134%

* = Outside of Control Limits.

7.3.1
7