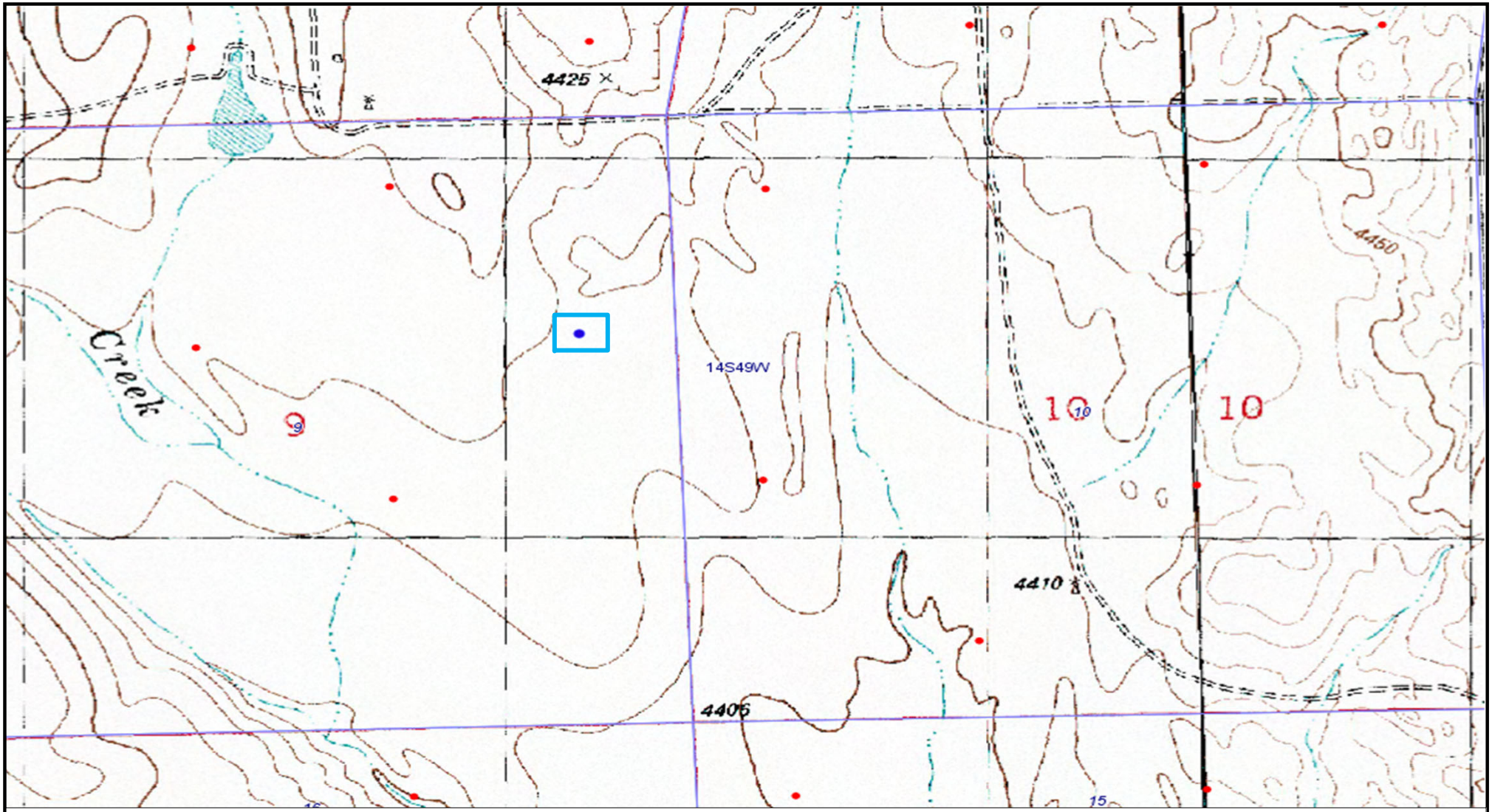
## FIGURES

**Figure 1: Topographic Site Location Map**

**Figure 2: 2023 Soil Sample Location Map**

**Figure 3: Further Assessment Soil Sample Map**




MULL DRILLING COMPANY, INC.
MULL UNIT #20
API 05-017-06274
SENE S9, T14S R49W, CHEYENNE COUNTY
TOPOGRAPHIC MAP

**Legend**

**Location Boundary**

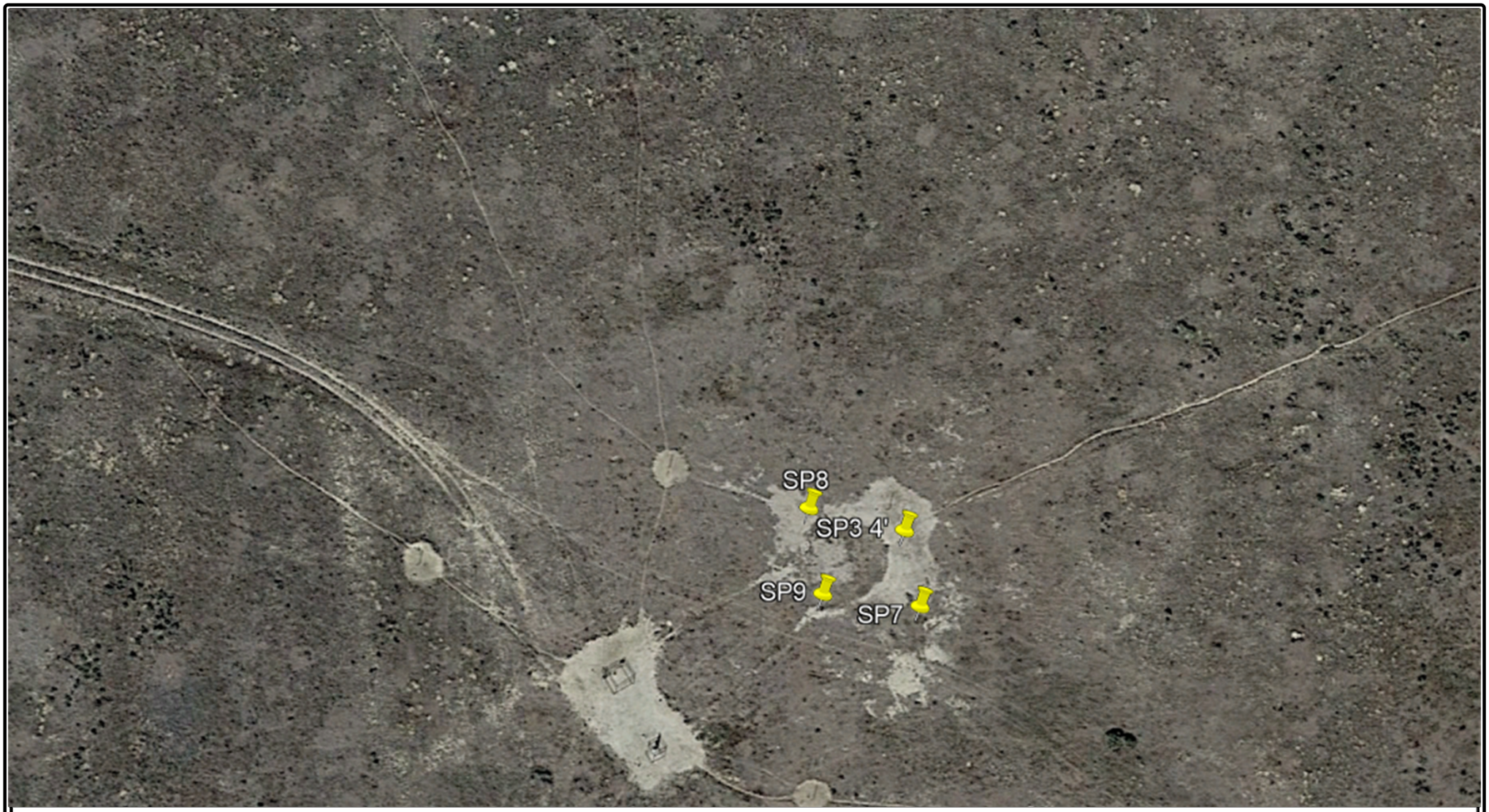
N

0 ft 350 ft 700 ft

ARDOR

Prepared By:
Ardor Environmental LLC

December 26, 2023




MULL DRILLING COMPANY, INC.
MULL UNIT #20
API 05-017-06274
SENE S9, T14S R49W, CHEYENNE COUNTY
OCTOBER 2023 SOIL SAMPLE LOCATIONS

**Legend**

Soil Sample Locations

Samples collected 10/24/23

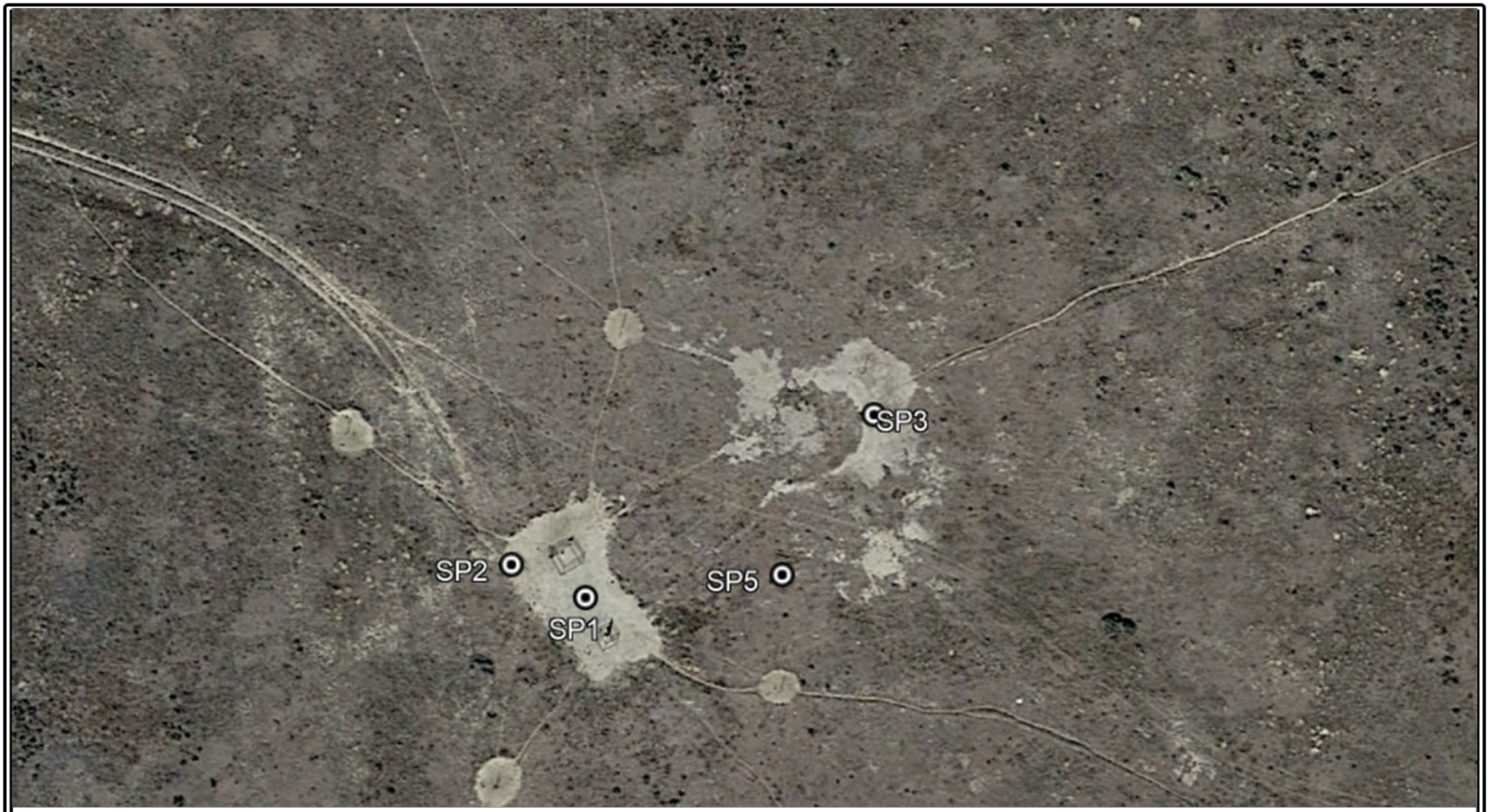
N

0 ft 65 ft

ARDOR

Prepared By:
Ardor Environmental LLC

January 4, 2024




MULL DRILLING COMPANY, INC.
MULL UNIT #20
API 05-017-06274
SENE S9, T14S R49W, CHEYENNE COUNTY
FURTHER ASSESSMENT SOIL SAMPLE LOCATIONS

**Legend**

Further Assessment Soil Sample Locations

N

0 ft 65 ft

ARDOR

Prepared By:
Ardor Environmental LLC

January 11, 2024

## TABLES

**Table 1: April 2023 Analytical Results**

**Table 2: October 2023 Analytical Results**

| MUSF 20 Table 915-1 | | | 4/13/2023 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **CLEANUP CONCENTRATIONS** | | | **SP 1 0'-1'** | **SP 1 4'** | **SP 2 0'-1'** | **SP 3 0'-1'** | **SP 4 0'-1'** | **SP 5 0'-1'** | **SP 6 0'-1' (Background)** |
| **Contaminant of Concern** | **Concentrations** | | **38.845399; -102.890035** | **38.845399; -102.890035** | **38.845438; -102.890148** | **38.845617; -102.889595** | **38.845349; 102.889941** | **38.845426; 102.889735** | **38.845532; - 102.890538** |
| Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons) | 500mg/kg | | 6.9J | ND | 5.7J | 7.7J | 49 | 72.1 | 21.6 |
| PID Reading | | | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm |
| **Soil Suitability for Reclamation** | | | | | | | | | |
| Electrical conductivity (EC) (by saturated paste method) | <4mmhos/cm | | 0.163 | 0.141 | 0.114 | 2.7 | 0.133 | 0.203 | 0.16 |
| Sodium adsorption ratio (SAR) (by saturated paste method) | <6 | | 0.3 | 0.399 | 0.108 | 2.55 | 0.118 | 0.0763 | 0.0756 |
| pH (by saturated paste method) | 6–8.3 | | **8.44** | **8.4** | 8.23 | 7.69 | 7.92 | 7.83 | 7.86 |
| boron (hot water soluble soil extract) | 2mg/l | | 0.176J | 0.195J | 0.195J | 0.418 | 0.252 | 0.322 | 0.201 |
| **Organic Compounds in Groundwater** | | | | | | | | | |
| benzene | 5µg/l | | NA | NA | NA | NA | NA | NA | NA |
| toluene | 560 to 1,000µg/l | | NA | NA | NA | NA | NA | NA | NA |
| ethylbenzene | 700µg/l | | NA | NA | NA | NA | NA | NA | NA |
| xylenes (sum of o-, m- and p- isomers = total xylenes) | 1,400 to 10,000µg/l | | NA | NA | NA | NA | NA | NA | NA |
| naphthalene | 140µg/l | | NA | NA | NA | NA | NA | NA | NA |
| 1,2,4-trimethylbenzene | 67µg/l | | NA | NA | NA | NA | NA | NA | NA |
| 1,3,5-trimethylbenzene | 67µg/l | | NA | NA | NA | NA | NA | NA | NA |
| **Groundwater Inorganic Parameters** | | | | | | | | | |
| total dissolved solids (TDS) | <1.25 X local background | | NA | NA | NA | NA | NA | NA | NA |
| chloride ion | 250mg/l or <1.25 X local background | | NA | NA | NA | NA | NA | NA | NA |
| sulfate ion | 250mg/l or <1.25 X local background | | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | |
| **Soils** | **Residential Soil Screening Level Concentrations (mg/kg)** | **Protection of Groundwater Soil Screening Level Concentrations (mg/kg)** | **SP 1 0'-1'** | **SP 1 4'** | **SP 2 0'-1'** | **SP 3 0'-1'** | **SP 4 0'-1'** | **SP 5 0'-1'** | **SP 6 0'-1' (Background)** |
| **Organic Compounds in Soils** | | | | | | | | | |
| benzene | 1.2 | 0.0026 (M) | ND | ND | ND | ND | ND | ND | ND |
| toluene | 490 | 0.69 (M) | ND | ND | ND | ND | ND | ND | ND |
| ethylbenzene | 5.8 | 0.78 (M) | ND | ND | ND | 0.0011J | ND | ND | ND |
| xylenes (sum of o-, m- and p- isomers = total xylenes) | 58 | 9.9 (M) | ND | ND | ND | 0.0061J | ND | ND | ND |
| 1,2,4-trimethylbenzene | 30 | 0.0081 (R) | ND | ND | ND | 0.0019J | ND | 0.0010J | ND |
| 1,3,5-trimethylbenzene | 27 | 0.0087 (R) | ND | ND | ND | 0.00064J | ND | ND | ND |
| acenaphthene | 360 | 0.55 (R) | ND | ND | ND | ND | ND | ND | ND |
| anthracene | 1800 | 5.8 (R) | ND | ND | ND | ND | ND | ND | ND |
| benz(a)anthracene | 1.1 | 0.011 (R) | ND | ND | ND | ND | ND | 0.0034J | ND |
| benzo(b)fluoranthene | 1.1 | 0.3 (R) | ND | ND | ND | 0.0031J | ND | 0.0027J | ND |
| benzo(k)fluoranthene | 11 | 2.9 (R) | ND | ND | ND | ND | ND | ND | ND |
| benzo(a)pyrene | 0.11 | 0.24 (M) | ND | ND | ND | ND | ND | ND | ND |
| chrysene | 110 | 9 (R) | ND | ND | ND | 0.0041 | ND | 0.0039 | ND |
| dibenzo(a,h)anthracene | 0.11 | 0.096 (R) | ND | ND | ND | ND | ND | ND | ND |
| fluoranthene | 240 | 8.9 (R) | ND | ND | ND | ND | ND | ND | ND |
| fluorene | 240 | 0.54 (R) | ND | ND | ND | ND | ND | ND | ND |
| indeno(1,2,3-cd)pyrene | 1.1 | 0.98 (R) | ND | ND | ND | ND | ND | ND | ND |
| 1-methylnaphthalene | 18 | 0.006 (R) | ND | ND | ND | ND | ND | ND | ND |
| 2-methylnaphthalene | 24 | 0.019 (R) | ND | ND | ND | ND | ND | ND | ND |
| naphthalene | 2 | 0.0038 (R) | ND | ND | ND | ND | ND | ND | ND |
| pyrene | 180 | 1.3 (R) | ND | ND | ND | ND | ND | ND | ND |
| **Metals in Soils** | | | | | | | | | |
| arsenic | 0.68 | 0.29 (M) | **5.1** | **3** | **4.3** | **5.6** | **3.3** | **3.3** | **2.7** |
| barium | 15000 | 82 (M) | 75.6 | 64 | 111 | 97.7 | 57.6 | 57.6 | 59.8 |
| cadmium | 71 | 0.38 (M) | 0.26J | 0.29J | 0.42 | 0.59 | 0.26J | 0.26J | 0.28J |
| chromium (VI) | 0.3 | 0.00067 (R) | ND | ND | ND | **1.4** | ND | **0.672J** | ND |
| copper | 3100 | 46 (M) | 4.5 | 4.7 | 7.3 | 9.2 | 4.9 | 11.2 | 4.5 |
| lead | 400 | 14 (M) | 8 | 4.6 | 7.1 | 19.4 | 21.7 | 27.3 | 4.8 |
| nickel | 1500 | 26 (R) | 4 | 5 | 7.7 | 9.5 | 3.7 | 10.7 | 4.4 |
| selenium | 390 | 0.26 (M) | ND | ND | ND | 0.75J | ND | 1.1J | ND |
| silver | 390 | 0.8 (R) | ND | ND | ND | ND | ND | ND | ND |
| zinc | 23000 | 370 (R) | 20.4 | 19.2 | 27.8 | 29.8 | 21.1 | 34.6 | 21 |

*The letter "(**R**)" following a protection of Groundwater soil screening level indicates the concentration is derived from a risk-based approach. The letter "(**M**)" following a protection of*
Quantifier "J" indicated analyte is present at an estimated concentration between the MDL and Reporting Limit.
Quantifier "U" indicates analyzed but not detected above the MDL.
Values presented in **BOLD** contained concentrations exceeding ECMC Table 915-1 Residential Soil Screening Level limits, but are within Background results.
Values presented in **BOLD** contained concentrations exceeding ECMC Table 915-1 Residential Soil Screening Level limits, and Background results.
*Arsenic is naturally occurring in Colorado at concentrations above ECMC Table 915-1, Local Clean-Up Level (3.375 mg/kg) is 1.25xBG (2.7 mg/kg)

| MUSF 20 Table 915-1 | | | 10/24/2023 | | | | |
|---|---|---|---|---|---|---|---|
| **CLEANUP CONCENTRATIONS** | | | **SP 3 4'** | **SP 7 0'-1'** | **SP 8 0'-1'** | **SP 9 0'-1'** | **Trip Blank** |
| **Contaminant of Concern** | **Concentrations** | | **38.845617; -102.889595** | **38.845518, -102.889569** | **38.845646, -102.889755** | **38.845534, -102.889732** | |
| Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons) | 500mg/kg | | ERO 6.7 GRO U | ERO 4.9 GRO U | ERO 34 GRO U | ERO 12 GRO U | NA |
| PID Reading | | | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm | 0.0 ppm |
| **Soil Suitability for Reclamation** | | | | | | | |
| Electrical conductivity (EC) (by saturated paste method) | <4mmhos/cm | | 1.4 | 0.8 | 11 | 3 | NA |
| Sodium adsorption ratio (SAR) (by saturated paste method) | <6 | | 6.1 | 0.25 | 4.2 | 1.2 | NA |
| pH (by saturated paste method) | 6–8.3 | | **8.35** | **8.1** | 7.29 | 7.22 | NA |
| boron (hot water soluble soil extract) | 2mg/l | | 0.35 | 0.71 | 0.47 | 0.48 | NA |
| **Organic Compounds in Groundwater** | | | | | | | |
| benzene | 5µg/l | | NA | NA | NA | NA | NA |
| toluene | 560 to 1,000µg/l | | NA | NA | NA | NA | NA |
| ethylbenzene | 700µg/l | | NA | NA | NA | NA | NA |
| xylenes (sum of o-, m- and p- isomers = total xylenes) | 1,400 to 10,000µg/l | | NA | NA | NA | NA | NA |
| naphthalene | 140µg/l | | NA | NA | NA | NA | NA |
| 1,2,4-trimethylbenzene | 67µg/l | | NA | NA | NA | NA | NA |
| 1,3,5-trimethylbenzene | 67µg/l | | NA | NA | NA | NA | NA |
| **Groundwater Inorganic Parameters** | | | | | | | |
| total dissolved solids (TDS) | <1.25 X local background | | NA | NA | NA | NA | NA |
| chloride ion | 250mg/l or <1.25 X local background | | NA | NA | NA | NA | NA |
| sulfate ion | 250mg/l or <1.25 X local background | | NA | NA | NA | NA | NA |
| | | | | | | | |
| **Soils** | **Residential Soil Screening Level Concentrations (mg/kg)** | **Protection of Groundwater Soil Screening Level Concentrations (mg/kg)** | | | | | |
| **Organic Compounds in Soils** | | | | | | | |
| benzene | 1.2 | 0.0026 (M) | U | 0.0022 J | 0.0027 J | 0.0016 J | U |
| toluene | 490 | 0.69 (M) | U | U | U | U | U |
| ethylbenzene | 5.8 | 0.78 (M) | U | U | U | U | U |
| xylenes (sum of o-, m- and p- isomers = total xylenes) | 58 | 9.9 (M) | U | U | U | U | U |
| 1,2,4-trimethylbenzene | 30 | 0.0081 (R) | U | U | U | U | U |
| 1,3,5-trimethylbenzene | 27 | 0.0087 (R) | U | U | U | U | U |
| acenaphthene | 360 | 0.55 (R) | U | U | U | U | NA |
| anthracene | 1800 | 5.8 (R) | U | U | U | U | NA |
| benz(a)anthracene | 1.1 | 0.011 (R) | U | U | U | U | NA |
| benzo(b)fluoranthene | 1.1 | 0.3 (R) | U | U | U | U | NA |
| benzo(k)fluoranthene | 11 | 2.9 (R) | U | U | U | U | NA |
| benzo(a)pyrene | 0.11 | 0.24 (M) | U | U | U | U | NA |
| chrysene | 110 | 9 (R) | U | U | U | U | NA |
| dibenzo(a,h)anthracene | 0.11 | 0.096 (R) | U | U | U | U | NA |
| fluoranthene | 240 | 8.9 (R) | U | U | U | U | NA |
| fluorene | 240 | 0.54 (R) | U | U | U | U | NA |
| indeno(1,2,3-cd)pyrene | 1.1 | 0.98 (R) | U | U | U | U | NA |
| 1-methylnaphthalene | 18 | 0.006 (R) | U | U | U | U | NA |
| 2-methylnaphthalene | 24 | 0.019 (R) | U | U | U | U | NA |
| naphthalene | 2 | 0.0038 (R) | U | U | U | U | NA |
| pyrene | 180 | 1.3 (R) | U | U | U | U | NA |
| **Metals in Soils** | | | | | | | |
| arsenic | 0.68 | 0.29 (M) | **3.4** | **3.1** | **3.2** | **3.3** | NA |
| barium | 15000 | 82 (M) | 130 | 100 | 93 | 95 | NA |
| cadmium | 71 | 0.38 (M) | 0.044 | 0.21 | 0.19 | 0.13 | NA |
| chromium (VI) | 0.3 | 0.00067 (R) | U | U | U | U | NA |
| copper | 3100 | 46 (M) | 5.7 | 7.3 | 7.2 | 8.4 | NA |
| lead | 400 | 14 (M) | 7.8 | 26 | 21 | 15 | NA |
| nickel | 1500 | 26 (R) | 7.1 | 7.7 | 7.8 | 6.8 | NA |
| selenium | 390 | 0.26 (M) | 0.28 | 0.51 | 0.63 | 0.43 | NA |
| silver | 390 | 0.8 (R) | U | U | U | U | NA |
| zinc | 23000 | 370 (R) | 22 | 24 | 24 | 24 | NA |

*The letter "(**R**)" following a protection of Groundwater soil screening level indicates the concentration is derived from a risk-based approach. The letter "(**M**)" following a*
Quantifier "J" indicated analyte is present at an estimated concentration between the MDL and Reporting Limit.
Quantifier "U" indicated analyzed but not detected above the MDL.
Values presented in **BOLD** contained concentrations exceeding ECMC Table 915-1 Residential Soil Screening Level limits, but are within Background results.
Values presented in **BOLD** contained concentrations exceeding ECMC Table 915-1 Residential Soil Screening Level limits, and Background results.
*Arsenic is naturally occurring in Colorado at concentrations above ECMC Table 915-1, Local Clean-Up Level (3.375 mg/kg) is 1.25xBG (2.7 mg/kg)

# ATTACHMENT A

## Laboratory Analytical Reports

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 02, 2023

James Beilman
Mull Drilling Company
1700 N Waterfront Pkwy
Bld. 1200
Wichita, KS 67206

RE: Project: MUSF 20
Pace Project No.: 60426357

Dear James Beilman:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace National - Mt. Juliet
- Pace Analytical Services - Kansas City

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures



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**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

# CERTIFICATIONS

Project: MUSF 20
Pace Project No.: 60426357

**Pace Analytical Services Kansas**

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 22-031-0
Illinois Certification #: 2000302021-3
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212023-1
Oklahoma Certification #: 2022-057
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-21-15
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

**Pace Analytical Services National**

12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 998093910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789



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**Pace Analytical Services, LLC**
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Lenexa, KS 66219
(913)599-5665

## SAMPLE SUMMARY

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60426357001** | **SP 1** | Solid | 04/13/23 13:00 | 04/15/23 10:31 |
| **60426357002** | **SP 1 4'** | Solid | 04/13/23 13:10 | 04/15/23 10:31 |
| **60426357003** | **SP 2** | Solid | 04/13/23 13:15 | 04/15/23 10:31 |
| **60426357004** | **SP 3** | Solid | 04/13/23 13:25 | 04/15/23 10:31 |
| **60426357005** | **SP 4** | Solid | 04/13/23 13:30 | 04/15/23 10:31 |
| **60426357006** | **SP 5** | Solid | 04/13/23 13:40 | 04/15/23 10:31 |
| **60426357007** | **SP 6** | Solid | 04/13/23 13:50 | 04/15/23 10:31 |



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## SAMPLE ANALYTE COUNT

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60426357001** | **SP 1** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357002** | **SP 1 4'** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357003** | **SP 2** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |



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## SAMPLE ANALYTE COUNT

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357004** | **SP 3** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357005** | **SP 4** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357006** | **SP 5** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |



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## SAMPLE ANALYTE COUNT

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| | | EPA 7199 | VSS | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |
| **60426357007** | **SP 6** | EPA 8015B | YGR | 4 | PASI-K |
| | | EPA 8015B | JLO | 2 | PASI-K |
| | | 6010B-NE493 Ch 2 | SPL | 1 | PAN |
| | | EPA 6010 | MA1 | 8 | PASI-K |
| | | EPA 6020 | JGP | 1 | PASI-K |
| | | EPA 8270 by SIM | SJJ | 17 | PASI-K |
| | | EPA 8260C | RAD | 9 | PASI-K |
| | | ASTM D2974 | DWC | 1 | PASI-K |
| | | SM 2540G | CMK | 1 | PAN |
| | | EPA 7199 | SET | 1 | PAN |
| | | EPA 9045D | KAD | 1 | PAN |
| | | EPA 9050 | NTG | 1 | PAN |
| | | Calculated | ZSA | 1 | PAN |

PAN = Pace National - Mt. Juliet
PASI-K = Pace Analytical Services - Kansas City



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 1** **Lab ID: 60426357001** Collected: 04/13/23 13:00 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | ND | mg/kg | 19.9 | 4.5 | 1 | 04/19/23 01:59 | 04/19/23 12:27 | | |
| TPH-DRO (C10-C28) | **6.9J** | mg/kg | 10 | 4.5 | 1 | 04/19/23 01:59 | 04/19/23 12:27 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 45 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 12:27 | 646-31-1 | |
| p-Terphenyl (S) | 46 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 12:27 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 10.1 | 1.2 | 1 | 04/20/23 13:54 | 04/21/23 01:36 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 87 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 01:36 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.176J** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:33 | 7440-42-8H | J |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **75.6** | mg/kg | 0.48 | 0.26 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-39-3 | |
| Cadmium | **0.26J** | mg/kg | 0.48 | 0.10 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-43-9 | |
| Copper | **4.5** | mg/kg | 1.9 | 0.29 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-50-8 | |
| Lead | **8.0** | mg/kg | 0.96 | 0.35 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7439-92-1 | |
| Nickel | **4.0** | mg/kg | 0.48 | 0.23 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-02-0 | |
| Selenium | ND | mg/kg | 1.4 | 0.72 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.67 | 0.17 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-22-4 | |
| Zinc | **20.4** | mg/kg | 9.6 | 1.3 | 1 | 04/22/23 10:38 | 05/01/23 18:18 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **5.1** | mg/kg | 0.96 | 0.18 | 10 | 04/22/23 10:38 | 04/25/23 09:31 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0033 | 0.0020 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0033 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0033 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0033 | 0.0013 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 50-32-8 | |
| Benzo(b)fluoranthene | ND | mg/kg | 0.0033 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 205-99-2 | |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0033 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 207-08-9 | |
| Chrysene | ND | mg/kg | 0.0033 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 218-01-9 | |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0033 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0033 | 0.0028 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0033 | 0.0025 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0033 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 1** **Lab ID: 60426357001** Collected: 04/13/23 13:00 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | ND | mg/kg | 0.0033 | 0.0016 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 90-12-0 | |
| 2-Methylnaphthalene | ND | mg/kg | 0.0033 | 0.0023 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 91-57-6 | |
| Naphthalene | ND | mg/kg | 0.0033 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 91-20-3 | |
| Pyrene | ND | mg/kg | 0.0033 | 0.0024 | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 55 | % | 40-120 | | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 321-60-8 | |
| Terphenyl-d14 (S) | 51 | % | 45-130 | | 1 | 04/18/23 16:27 | 04/26/23 15:24 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0051 | 0.00046 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0051 | 0.00088 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.020 | 0.0045 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | ND | mg/kg | 0.0051 | 0.00070 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0051 | 0.00044 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.015 | 0.0037 | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 106 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 102 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 97 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:20 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **1.6** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **95.1** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | ND | mg/kg | 1.05 | 0.268 | 1 | 04/21/23 11:53 | 04/24/23 02:51 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **8.44** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **163** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.300** | | | | 1 | 04/25/23 20:46 | 04/25/23 20:46 | SAR | |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 1 4'** **Lab ID: 60426357002** Collected: 04/13/23 13:10 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | ND | mg/kg | 21.5 | 4.8 | 1 | 04/19/23 01:59 | 04/19/23 12:35 | | |
| TPH-DRO (C10-C28) | ND | mg/kg | 10.7 | 4.8 | 1 | 04/19/23 01:59 | 04/19/23 12:35 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 62 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 12:35 | 646-31-1 | |
| p-Terphenyl (S) | 64 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 12:35 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 11.2 | 1.4 | 1 | 04/20/23 13:54 | 04/21/23 01:51 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 83 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 01:51 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.153J** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:36 | 7440-42-8H | J |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **64.0** | mg/kg | 0.44 | 0.24 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-39-3 | |
| Cadmium | **0.29J** | mg/kg | 0.44 | 0.092 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-43-9 | |
| Copper | **4.7** | mg/kg | 1.7 | 0.27 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-50-8 | |
| Lead | **4.6** | mg/kg | 0.87 | 0.31 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7439-92-1 | |
| Nickel | **5.0** | mg/kg | 0.44 | 0.20 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-02-0 | |
| Selenium | ND | mg/kg | 1.3 | 0.66 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.61 | 0.15 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-22-4 | |
| Zinc | **19.2** | mg/kg | 8.7 | 1.1 | 1 | 04/22/23 10:38 | 05/01/23 18:21 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **3.0** | mg/kg | 0.87 | 0.16 | 10 | 04/22/23 10:38 | 04/25/23 09:34 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0035 | 0.0021 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0035 | 0.0020 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0035 | 0.0014 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 50-32-8 | |
| Benzo(b)fluoranthene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 205-99-2 | |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 207-08-9 | |
| Chrysene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 218-01-9 | |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0035 | 0.0029 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0035 | 0.0027 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 1 4'** **Lab ID: 60426357002** Collected: 04/13/23 13:10 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | ND | mg/kg | 0.0035 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 90-12-0 | |
| 2-Methylnaphthalene | ND | mg/kg | 0.0035 | 0.0025 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 91-57-6 | |
| Naphthalene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 91-20-3 | |
| Pyrene | ND | mg/kg | 0.0035 | 0.0026 | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 58 | % | 40-120 | | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 321-60-8 | |
| Terphenyl-d14 (S) | 57 | % | 45-130 | | 1 | 04/18/23 16:27 | 04/26/23 15:42 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0057 | 0.00052 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0057 | 0.00099 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.023 | 0.0051 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | ND | mg/kg | 0.0057 | 0.00079 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0057 | 0.00050 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.017 | 0.0042 | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 106 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 101 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 99 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:40 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **7.5** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **94.6** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | ND | mg/kg | 1.06 | 0.270 | 1 | 04/21/23 11:53 | 04/24/23 02:56 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **8.40** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **141** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.399** | | | | 1 | 04/25/23 21:00 | 04/25/23 21:00 | SAR | |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 2** **Lab ID: 60426357003** Collected: 04/13/23 13:15 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | ND | mg/kg | 20.5 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:43 | | |
| TPH-DRO (C10-C28) | **5.7J** | mg/kg | 10.3 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:43 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 75 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 12:43 | 646-31-1 | |
| p-Terphenyl (S) | 69 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 12:43 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 10.2 | 1.2 | 1 | 04/20/23 13:54 | 04/21/23 02:36 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 84 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 02:36 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.195J** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:39 | 7440-42-8H | J |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **111** | mg/kg | 0.40 | 0.22 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-39-3 | |
| Cadmium | **0.42** | mg/kg | 0.40 | 0.084 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-43-9 | |
| Copper | **7.3** | mg/kg | 1.6 | 0.25 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-50-8 | |
| Lead | **7.1** | mg/kg | 0.80 | 0.29 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7439-92-1 | |
| Nickel | **7.7** | mg/kg | 0.40 | 0.19 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-02-0 | |
| Selenium | ND | mg/kg | 1.2 | 0.61 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.56 | 0.14 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-22-4 | |
| Zinc | **27.8** | mg/kg | 8.0 | 1.1 | 1 | 04/22/23 10:38 | 05/01/23 18:23 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **4.3** | mg/kg | 0.80 | 0.15 | 10 | 04/22/23 10:38 | 04/25/23 09:36 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0034 | 0.0021 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0034 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0034 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0034 | 0.0014 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 50-32-8 | |
| Benzo(b)fluoranthene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 205-99-2 | |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 207-08-9 | |
| Chrysene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 218-01-9 | |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0034 | 0.0028 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0034 | 0.0026 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 2** **Lab ID: 60426357003** Collected: 04/13/23 13:15 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | ND | mg/kg | 0.0034 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 90-12-0 | |
| 2-Methylnaphthalene | ND | mg/kg | 0.0034 | 0.0024 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 91-57-6 | |
| Naphthalene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 91-20-3 | |
| Pyrene | ND | mg/kg | 0.0034 | 0.0025 | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 59 | % | 40-120 | | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 321-60-8 | |
| Terphenyl-d14 (S) | 60 | % | 45-130 | | 1 | 04/18/23 16:27 | 04/26/23 16:00 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0053 | 0.00048 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0053 | 0.00091 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.021 | 0.0047 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | ND | mg/kg | 0.0053 | 0.00073 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0053 | 0.00046 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.016 | 0.0039 | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 104 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 101 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 98 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 17:59 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **2.9** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **96.6** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | ND | mg/kg | 1.04 | 0.264 | 1 | 04/21/23 11:53 | 04/24/23 03:01 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **8.23** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **114** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.108** | | | | 1 | 04/25/23 20:52 | 04/25/23 20:52 | SAR | |

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 3** **Lab ID: 60426357004** Collected: 04/13/23 13:25 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | ND | mg/kg | 20.6 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:51 | | |
| TPH-DRO (C10-C28) | **7.7J** | mg/kg | 10.3 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:51 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 68 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 12:51 | 646-31-1 | |
| p-Terphenyl (S) | 68 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 12:51 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 10.0 | 1.2 | 1 | 04/20/23 13:54 | 04/21/23 02:51 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 84 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 02:51 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.418** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:42 | 7440-42-8H | |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **97.7** | mg/kg | 0.48 | 0.27 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-39-3 | |
| Cadmium | **0.59** | mg/kg | 0.48 | 0.10 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-43-9 | |
| Copper | **9.2** | mg/kg | 1.9 | 0.30 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-50-8 | |
| Lead | **19.4** | mg/kg | 0.97 | 0.35 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7439-92-1 | |
| Nickel | **9.5** | mg/kg | 0.48 | 0.23 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-02-0 | |
| Selenium | **0.75J** | mg/kg | 1.4 | 0.73 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.68 | 0.17 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-22-4 | |
| Zinc | **29.8** | mg/kg | 9.7 | 1.3 | 1 | 04/22/23 10:38 | 05/01/23 18:25 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **5.6** | mg/kg | 0.97 | 0.18 | 10 | 04/22/23 10:38 | 04/25/23 09:39 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0034 | 0.0021 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0034 | 0.0020 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0034 | 0.0019 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0034 | 0.0014 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 50-32-8 | |
| Benzo(b)fluoranthene | **0.0031J** | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 205-99-2 | B |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 207-08-9 | |
| Chrysene | **0.0041** | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 218-01-9 | B |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0034 | 0.0029 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0034 | 0.0026 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 3** **Lab ID: 60426357004** Collected: 04/13/23 13:25 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | **0.0068** | mg/kg | 0.0034 | 0.0017 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 90-12-0 | |
| 2-Methylnaphthalene | **0.0072** | mg/kg | 0.0034 | 0.0024 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 91-57-6 | |
| Naphthalene | **0.0045** | mg/kg | 0.0034 | 0.0018 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 91-20-3 | |
| Pyrene | **0.0038** | mg/kg | 0.0034 | 0.0025 | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 129-00-0 | B |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 75 | % | 40-120 | | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 321-60-8 | |
| Terphenyl-d14 (S) | 76 | % | 45-130 | | 1 | 04/27/23 15:34 | 05/01/23 22:23 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0053 | 0.00049 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 71-43-2 | |
| Ethylbenzene | **0.0011J** | mg/kg | 0.0053 | 0.00093 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.021 | 0.0048 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | **0.0019J** | mg/kg | 0.0053 | 0.00074 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | **0.00064J** | mg/kg | 0.0053 | 0.00046 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 108-67-8 | |
| Xylene (Total) | **0.0061J** | mg/kg | 0.016 | 0.0039 | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 104 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 101 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 100 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:19 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **4.1** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **96.1** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | **1.40** | mg/kg | 1.04 | 0.265 | 1 | 04/21/23 11:53 | 04/24/23 03:06 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **7.69** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **2700** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **2.55** | | | | 1 | 04/25/23 20:49 | 04/25/23 20:49 | SAR | |

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 4** **Lab ID: 60426357005** Collected: 04/13/23 13:30 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | **28.0** | mg/kg | 20.4 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:59 | | |
| TPH-DRO (C10-C28) | **21.0** | mg/kg | 10.2 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 12:59 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 75 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 12:59 | 646-31-1 | |
| p-Terphenyl (S) | 74 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 12:59 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | **1.6J** | mg/kg | 10.1 | 1.2 | 1 | 04/20/23 13:54 | 04/21/23 03:06 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 87 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 03:06 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.252** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:53 | 7440-42-8H | |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **57.6** | mg/kg | 0.38 | 0.21 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-39-3 | |
| Cadmium | **0.26J** | mg/kg | 0.38 | 0.079 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-43-9 | |
| Copper | **4.9** | mg/kg | 1.5 | 0.23 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-50-8 | |
| Lead | **21.7** | mg/kg | 0.75 | 0.27 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7439-92-1 | |
| Nickel | **3.7** | mg/kg | 0.38 | 0.18 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-02-0 | |
| Selenium | ND | mg/kg | 1.1 | 0.57 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.53 | 0.13 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-22-4 | |
| Zinc | **21.1** | mg/kg | 7.5 | 0.99 | 1 | 04/22/23 10:38 | 05/01/23 18:27 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **3.3** | mg/kg | 0.75 | 0.14 | 10 | 04/22/23 10:38 | 04/25/23 09:44 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0032 | 0.0020 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0032 | 0.0018 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0032 | 0.0018 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0032 | 0.0013 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 50-32-8 | |
| Benzo(b)fluoranthene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 205-99-2 | |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 207-08-9 | |
| Chrysene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 218-01-9 | |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0032 | 0.0027 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0032 | 0.0024 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 4** **Lab ID: 60426357005** Collected: 04/13/23 13:30 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | ND | mg/kg | 0.0032 | 0.0016 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 90-12-0 | |
| 2-Methylnaphthalene | ND | mg/kg | 0.0032 | 0.0023 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 91-57-6 | |
| Naphthalene | ND | mg/kg | 0.0032 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 91-20-3 | |
| Pyrene | ND | mg/kg | 0.0032 | 0.0023 | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 63 | % | 40-120 | | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 321-60-8 | |
| Terphenyl-d14 (S) | 59 | % | 45-130 | | 1 | 04/27/23 15:34 | 05/02/23 09:57 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0052 | 0.00048 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0052 | 0.00091 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.021 | 0.0047 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | **0.0010J** | mg/kg | 0.0052 | 0.00072 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0052 | 0.00045 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.016 | 0.0038 | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 105 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 102 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 99 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:39 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **2.4** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **97.6** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | ND | mg/kg | 1.02 | 0.261 | 1 | 04/21/23 11:53 | 04/24/23 03:12 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **7.92** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **133** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.118** | | | | 1 | 04/25/23 20:38 | 04/25/23 20:38 | SAR | |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 5** **Lab ID: 60426357006** Collected: 04/13/23 13:40 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | **38.6** | mg/kg | 21.2 | 4.7 | 1 | 04/19/23 01:59 | 04/19/23 13:15 | | |
| TPH-DRO (C10-C28) | **33.5** | mg/kg | 10.6 | 4.7 | 1 | 04/19/23 01:59 | 04/19/23 13:15 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 74 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 13:15 | 646-31-1 | |
| p-Terphenyl (S) | 70 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 13:15 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 11.4 | 1.4 | 1 | 04/20/23 13:54 | 04/21/23 03:21 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 82 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 03:21 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.322** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:55 | 7440-42-8H | |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **104** | mg/kg | 0.47 | 0.26 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-39-3 | |
| Cadmium | **0.67** | mg/kg | 0.47 | 0.10 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-43-9 | |
| Copper | **11.2** | mg/kg | 1.9 | 0.29 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-50-8 | |
| Lead | **27.3** | mg/kg | 0.95 | 0.34 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7439-92-1 | |
| Nickel | **10.7** | mg/kg | 0.47 | 0.22 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-02-0 | |
| Selenium | **1.1J** | mg/kg | 1.4 | 0.71 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.66 | 0.16 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-22-4 | |
| Zinc | **34.6** | mg/kg | 9.5 | 1.2 | 1 | 04/22/23 10:38 | 05/01/23 18:29 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **4.6** | mg/kg | 0.95 | 0.17 | 10 | 04/22/23 10:38 | 04/25/23 09:46 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0035 | 0.0021 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0035 | 0.0020 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 120-12-7 | |
| Benzo(a)anthracene | **0.0034J** | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 56-55-3 | B |
| Benzo(a)pyrene | ND | mg/kg | 0.0035 | 0.0014 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 50-32-8 | |
| Benzo(b)fluoranthene | **0.0027J** | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 205-99-2 | B |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 207-08-9 | |
| Chrysene | **0.0039** | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 218-01-9 | B |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 53-70-3 | |
| Fluoranthene | **0.0031J** | mg/kg | 0.0035 | 0.0029 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 206-44-0 | B |
| Fluorene | ND | mg/kg | 0.0035 | 0.0027 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 5** **Lab ID: 60426357006** Collected: 04/13/23 13:40 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | **0.0063** | mg/kg | 0.0035 | 0.0017 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 90-12-0 | |
| 2-Methylnaphthalene | **0.0069** | mg/kg | 0.0035 | 0.0025 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 91-57-6 | |
| Naphthalene | **0.0043** | mg/kg | 0.0035 | 0.0019 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 91-20-3 | |
| Pyrene | **0.0035J** | mg/kg | 0.0035 | 0.0025 | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 129-00-0 | B |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 71 | % | 40-120 | | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 321-60-8 | |
| Terphenyl-d14 (S) | 71 | % | 45-130 | | 1 | 04/27/23 15:34 | 05/02/23 10:15 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0058 | 0.00053 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0058 | 0.0010 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.023 | 0.0051 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | **0.0016J** | mg/kg | 0.0058 | 0.00079 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0058 | 0.00050 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.017 | 0.0042 | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 107 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 103 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 98 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 18:59 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **7.5** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **94.3** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | **0.672J** | mg/kg | 1.06 | 0.270 | 1 | 04/21/23 11:53 | 04/24/23 03:32 | 18540-29-9 | J |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **7.83** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **203** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.0763** | | | | 1 | 04/25/23 20:41 | 04/25/23 20:41 | SAR | |

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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 6** **Lab ID: 60426357007** Collected: 04/13/23 13:50 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8015B Diesel Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-RRO (C28-C36) | **12.1J** | mg/kg | 20.5 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 13:31 | | |
| TPH-DRO (C10-C28) | **9.5J** | mg/kg | 10.3 | 4.6 | 1 | 04/19/23 01:59 | 04/19/23 13:31 | | |
| ***Surrogates*** | | | | | | | | | |
| n-Tetracosane (S) | 66 | % | 31-152 | | 1 | 04/19/23 01:59 | 04/19/23 13:31 | 646-31-1 | |
| p-Terphenyl (S) | 66 | % | 46-130 | | 1 | 04/19/23 01:59 | 04/19/23 13:31 | 92-94-4 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015B Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| TPH-GRO | ND | mg/kg | 9.6 | 1.2 | 1 | 04/20/23 13:54 | 04/21/23 03:36 | | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 83 | % | 66-130 | | 1 | 04/20/23 13:54 | 04/21/23 03:36 | 460-00-4 | |
| **Metals (ICP) 6010B-NE493 Ch 2** | Analytical Method: 6010B-NE493 Ch 2 Preparation Method: HWS Boron | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Boron, Hot Water Soluble | **0.201** | mg/L | 0.200 | 0.0167 | 1 | 04/24/23 12:14 | 04/26/23 11:58 | 7440-42-8H | |
| **6010 MET ICP Red. Interference** | Analytical Method: EPA 6010 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Barium | **59.8** | mg/kg | 0.46 | 0.26 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-39-3 | |
| Cadmium | **0.28J** | mg/kg | 0.46 | 0.097 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-43-9 | |
| Copper | **4.5** | mg/kg | 1.9 | 0.29 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-50-8 | |
| Lead | **4.8** | mg/kg | 0.93 | 0.34 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7439-92-1 | |
| Nickel | **4.4** | mg/kg | 0.46 | 0.22 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-02-0 | |
| Selenium | ND | mg/kg | 1.4 | 0.70 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7782-49-2 | |
| Silver | ND | mg/kg | 0.65 | 0.16 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-22-4 | |
| Zinc | **21.0** | mg/kg | 9.3 | 1.2 | 1 | 04/22/23 10:38 | 05/01/23 18:31 | 7440-66-6 | |
| **6020 MET ICPMS** | Analytical Method: EPA 6020 Preparation Method: EPA 3050 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Arsenic | **2.7** | mg/kg | 0.93 | 0.17 | 10 | 04/22/23 10:38 | 04/25/23 09:49 | 7440-38-2 | |
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Acenaphthene | ND | mg/kg | 0.0034 | 0.0021 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 83-32-9 | |
| Anthracene | ND | mg/kg | 0.0034 | 0.0020 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 120-12-7 | |
| Benzo(a)anthracene | ND | mg/kg | 0.0034 | 0.0019 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 56-55-3 | |
| Benzo(a)pyrene | ND | mg/kg | 0.0034 | 0.0014 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 50-32-8 | |
| Benzo(b)fluoranthene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 205-99-2 | |
| Benzo(k)fluoranthene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 207-08-9 | |
| Chrysene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 218-01-9 | |
| Dibenz(a,h)anthracene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 53-70-3 | |
| Fluoranthene | ND | mg/kg | 0.0034 | 0.0028 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 206-44-0 | |
| Fluorene | ND | mg/kg | 0.0034 | 0.0026 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 86-73-7 | |
| Indeno(1,2,3-cd)pyrene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 193-39-5 | |



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# ANALYTICAL RESULTS

Project: MUSF 20
Pace Project No.: 60426357

**Sample: SP 6** **Lab ID: 60426357007** Collected: 04/13/23 13:50 Received: 04/15/23 10:31 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | Report Limit | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8270 MSSV PAH by SIM** | Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| 1-Methylnaphthalene | ND | mg/kg | 0.0034 | 0.0017 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 90-12-0 | |
| 2-Methylnaphthalene | ND | mg/kg | 0.0034 | 0.0024 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 91-57-6 | |
| Naphthalene | ND | mg/kg | 0.0034 | 0.0018 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 91-20-3 | |
| Pyrene | ND | mg/kg | 0.0034 | 0.0025 | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 129-00-0 | |
| ***Surrogates*** | | | | | | | | | |
| 2-Fluorobiphenyl (S) | 53 | % | 40-120 | | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 321-60-8 | |
| Terphenyl-d14 (S) | 53 | % | 45-130 | | 1 | 04/18/23 16:27 | 04/26/23 20:49 | 1718-51-0 | |
| **8260C MSV 5035A Low Level** | Analytical Method: EPA 8260C Preparation Method: EPA 5035A/5030B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Benzene | ND | mg/kg | 0.0053 | 0.00049 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 71-43-2 | |
| Ethylbenzene | ND | mg/kg | 0.0053 | 0.00092 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 100-41-4 | |
| Toluene | ND | mg/kg | 0.021 | 0.0047 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 108-88-3 | |
| 1,2,4-Trimethylbenzene | ND | mg/kg | 0.0053 | 0.00073 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 95-63-6 | |
| 1,3,5-Trimethylbenzene | ND | mg/kg | 0.0053 | 0.00046 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 108-67-8 | |
| Xylene (Total) | ND | mg/kg | 0.016 | 0.0039 | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 108 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 102 | % | 83-119 | | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 99 | % | 80-120 | | 1 | 04/19/23 11:54 | 04/19/23 19:19 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974 | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Percent Moisture | **3.8** | % | 0.50 | 0.50 | 1 | | 04/17/23 16:46 | | |
| **Total Solids 2540 G-2011** | Analytical Method: SM 2540G Preparation Method: SM 2540 G | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Total Solids | **95.4** | % | | | 1 | 04/22/23 16:51 | 04/22/23 17:03 | | |
| **Wet Chemistry 7199** | Analytical Method: EPA 7199 Preparation Method: 3060A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Chromium, Hexavalent | ND | mg/kg | 1.05 | 0.267 | 1 | 04/23/23 09:20 | 04/25/23 14:43 | 18540-29-9 | |
| **Wet Chemistry 9045D** | Analytical Method: EPA 9045D Preparation Method: 9045C/9045D | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| pH | **7.86** | Std. Units | | 0.10 | 1 | 04/21/23 20:00 | 04/21/23 22:32 | | H3 |
| **Wet Chemistry 9050AMod** | Analytical Method: EPA 9050 Preparation Method: 9050A | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Specific Conductance @ 25 C | **160** | umhos/cm | 10.0 | 10.0 | 1 | 04/21/23 13:00 | 04/21/23 17:08 | | |
| **Calculated Results** | Analytical Method: Calculated Preparation Method: Calc | | | | | | | | |
| | Pace National - Mt. Juliet | | | | | | | | |
| Sodium Adsorption Ratio | **0.0756** | | | | 1 | 04/25/23 20:44 | 04/25/23 20:44 | SAR | |

## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 842659
QC Batch Method: EPA 5035A/5030B
Analysis Method: EPA 8015B
Analysis Description: Gasoline Range Organics
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3339734 Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| TPH-GRO | mg/kg | ND | 10.0 | 1.2 | 04/21/23 00:05 | |
| 4-Bromofluorobenzene (S) | % | 93 | 66-130 | | 04/21/23 00:05 | |

LABORATORY CONTROL SAMPLE: 3339735

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| TPH-GRO | mg/kg | 50 | 47.5 | 95 | 70-130 | |
| 4-Bromofluorobenzene (S) | % | | | 89 | 66-130 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3339736 3339737

| Parameter | Units | 60426357007 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH-GRO | mg/kg | ND | 47.8 | 47.8 | 40.0 | 41.0 | 82 | 84 | 70-130 | 2 | 25 | |
| 4-Bromofluorobenzene (S) | % | | | | | | 87 | 91 | 66-130 | | | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045653
QC Batch Method: HWS Boron
Analysis Method: 6010B-NE493 Ch 2
Analysis Description: Metals (ICP) 6010B-NE493 Ch 2
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: R3917697-1
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron, Hot Water Soluble | mg/L | ND | 0.200 | 0.0167 | 04/26/23 10:44 | |

LABORATORY CONTROL SAMPLE & LCSD: R3917697-2 R3917697-3

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron, Hot Water Soluble | mg/L | 1.00 | 1.03 | 1.03 | 103 | 103 | 80.0-120 | 0.260 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 843041
QC Batch Method: EPA 3050
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3341537
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Barium | mg/kg | ND | 0.50 | 0.28 | 05/01/23 17:52 | |
| Cadmium | mg/kg | ND | 0.50 | 0.10 | 05/01/23 17:52 | |
| Copper | mg/kg | ND | 2.0 | 0.31 | 05/01/23 17:52 | |
| Lead | mg/kg | ND | 1.0 | 0.36 | 05/01/23 17:52 | |
| Nickel | mg/kg | ND | 0.50 | 0.24 | 05/01/23 17:52 | |
| Selenium | mg/kg | ND | 1.5 | 0.75 | 05/01/23 17:52 | |
| Silver | mg/kg | ND | 0.70 | 0.17 | 05/01/23 17:52 | |
| Zinc | mg/kg | ND | 10.0 | 1.3 | 05/01/23 17:52 | |

LABORATORY CONTROL SAMPLE: 3341538

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Barium | mg/kg | 100 | 104 | 104 | 80-120 | |
| Cadmium | mg/kg | 100 | 102 | 102 | 80-120 | |
| Copper | mg/kg | 100 | 101 | 101 | 80-120 | |
| Lead | mg/kg | 100 | 103 | 103 | 80-120 | |
| Nickel | mg/kg | 100 | 105 | 105 | 80-120 | |
| Selenium | mg/kg | 100 | 88.4 | 88 | 80-120 | |
| Silver | mg/kg | 50 | 47.4 | 95 | 80-120 | |
| Zinc | mg/kg | 100 | 101 | 101 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3341539 3341540

| Parameter | Units | 60426353001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | mg/kg | 219 | 109 | 99.5 | 342 | 315 | 113 | 96 | 75-125 | 8 | 20 | |
| Cadmium | mg/kg | 0.59 | 109 | 99.5 | 95.9 | 86.0 | 87 | 86 | 75-125 | 11 | 20 | |
| Copper | mg/kg | 10.2 | 109 | 99.5 | 116 | 104 | 97 | 94 | 75-125 | 11 | 20 | |
| Lead | mg/kg | 9.1 | 109 | 99.5 | 105 | 95.1 | 88 | 86 | 75-125 | 10 | 20 | |
| Nickel | mg/kg | 10.5 | 109 | 99.5 | 109 | 97.3 | 90 | 87 | 75-125 | 11 | 20 | |
| Selenium | mg/kg | ND | 109 | 99.5 | 87.5 | 79.5 | 80 | 80 | 75-125 | 10 | 20 | |
| Silver | mg/kg | ND | 54.6 | 49.7 | 47.3 | 42.9 | 87 | 86 | 75-125 | 10 | 20 | |
| Zinc | mg/kg | 37.6 | 109 | 99.5 | 133 | 120 | 87 | 83 | 75-125 | 10 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 843042
QC Batch Method: EPA 3050
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3341541
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | ND | 1.0 | 0.18 | 04/25/23 09:03 | |

LABORATORY CONTROL SAMPLE: 3341542

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 100 | 100 | 100 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3341543 3341544

| Parameter | Units | 60426353002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 5.4 | 98.6 | 102 | 100 | 103 | 96 | 96 | 75-125 | 3 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 842421 | Analysis Method: EPA 8260C
QC Batch Method: EPA 5035A/5030B | Analysis Description: 8260C MSV 5035A Low Level
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3338687 | Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | mg/kg | ND | 0.0050 | 0.00069 | 04/19/23 15:17 | |
| 1,3,5-Trimethylbenzene | mg/kg | ND | 0.0050 | 0.00043 | 04/19/23 15:17 | |
| Benzene | mg/kg | ND | 0.0050 | 0.00046 | 04/19/23 15:17 | |
| Ethylbenzene | mg/kg | ND | 0.0050 | 0.00087 | 04/19/23 15:17 | |
| Toluene | mg/kg | ND | 0.020 | 0.0044 | 04/19/23 15:17 | |
| Xylene (Total) | mg/kg | ND | 0.015 | 0.0037 | 04/19/23 15:17 | |
| 1,2-Dichlorobenzene-d4 (S) | % | 99 | 80-120 | | 04/19/23 15:17 | |
| 4-Bromofluorobenzene (S) | % | 102 | 83-119 | | 04/19/23 15:17 | |
| Toluene-d8 (S) | % | 106 | 80-120 | | 04/19/23 15:17 | |

LABORATORY CONTROL SAMPLE: 3338688

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | mg/kg | 1.2 | 1.3 | 108 | 79-121 | |
| 1,3,5-Trimethylbenzene | mg/kg | 1.2 | 1.4 | 108 | 81-122 | |
| Benzene | mg/kg | 1.2 | 1.3 | 101 | 67-126 | |
| Ethylbenzene | mg/kg | 1.2 | 1.3 | 102 | 69-127 | |
| Toluene | mg/kg | 1.2 | 1.2 | 97 | 80-118 | |
| Xylene (Total) | mg/kg | 3.8 | 3.8 | 101 | 69-130 | |
| 1,2-Dichlorobenzene-d4 (S) | % | | | 99 | 80-120 | |
| 4-Bromofluorobenzene (S) | % | | | 96 | 83-119 | |
| Toluene-d8 (S) | % | | | 95 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3338689 3338690

| Parameter | Units | 60426353001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | mg/kg | ND | 1.6 | 1.6 | 1.5 | 1.6 | 101 | 103 | 10-124 | 2 | 68 | |
| 1,3,5-Trimethylbenzene | mg/kg | ND | 1.6 | 1.6 | 1.5 | 1.5 | 101 | 102 | 10-125 | 1 | 65 | |
| Benzene | mg/kg | ND | 1.6 | 1.6 | 1.4 | 1.4 | 92 | 95 | 17-134 | 3 | 53 | |
| Ethylbenzene | mg/kg | ND | 1.6 | 1.6 | 1.4 | 1.5 | 95 | 97 | 10-137 | 2 | 60 | |
| Toluene | mg/kg | ND | 1.6 | 1.6 | 1.3 | 1.4 | 89 | 90 | 13-131 | 1 | 60 | |
| Xylene (Total) | mg/kg | ND | 4.6 | 4.6 | 4.4 | 4.4 | 96 | 97 | 10-137 | 1 | 58 | |
| 1,2-Dichlorobenzene-d4 (S) | % | | | | | | 100 | 101 | 80-120 | | | |
| 4-Bromofluorobenzene (S) | % | | | | | | 100 | 100 | 83-119 | | | |
| Toluene-d8 (S) | % | | | | | | 95 | 97 | 80-120 | | | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 842084
QC Batch Method: EPA 3546
Analysis Method: EPA 8015B
Analysis Description: EPA 8015B
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3337608 Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| TPH-DRO (C10-C28) | mg/kg | ND | 9.9 | 4.4 | 04/19/23 10:36 | |
| TPH-RRO (C28-C36) | mg/kg | ND | 19.8 | 4.4 | 04/19/23 10:36 | |
| n-Tetracosane (S) | % | 70 | 31-152 | | 04/19/23 10:36 | |
| p-Terphenyl (S) | % | 73 | 46-130 | | 04/19/23 10:36 | |

LABORATORY CONTROL SAMPLE: 3337609

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| TPH-DRO (C10-C28) | mg/kg | 81.9 | 63.2 | 77 | 74-124 | |
| n-Tetracosane (S) | % | | | 79 | 31-152 | |
| p-Terphenyl (S) | % | | | 80 | 46-130 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3337610 3337611

| Parameter | Units | 60426353001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH-DRO (C10-C28) | mg/kg | 15.5 | 90.8 | 92.4 | 58.5 | 62.7 | 47 | 51 | 30-130 | 7 | 35 | |
| n-Tetracosane (S) | % | | | | | | 62 | 67 | 31-152 | | | |
| p-Terphenyl (S) | % | | | | | | 65 | 67 | 46-130 | | | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 842085
QC Batch Method: EPA 3546
Analysis Method: EPA 8270 by SIM
Analysis Description: 8270/3546 MSSV PAH by SIM
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357007

METHOD BLANK: 3337612
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | ND | 0.0032 | 0.0016 | 04/26/23 11:18 | |
| 2-Methylnaphthalene | mg/kg | ND | 0.0032 | 0.0023 | 04/26/23 11:18 | |
| Acenaphthene | mg/kg | ND | 0.0032 | 0.0020 | 04/26/23 11:18 | |
| Anthracene | mg/kg | ND | 0.0032 | 0.0018 | 04/26/23 11:18 | |
| Benzo(a)anthracene | mg/kg | 0.0022J | 0.0032 | 0.0018 | 04/26/23 11:18 | |
| Benzo(a)pyrene | mg/kg | 0.0024J | 0.0032 | 0.0013 | 04/26/23 11:18 | |
| Benzo(b)fluoranthene | mg/kg | 0.0024J | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Benzo(k)fluoranthene | mg/kg | ND | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Chrysene | mg/kg | 0.0022J | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Dibenz(a,h)anthracene | mg/kg | ND | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Fluoranthene | mg/kg | 0.0047 | 0.0032 | 0.0027 | 04/26/23 11:18 | |
| Fluorene | mg/kg | ND | 0.0032 | 0.0024 | 04/26/23 11:18 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | ND | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Naphthalene | mg/kg | ND | 0.0032 | 0.0017 | 04/26/23 11:18 | |
| Pyrene | mg/kg | 0.0039 | 0.0032 | 0.0023 | 04/26/23 11:18 | |
| 2-Fluorobiphenyl (S) | % | 69 | 40-120 | | 04/26/23 11:18 | |
| Terphenyl-d14 (S) | % | 72 | 45-130 | | 04/26/23 11:18 | |

LABORATORY CONTROL SAMPLE: 3337613

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | 0.033 | 0.022 | 68 | 55-120 | |
| 2-Methylnaphthalene | mg/kg | 0.033 | 0.022 | 68 | 55-120 | |
| Acenaphthene | mg/kg | 0.033 | 0.023 | 68 | 45-120 | |
| Anthracene | mg/kg | 0.033 | 0.024 | 72 | 50-120 | |
| Benzo(a)anthracene | mg/kg | 0.033 | 0.022 | 65 | 55-125 | |
| Benzo(a)pyrene | mg/kg | 0.033 | 0.023 | 68 | 45-120 | |
| Benzo(b)fluoranthene | mg/kg | 0.033 | 0.018 | 55 | 50-125 | |
| Benzo(k)fluoranthene | mg/kg | 0.033 | 0.025 | 76 | 55-120 | |
| Chrysene | mg/kg | 0.033 | 0.024 | 74 | 55-120 | |
| Dibenz(a,h)anthracene | mg/kg | 0.033 | 0.015 | 45 | 40-125 | |
| Fluoranthene | mg/kg | 0.033 | 0.025 | 74 | 50-125 | |
| Fluorene | mg/kg | 0.033 | 0.022 | 66 | 50-120 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.033 | 0.018 | 54 | 44-125 | |
| Naphthalene | mg/kg | 0.033 | 0.022 | 67 | 45-120 | |
| Pyrene | mg/kg | 0.033 | 0.026 | 79 | 50-125 | |
| 2-Fluorobiphenyl (S) | % | | | 65 | 40-120 | |
| Terphenyl-d14 (S) | % | | | 64 | 45-130 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

MATRIX SPIKE SAMPLE: 3337614

| Parameter | Units | 60426353002 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | ND | 0.038 | 0.023 | 61 | 50-145 | |
| 2-Methylnaphthalene | mg/kg | ND | 0.038 | 0.024 | 63 | 50-120 | |
| Acenaphthene | mg/kg | ND | 0.038 | 0.022 | 59 | 10-150 | |
| Anthracene | mg/kg | ND | 0.038 | 0.025 | 65 | 10-160 | |
| Benzo(a)anthracene | mg/kg | ND | 0.038 | 0.023 | 60 | 10-160 | |
| Benzo(a)pyrene | mg/kg | ND | 0.038 | 0.021 | 55 | 10-150 | |
| Benzo(b)fluoranthene | mg/kg | ND | 0.038 | 0.020 | 52 | 10-165 | |
| Benzo(k)fluoranthene | mg/kg | ND | 0.038 | 0.023 | 61 | 10-165 | |
| Chrysene | mg/kg | ND | 0.038 | 0.023 | 61 | 10-150 | |
| Dibenz(a,h)anthracene | mg/kg | ND | 0.038 | 0.022 | 58 | 10-175 | |
| Fluoranthene | mg/kg | ND | 0.038 | 0.026 | 67 | 10-180 | |
| Fluorene | mg/kg | ND | 0.038 | 0.024 | 64 | 20-145 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | ND | 0.038 | 0.022 | 57 | 10-150 | |
| Naphthalene | mg/kg | ND | 0.038 | 0.023 | 60 | 10-165 | |
| Pyrene | mg/kg | ND | 0.038 | 0.025 | 66 | 10-180 | |
| 2-Fluorobiphenyl (S) | % | | | | 57 | 40-120 | |
| Terphenyl-d14 (S) | % | | | | 55 | 45-130 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 844092
QC Batch Method: EPA 3546
Analysis Method: EPA 8270 by SIM
Analysis Description: 8270/3546 MSSV PAH by SIM
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357004, 60426357005, 60426357006

METHOD BLANK: 3345415
Matrix: Solid
Associated Lab Samples: 60426357004, 60426357005, 60426357006

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | ND | 0.0031 | 0.0015 | 05/02/23 09:39 | |
| 2-Methylnaphthalene | mg/kg | ND | 0.0031 | 0.0022 | 05/02/23 09:39 | |
| Acenaphthene | mg/kg | ND | 0.0031 | 0.0019 | 05/02/23 09:39 | |
| Anthracene | mg/kg | 0.0034 | 0.0031 | 0.0018 | 05/02/23 09:39 | |
| Benzo(a)anthracene | mg/kg | 0.0082 | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Benzo(a)pyrene | mg/kg | 0.0080 | 0.0031 | 0.0013 | 05/02/23 09:39 | |
| Benzo(b)fluoranthene | mg/kg | 0.013 | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Benzo(k)fluoranthene | mg/kg | 0.0047 | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Chrysene | mg/kg | 0.0075 | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Dibenz(a,h)anthracene | mg/kg | ND | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Fluoranthene | mg/kg | 0.016 | 0.0031 | 0.0026 | 05/02/23 09:39 | |
| Fluorene | mg/kg | ND | 0.0031 | 0.0024 | 05/02/23 09:39 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.0046 | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Naphthalene | mg/kg | ND | 0.0031 | 0.0017 | 05/02/23 09:39 | |
| Pyrene | mg/kg | 0.013 | 0.0031 | 0.0023 | 05/02/23 09:39 | |
| 2-Fluorobiphenyl (S) | % | 83 | 40-120 | | 05/02/23 09:39 | |
| Terphenyl-d14 (S) | % | 78 | 45-130 | | 05/02/23 09:39 | |

LABORATORY CONTROL SAMPLE: 3345416

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | 0.032 | 0.027 | 85 | 55-120 | |
| 2-Methylnaphthalene | mg/kg | 0.032 | 0.027 | 85 | 55-120 | |
| Acenaphthene | mg/kg | 0.032 | 0.027 | 86 | 45-120 | |
| Anthracene | mg/kg | 0.032 | 0.028 | 88 | 50-120 | |
| Benzo(a)anthracene | mg/kg | 0.032 | 0.029 | 91 | 55-125 | |
| Benzo(a)pyrene | mg/kg | 0.032 | 0.027 | 85 | 45-120 | |
| Benzo(b)fluoranthene | mg/kg | 0.032 | 0.029 | 90 | 50-125 | |
| Benzo(k)fluoranthene | mg/kg | 0.032 | 0.030 | 95 | 55-120 | |
| Chrysene | mg/kg | 0.032 | 0.029 | 92 | 55-120 | |
| Dibenz(a,h)anthracene | mg/kg | 0.032 | 0.027 | 85 | 40-125 | |
| Fluoranthene | mg/kg | 0.032 | 0.031 | 96 | 50-125 | |
| Fluorene | mg/kg | 0.032 | 0.028 | 88 | 50-120 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.032 | 0.028 | 87 | 44-125 | |
| Naphthalene | mg/kg | 0.032 | 0.026 | 83 | 45-120 | |
| Pyrene | mg/kg | 0.032 | 0.029 | 91 | 50-125 | |
| 2-Fluorobiphenyl (S) | % | | | 84 | 40-120 | |
| Terphenyl-d14 (S) | % | | | 86 | 45-130 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3345417 3345418

| Parameter | Units | 60426353005 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | mg/kg | ND | 0.038 | 0.038 | 0.027 | 0.023 | 71 | 60 | 50-145 | 16 | 61 | |
| 2-Methylnaphthalene | mg/kg | ND | 0.038 | 0.038 | 0.027 | 0.023 | 72 | 61 | 50-120 | 17 | 61 | |
| Acenaphthene | mg/kg | ND | 0.038 | 0.038 | 0.028 | 0.024 | 73 | 63 | 10-150 | 16 | 42 | |
| Anthracene | mg/kg | ND | 0.038 | 0.038 | 0.028 | 0.024 | 74 | 64 | 10-160 | 15 | 54 | |
| Benzo(a)anthracene | mg/kg | ND | 0.038 | 0.038 | 0.029 | 0.025 | 76 | 65 | 10-160 | 16 | 62 | |
| Benzo(a)pyrene | mg/kg | ND | 0.038 | 0.038 | 0.027 | 0.023 | 70 | 60 | 10-150 | 16 | 66 | |
| Benzo(b)fluoranthene | mg/kg | ND | 0.038 | 0.038 | 0.028 | 0.024 | 73 | 64 | 10-165 | 14 | 61 | |
| Benzo(k)fluoranthene | mg/kg | ND | 0.038 | 0.038 | 0.033 | 0.024 | 86 | 62 | 10-165 | 33 | 53 | |
| Chrysene | mg/kg | ND | 0.038 | 0.038 | 0.029 | 0.025 | 75 | 65 | 10-150 | 16 | 57 | |
| Dibenz(a,h)anthracene | mg/kg | ND | 0.038 | 0.038 | 0.027 | 0.023 | 70 | 61 | 10-175 | 15 | 48 | |
| Fluoranthene | mg/kg | ND | 0.038 | 0.038 | 0.032 | 0.027 | 84 | 71 | 10-180 | 17 | 54 | |
| Fluorene | mg/kg | ND | 0.038 | 0.038 | 0.030 | 0.025 | 78 | 67 | 20-145 | 17 | 39 | |
| Indeno(1,2,3-cd)pyrene | mg/kg | ND | 0.038 | 0.038 | 0.028 | 0.023 | 72 | 61 | 10-150 | 18 | 59 | |
| Naphthalene | mg/kg | ND | 0.038 | 0.038 | 0.027 | 0.022 | 70 | 59 | 10-165 | 18 | 54 | |
| Pyrene | mg/kg | ND | 0.038 | 0.038 | 0.029 | 0.025 | 76 | 65 | 10-180 | 16 | 61 | |
| 2-Fluorobiphenyl (S) | % | | | | | | 74 | 63 | 40-120 | | | |
| Terphenyl-d14 (S) | % | | | | | | 73 | 65 | 45-130 | | | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 841937
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: 3337259
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | ND | 0.50 | 0.50 | 04/17/23 16:45 | |

SAMPLE DUPLICATE: 3337260

| Parameter | Units | 60426355027 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 10.4 | 10.2 | 2 | 20 | |

SAMPLE DUPLICATE: 3337261

| Parameter | Units | 60426355029 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 10.0 | 10.1 | 1 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045414
QC Batch Method: SM 2540 G
Analysis Method: SM 2540G
Analysis Description: Total Solids 2540 G-2011
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: R3916512-1
Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Solids | % | 0.00100 | | | 04/22/23 17:03 | |

LABORATORY CONTROL SAMPLE: R3916512-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Solids | % | 50.0 | 50.0 | 100 | 85.0-115 | |

SAMPLE DUPLICATE: R3916512-3

| Parameter | Units | 60426357006 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Solids | % | 94.3 | 93.9 | 0.439 | 10 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045352
QC Batch Method: 3060A
Analysis Method: EPA 7199
Analysis Description: Wet Chemistry 7199
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006

METHOD BLANK: R3916419-1 Matrix: Solid
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 1.00 | 0.255 | 04/24/23 01:20 | |

LABORATORY CONTROL SAMPLE: R3916419-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | 10.0 | 10.5 | 105 | 80.0-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3916419-5 R3916419-6

| Parameter | Units | L1606850-05 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 23.7 | 23.7 | 17.9 | 18.5 | 75.8 | 78.3 | 75.0-125 | 3.23 | 20 | |

MATRIX SPIKE SAMPLE: R3916419-7

| Parameter | Units | L1606850-05 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 761 | 693 | 91.1 | 75.0-125 | |

SAMPLE DUPLICATE: R3916419-3

| Parameter | Units | L1606425-09 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | ND | 0.00 | 20 | |

SAMPLE DUPLICATE: R3916419-8

| Parameter | Units | 60426357005 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | ND | 0.00 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045357
QC Batch Method: 3060A
Analysis Method: EPA 7199
Analysis Description: Wet Chemistry 7199
Laboratory: Pace National - Mt. Juliet

Associated Lab Samples: 60426357007

METHOD BLANK: R3917218-1 Matrix: Solid
Associated Lab Samples: 60426357007

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 1.00 | 0.255 | 04/25/23 14:30 | |

LABORATORY CONTROL SAMPLE: R3917218-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | 10.0 | 10.7 | 107 | 80.0-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3917218-3 R3917218-4

| Parameter | Units | 60426357007 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 21.0 | 21.0 | 19.6 | 22.3 | 93.4 | 106 | 75.0-125 | 12.8 | 20 | |

MATRIX SPIKE SAMPLE: R3917218-5

| Parameter | Units | 60426357007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 682 | 649 | 95.1 | 75.0-125 | |

SAMPLE DUPLICATE: R3917218-7

| Parameter | Units | L1606925-05 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | 2.34 | 2.10 | 10.7 | 20 | |

SAMPLE DUPLICATE: R3917218-8

| Parameter | Units | L1606951-06 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chromium, Hexavalent | mg/kg | ND | 0.375J | 200 | 20 | D8,J |

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## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2046581
QC Batch Method: 9045C/9045D
Analysis Method: EPA 9045D
Analysis Description: Wet Chemistry 9045D
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

LABORATORY CONTROL SAMPLE: R3916113-1

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| pH | Std. Units | 10.0 | 9.98 | 99.8 | 99.0-101 | |

SAMPLE DUPLICATE: R3916113-2

| Parameter | Units | L1606850-05 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| pH | Std. Units | 8.08 | 8.05 | 0.372 | 1 | |

SAMPLE DUPLICATE: R3916113-3

| Parameter | Units | L1607178-01 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| pH | Std. Units | 7.02 | 7.03 | 0.142 | 1 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045126
QC Batch Method: EPA 9050
Analysis Method: EPA 9050
Analysis Description: Wet Chemistry 9050AMod
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: R3916056-1
Matrix: Solid
Associated Lab Samples:

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | ND | 10.0 | 10.0 | 04/21/23 17:08 | |

LABORATORY CONTROL SAMPLE: R3916056-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 1120 | 1050 | 93.5 | 85.0-115 | |

SAMPLE DUPLICATE: R3916056-3

| Parameter | Units | L1606678-04 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 211 | 208 | 1.19 | 20 | |

SAMPLE DUPLICATE: R3916056-4

| Parameter | Units | 60426357004 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 2700 | 2760 | 2.12 | 20 | |

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# QUALITY CONTROL DATA

Project: MUSF 20
Pace Project No.: 60426357

QC Batch: 2045126
QC Batch Method: 9050A
Analysis Method: EPA 9050
Analysis Description: Wet Chemistry 9050AMod
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 60426357001, 60426357002, 60426357003, 60426357004, 60426357005, 60426357006, 60426357007

METHOD BLANK: R3916056-1
Matrix: Solid
Associated Lab Samples:

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | ND | 10.0 | 10.0 | 04/21/23 17:08 | |

LABORATORY CONTROL SAMPLE: R3916056-2

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 1120 | 1050 | 93.5 | 85.0-115 | |

SAMPLE DUPLICATE: R3916056-3

| Parameter | Units | L1606678-04 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 211 | 208 | 1.19 | 20 | |

SAMPLE DUPLICATE: R3916056-4

| Parameter | Units | 60426357004 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Specific Conductance @ 25 C | umhos/cm | 2700 | 2760 | 2.12 | 20 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**



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Lenexa, KS 66219
(913)599-5665

# QUALIFIERS

Project: MUSF 20
Pace Project No.: 60426357

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## SAMPLE QUALIFIERS

Sample: 60426357001
- [1] Wet Chemistry by Method 9045D - 8.44 at 19.7C
- [1] Wet Chemistry by Method 9050AMod - at 25C

Sample: 60426357002
- [1] Wet Chemistry by Method 9045D - 8.4 at 19.7C
- [1] Wet Chemistry by Method 9050AMod - at 25C

Sample: 60426357003
- [1] Wet Chemistry by Method 9045D - 8.23 at 19.5C
- [1] Wet Chemistry by Method 9050AMod - at 25C

Sample: 60426357004
- [1] Wet Chemistry by Method 9045D - 7.69 at 19.5C
- [1] Wet Chemistry by Method 9050AMod - at 25C

Sample: 60426357005
- [1] Wet Chemistry by Method 9045D - 7.92 at 19.5C
- [1] Wet Chemistry by Method 9050AMod - at 25C

Sample: 60426357006
- [1] Wet Chemistry by Method 9045D - 7.83 at 19.5C



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# QUALIFIERS

Project: MUSF 20
Pace Project No.: 60426357

## SAMPLE QUALIFIERS

Sample: 60426357006
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: 60426357007
[1] Wet Chemistry by Method 9045D - 7.86 at 19.6C
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: R3916056-1
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: R3916056-2
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: R3916056-3
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: R3916056-4
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: R3916113-1
[1] Wet Chemistry by Method 9045D - 9.98 at 19.2C
Sample: R3916113-2
[1] Wet Chemistry by Method 9045D - 8.05 at 19.7C
Sample: R3916113-3
[1] Wet Chemistry by Method 9045D - 7.03 at 19.5C
Sample: L1606678-04
[1] Wet Chemistry by Method 9050AMod - at 25C
Sample: L1606850-05
[1] Wet Chemistry by Method 9045D - 8.08 at 19.7C
Sample: L1607178-01
[1] Wet Chemistry by Method 9045D - 7.02 at 19.5C

## ANALYTE QUALIFIERS

| | |
|---|---|
| B | Analyte was detected in the associated method blank. |
| D8 | The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid. |
| H3 | Sample was received or analysis requested beyond the recognized method holding time. |
| J | Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs. |



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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60426357001** | **SP 1** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357002** | **SP 1 4'** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357003** | **SP 2** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357004** | **SP 3** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357005** | **SP 4** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357006** | **SP 5** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357007** | **SP 6** | EPA 3546 | 842084 | EPA 8015B | 842336 |
| **60426357001** | **SP 1** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357002** | **SP 1 4'** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357003** | **SP 2** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357004** | **SP 3** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357005** | **SP 4** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357006** | **SP 5** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357007** | **SP 6** | EPA 5035A/5030B | 842659 | EPA 8015B | 842790 |
| **60426357001** | **SP 1** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357002** | **SP 1 4'** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357003** | **SP 2** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357004** | **SP 3** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357005** | **SP 4** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357006** | **SP 5** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357007** | **SP 6** | HWS Boron | 2045653 | 6010B-NE493 Ch 2 | 2045653 |
| **60426357001** | **SP 1** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357002** | **SP 1 4'** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357003** | **SP 2** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357004** | **SP 3** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357005** | **SP 4** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357006** | **SP 5** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357007** | **SP 6** | EPA 3050 | 843041 | EPA 6010 | 843212 |
| **60426357001** | **SP 1** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357002** | **SP 1 4'** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357003** | **SP 2** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357004** | **SP 3** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357005** | **SP 4** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357006** | **SP 5** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357007** | **SP 6** | EPA 3050 | 843042 | EPA 6020 | 843215 |
| **60426357001** | **SP 1** | EPA 3546 | 842085 | EPA 8270 by SIM | 843724 |
| **60426357002** | **SP 1 4'** | EPA 3546 | 842085 | EPA 8270 by SIM | 843724 |
| **60426357003** | **SP 2** | EPA 3546 | 842085 | EPA 8270 by SIM | 843724 |
| **60426357004** | **SP 3** | EPA 3546 | 844092 | EPA 8270 by SIM | 844607 |
| **60426357005** | **SP 4** | EPA 3546 | 844092 | EPA 8270 by SIM | 844607 |
| **60426357006** | **SP 5** | EPA 3546 | 844092 | EPA 8270 by SIM | 844607 |
| **60426357007** | **SP 6** | EPA 3546 | 842085 | EPA 8270 by SIM | 843724 |
| **60426357001** | **SP 1** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357002** | **SP 1 4'** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357003** | **SP 2** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |



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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60426357004** | **SP 3** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357005** | **SP 4** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357006** | **SP 5** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357007** | **SP 6** | EPA 5035A/5030B | 842421 | EPA 8260C | 842464 |
| **60426357001** | **SP 1** | ASTM D2974 | 841937 | | |
| **60426357002** | **SP 1 4'** | ASTM D2974 | 841937 | | |
| **60426357003** | **SP 2** | ASTM D2974 | 841937 | | |
| **60426357004** | **SP 3** | ASTM D2974 | 841937 | | |
| **60426357005** | **SP 4** | ASTM D2974 | 841937 | | |
| **60426357006** | **SP 5** | ASTM D2974 | 841937 | | |
| **60426357007** | **SP 6** | ASTM D2974 | 841937 | | |
| **60426357001** | **SP 1** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357002** | **SP 1 4'** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357003** | **SP 2** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357004** | **SP 3** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357005** | **SP 4** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357006** | **SP 5** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357007** | **SP 6** | SM 2540 G | 2045414 | SM 2540G | 2045414 |
| **60426357001** | **SP 1** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357002** | **SP 1 4'** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357003** | **SP 2** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357004** | **SP 3** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357005** | **SP 4** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357006** | **SP 5** | 3060A | 2045352 | EPA 7199 | 2045352 |
| **60426357007** | **SP 6** | 3060A | 2045357 | EPA 7199 | 2045357 |
| **60426357001** | **SP 1** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357002** | **SP 1 4'** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357003** | **SP 2** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357004** | **SP 3** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357005** | **SP 4** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357006** | **SP 5** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357007** | **SP 6** | 9045C/9045D | 2046581 | EPA 9045D | 2046581 |
| **60426357001** | **SP 1** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357002** | **SP 1 4'** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357003** | **SP 2** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357004** | **SP 3** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357005** | **SP 4** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357006** | **SP 5** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357007** | **SP 6** | 9050A | 2045126 | EPA 9050 | 2045126 |
| **60426357001** | **SP 1** | Calc | 2045648 | Calculated | 2045648 |
| **60426357002** | **SP 1 4'** | Calc | 2045648 | Calculated | 2045648 |
| **60426357003** | **SP 2** | Calc | 2045648 | Calculated | 2045648 |
| **60426357004** | **SP 3** | Calc | 2045648 | Calculated | 2045648 |
| **60426357005** | **SP 4** | Calc | 2045648 | Calculated | 2045648 |
| **60426357006** | **SP 5** | Calc | 2045648 | Calculated | 2045648 |



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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MUSF 20
Pace Project No.: 60426357

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60426357007** | **SP 6** | Calc | 2045648 | Calculated | 2045648 |



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| Pace ANALYTICAL SERVICES | DC#_Title: ENV-FRM-LENE-0009 | |
|---|---|---|
| | Revision: 2 | Effective Date: 01 |

WO# : 60426357

60426357

Client Name: Mull Drilling

**Courier:** FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☒ Other ☐

**Tracking #:** _____ Pace Shipping Label Used? Yes ☐ No ☒

**Custody Seal on Cooler/Box Present:** Yes ☐ No ☒ Seals intact: Yes ☐ No ☒

**Packing Material:** Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other ☐

**Thermometer Used:** T-299 **Type of Ice:** (Wet) Blue None

**Cooler Temperature (°C):** **As-read** 1.6 **Corr. Factor** +0.2 **Corrected** 1.8

**Date and initials of person examining contents:** AL 4/15

Temperature should be above freezing to 6°C

| | | |
|---|---|---|
| Chain of Custody present: | ☒Yes ☐No ☐N/A | |
| Chain of Custody relinquished: | ☒Yes ☐No ☐N/A | |
| Samples arrived within holding time: | ☒Yes ☐No ☐N/A | |
| **Short Hold Time analyses (<72hr):** | ☐Yes ☒No ☐N/A | |
| **Rush Turn Around Time requested:** | ☐Yes ☒No ☐N/A | |
| Sufficient volume: | ☒Yes ☐No ☐N/A | |
| Correct containers used: | ☒Yes ☐No ☐N/A | |
| Pace containers used: | ☒Yes ☐No ☐N/A | |
| Containers intact: | ☒Yes ☐No ☐N/A | |
| Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? | ☐Yes ☒No ☐N/A | |
| Filtered volume received for dissolved tests? | ☐Yes ☒No ☐N/A | |
| Sample labels match COC: Date / time / ID / analyses | ☒Yes ☐No ☐N/A | |
| Samples contain multiple phases? Matrix: SL | ☐Yes ☒No ☐N/A | |
| Containers requiring pH preservation in compliance? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** | ☐Yes ☐No ☒N/A | List sample IDs, volumes, lot #'s of preservative and the date/time added. |
| Cyanide water sample checks: Lead acetate strip turns dark? (Record only) | ☐Yes ☐No | |
| Potassium iodide test strip turns blue/purple? (Preserve) | ☐Yes ☐No | |
| Trip Blank present: | ☐Yes ☒No ☐N/A | |
| Headspace in VOA vials ( >6mm): | ☐Yes ☒No ☐N/A | |
| Samples from USDA Regulated Area: State: SL | ☐Yes ☒No ☐N/A | |
| Additional labels attached to 5035A / TX1005 vials in the field? | ☐Yes ☒No ☐N/A | |

**Client Notification/ Resolution:** Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical
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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.



**Section A — Required Client Information:**

Company: Mull Drilling Company
Address: 1700 N Waterfront Pkwy
Wichita, KS 67206
Email: jbeilman@mulldrilling.com
Phone: 316-364-6366 Fax:
Requested Due Date:

**Section B — Required Project Information:**

Report To: James Beilman
Copy To:
Purchase Order #:
Project Name: ~~[illegible]~~ MUSF 20
Project #: MUSF 20

**Section C — Invoice Information:**

Attention:
Company Name:
Address:
Pace Quote:
Pace Project Manager: nolie.wood@pacelabs.com,
Pace Profile #: 15035, 2

**Regulatory Agency:**

**State / Location:** CO

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique) | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED START DATE | COLLECTED START TIME | COLLECTED END DATE | COLLECTED END TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Unpreserved | H2SO4 | HNO3 | HCl | NaOH | Na2S2O3 | Methanol | Other 1 G | Analyses Test Y/N | VOAS/SVOA PAH SIM | 8015 DRO/GRO | 6010/6020 metals | Paste EC, SAR, pH, | HW Boron, 7199 CrIV | Residual Chlorine (Y/N) | 60426357 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SP 1 | SL | G | 4/13/23 | 0 | 1300 | | | 1 | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 2 | SP 1 4' | | | | | 1310 | | | | | | | | | | | | | | | | | | | |
| 3 | SP 2 | | | | | 1315 | | | | | | | | | | | | | | | | | | | |
| 4 | SP 3 | | | | | 1325 | | | | | | | | | | | | | | | | | | | |
| 5 | SP 4 | | | | | 1330 | | | | | | | | | | | | | | | | | | | |
| 6 | SP 5 | | | | | 1340 | | | | | | | | | | | | | | | | | | | |
| 7 | SP 6 | | | | | 1350 | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | |

Matrix codes: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Send 7199 CrIV,Saturated Paste EC, SAR, pH, and Hot Water Boron to Pace National | [signature] | 4/15/23 | 1031 | [signature] Pace | 4/15 | 1031 | 1.8 | Y | Y | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: J. Beilman

SIGNATURE of SAMPLER: [signature]

DATE Signed: 4/13/23

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

J074

# Internal Transfer Chain of Custody

Pace Analytical®
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☐ Samples Pre-Logged into eCOC.

State Of Origin: CO
Cert. Needed: ☐ Yes ☐ No

**Workorder:** 60426357 **Workorder Name:** MUSF 20 **Owner Received Date:** 4/15/2023 **Results Requested By:** 5/2/2023

**Report To**

Heather Wilson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone 1(913)563-1407

**Subcontract To**

Pace National
12065 Lebanon Rd
Mt. Juliet, TN 37122
Phone (615) 758-5858

**Requested Analysis**

| Item | Sample ID | Sample Type | Collect Date/Time | Lab ID | Matrix | Preserved Containers: Unpreserved | | | | | | 7199 CrIV | Hot water Boron | Saturated Paste EC,SAR,pH | | | | | | | | | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | 41606853 |
| 1 | SP 1 | PS | 4/13/2023 13:00 | 60426357001 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -01 |
| 2 | SP 1 4' | PS | 4/13/2023 13:10 | 60426357002 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -02 |
| 3 | SP 2 | PS | 4/13/2023 13:15 | 60426357003 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -03 |
| 4 | SP 3 | PS | 4/13/2023 13:25 | 60426357004 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -04 |
| 5 | SP 4 | PS | 4/13/2023 13:30 | 60426357005 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -05 |
| 6 | SP 5 | PS | 4/13/2023 13:40 | 60426357006 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -06 |
| 7 | SP 6 | PS | 4/13/2023 13:50 | 60426357007 | Solid | 1 | | | | | | X | X | X | | | | | | | | | -07 |

| Transfers | Released By | Date/Time | Received By | Date/Time |
|---|---|---|---|---|
| 1 | [illegible] | 4/18/23 1700 | [illegible] | 04/19/23 0905 |
| 2 | | | | |
| 3 | | | | |

**Comments**

**Cooler Temperature on Receipt** 1.8 °C (NSLVI) **Custody Seal** Y or N **Received on Ice** Y or N **Samples Intact** Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Receipt Checklist

COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N

If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

13-Nov-2023

James Beilman
Mull Drilling Company
1700 N Waterfront Pkwy, Bld. 1200
Wichita, KS 67206

Re: **MUSF 20** Work Order: **23102584**

Dear James,

ALS Environmental received 5 samples on 28-Oct-2023 09:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 35.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

# ALS Group, USA

Date: 13-Nov-23

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Work Order:** **23102584**

## Work Order Sample Summary

| Lab Samp ID | Client Sample ID | Matrix | Tag Number | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| 23102584-01 | SP 3 4' | Soil | | 10/24/2023 09:00 | 10/28/2023 09:15 | ☐ |
| 23102584-02 | SP 7 | Soil | | 10/24/2023 09:30 | 10/28/2023 09:15 | ☐ |
| 23102584-03 | SP 8 | Soil | | 10/24/2023 09:45 | 10/28/2023 09:15 | ☐ |
| 23102584-04 | SP 9 | Soil | | 10/24/2023 10:00 | 10/28/2023 09:15 | ☐ |
| 23102584-05 | TRIP BLANK | Soil | | 10/24/2023 | 10/28/2023 09:15 | ☐ |

# ALS Group, USA

*Date: 13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Work Order:** 23102584

## Case Narrative

The attached "Sample Receipt Checklist" documents the date of receipt, status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. A copy of the laboratory's scope of accreditation is available upon request.

Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

Any flags on MS/MSD samples not addressed in this narrative are unrelated to samples in this report.

With the following exceptions, all sample analyses achieved analytical criteria.

Batch 228202, Method SW7196A, Sample 23102584-03A MS/MSD: The MS/MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte: Hexavalent chromium.

Batch 228325, Method SW6020B, Sample 23102584-04A MS/MSD: The MS/MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Barium, Zinc.

Batch 228325, Method SW6020B, Sample 23102584-04A MS: The MS recovery was outside of the control limit. However, the MSD recovery and the RPD between the MS and MSD was in control. No qualification is required for this analyte: Lead.

**Client:** Mull Drilling Company
**Project:** MUSF 20
**WorkOrder:** **23102584**

# QUALIFIERS, ACRONYMS, UNITS

| Qualifier | Description |
|---|---|
| * | Value exceeds Regulatory Limit |
| ** | Estimated Value |
| a | Analyte is non-accredited |
| B | Analyte detected in the associated Method Blank above the Reporting Limit |
| E | Value above quantitation range |
| H | Analyzed outside of Holding Time |
| Hr | BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated. |
| J | Analyte is present at an estimated concentration between the MDL and Report Limit |
| n | Analyte accreditation is not offered |
| ND | Not Detected at the Reporting Limit |
| O | Sample amount is > 4 times amount spiked |
| P | Dual Column results percent difference > 40% |
| R | RPD above laboratory control limit |
| S | Spike Recovery outside laboratory control limits |
| U | Analyzed but not detected above the MDL |
| X | Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level. |

| Acronym | Description |
|---|---|
| DUP | Method Duplicate |
| LCS | Laboratory Control Sample |
| LCSD | Laboratory Control Sample Duplicate |
| LOD | Limit of Detection (see MDL) |
| LOQ | Limit of Quantitation (see PQL) |
| MBLK | Method Blank |
| MDL | Method Detection Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| PQL | Practical Quantitation Limit |
| RPD | Relative Percent Difference |
| TDL | Target Detection Limit |
| TNTC | Too Numerous To Count |
| A | APHA Standard Methods |
| D | ASTM |
| E | EPA |
| SW | SW-846 Update III |

| Units Reported | Description |
|---|---|
| % of sample | Percent of Sample |
| µg/Kg | Micrograms per Kilogram |
| µg/Kg-dry | Micrograms per Kilogram Dry Weight |
| mg/Kg-dry | Milligrams per Kilogram Dry Weight |
| mg/L | Milligrams per Liter |
| mmhos/cm @25°C | Millimhos-Centimeter at 25 Degrees Celcius |

none

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 3 4'
**Collection Date:** 10/24/2023 09:00 AM

**Work Order:** 23102584
**Lab ID:** 23102584-01
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **DIESEL RANGE ORGANICS BY GC-FID** | | | Method: **SW8015C** | | Prep: SW3546 / 11/3/23 | | Analyst: **SJB** |
| **ERO (C10-C36)** | **6.7** | J | **2.8** | **21** | **mg/Kg-dry** | 1 | 11/4/2023 06:14 |
| *Surr: 4-Terphenyl-d14* | *62.4* | | | *34-130* | *%REC* | 1 | 11/4/2023 06:14 |
| **GASOLINE RANGE ORGANICS BY GC-FID** | | | Method: **SW8015C** | | Prep: SW5035A / 10/30/23 | | Analyst: **SJB** |
| GRO (C6-C10) | U | | 5,600 | 6,000 | µg/Kg-dry | 1 | 10/30/2023 17:54 |
| *Surr: Toluene-d8* | *99.7* | | | *75-120* | *%REC* | 1 | 10/30/2023 17:54 |
| **METALS BY ICP-MS** | | | Method: **SW6020B** | | Prep: SW3050B / 11/1/23 | | Analyst: **STP** |
| **Arsenic** | **3.4** | | **0.035** | **0.29** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **Barium** | **130** | | **2.7** | **2.9** | **mg/Kg-dry** | 10 | 11/2/2023 17:10 |
| **Cadmium** | **0.044** | J | **0.018** | **0.12** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **Copper** | **5.7** | | **0.29** | **0.29** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **Lead** | **7.8** | | **0.14** | **0.29** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **Nickel** | **7.1** | | **0.15** | **0.29** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **Selenium** | **0.28** | J | **0.27** | **0.29** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| Silver | U | | 0.039 | 0.29 | mg/Kg-dry | 1 | 11/2/2023 00:58 |
| **Zinc** | **22** | | **0.58** | **0.59** | **mg/Kg-dry** | 1 | 11/2/2023 00:58 |
| **SOLUBLE CATIONS FOR SAR** | | | Method: **SW6020B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Calcium** | **53** | | **2.5** | **5.0** | **mg/L** | 10 | 11/6/2023 18:56 |
| **Magnesium** | **11** | | **0.50** | **2.0** | **mg/L** | 10 | 11/6/2023 18:56 |
| **Sodium** | **190** | | **1.8** | **2.0** | **mg/L** | 10 | 11/6/2023 18:56 |
| **HOT WATER SOLUBLE BORON BY ICP-MS** | | | Method: **SW6020B** | | Prep: EXTRACT / 10/31/23 | | Analyst: **DSC** |
| **Boron (Hot Water Soluble)** | **0.35** | J | **0.017** | **0.44** | **mg/Kg-dry** | 10 | 10/31/2023 19:06 |
| **SODIUM ADSORPTION RATIO** | | | Method: **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Sodium Adsorption Ratio** | **6.1** | | **0.010** | **0.010** | **none** | 1 | 11/6/2023 |
| **POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)** | | | Method: **SW8270E** | | Prep: SW3546 / 11/7/23 | | Analyst: **SMT** |
| 1-Methylnaphthalene | U | | 0.93 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| 2-Methylnaphthalene | U | | 1.1 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Acenaphthene | U | | 1.7 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Anthracene | U | | 0.83 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Benzo(a)anthracene | U | | 3.3 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Benzo(a)pyrene | U | | 3.1 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Benzo(b)fluoranthene | U | | 2.7 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Benzo(k)fluoranthene | U | | 0.68 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Chrysene | U | | 3.0 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 3 4'
**Collection Date:** 10/24/2023 09:00 AM

**Work Order:** 23102584
**Lab ID:** 23102584-01
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Dibenzo(a,h)anthracene | U | | 2.6 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Fluoranthene | U | | 2.3 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Fluorene | U | | 1.1 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Indeno(1,2,3-cd)pyrene | U | | 3.1 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Naphthalene | U | | 0.86 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| Pyrene | U | | 2.9 | 4.5 | µg/Kg-dry | 1 | 11/7/2023 17:51 |
| *Surr: 2-Fluorobiphenyl* | *90.5* | | | *20-140* | *%REC* | 1 | 11/7/2023 17:51 |
| *Surr: 4-Terphenyl-d14* | *88.3* | | | *22-172* | *%REC* | 1 | 11/7/2023 17:51 |
| *Surr: Nitrobenzene-d5* | *99.5* | | | *28-140* | *%REC* | 1 | 11/7/2023 17:51 |
| **VOLATILE ORGANIC COMPOUNDS - LOW LEVEL** | | Method: | **SW8260D** | | | | Analyst: **SBR** |
| 1,2,4-Trimethylbenzene | U | | 2.1 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| 1,3,5-Trimethylbenzene | U | | 1.9 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| Benzene | U | | 0.61 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| Ethylbenzene | U | | 1.0 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| m,p-Xylene | U | | 2.6 | 2.9 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| o-Xylene | U | | 1.4 | 2.9 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| Toluene | U | | 2.0 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| Xylenes, Total | U | | 2.6 | 5.8 | µg/Kg-dry | 1.06 | 11/7/2023 20:07 |
| *Surr: 1,2-Dichloroethane-d4* | *109* | | | *83-132* | *%REC* | 1.06 | 11/7/2023 20:07 |
| *Surr: 4-Bromofluorobenzene* | *99.6* | | | *83-111* | *%REC* | 1.06 | 11/7/2023 20:07 |
| *Surr: Dibromofluoromethane* | *108* | | | *77-125* | *%REC* | 1.06 | 11/7/2023 20:07 |
| *Surr: Toluene-d8* | *95.8* | | | *86-108* | *%REC* | 1.06 | 11/7/2023 20:07 |
| **ELECTRICAL CONDUCTIVITY (SAR)** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **Electrical Conductivity @ Saturation** | **1.4** | | **0.011** | **0.10** | **mmhos/cm @25°C** | 20 | 11/4/2023 11:30 |
| **CHROMIUM, HEXAVALENT** | | Method: | **SW7196A** | | Prep: SW3060A / 10/29/23 | | Analyst: **AXW** |
| Chromium, Hexavalent | U | | 0.88 | 1.0 | mg/Kg-dry | 1 | 11/3/2023 13:22 |
| **MOISTURE** | | Method: | **SW3550C** | | | | Analyst: **SGH** |
| **Moisture** | **9.3** | | **0.10** | **0.10** | **% of sample** | 1 | 10/31/2023 12:58 |
| **PH MEASURED IN SOIL PASTE** | | Method: | **USDA METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **pH @ Saturation** | **8.35** | | **0.11** | **0.11** | **s.u.-dry** | 1 | 11/4/2023 10:31 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 7
**Collection Date:** 10/24/2023 09:30 AM

**Work Order:** 23102584
**Lab ID:** 23102584-02
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **DIESEL RANGE ORGANICS BY GC-FID** | | Method: | **SW8015C** | | Prep: SW3546 / 11/3/23 | | Analyst: **SJB** |
| **ERO (C10-C36)** | **4.9** | J | **2.8** | **21** | **mg/Kg-dry** | 1 | 11/4/2023 07:50 |
| *Surr: 4-Terphenyl-d14* | *56.4* | | | *34-130* | *%REC* | 1 | 11/4/2023 07:50 |
| **GASOLINE RANGE ORGANICS BY GC-FID** | | Method: | **SW8015C** | | Prep: SW5035A / 10/30/23 | | Analyst: **SJB** |
| GRO (C6-C10) | U | | 6,000 | 6,400 | µg/Kg-dry | 1 | 10/30/2023 20:52 |
| *Surr: Toluene-d8* | *101* | | | *75-120* | *%REC* | 1 | 10/30/2023 20:52 |
| **METALS BY ICP-MS** | | Method: | **SW6020B** | | Prep: SW3050B / 11/1/23 | | Analyst: **STP** |
| **Arsenic** | **3.1** | | **0.036** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Barium** | **100** | | **0.28** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Cadmium** | **0.21** | | **0.018** | **0.12** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Copper** | **7.3** | | **0.30** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Lead** | **26** | | **0.15** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Nickel** | **7.7** | | **0.16** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **Selenium** | **0.51** | | **0.28** | **0.30** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| Silver | U | | 0.040 | 0.30 | mg/Kg-dry | 1 | 11/2/2023 01:00 |
| **Zinc** | **24** | | **0.59** | **0.61** | **mg/Kg-dry** | 1 | 11/2/2023 01:00 |
| **SOLUBLE CATIONS FOR SAR** | | Method: | **SW6020B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Calcium** | **110** | | **2.5** | **5.0** | **mg/L** | 10 | 11/6/2023 19:02 |
| **Magnesium** | **9.4** | | **0.50** | **2.0** | **mg/L** | 10 | 11/6/2023 19:02 |
| **Sodium** | **9.8** | | **1.8** | **2.0** | **mg/L** | 10 | 11/6/2023 19:02 |
| **HOT WATER SOLUBLE BORON BY ICP-MS** | | Method: | **SW6020B** | | Prep: EXTRACT / 10/31/23 | | Analyst: **DSC** |
| **Boron (Hot Water Soluble)** | **0.71** | | **0.017** | **0.42** | **mg/Kg-dry** | 10 | 10/31/2023 19:08 |
| **SODIUM ADSORPTION RATIO** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Sodium Adsorption Ratio** | **0.25** | | **0.010** | **0.010** | **none** | 1 | 11/6/2023 |
| **POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)** | | Method: | **SW8270E** | | Prep: SW3546 / 11/3/23 | | Analyst: **SMT** |
| 1-Methylnaphthalene | U | | 0.90 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| 2-Methylnaphthalene | U | | 1.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Acenaphthene | U | | 1.7 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Anthracene | U | | 0.80 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Benzo(a)anthracene | U | | 3.2 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Benzo(a)pyrene | U | | 3.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Benzo(b)fluoranthene | U | | 2.6 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Benzo(k)fluoranthene | U | | 0.66 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Chrysene | U | | 2.9 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 7
**Collection Date:** 10/24/2023 09:30 AM

**Work Order:** 23102584
**Lab ID:** 23102584-02
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Dibenzo(a,h)anthracene | U | | 2.6 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Fluoranthene | U | | 2.2 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Fluorene | U | | 1.1 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Indeno(1,2,3-cd)pyrene | U | | 3.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Naphthalene | U | | 0.83 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| Pyrene | U | | 2.8 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:30 |
| *Surr: 2-Fluorobiphenyl* | *84.4* | | | *20-140* | *%REC* | 1 | 11/3/2023 22:30 |
| *Surr: 4-Terphenyl-d14* | *76.5* | | | *22-172* | *%REC* | 1 | 11/3/2023 22:30 |
| *Surr: Nitrobenzene-d5* | *99.7* | | | *28-140* | *%REC* | 1 | 11/3/2023 22:30 |
| **VOLATILE ORGANIC COMPOUNDS - LOW LEVEL** | | Method: | **SW8260D** | | | | Analyst: **SBR** |
| 1,2,4-Trimethylbenzene | U | | 2.2 | 6.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| 1,3,5-Trimethylbenzene | U | | 1.9 | 6.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| **Benzene** | **2.4** | J | **0.63** | **6.0** | **µg/Kg-dry** | 1.14 | 11/7/2023 20:27 |
| Ethylbenzene | U | | 1.0 | 6.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| m,p-Xylene | U | | 2.7 | 3.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| o-Xylene | U | | 1.4 | 3.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| Toluene | U | | 2.1 | 6.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| Xylenes, Total | U | | 2.7 | 6.0 | µg/Kg-dry | 1.14 | 11/7/2023 20:27 |
| *Surr: 1,2-Dichloroethane-d4* | *114* | | | *83-132* | *%REC* | 1.14 | 11/7/2023 20:27 |
| *Surr: 4-Bromofluorobenzene* | *102* | | | *83-111* | *%REC* | 1.14 | 11/7/2023 20:27 |
| *Surr: Dibromofluoromethane* | *108* | | | *77-125* | *%REC* | 1.14 | 11/7/2023 20:27 |
| *Surr: Toluene-d8* | *95.9* | | | *86-108* | *%REC* | 1.14 | 11/7/2023 20:27 |
| **ELECTRICAL CONDUCTIVITY (SAR)** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **Electrical Conductivity @ Saturation** | **0.80** | | **0.011** | **0.10** | **mmhos/cm @25°C** | 20 | 11/4/2023 11:30 |
| **CHROMIUM, HEXAVALENT** | | Method: | **SW7196A** | | Prep: SW3060A / 10/29/23 | | Analyst: **AXW** |
| Chromium, Hexavalent | U | | 0.85 | 1.0 | mg/Kg-dry | 1 | 11/3/2023 13:22 |
| **MOISTURE** | | Method: | **SW3550C** | | | | Analyst: **SGH** |
| **Moisture** | **5.5** | | **0.10** | **0.10** | **% of sample** | 1 | 10/31/2023 12:58 |
| **PH MEASURED IN SOIL PASTE** | | Method: | **USDA METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **pH @ Saturation** | **8.10** | | **0.11** | **0.11** | **s.u.-dry** | 1 | 11/4/2023 10:31 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 8
**Collection Date:** 10/24/2023 09:45 AM

**Work Order:** 23102584
**Lab ID:** 23102584-03
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **DIESEL RANGE ORGANICS BY GC-FID** | | Method: **SW8015C** | | | Prep: SW3546 / 11/3/23 | | Analyst: **SJB** |
| **ERO (C10-C36)** | **34** | | **2.8** | **21** | **mg/Kg-dry** | 1 | 11/4/2023 08:27 |
| *Surr: 4-Terphenyl-d14* | *42.3* | | | *34-130* | *%REC* | 1 | 11/4/2023 08:27 |
| **GASOLINE RANGE ORGANICS BY GC-FID** | | Method: **SW8015C** | | | Prep: SW5035A / 10/30/23 | | Analyst: **SJB** |
| GRO (C6-C10) | U | | 5,500 | 5,900 | µg/Kg-dry | 1 | 10/30/2023 21:14 |
| *Surr: Toluene-d8* | *104* | | | *75-120* | *%REC* | 1 | 10/30/2023 21:14 |
| **METALS BY ICP-MS** | | Method: **SW6020B** | | | Prep: SW3050B / 11/1/23 | | Analyst: **STP** |
| **Arsenic** | **3.2** | | **0.040** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Barium** | **93** | | **0.30** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Cadmium** | **0.19** | | **0.020** | **0.13** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Copper** | **7.2** | | **0.33** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Lead** | **21** | | **0.16** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Nickel** | **7.8** | | **0.17** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **Selenium** | **0.63** | | **0.30** | **0.33** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| Silver | U | | 0.044 | 0.33 | mg/Kg-dry | 1 | 11/2/2023 01:01 |
| **Zinc** | **24** | | **0.65** | **0.66** | **mg/Kg-dry** | 1 | 11/2/2023 01:01 |
| **SOLUBLE CATIONS FOR SAR** | | Method: **SW6020B** | | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Calcium** | **1,400** | | **2.5** | **5.0** | **mg/L** | 10 | 11/6/2023 19:03 |
| **Magnesium** | **110** | | **0.50** | **2.0** | **mg/L** | 10 | 11/6/2023 19:03 |
| **Sodium** | **600** | | **1.8** | **2.0** | **mg/L** | 10 | 11/6/2023 19:03 |
| **HOT WATER SOLUBLE BORON BY ICP-MS** | | Method: **SW6020B** | | | Prep: EXTRACT / 10/31/23 | | Analyst: **DSC** |
| **Boron (Hot Water Soluble)** | **0.47** | | **0.017** | **0.42** | **mg/Kg-dry** | 10 | 10/31/2023 19:10 |
| **SODIUM ADSORPTION RATIO** | | Method: **USDA H60 METHOD 20B** | | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Sodium Adsorption Ratio** | **4.2** | | **0.010** | **0.010** | **none** | 1 | 11/6/2023 |
| **POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)** | | Method: **SW8270E** | | | Prep: SW3546 / 11/3/23 | | Analyst: **SMT** |
| 1-Methylnaphthalene | U | | 0.90 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| 2-Methylnaphthalene | U | | 1.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Acenaphthene | U | | 1.7 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Anthracene | U | | 0.80 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Benzo(a)anthracene | U | | 3.2 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Benzo(a)pyrene | U | | 3.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Benzo(b)fluoranthene | U | | 2.6 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Benzo(k)fluoranthene | U | | 0.66 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Chrysene | U | | 2.9 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 8
**Collection Date:** 10/24/2023 09:45 AM

**Work Order:** 23102584
**Lab ID:** 23102584-03
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Dibenzo(a,h)anthracene | U | | 2.5 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Fluoranthene | U | | 2.2 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Fluorene | U | | 1.1 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Indeno(1,2,3-cd)pyrene | U | | 3.0 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Naphthalene | U | | 0.83 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| Pyrene | U | | 2.8 | 4.4 | µg/Kg-dry | 1 | 11/3/2023 22:46 |
| *Surr: 2-Fluorobiphenyl* | *66.0* | | | *20-140* | *%REC* | 1 | 11/3/2023 22:46 |
| *Surr: 4-Terphenyl-d14* | *57.3* | | | *22-172* | *%REC* | 1 | 11/3/2023 22:46 |
| *Surr: Nitrobenzene-d5* | *71.9* | | | *28-140* | *%REC* | 1 | 11/3/2023 22:46 |
| **VOLATILE ORGANIC COMPOUNDS - LOW LEVEL** | | Method: | **SW8260D** | | | | Analyst: **SBR** |
| 1,2,4-Trimethylbenzene | U | | 2.1 | 5.8 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| 1,3,5-Trimethylbenzene | U | | 1.9 | 5.8 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| **Benzene** | **2.7** | J | **0.61** | **5.8** | **µg/Kg-dry** | 1.1 | 11/7/2023 20:47 |
| Ethylbenzene | U | | 1.0 | 5.8 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| m,p-Xylene | U | | 2.6 | 2.9 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| o-Xylene | U | | 1.4 | 2.9 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| Toluene | U | | 2.0 | 5.8 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| Xylenes, Total | U | | 2.6 | 5.8 | µg/Kg-dry | 1.1 | 11/7/2023 20:47 |
| *Surr: 1,2-Dichloroethane-d4* | *116* | | | *83-132* | *%REC* | 1.1 | 11/7/2023 20:47 |
| *Surr: 4-Bromofluorobenzene* | *101* | | | *83-111* | *%REC* | 1.1 | 11/7/2023 20:47 |
| *Surr: Dibromofluoromethane* | *109* | | | *77-125* | *%REC* | 1.1 | 11/7/2023 20:47 |
| *Surr: Toluene-d8* | *95.2* | | | *86-108* | *%REC* | 1.1 | 11/7/2023 20:47 |
| **ELECTRICAL CONDUCTIVITY (SAR)** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **Electrical Conductivity @ Saturation** | **11** | | **0.011** | **0.10** | **mmhos/cm @25°C** | 20 | 11/4/2023 11:30 |
| **CHROMIUM, HEXAVALENT** | | Method: | **SW7196A** | | Prep: SW3060A / 10/29/23 | | Analyst: **AXW** |
| Chromium, Hexavalent | U | | 0.88 | 1.0 | mg/Kg-dry | 1 | 11/3/2023 13:22 |
| **MOISTURE** | | Method: | **SW3550C** | | | | Analyst: **SGH** |
| **Moisture** | **5.7** | | **0.10** | **0.10** | **% of sample** | 1 | 10/31/2023 12:58 |
| **PH MEASURED IN SOIL PASTE** | | Method: | **USDA METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **pH @ Saturation** | **7.29** | | **0.11** | **0.11** | **s.u.-dry** | 1 | 11/4/2023 10:31 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 9
**Collection Date:** 10/24/2023 10:00 AM

**Work Order:** 23102584
**Lab ID:** 23102584-04
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **DIESEL RANGE ORGANICS BY GC-FID** | | Method: | **SW8015C** | | Prep: SW3546 / 11/3/23 | | Analyst: **SJB** |
| **ERO (C10-C36)** | **12** | J | **2.7** | **21** | **mg/Kg-dry** | 1 | 11/4/2023 09:04 |
| *Surr: 4-Terphenyl-d14* | *46.3* | | | *34-130* | *%REC* | 1 | 11/4/2023 09:04 |
| **GASOLINE RANGE ORGANICS BY GC-FID** | | Method: | **SW8015C** | | Prep: SW5035A / 10/30/23 | | Analyst: **SJB** |
| GRO (C6-C10) | U | | 4,300 | 4,600 | µg/Kg-dry | 1 | 10/31/2023 00:57 |
| *Surr: Toluene-d8* | *102* | | | *75-120* | *%REC* | 1 | 10/31/2023 00:57 |
| **METALS BY ICP-MS** | | Method: | **SW6020B** | | Prep: SW3050B / 11/1/23 | | Analyst: **STP** |
| **Arsenic** | **3.3** | | **0.032** | **0.27** | **mg/Kg-dry** | 1 | 11/2/2023 01:03 |
| **Barium** | **95** | | **2.5** | **2.7** | **mg/Kg-dry** | 10 | 11/2/2023 17:12 |
| **Cadmium** | **0.13** | | **0.016** | **0.11** | **mg/Kg-dry** | 1 | 11/2/2023 01:03 |
| **Copper** | **8.4** | | **2.7** | **2.7** | **mg/Kg-dry** | 10 | 11/2/2023 17:12 |
| **Lead** | **15** | | **1.3** | **2.7** | **mg/Kg-dry** | 10 | 11/2/2023 17:12 |
| **Nickel** | **6.8** | | **0.14** | **0.27** | **mg/Kg-dry** | 1 | 11/2/2023 01:03 |
| **Selenium** | **0.43** | | **0.25** | **0.27** | **mg/Kg-dry** | 1 | 11/2/2023 01:03 |
| Silver | U | | 0.035 | 0.27 | mg/Kg-dry | 1 | 11/2/2023 01:03 |
| **Zinc** | **24** | | **0.52** | **0.53** | **mg/Kg-dry** | 1 | 11/2/2023 01:03 |
| **SOLUBLE CATIONS FOR SAR** | | Method: | **SW6020B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Calcium** | **350** | | **2.5** | **5.0** | **mg/L** | 10 | 11/6/2023 19:05 |
| **Magnesium** | **30** | | **0.50** | **2.0** | **mg/L** | 10 | 11/6/2023 19:05 |
| **Sodium** | **90** | | **1.8** | **2.0** | **mg/L** | 10 | 11/6/2023 19:05 |
| **HOT WATER SOLUBLE BORON BY ICP-MS** | | Method: | **SW6020B** | | Prep: EXTRACT / 10/31/23 | | Analyst: **DSC** |
| **Boron (Hot Water Soluble)** | **0.48** | | **0.016** | **0.41** | **mg/Kg-dry** | 10 | 10/31/2023 19:11 |
| **SODIUM ADSORPTION RATIO** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **STP** |
| **Sodium Adsorption Ratio** | **1.2** | | **0.010** | **0.010** | **none** | 1 | 11/6/2023 |
| **POLYNUCLEAR AROMATIC HYDROCARBONS (SIM)** | | Method: | **SW8270E** | | Prep: SW3546 / 11/3/23 | | Analyst: **SMT** |
| 1-Methylnaphthalene | U | | 0.88 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| 2-Methylnaphthalene | U | | 1.0 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Acenaphthene | U | | 1.6 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Anthracene | U | | 0.78 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Benzo(a)anthracene | U | | 3.1 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Benzo(a)pyrene | U | | 2.9 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Benzo(b)fluoranthene | U | | 2.6 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Benzo(k)fluoranthene | U | | 0.65 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Chrysene | U | | 2.8 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** SP 9
**Collection Date:** 10/24/2023 10:00 AM

**Work Order:** 23102584
**Lab ID:** 23102584-04
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| Dibenzo(a,h)anthracene | U | | 2.5 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Fluoranthene | U | | 2.2 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Fluorene | U | | 1.1 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Indeno(1,2,3-cd)pyrene | U | | 3.0 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Naphthalene | U | | 0.81 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| Pyrene | U | | 2.7 | 4.3 | µg/Kg-dry | 1 | 11/3/2023 23:01 |
| *Surr: 2-Fluorobiphenyl* | *66.0* | | | *20-140* | *%REC* | 1 | 11/3/2023 23:01 |
| *Surr: 4-Terphenyl-d14* | *61.2* | | | *22-172* | *%REC* | 1 | 11/3/2023 23:01 |
| *Surr: Nitrobenzene-d5* | *78.2* | | | *28-140* | *%REC* | 1 | 11/3/2023 23:01 |
| **VOLATILE ORGANIC COMPOUNDS - LOW LEVEL** | | Method: | **SW8260D** | | | | Analyst: **SBR** |
| 1,2,4-Trimethylbenzene | U | | 1.8 | 5.0 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| 1,3,5-Trimethylbenzene | U | | 1.6 | 5.0 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| **Benzene** | **1.6** | J | **0.52** | **5.0** | **µg/Kg-dry** | 0.965 | 11/7/2023 21:17 |
| Ethylbenzene | U | | 0.87 | 5.0 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| m,p-Xylene | U | | 2.2 | 2.5 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| o-Xylene | U | | 1.2 | 2.5 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| Toluene | U | | 1.7 | 5.0 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| Xylenes, Total | U | | 2.2 | 5.0 | µg/Kg-dry | 0.965 | 11/7/2023 21:17 |
| *Surr: 1,2-Dichloroethane-d4* | *113* | | | *83-132* | *%REC* | 0.965 | 11/7/2023 21:17 |
| *Surr: 4-Bromofluorobenzene* | *104* | | | *83-111* | *%REC* | 0.965 | 11/7/2023 21:17 |
| *Surr: Dibromofluoromethane* | *108* | | | *77-125* | *%REC* | 0.965 | 11/7/2023 21:17 |
| *Surr: Toluene-d8* | *97.0* | | | *86-108* | *%REC* | 0.965 | 11/7/2023 21:17 |
| **ELECTRICAL CONDUCTIVITY (SAR)** | | Method: | **USDA H60 METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **Electrical Conductivity @ Saturation** | **3.0** | | **0.011** | **0.10** | **mmhos/cm @25°C** | 20 | 11/4/2023 11:30 |
| **CHROMIUM, HEXAVALENT** | | Method: | **SW7196A** | | Prep: SW3060A / 10/29/23 | | Analyst: **AXW** |
| Chromium, Hexavalent | U | | 0.87 | 1.0 | mg/Kg-dry | 1 | 11/3/2023 13:22 |
| **MOISTURE** | | Method: | **SW3550C** | | | | Analyst: **SGH** |
| **Moisture** | **3.6** | | **0.10** | **0.10** | **% of sample** | 1 | 10/31/2023 12:58 |
| **PH MEASURED IN SOIL PASTE** | | Method: | **USDA METHOD 20B** | | Prep: USDA Method 20B / 11/3/23 | | Analyst: **CLJ** |
| **pH @ Saturation** | **7.22** | | **0.10** | **0.10** | **s.u.-dry** | 1 | 11/4/2023 10:31 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

**Date:** *13-Nov-23*

**Client:** Mull Drilling Company
**Project:** MUSF 20
**Sample ID:** TRIP BLANK
**Collection Date:** 10/24/2023

**Work Order:** 23102584
**Lab ID:** 23102584-05
**Matrix:** SOIL

| Analyses | Result | Qual | MDL | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|---|
| **VOLATILE ORGANIC COMPOUNDS - LOW LEVEL** | | Method: **SW8260D** | | | | | Analyst: **SBR** |
| 1,2,4-Trimethylbenzene | U | | 1.8 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| 1,3,5-Trimethylbenzene | U | | 1.6 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| Benzene | U | | 0.52 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| Ethylbenzene | U | | 0.87 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| m,p-Xylene | U | | 2.2 | 2.5 | µg/Kg | 1 | 11/3/2023 12:28 |
| o-Xylene | U | | 1.2 | 2.5 | µg/Kg | 1 | 11/3/2023 12:28 |
| Toluene | U | | 1.7 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| Xylenes, Total | U | | 2.2 | 5.0 | µg/Kg | 1 | 11/3/2023 12:28 |
| *Surr: 1,2-Dichloroethane-d4* | *104* | | | *83-132* | *%REC* | 1 | 11/3/2023 12:28 |
| *Surr: 4-Bromofluorobenzene* | *97.0* | | | *83-111* | *%REC* | 1 | 11/3/2023 12:28 |
| *Surr: Dibromofluoromethane* | *112* | | | *77-125* | *%REC* | 1 | 11/3/2023 12:28 |
| *Surr: Toluene-d8* | *95.6* | | | *86-108* | *%REC* | 1 | 11/3/2023 12:28 |

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 13-Nov-23

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228541** Instrument ID **GC8** Method: **SW8015C**

**MBLK** Sample ID: **DBLKS1-228541-228541** Units: **mg/Kg** Analysis Date: **11/4/2023 01:56 AM**

Client ID: Run ID: **GC8_231102A** SeqNo: **10170392** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| ERO (C10-C36) | 4.95 | 20 | | | | | | | | J |
| *Surr: 4-Terphenyl-d14* | *0.4833* | 0 | *0.828* | 0 | *58.4* | *34-130* | 0 | | | |

**LCS** Sample ID: **DLCSS1-228541-228541** Units: **mg/Kg** Analysis Date: **11/4/2023 02:33 AM**

Client ID: Run ID: **GC8_231102A** SeqNo: **10170393** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| ERO (C10-C36) | 708.6 | 20 | 833 | 0 | 85.1 | 50-150 | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *0.5833* | 0 | *0.828* | 0 | *70.5* | *34-130* | 0 | | | |

**MS** Sample ID: **23102586-10A MS** Units: **mg/Kg** Analysis Date: **11/4/2023 03:09 AM**

Client ID: Run ID: **GC8_231102A** SeqNo: **10170394** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| ERO (C10-C36) | 768.5 | 20 | 828 | 35.01 | 88.6 | 50-150 | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *0.4805* | 0 | *0.8231* | 0 | *58.4* | *34-130* | 0 | | | |

**MSD** Sample ID: **23102586-10A MSD** Units: **mg/Kg** Analysis Date: **11/4/2023 03:46 AM**

Client ID: Run ID: **GC8_231102A** SeqNo: **10170395** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| ERO (C10-C36) | 219.6 | 20 | 815.1 | 35.01 | 22.6 | 50-150 | 768.5 | 111 | 30 | SR |
| *Surr: 4-Terphenyl-d14* | *0.1631* | 0 | *0.8102* | 0 | *20.1* | *34-130* | 0.4805 | *98.6* | *30* | *SR* |

**The following samples were analyzed in this batch:**

23102584-01A 23102584-02A 23102584-03A
23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228231** Instrument ID **GC9** Method: **SW8015C**

**MBLK** Sample ID: **MBLK-228231-228231** Units: **µg/Kg-dry** Analysis Date: **10/30/2023 08:07 PM**
Client ID: Run ID: **GC9_231030A** SeqNo: **10149884** Prep Date: **10/30/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| GRO (C6-C10) | U | 5,000 | 0 | 0 | 0 | | 0 | | | |
| *Surr: Toluene-d8* | *5032* | 0 | *5000* | 0 | *101* | *75-120* | 0 | | | |

**LCS** Sample ID: **LCS-228231-228231** Units: **µg/Kg-dry** Analysis Date: **10/30/2023 07:23 PM**
Client ID: Run ID: **GC9_231030A** SeqNo: **10149883** Prep Date: **10/30/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| GRO (C6-C10) | 246100 | 5,000 | 250000 | 0 | 98.4 | 63-126 | 0 | | | |
| *Surr: Toluene-d8* | *5507* | 0 | *5000* | 0 | *110* | *75-120* | 0 | | | |

**MS** Sample ID: **23102410-01B MS** Units: **µg/Kg-dry** Analysis Date: **10/30/2023 09:36 PM**
Client ID: Run ID: **GC9_231030A** SeqNo: **10149888** Prep Date: **10/30/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| GRO (C6-C10) | 507300 | 7,900 | 395500 | 0 | 128 | 63-126 | 0 | | | S |
| *Surr: Toluene-d8* | *9253* | 0 | *7911* | 0 | *117* | *75-120* | 0 | | | |

**MSD** Sample ID: **23102410-01B MSD** Units: **µg/Kg-dry** Analysis Date: **10/30/2023 09:59 PM**
Client ID: Run ID: **GC9_231030A** SeqNo: **10149889** Prep Date: **10/30/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| GRO (C6-C10) | 500300 | 7,900 | 395500 | 0 | 126 | 63-126 | 507300 | 1.39 | 30 | S |
| *Surr: Toluene-d8* | *9083* | 0 | *7911* | 0 | *115* | *75-120* | 9253 | *1.86* | *30* | |

**The following samples were analyzed in this batch:**

| | | |
|---|---|---|
| 23102584-01C | 23102584-02C | 23102584-03C |
| 23102584-04C | 23102584-05A | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228324** Instrument ID **ICPMS3** Method: **SW6020B**

**MBLK** Sample ID: **MBLK-228324-228324** Units: **mg/Kg** Analysis Date: **10/31/2023 07:03 PM**

Client ID: Run ID: **ICPMS3_231031B** SeqNo: **10150557** Prep Date: **10/31/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron (Hot Water Soluble) | 0.008178 | 0.040 | | | | | | | | J |

**LCS** Sample ID: **LCS-228324-228324** Units: **mg/Kg** Analysis Date: **10/31/2023 07:04 PM**

Client ID: Run ID: **ICPMS3_231031B** SeqNo: **10150558** Prep Date: **10/31/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Boron (Hot Water Soluble) | 0.8744 | 0.040 | 1 | 0 | 87.4 | 80-120 | | 0 | | |

**The following samples were analyzed in this batch:**

23102584-01A 23102584-02A 23102584-03A
23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228325** Instrument ID **ICPMS3** Method: **SW6020B**

**MBLK** Sample ID: **MBLK-228325-228325** Units: **mg/Kg** Analysis Date: **11/2/2023 12:54 AM**

Client ID: Run ID: **ICPMS3_231101B** SeqNo: **10155948** Prep Date: **11/1/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | U | 0.25 | | | | | | | | |
| Barium | U | 0.25 | | | | | | | | |
| Cadmium | U | 0.10 | | | | | | | | |
| Copper | U | 0.25 | | | | | | | | |
| Lead | U | 0.25 | | | | | | | | |
| Nickel | U | 0.25 | | | | | | | | |
| Selenium | U | 0.25 | | | | | | | | |
| Silver | U | 0.25 | | | | | | | | |
| Zinc | U | 0.50 | | | | | | | | |

**LCS** Sample ID: **LCS-228325-228325** Units: **mg/Kg** Analysis Date: **11/2/2023 12:56 AM**

Client ID: Run ID: **ICPMS3_231101B** SeqNo: **10155949** Prep Date: **11/1/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 5.136 | 0.25 | 5 | 0 | 103 | 80-120 | 0 | | | |
| Barium | 5.163 | 0.25 | 5 | 0 | 103 | 80-120 | 0 | | | |
| Cadmium | 4.945 | 0.10 | 5 | 0 | 98.9 | 80-120 | 0 | | | |
| Copper | 5.179 | 0.25 | 5 | 0 | 104 | 80-120 | 0 | | | |
| Lead | 5.209 | 0.25 | 5 | 0 | 104 | 80-120 | 0 | | | |
| Nickel | 5.239 | 0.25 | 5 | 0 | 105 | 80-120 | 0 | | | |
| Selenium | 5.103 | 0.25 | 5 | 0 | 102 | 80-120 | 0 | | | |
| Silver | 5.035 | 0.25 | 5 | 0 | 101 | 80-120 | 0 | | | |
| Zinc | 5.044 | 0.50 | 5 | 0 | 101 | 80-120 | 0 | | | |

**MS** Sample ID: **23102584-04AMS** Units: **mg/Kg** Analysis Date: **11/2/2023 01:05 AM**

Client ID: **SP 9** Run ID: **ICPMS3_231101B** SeqNo: **10155954** Prep Date: **11/1/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7.534 | 0.26 | 5.16 | 3.185 | 84.3 | 75-125 | 0 | | | |
| Cadmium | 4.243 | 0.10 | 5.16 | 0.1231 | 79.8 | 75-125 | 0 | | | |
| Nickel | 10.84 | 0.26 | 5.16 | 6.581 | 82.6 | 75-125 | 0 | | | |
| Selenium | 4.696 | 0.26 | 5.16 | 0.4143 | 83 | 75-125 | 0 | | | |
| Silver | 4.185 | 0.26 | 5.16 | 0.02433 | 80.6 | 75-125 | 0 | | | |
| Zinc | 33.08 | 0.52 | 5.16 | 23.13 | 193 | 75-125 | 0 | | | SO |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228325** Instrument ID **ICPMS3** Method: **SW6020B**

**MS** Sample ID: **23102584-04AMS** Units: **mg/Kg** Analysis Date: **11/2/2023 05:14 PM**

Client ID: **SP 9** Run ID: **ICPMS3_231102B** SeqNo: **10159927** Prep Date: **11/1/2023** DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 92.48 | 2.6 | 5.16 | 91.54 | 18.3 | 75-125 | 0 | | | SO |
| Copper | 12.77 | 2.6 | 5.16 | 8.111 | 90.2 | 75-125 | 0 | | | |
| Lead | 22.42 | 2.6 | 5.16 | 14.92 | 146 | 75-125 | 0 | | | S |

**MSD** Sample ID: **23102584-04AMSD** Units: **mg/Kg** Analysis Date: **11/2/2023 01:07 AM**

Client ID: **SP 9** Run ID: **ICPMS3_231101B** SeqNo: **10155955** Prep Date: **11/1/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7.624 | 0.27 | 5.336 | 3.185 | 83.2 | 75-125 | 7.534 | 1.18 | 20 | |
| Cadmium | 4.435 | 0.11 | 5.336 | 0.1231 | 80.8 | 75-125 | 4.243 | 4.44 | 20 | |
| Nickel | 11.08 | 0.27 | 5.336 | 6.581 | 84.2 | 75-125 | 10.84 | 2.11 | 20 | |
| Selenium | 4.88 | 0.27 | 5.336 | 0.4143 | 83.7 | 75-125 | 4.696 | 3.83 | 20 | |
| Silver | 4.336 | 0.27 | 5.336 | 0.02433 | 80.8 | 75-125 | 4.185 | 3.54 | 20 | |
| Zinc | 27.31 | 0.53 | 5.336 | 23.13 | 78.3 | 75-125 | 33.08 | 19.1 | 20 | O |

**MSD** Sample ID: **23102584-04AMSD** Units: **mg/Kg** Analysis Date: **11/2/2023 05:15 PM**

Client ID: **SP 9** Run ID: **ICPMS3_231102B** SeqNo: **10159928** Prep Date: **11/1/2023** DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 92.22 | 2.7 | 5.336 | 91.54 | 12.7 | 75-125 | 92.48 | 0.287 | 20 | SO |
| Copper | 13.1 | 2.7 | 5.336 | 8.111 | 93.5 | 75-125 | 12.77 | 2.58 | 20 | |
| Lead | 19.34 | 2.7 | 5.336 | 14.92 | 82.9 | 75-125 | 22.42 | 14.8 | 20 | |

**The following samples were analyzed in this batch:**

23102584-01A 23102584-02A 23102584-03A
23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228580** Instrument ID **ICPMS3** Method: **SW6020B**

**DUP** Sample ID: **23102586-11ADUP** Units: **mg/L** Analysis Date: **11/6/2023 07:15 PM**

Client ID: Run ID: **ICPMS3_231106A** SeqNo: **10172364** Prep Date: **11/3/2023** DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 48.69 | 5.0 | 0 | 0 | 0 | 0-0 | 107.7 | 75.5 | | |
| Magnesium | 8.539 | 2.0 | 0 | 0 | 0 | 0-0 | 11.41 | 28.8 | | |
| Sodium | 69.27 | 2.0 | 0 | 0 | 0 | 0-0 | 81.06 | 15.7 | | |

**The following samples were analyzed in this batch:** 23102584-01A 23102584-02A 23102584-03A 23102584-04A

Batch ID: **228580** Instrument ID **SAR** Method: **USDA H60 Metho**

**DUP** Sample ID: **23102586-11ADUP** Units: **none** Analysis Date: **11/6/2023**

Client ID: Run ID: **SAR_231106B** SeqNo: **10172848** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Sodium Adsorption Ratio | 2.408 | 0.010 | 0 | 0 | 0 | | 1.985 | 19.3 | 50 | |

**The following samples were analyzed in this batch:** 23102584-01A 23102584-02A 23102584-03A 23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228540** Instrument ID **SVMS6** Method: **SW8270E**

**MBLK** Sample ID: **SBLKS1-228540-228540** Units: **µg/Kg** Analysis Date: **11/3/2023 01:58 PM**

Client ID: Run ID: **SVMS6_231103A** SeqNo: **10168530** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | U | 4.2 | | | | | | | | |
| 2-Methylnaphthalene | U | 4.2 | | | | | | | | |
| Acenaphthene | U | 4.2 | | | | | | | | |
| Anthracene | U | 4.2 | | | | | | | | |
| Benzo(a)anthracene | U | 4.2 | | | | | | | | |
| Benzo(a)pyrene | U | 4.2 | | | | | | | | |
| Benzo(b)fluoranthene | U | 4.2 | | | | | | | | |
| Benzo(k)fluoranthene | U | 4.2 | | | | | | | | |
| Chrysene | U | 4.2 | | | | | | | | |
| Dibenzo(a,h)anthracene | U | 4.2 | | | | | | | | |
| Fluoranthene | U | 4.2 | | | | | | | | |
| Fluorene | U | 4.2 | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | U | 4.2 | | | | | | | | |
| Naphthalene | U | 4.2 | | | | | | | | |
| Pyrene | U | 4.2 | | | | | | | | |
| *Surr: 2-Fluorobiphenyl* | *564.7* | 0 | *666.6* | 0 | *84.7* | *20-140* | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *555* | 0 | *666.6* | 0 | *83.3* | *22-172* | 0 | | | |
| *Surr: Nitrobenzene-d5* | *673.6* | 0 | *666.6* | 0 | *101* | *28-140* | 0 | | | |

**LCS** Sample ID: **SLCSS1-228540-228540** Units: **µg/Kg** Analysis Date: **11/3/2023 02:29 PM**

Client ID: Run ID: **SVMS6_231103A** SeqNo: **10168533** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 628.4 | 4.2 | 666.6 | 0 | 94.3 | 40-140 | 0 | | | |
| 2-Methylnaphthalene | 829.7 | 4.2 | 666.6 | 0 | 124 | 40-140 | 0 | | | |
| Acenaphthene | 667.9 | 4.2 | 666.6 | 0 | 100 | 40-140 | 0 | | | |
| Anthracene | 692.6 | 4.2 | 666.6 | 0 | 104 | 40-140 | 0 | | | |
| Benzo(a)anthracene | 645.8 | 4.2 | 666.6 | 0 | 96.9 | 40-140 | 0 | | | |
| Benzo(a)pyrene | 651 | 4.2 | 666.6 | 0 | 97.7 | 40-140 | 0 | | | |
| Benzo(b)fluoranthene | 585.2 | 4.2 | 666.6 | 0 | 87.8 | 40-140 | 0 | | | |
| Benzo(k)fluoranthene | 610.6 | 4.2 | 666.6 | 0 | 91.6 | 40-140 | 0 | | | |
| Chrysene | 693.3 | 4.2 | 666.6 | 0 | 104 | 40-140 | 0 | | | |
| Dibenzo(a,h)anthracene | 586.4 | 4.2 | 666.6 | 0 | 88 | 40-140 | 0 | | | |
| Fluoranthene | 698.8 | 4.2 | 666.6 | 0 | 105 | 40-140 | 0 | | | |
| Fluorene | 629.4 | 4.2 | 666.6 | 0 | 94.4 | 40-140 | 0 | | | |
| Indeno(1,2,3-cd)pyrene | 593.3 | 4.2 | 666.6 | 0 | 89 | 40-140 | 0 | | | |
| Naphthalene | 697.3 | 4.2 | 666.6 | 0 | 105 | 40-140 | 0 | | | |
| Pyrene | 647.9 | 4.2 | 666.6 | 0 | 97.2 | 40-140 | 0 | | | |
| *Surr: 2-Fluorobiphenyl* | *534.1* | 0 | *666.6* | 0 | *80.1* | *20-140* | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *534.8* | 0 | *666.6* | 0 | *80.2* | *22-172* | 0 | | | |
| *Surr: Nitrobenzene-d5* | *600.6* | 0 | *666.6* | 0 | *90.1* | *28-140* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228540** Instrument ID **SVMS6** Method: **SW8270E**

**The following samples were analyzed in this batch:**

| | | |
|---|---|---|
| 23102584-01A | 23102584-02A | 23102584-03A |
| 23102584-04A | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228716** Instrument ID **SVMS6** Method: **SW8270E**

**MBLK** Sample ID: **SBLKS1-228716-228716** Units: **µg/Kg** Analysis Date: **11/7/2023 04:02 PM**

Client ID: Run ID: **SVMS6_231107A** SeqNo: **10176763** Prep Date: **11/7/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | U | 4.2 | | | | | | | | |
| 2-Methylnaphthalene | U | 4.2 | | | | | | | | |
| Acenaphthene | U | 4.2 | | | | | | | | |
| Anthracene | U | 4.2 | | | | | | | | |
| Benzo(a)anthracene | U | 4.2 | | | | | | | | |
| Benzo(a)pyrene | U | 4.2 | | | | | | | | |
| Benzo(b)fluoranthene | U | 4.2 | | | | | | | | |
| Benzo(k)fluoranthene | U | 4.2 | | | | | | | | |
| Chrysene | U | 4.2 | | | | | | | | |
| Dibenzo(a,h)anthracene | U | 4.2 | | | | | | | | |
| Fluoranthene | U | 4.2 | | | | | | | | |
| Fluorene | U | 4.2 | | | | | | | | |
| Indeno(1,2,3-cd)pyrene | U | 4.2 | | | | | | | | |
| Naphthalene | U | 4.2 | | | | | | | | |
| Pyrene | U | 4.2 | | | | | | | | |
| *Surr: 2-Fluorobiphenyl* | *595.8* | 0 | *666.6* | 0 | *89.4* | *20-140* | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *525.5* | 0 | *666.6* | 0 | *78.8* | *22-172* | 0 | | | |
| *Surr: Nitrobenzene-d5* | *701* | 0 | *666.6* | 0 | *105* | *28-140* | 0 | | | |

**LCS** Sample ID: **SLCSS1-228716-228716** Units: **µg/Kg** Analysis Date: **11/7/2023 04:49 PM**

Client ID: Run ID: **SVMS6_231107A** SeqNo: **10176764** Prep Date: **11/7/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 751.1 | 4.2 | 666.6 | 0 | 113 | 40-140 | 0 | | | |
| 2-Methylnaphthalene | 800.7 | 4.2 | 666.6 | 0 | 120 | 40-140 | 0 | | | |
| Acenaphthene | 792.5 | 4.2 | 666.6 | 0 | 119 | 40-140 | 0 | | | |
| Anthracene | 804.1 | 4.2 | 666.6 | 0 | 121 | 40-140 | 0 | | | |
| Benzo(a)anthracene | 710.7 | 4.2 | 666.6 | 0 | 107 | 40-140 | 0 | | | |
| Benzo(a)pyrene | 727 | 4.2 | 666.6 | 0 | 109 | 40-140 | 0 | | | |
| Benzo(b)fluoranthene | 648.1 | 4.2 | 666.6 | 0 | 97.2 | 40-140 | 0 | | | |
| Benzo(k)fluoranthene | 672.7 | 4.2 | 666.6 | 0 | 101 | 40-140 | 0 | | | |
| Chrysene | 769.2 | 4.2 | 666.6 | 0 | 115 | 40-140 | 0 | | | |
| Dibenzo(a,h)anthracene | 683.9 | 4.2 | 666.6 | 0 | 103 | 40-140 | 0 | | | |
| Fluoranthene | 789.3 | 4.2 | 666.6 | 0 | 118 | 40-140 | 0 | | | |
| Fluorene | 746 | 4.2 | 666.6 | 0 | 112 | 40-140 | 0 | | | |
| Indeno(1,2,3-cd)pyrene | 685.7 | 4.2 | 666.6 | 0 | 103 | 40-140 | 0 | | | |
| Naphthalene | 807.4 | 4.2 | 666.6 | 0 | 121 | 40-140 | 0 | | | |
| Pyrene | 731.6 | 4.2 | 666.6 | 0 | 110 | 40-140 | 0 | | | |
| *Surr: 2-Fluorobiphenyl* | *586.7* | 0 | *666.6* | 0 | *88* | *20-140* | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *544.3* | 0 | *666.6* | 0 | *81.6* | *22-172* | 0 | | | |
| *Surr: Nitrobenzene-d5* | *631.5* | 0 | *666.6* | 0 | *94.7* | *28-140* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228716** Instrument ID **SVMS6** Method: **SW8270E**

**MS** Sample ID: **23102655-02A MS** Units: **µg/Kg** Analysis Date: **11/7/2023 05:04 PM**

Client ID: Run ID: **SVMS6_231107A** SeqNo: **10176765** Prep Date: **11/7/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 756.5 | 4.1 | 660.4 | 0 | 115 | 40-140 | 0 | | | |
| 2-Methylnaphthalene | 723.5 | 4.1 | 660.4 | 0 | 110 | 40-140 | 0 | | | |
| Acenaphthene | 794.2 | 4.1 | 660.4 | 0 | 120 | 40-140 | 0 | | | |
| Anthracene | 816.7 | 4.1 | 660.4 | 0 | 124 | 40-140 | 0 | | | |
| Benzo(a)anthracene | 729.9 | 4.1 | 660.4 | 0 | 111 | 40-140 | 0 | | | |
| Benzo(a)pyrene | 732.3 | 4.1 | 660.4 | 2.882 | 110 | 40-140 | 0 | | | |
| Benzo(b)fluoranthene | 648.4 | 4.1 | 660.4 | 2.85 | 97.7 | 40-140 | 0 | | | |
| Benzo(k)fluoranthene | 674.6 | 4.1 | 660.4 | 0 | 102 | 40-140 | 0 | | | |
| Chrysene | 797.3 | 4.1 | 660.4 | 0 | 121 | 40-140 | 0 | | | |
| Dibenzo(a,h)anthracene | 683.8 | 4.1 | 660.4 | 0 | 104 | 40-140 | 0 | | | |
| Fluoranthene | 786.6 | 4.1 | 660.4 | 3.319 | 119 | 40-140 | 0 | | | |
| Fluorene | 748.4 | 4.1 | 660.4 | 0 | 113 | 40-140 | 0 | | | |
| Indeno(1,2,3-cd)pyrene | 709.8 | 4.1 | 660.4 | 0 | 107 | 40-140 | 0 | | | |
| Naphthalene | 819.1 | 4.1 | 660.4 | 0 | 124 | 40-140 | 0 | | | |
| Pyrene | 726.7 | 4.1 | 660.4 | 3.076 | 110 | 40-140 | 0 | | | |
| *Surr: 2-Fluorobiphenyl* | *596.2* | 0 | *660.4* | 0 | *90.3* | *20-140* | 0 | | | |
| *Surr: 4-Terphenyl-d14* | *537.2* | 0 | *660.4* | 0 | *81.3* | *22-172* | 0 | | | |
| *Surr: Nitrobenzene-d5* | *647.1* | 0 | *660.4* | 0 | *98* | *28-140* | 0 | | | |

**MSD** Sample ID: **23102655-02A MSD** Units: **µg/Kg** Analysis Date: **11/7/2023 05:20 PM**

Client ID: Run ID: **SVMS6_231107A** SeqNo: **10176766** Prep Date: **11/7/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 744.3 | 4.1 | 659.6 | 0 | 113 | 40-140 | 756.5 | 1.62 | 30 | |
| 2-Methylnaphthalene | 768.3 | 4.1 | 659.6 | 0 | 116 | 40-140 | 723.5 | 6.01 | 30 | |
| Acenaphthene | 796 | 4.1 | 659.6 | 0 | 121 | 40-140 | 794.2 | 0.219 | 30 | |
| Anthracene | 828.2 | 4.1 | 659.6 | 0 | 126 | 40-140 | 816.7 | 1.4 | 30 | |
| Benzo(a)anthracene | 734.2 | 4.1 | 659.6 | 0 | 111 | 40-140 | 729.9 | 0.587 | 30 | |
| Benzo(a)pyrene | 745 | 4.1 | 659.6 | 2.882 | 113 | 40-140 | 732.3 | 1.71 | 30 | |
| Benzo(b)fluoranthene | 652.1 | 4.1 | 659.6 | 2.85 | 98.4 | 40-140 | 648.4 | 0.569 | 30 | |
| Benzo(k)fluoranthene | 695.4 | 4.1 | 659.6 | 0 | 105 | 40-140 | 674.6 | 3.05 | 30 | |
| Chrysene | 804.3 | 4.1 | 659.6 | 0 | 122 | 40-140 | 797.3 | 0.876 | 30 | |
| Dibenzo(a,h)anthracene | 689.9 | 4.1 | 659.6 | 0 | 105 | 40-140 | 683.8 | 0.897 | 30 | |
| Fluoranthene | 790.5 | 4.1 | 659.6 | 3.319 | 119 | 40-140 | 786.6 | 0.49 | 30 | |
| Fluorene | 764.1 | 4.1 | 659.6 | 0 | 116 | 40-140 | 748.4 | 2.07 | 30 | |
| Indeno(1,2,3-cd)pyrene | 712.4 | 4.1 | 659.6 | 0 | 108 | 40-140 | 709.8 | 0.365 | 30 | |
| Naphthalene | 820.4 | 4.1 | 659.6 | 0 | 124 | 40-140 | 819.1 | 0.166 | 30 | |
| Pyrene | 790.2 | 4.1 | 659.6 | 3.076 | 119 | 40-140 | 726.7 | 8.37 | 30 | |
| *Surr: 2-Fluorobiphenyl* | *593.7* | 0 | *659.6* | 0 | *90* | *20-140* | 596.2 | *0.434* | *30* | |
| *Surr: 4-Terphenyl-d14* | *569.4* | 0 | *659.6* | 0 | *86.3* | *22-172* | 537.2 | *5.82* | *30* | |
| *Surr: Nitrobenzene-d5* | *644* | 0 | *659.6* | 0 | *97.6* | *28-140* | 647.1 | *0.474* | *30* | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228716** Instrument ID **SVMS6** Method: **SW8270E**

**The following samples were analyzed in this batch:** 23102584-01A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **R387210b** Instrument ID **VMS8** Method: **SW8260D**

**MBLK** Sample ID: **8V-BLKS1-231103-R387210b** Units: **µg/Kg** Analysis Date: **11/3/2023 12:03 PM**

Client ID: Run ID: **VMS8_231103A** SeqNo: **10168261** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | U | 5.0 | | | | | | | | |
| 1,3,5-Trimethylbenzene | U | 5.0 | | | | | | | | |
| Benzene | U | 5.0 | | | | | | | | |
| Ethylbenzene | U | 5.0 | | | | | | | | |
| m,p-Xylene | U | 2.5 | | | | | | | | |
| o-Xylene | U | 2.5 | | | | | | | | |
| Toluene | U | 5.0 | | | | | | | | |
| Xylenes, Total | U | 5.0 | | | | | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *19.78* | 0 | *20* | 0 | *98.9* | *83-132* | 0 | | | |
| *Surr: 4-Bromofluorobenzene* | *19.69* | 0 | *20* | 0 | *98.4* | *83-111* | 0 | | | |
| *Surr: Dibromofluoromethane* | *21.66* | 0 | *20* | 0 | *108* | *77-125* | 0 | | | |
| *Surr: Toluene-d8* | *19.87* | 0 | *20* | 0 | *99.4* | *86-108* | 0 | | | |

**LCS** Sample ID: **8V-LCSS1-231103-R387210b** Units: **µg/Kg** Analysis Date: **11/3/2023 11:27 AM**

Client ID: Run ID: **VMS8_231103A** SeqNo: **10168260** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 19.87 | 5.0 | 20 | 0 | 99.4 | 71-133 | 0 | | | |
| 1,3,5-Trimethylbenzene | 20.38 | 5.0 | 20 | 0 | 102 | 71-139 | 0 | | | |
| Benzene | 20.13 | 5.0 | 20 | 0 | 101 | 77-133 | 0 | | | |
| Ethylbenzene | 20.68 | 5.0 | 20 | 0 | 103 | 75-133 | 0 | | | |
| m,p-Xylene | 40.14 | 2.5 | 40 | 0 | 100 | 75-134 | 0 | | | |
| o-Xylene | 19.67 | 2.5 | 20 | 0 | 98.4 | 76-130 | 0 | | | |
| Toluene | 19.84 | 5.0 | 20 | 0 | 99.2 | 76-130 | 0 | | | |
| Xylenes, Total | 59.81 | 5.0 | 60 | 0 | 99.7 | 75-132 | 0 | | | |
| *Surr: 1,2-Dichloroethane-d4* | *18.76* | 0 | *20* | 0 | *93.8* | *83-132* | 0 | | | |
| *Surr: 4-Bromofluorobenzene* | *18.98* | 0 | *20* | 0 | *94.9* | *83-111* | 0 | | | |
| *Surr: Dibromofluoromethane* | *20.8* | 0 | *20* | 0 | *104* | *77-125* | 0 | | | |
| *Surr: Toluene-d8* | *19.91* | 0 | *20* | 0 | *99.6* | *86-108* | 0 | | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **R387210b** Instrument ID **VMS8** Method: **SW8260D**

**MS** Sample ID: **23102398-08C MS** Units: **µg/Kg** Analysis Date: **11/3/2023 08:17 PM**

Client ID: Run ID: **VMS8_231103A** SeqNo: **10168283** Prep Date: DF: **0.71**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 12.4 | 3.6 | 14.2 | 0 | 87.4 | 71-133 | 0 | | | |
| 1,3,5-Trimethylbenzene | 13.12 | 3.6 | 14.2 | 0 | 92.4 | 71-139 | 0 | | | |
| Benzene | 12.84 | 3.6 | 14.2 | 0 | 90.4 | 77-133 | 0 | | | |
| Ethylbenzene | 13.01 | 3.6 | 14.2 | 0 | 91.6 | 75-133 | 0 | | | |
| m,p-Xylene | 25.95 | 1.8 | 28.4 | 0 | 91.4 | 75-134 | 0 | | | |
| o-Xylene | 13.14 | 1.8 | 14.2 | 0 | 92.5 | 76-130 | 0 | | | |
| Toluene | 12.43 | 3.6 | 14.2 | 0 | 87.6 | 76-130 | 0 | | | |
| Xylenes, Total | 39.09 | 3.6 | 42.6 | 0 | 91.8 | 75-132 | 0 | | | |
| *Surr: 1,2-Dichloroethane-d4* | *14.21* | 0 | *14.2* | 0 | *100* | *83-132* | 0 | | | |
| *Surr: 4-Bromofluorobenzene* | *13.98* | 0 | *14.2* | 0 | *98.4* | *83-111* | 0 | | | |
| *Surr: Dibromofluoromethane* | *14.84* | 0 | *14.2* | 0 | *104* | *77-125* | 0 | | | |
| *Surr: Toluene-d8* | *13.39* | 0 | *14.2* | 0 | *94.3* | *86-108* | 0 | | | |

**MSD** Sample ID: **23102398-08C MSD** Units: **µg/Kg** Analysis Date: **11/3/2023 08:36 PM**

Client ID: Run ID: **VMS8_231103A** SeqNo: **10168285** Prep Date: DF: **0.816**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 15.16 | 4.1 | 16.32 | 0 | 92.9 | 71-133 | 12.4 | 20 | 30 | |
| 1,3,5-Trimethylbenzene | 16.16 | 4.1 | 16.32 | 0 | 99 | 71-139 | 13.12 | 20.7 | 30 | |
| Benzene | 15.76 | 4.1 | 16.32 | 0 | 96.6 | 77-133 | 12.84 | 20.4 | 30 | |
| Ethylbenzene | 15.59 | 4.1 | 16.32 | 0 | 95.5 | 75-133 | 13.01 | 18 | 30 | |
| m,p-Xylene | 31.43 | 2.0 | 32.64 | 0 | 96.3 | 75-134 | 25.95 | 19.1 | 30 | |
| o-Xylene | 15.01 | 2.0 | 16.32 | 0 | 91.9 | 76-130 | 13.14 | 13.3 | 30 | |
| Toluene | 17.36 | 4.1 | 16.32 | 0 | 106 | 76-130 | 12.43 | 33.1 | 30 | R |
| Xylenes, Total | 46.44 | 4.1 | 48.96 | 0 | 94.8 | 75-132 | 39.09 | 17.2 | 30 | |
| *Surr: 1,2-Dichloroethane-d4* | *18.07* | 0 | *16.32* | 0 | *111* | *83-132* | 14.21 | *23.9* | *30* | |
| *Surr: 4-Bromofluorobenzene* | *16.43* | 0 | *16.32* | 0 | *101* | *83-111* | 13.98 | *16.1* | *30* | |
| *Surr: Dibromofluoromethane* | *16.48* | 0 | *16.32* | 0 | *101* | *77-125* | 14.84 | *10.4* | *30* | |
| *Surr: Toluene-d8* | *18.01* | 0 | *16.32* | 0 | *110* | *86-108* | 13.39 | *29.4* | *30* | *S* |

**The following samples were analyzed in this batch:** 23102584-05A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **R388541** Instrument ID **VMS8** Method: **SW8260D**

**MBLK** Sample ID: **8V-BLKS2-231107-R388541** Units: **µg/Kg** Analysis Date: **11/7/2023 07:48 PM**

Client ID: Run ID: **VMS8_231107A** SeqNo: **10177122** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | U | 5.0 | | | | | | | | |
| 1,3,5-Trimethylbenzene | U | 5.0 | | | | | | | | |
| Benzene | U | 5.0 | | | | | | | | |
| Ethylbenzene | U | 5.0 | | | | | | | | |
| m,p-Xylene | U | 2.5 | | | | | | | | |
| o-Xylene | U | 2.5 | | | | | | | | |
| Toluene | U | 5.0 | | | | | | | | |
| Xylenes, Total | U | 5.0 | | | | | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *19.87* | 0 | *20* | 0 | *99.4* | *83-132* | 0 | | | |
| *Surr: 4-Bromofluorobenzene* | *19.47* | 0 | *20* | 0 | *97.4* | *83-111* | 0 | | | |
| *Surr: Dibromofluoromethane* | *20.7* | 0 | *20* | 0 | *104* | *77-125* | 0 | | | |
| *Surr: Toluene-d8* | *19.69* | 0 | *20* | 0 | *98.4* | *86-108* | 0 | | | |

**LCS** Sample ID: **8V-LCSS1-231107-R388541** Units: **µg/Kg** Analysis Date: **11/7/2023 06:36 PM**

Client ID: Run ID: **VMS8_231107A** SeqNo: **10177120** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 19.01 | 5.0 | 20 | 0 | 95 | 71-133 | 0 | | | |
| 1,3,5-Trimethylbenzene | 20.02 | 5.0 | 20 | 0 | 100 | 71-139 | 0 | | | |
| Benzene | 19.49 | 5.0 | 20 | 0 | 97.4 | 77-133 | 0 | | | |
| Ethylbenzene | 19.41 | 5.0 | 20 | 0 | 97 | 75-133 | 0 | | | |
| m,p-Xylene | 38.66 | 2.5 | 40 | 0 | 96.6 | 75-134 | 0 | | | |
| o-Xylene | 19.96 | 2.5 | 20 | 0 | 99.8 | 76-130 | 0 | | | |
| Toluene | 18.81 | 5.0 | 20 | 0 | 94 | 76-130 | 0 | | | |
| Xylenes, Total | 58.62 | 5.0 | 60 | 0 | 97.7 | 75-132 | 0 | | | |
| *Surr: 1,2-Dichloroethane-d4* | *19.76* | 0 | *20* | 0 | *98.8* | *83-132* | 0 | | | |
| *Surr: 4-Bromofluorobenzene* | *19.45* | 0 | *20* | 0 | *97.2* | *83-111* | 0 | | | |
| *Surr: Dibromofluoromethane* | *20.18* | 0 | *20* | 0 | *101* | *77-125* | 0 | | | |
| *Surr: Toluene-d8* | *19.74* | 0 | *20* | 0 | *98.7* | *86-108* | 0 | | | |

**The following samples were analyzed in this batch:**

23102584-01C 23102584-02C 23102584-03C
23102584-04C

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228202** Instrument ID **SPEC-04** Method: **SW7196A**

**MBLK** Sample ID: **MBLK-228202-228202** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: Run ID: **SPEC-04_231103B** SeqNo: **10163025** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | U | 1.0 | | | | | | | | |

**LCS** Sample ID: **LCS-228202-228202** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: Run ID: **SPEC-04_231103B** SeqNo: **10163026** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 4.208 | 0.99 | 4.95 | 0 | 85 | 80-120 | 0 | | | |

**MS** Sample ID: **23102584-03A MS** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: **SP 8** Run ID: **SPEC-04_231103B** SeqNo: **10163030** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | U | 0.98 | 4.902 | 0.4118 | -8.4 | 75-125 | 0 | | | S |

**MS** Sample ID: **23102584-03A MSI** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: **SP 8** Run ID: **SPEC-04_231103B** SeqNo: **10163032** Prep Date: **10/29/2023** DF: **100**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 1715 | 97 | 2218 | 0.4118 | 77.3 | 75-125 | 0 | | | |

**MS** Sample ID: **23102586-10A MS** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: Run ID: **SPEC-04_231103B** SeqNo: **10163045** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 3.562 | 0.95 | 4.762 | 0.1524 | 71.6 | 75-125 | 0 | | | S |

**MS** Sample ID: **23102586-10A MSI** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: Run ID: **SPEC-04_231103B** SeqNo: **10163047** Prep Date: **10/29/2023** DF: **100**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 1835 | 94 | 2322 | 0.1524 | 79 | 75-125 | 0 | | | |

**MSD** Sample ID: **23102584-03A MSD** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**
Client ID: **SP 8** Run ID: **SPEC-04_231103B** SeqNo: **10163031** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | U | 0.97 | 4.854 | 0.4118 | -8.48 | 75-125 | 0.2843 | 0 | 20 | S |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228202** Instrument ID **SPEC-04** Method: **SW7196A**

**MSD** Sample ID: **23102586-10A MSD** Units: **mg/Kg** Analysis Date: **11/3/2023 01:22 PM**

Client ID: Run ID: **SPEC-04_231103B** SeqNo: **10163046** Prep Date: **10/29/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 3.505 | 0.97 | 4.854 | 0.1524 | 69.1 | 75-125 | 3.562 | 1.61 | 20 | S |

**The following samples were analyzed in this batch:**

23102584-01A 23102584-02A 23102584-03A
23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **228580** Instrument ID **WETCHEM** Method: **USDA Method 20**

**DUP** Sample ID: **23102586-11ADUP** Units: **s.u.** Analysis Date: **11/4/2023 10:31 AM**

Client ID: Run ID: **WETCHEM_231104A** SeqNo: **10165445** Prep Date: **11/3/2023** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| pH @ Saturation | 6.99 | 0.10 | 0 | 0 | 0 | 0-0 | 7.17 | 2.54 | 20 | |

**DUP** Sample ID: **23102586-11ADUP** Units: **mmhos/cm @25°** Analysis Date: **11/4/2023 11:30 AM**

Client ID: Run ID: **WETCHEM_231104B** SeqNo: **10165618** Prep Date: **11/3/2023** DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Electrical Conductivity @ Saturation | 0.6792 | 0.10 | 0 | 0 | 0 | | 0.9046 | 28.5 | 50 | |

**The following samples were analyzed in this batch:**

23102584-01A 23102584-02A 23102584-03A
23102584-04A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Mull Drilling Company
**Work Order:** 23102584
**Project:** MUSF 20

# QC BATCH REPORT

Batch ID: **R387001** Instrument ID **MOIST** Method: **SW3550C**

**MBLK** Sample ID: **WBLKS-R387001** Units: **% of sample** Analysis Date: **10/31/2023 12:58 PM**
Client ID: Run ID: **MOIST_231031A** SeqNo: **10152525** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | U | 0.10 | | | | | | | | |

**LCS** Sample ID: **LCS-R387001** Units: **% of sample** Analysis Date: **10/31/2023 12:58 PM**
Client ID: Run ID: **MOIST_231031A** SeqNo: **10152524** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 100 | 0.10 | 100 | 0 | 100 | 98-102 | 0 | | | |

**DUP** Sample ID: **23102584-01A DUP** Units: **% of sample** Analysis Date: **10/31/2023 12:58 PM**
Client ID: **SP 3 4'** Run ID: **MOIST_231031A** SeqNo: **10152503** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 9.21 | 0.10 | 0 | 0 | 0 | 0-0 | 9.29 | 0.865 | 10 | |

**DUP** Sample ID: **23102585-03B DUP** Units: **% of sample** Analysis Date: **10/31/2023 12:58 PM**
Client ID: Run ID: **MOIST_231031A** SeqNo: **10152510** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Moisture | 10.5 | 0.10 | 0 | 0 | 0 | 0-0 | 11.05 | 5.1 | 10 | |

**The following samples were analyzed in this batch:**

| | | |
|---|---|---|
| 23102584-01A | 23102584-02A | 23102584-03A |
| 23102584-04A | | |

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# Chain of Custody Form

ALS Group USA, Corp

Work Order: _____

| | | | | | |
|---|---|---|---|---|---|
| Company Name | Mull Drilling Company | Purchase Order | | Parameter/Method Request for Analysis | |
| | | Company Name | Mull Drilling Company | A | Table 915-1 |
| Send Report To | James Beilman | Invoice Attn | Accounts Payable | B | |
| Project Name | | Project # | MUSF 20 | C | |
| | | | | D | |
| Address | 1700 N Waterfront Pkwy, Bld. 1200 | Address | 1700 N Waterfront Pkwy, Bld. 1200 | E | |
| | | | | F | |
| City State Zip | Wichita, KS 67206 | City State Zip | Wichita, KS 67206 | G | |
| Phone | 3162646366 | Phone | 3162646366 | H | |
| e-Mail Address | | e-Mail Address | | I | |
| | | | | J | |

| # | Sample Description | Date | Time | Matrix | Preservative | # Bottles | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SP 3 4' | 10/24/23 | 0900 | Soil | Various | 5 | ✓ | | | | | | | | |
| 2 | SP 7 | ↓ | 0930 | ↓ | | ↓ | ✓ | | | | | | | | |
| 3 | SP 8 | | 0945 | | | | ✓ | | | | | | | | |
| 4 | SP 9 | | 1000 | | | | ✓ | | | | | | | | |
| 5 | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |

23102584
MULLDRILLING: Mull Drilling Company
Project: MUSF 20

Notes: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Required Turnaround Time: A Std 10 Wk days ___ 5 Wk days ___ 2 Wk days ___ 24 hr

Results Due:

| Relinquised by | Date | Time | Received by | Date | Time |
|---|---|---|---|---|---|
| James Beilman | 10/26/23 | 1730 | Fedex | | |
| Fedex | 10/28/23 | 915 | [illegible] | 10/28/23 | 915 |
| | | | | | |

NOTES: 5.7°C DF2

QC Reporting Level: (check box below)

- Level II: Standard QC
- Level III: Std QC + Raw data
- Level IV: SW846 CLP-Like

Other:



ALS Group USA, Corp | 3352 128th Ave | | Holland Michigan 49424 | TEL. (616) 399-6070

ALS Group, USA
Holland, Michigan

## Sample Receipt Checklist

Client Name: **MULLDRILLING** Date/Time Received: **28-Oct-23 09:15**

Work Order: **23102584** Received by: **WSK**

Checklist completed by Weston Kotecki (eSignature) 28-Oct-23 (Date) Reviewed by: Chad Whelton (eSignature) 31-Oct-23 (Date)

Matrices: Soil
Carrier name: FedEx

| | | | |
|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | Yes ☑ | No ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| Chain of custody present? | Yes ☑ | No ☐ | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | |
| Sample containers intact? | Yes ☑ | No ☐ | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | |
| All samples received within holding time? | Yes ☑ | No ☐ | |
| Container/Temp Blank temperature in compliance? | Yes ☑ | No ☐ | |
| Sample(s) received on ice? | Yes ☑ | No ☐ | |
| Temperature(s)/Thermometer(s): | 5.7/5.7C | DF2 | |
| Cooler(s)/Kit(s): | | | |
| Date/Time sample(s) sent to storage: | 10/28/2023 1:09:45 PM | | |
| Water - VOA vials have zero headspace? | Yes ☑ | No ☐ | No VOA vials submitted ☐ |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☑ |
| pH adjusted? | Yes ☐ | No ☐ | N/A ☑ |
| pH adjusted by: | - | | |

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: