

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D17735

Sampling Date: 09/27/10

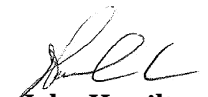
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: 119



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | | |
|---|------------|-----------|
| Section 1: Sample Summary | 4 | 1 |
| Section 2: Case Narrative/Conformance Summary | 5 | 2 |
| Section 3: Sample Results | 9 | 3 |
| 3.1: D17735-1: 13C-F1 | 10 | 4 |
| 3.2: D17735-2: 13C-F2 | 16 | 5 |
| 3.3: D17735-3: 13C-F3 | 22 | 6 |
| 3.4: D17735-3A: 13C-F3 | 28 | 7 |
| 3.5: D17735-4: 13C-F4 | 30 | 8 |
| 3.6: D17735-4A: 13C-F4 | 36 | 9 |
| 3.7: D17735-5: 13C-TS1 | 38 | 10 |
| 3.8: D17735-5A: 13C-TS1 | 44 | 11 |
| 3.9: D17735-6: 13C-TS2 | 46 | 12 |
| 3.10: D17735-6A: 13C-TS2 | 52 | |
| 3.11: D17735-7: 13C-F3DUP | 54 | |
| 3.12: D17735-7A: 13C-F3DUP | 60 | |
| Section 4: Misc. Forms | 62 | |
| 4.1: Chain of Custody | 63 | |
| Section 5: GC/MS Volatiles - QC Data Summaries | 65 | |
| 5.1: Method Blank Summary | 66 | |
| 5.2: Blank Spike Summary | 67 | |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 68 | |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 69 | |
| 6.1: Method Blank Summary | 70 | |
| 6.2: Blank Spike Summary | 71 | |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 72 | |
| Section 7: GC Volatiles - QC Data Summaries | 73 | |
| 7.1: Method Blank Summary | 74 | |
| 7.2: Blank Spike Summary | 76 | |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 78 | |
| Section 8: GC Semi-volatiles - QC Data Summaries | 80 | |
| 8.1: Method Blank Summary | 81 | |
| 8.2: Blank Spike Summary | 82 | |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 83 | |
| Section 9: Metals Analysis - QC Data Summaries | 84 | |
| 9.1: Prep QC MP3008: Hg | 85 | |
| 9.2: Prep QC MP3055: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 89 | |
| 9.3: Prep QC MP3056: As | 99 | |
| 9.4: Prep QC MP3061: Ca,Mg,Na,Sodium Adsorption Ratio | 104 | |
| Section 10: General Chemistry - QC Data Summaries | 112 | |
| 10.1: Method Blank and Spike Results Summary | 113 | |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 114 | |
| 11.1: Chain of Custody | 115 | |

Table of Contents

-2-

| | |
|---|------------|
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 116 |
| 12.1: Method Blank and Spike Results Summary | 117 |
| 12.2: Duplicate Results Summary | 118 |
| 12.3: Matrix Spike Results Summary | 119 |

1

2

3

4

5

6

7

8

9

10

11

12



Sample Summary

Marathon Oil

Job No: D17735

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17735-1 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F1 |
| D17735-2 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F2 |
| D17735-3 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F3 |
| D17735-3A | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F3 |
| D17735-4 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F4 |
| D17735-4A | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F4 |
| D17735-5 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-TS1 |
| D17735-5A | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-TS1 |
| D17735-6 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-TS2 |
| D17735-6A | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-TS2 |
| D17735-7 | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F3DUP |
| D17735-7A | 09/27/10 | 10:00 BY | 09/28/10 | SO | Soil | 13C-F3DUP |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17735

Site: Roan Pit Closure

Report Dat 10/8/2010 10:13:48 AM

On 09/28/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.1°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17735 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V3V403 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17932-3MS and D17932-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2578 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D17557-1MS and D17557-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB409 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS and D17733-1MSD were used as the QC samples indicated.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB410 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17735-7MS and D17735-7MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2584 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17735-1MS and D17735-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP3061

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17735-3AMS and D17735-3AMSD were used as the QC samples for the metals analysis.

Matrix SO

Batch ID: MP3055

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-7MS, D17734-7MSD, and D17734-7SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery of Barium is outside control limits. Probable cause due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPDs for Cadmium, Chromium, Lead, Nickel, Selenium, Silver, and Zinc are outside control limits for sample MP3055-SD1. The percent differences are acceptable for Cadmium, Selenium, and Silver due to low initial sample concentration (< 50 times IDL).
- MP3055-SD1 for Chromium, Lead, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

Matrix SO

Batch ID: MP3056

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-7MS, D17734-7MSD, and D17734-7SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP3056-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 7471A

Matrix SO

Batch ID: MP3008

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-1MSD and D17734-1MS were used as the QC samples for the Mercury analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Mercury are outside control limits. The spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to the lab control or spike blank for recovery information.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: M:GN32947

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17735-1, D17735-2, D17735-3, and D17735-4.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix SO

Batch ID: M:GN32958

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17735-5, D17735-6, and D17735-7.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO

Batch ID: MP3061

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6563 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4614 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12078 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17735

Site: MOILCOGJ: Roan Pit Closure

Report Date 10/1/2010 10:42:43 AM

7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/27/2010 and were received at Accutest on 09/28/2010 properly preserved, at 1.8 Deg. C and intact. These Samples received an Accutest job number of D17735. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN32947 |
|------------------|--------------------------|

- Sample(s) D17737-6DUP were used as the QC samples for Redox Potential Vs H2.

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN32958 |
|------------------|--------------------------|

- Sample(s) D17735-5DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12078 |
|------------------|--------------------------|

- All samples were distilled and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17735-4DUP, D17735-4MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17735).

Sample Results

Report of Analysis

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F1 | |
| Lab Sample ID: D17735-1 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07516.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 89% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-F1 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-1 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 90.2 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02034.D | 2 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.067 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.013 | 0.0084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.013 | 0.0097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.013 | 0.0083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.013 | 0.0067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0099 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.067 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.067 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.013 | 0.0090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 34% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 55% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 58% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7521.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 83% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 13C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4430.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 108% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

31
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 27.8 | 0.42 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 262 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 28.9 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 16.3 | 0.53 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10 | 5.3 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 17.7 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.3 | 5.3 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 49.1 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.58 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 28.3 | 1.6 | mg/kg | 1 | 10/04/10 14:44 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 360 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.2 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.30 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 82.1 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07518.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.059 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.059 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | ND | 0.24 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-F2 | | |
| Lab Sample ID: D17735-2 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 82.1 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02035.D | 2 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.067 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.013 | 0.0084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0123 | 0.013 | 0.0097 | mg/kg | J |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.013 | 0.0083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.013 | 0.0067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0099 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.067 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.067 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.013 | 0.0090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 31% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 49% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 56% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

32
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 82.1 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7522.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 88% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 13C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 82.1 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4431.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 112% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 82.1 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 15.8 | 0.39 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 501 | 0.98 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.98 | 0.98 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 30.6 | 0.98 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 16.2 | 0.49 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10.2 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 17.1 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 40.8 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1009

(2) Instrument QC Batch: MA1018

(3) Instrument QC Batch: MA1023

(4) Prep QC Batch: MP3008

(5) Prep QC Batch: MP3055

(6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 82.1 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.59 | 0.49 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 30.0 | 1.5 | mg/kg | 1 | 10/04/10 14:49 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 344 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 82.1 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.46 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07519.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 82% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-F3 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 84.9 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02036.D | 5 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 35% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 59% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 62% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7523.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 80% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis



| | |
|--|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4432.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 68.9 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 117% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 17.2 | 0.42 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 311 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 31.7 | 1.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 19.8 | 0.53 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 13.6 | 5.3 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 20.7 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.3 | 5.3 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 56.8 | 3.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.84 | 0.49 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 30.9 | 1.6 | mg/kg | 1 | 10/04/10 14:55 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 343 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.9 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 276 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.30 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

3.4
3

| | |
|--|---|
| Client Sample ID: 13C-F3 Lab Sample ID: D17735-3A Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/27/10 Date Received: 09/28/10 Percent Solids: 84.9 ^a |
|--|---|

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 29.3 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 6.32 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 17.9 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-3A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.782 | | ratio | 1 | 10/04/10 17:10 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07520.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 89% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 84% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-F4 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 85.8 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02037.D | 5 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 47% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 70% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 78% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7524.D | 1 | 09/29/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 91% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4444.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 46.9 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 104% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 22.7 | 0.38 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 243 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 36.6 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 17.8 | 0.48 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 12.9 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 21.5 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 55.1 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | |
| Lab Sample ID: D17735-4 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 85.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 36.6 | 1.5 | mg/kg | 1 | 10/04/10 15:00 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 347 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 85.8 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 897 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.09 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 105 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 22.6 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 34.2 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.789 | | ratio | 1 | 10/04/10 17:41 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07521.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 90% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-TS1 | | |
| Lab Sample ID: D17735-5 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02038.D | 5 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.022 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.030 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.027 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.023 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 44% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 67% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 76% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7525.D | 1 | 09/29/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 82% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4445.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 24.5 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 111% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.2 | 0.39 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 209 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 21.5 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 13.6 | 0.49 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10.6 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 11.8 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 44.5 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.5 | 1.5 | mg/kg | 1 | 10/04/10 15:06 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 371 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.9 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 557 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 6.84 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis



| | |
|---|---|
| Client Sample ID: 13C-TS1 Lab Sample ID: D17735-5A Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/27/10 Date Received: 09/28/10 Percent Solids: 84.9 ^a |
|---|---|

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 67.2 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 12.8 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 13.2 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-5A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.387 | | ratio | 1 | 10/04/10 17:58 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 92.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07522.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.054 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.054 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-TS2 | | |
| Lab Sample ID: D17735-6 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02039.D | 5 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 55% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 75% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 76% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 13C-TS2 | | |
| Lab Sample ID: D17735-6 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8015B | | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7526.D | 1 | 09/29/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: 13C-TS2 | |
| Lab Sample ID: D17735-6 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4446.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 110% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.0 | 0.41 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 192 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 24.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 12.8 | 0.51 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 12.1 | 5.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 11.9 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 44.8 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

39
3

| | | |
|----------------------------------|--|--|
| Client Sample ID: 13C-TS2 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-6 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.77 | 0.49 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.2 | 1.5 | mg/kg | 1 | 10/04/10 15:11 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 376 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 92.4 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 340 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 6.62 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 43.0 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 8.06 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 10.6 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 13C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 92.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.389 | | ratio | 1 | 10/04/10 18:04 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | |
| Lab Sample ID: D17735-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07523.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 89% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 90% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-F3DUP | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17735-7 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 86.5 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02040.D | 5 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 72% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 96% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 116% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | |
| Lab Sample ID: D17735-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8015B | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7530.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 81% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-F3DUP | |
| Lab Sample ID: D17735-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4447.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 90.3 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 108% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 11.1 | 0.41 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 240 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 23.9 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 17.4 | 0.51 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10.8 | 5.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.7 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 43.2 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.95 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.0 | 1.5 | mg/kg | 1 | 10/04/10 15:17 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 350 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 86.5 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 302 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.05 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 28.6 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 5.64 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 18.3 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 13C-F3DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17735-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.818 | | ratio | 1 | 10/04/10 18:10 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, Colorado 80033
 TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
 www.accutest.com

D17735

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

| Client / Reporting Information | | | | Project Information | | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | | | | | | | | | |
|--------------------------------|--------------------------------|----------------|------------|---------------------|------------|--------|--------------|---|--|--|--|--|--|--|--|--|--|---|--|--|-----|------|------|----------------|-----|-----|-----|-----|-----|--------------|-----|--|
| Company Name MARATHON | | | | Project Name: | | | | <div style="display: flex; justify-content: space-around; font-size: 12pt;"> TPH - CAD TPH - DRO BTEX PAHS Metals SAR - EC, PH AG </div> <div style="display: flex; justify-content: space-around; font-size: 12pt;"> yes NO </div> | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment O - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | | | | | | | | | | | | |
| Street Address | | | | Street | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| City State Zip | | | | City State | | | | | | | | | | | | | | | | Billing Information (if different from Report to) | | | | | | | | | | | | |
| | | | | Company Name | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Contact | | | | Project # | | | | | | | | | | | | | | | | Street Address | | | | | | | | | | | | |
| Phone # | | | | Fax # | | | | | | | | | | | | | | | | Client Purchase Order # | | | | City State Zip | | | | | | | | |
| Sampler(s) Name(s) | | | | Phone # | | | | | | | | | | | | | | | | Project Manager | | | | Attention: | | | | | | | | |
| Accutest Sample # | Field ID / Point of Collection | MECH/VI Vial # | Collection | | Sampled by | Matrix | # of bottles | | | | | | | | | | | | | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | | |
| | | | Date | Time | | | | | | | | | | | | | | | | MIC | MCH | MNO3 | MNO2 | MNO4 | MNO | MNO | MNO | MNO | MNO | MNO | MNO | |
| | 13C-F1 | | 9/27 | 1000 | BY | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13C-F2 | | | | | | 5 | | | | | | | | | | | | | | 02 | | | | | | | | | | | |
| | 13C-F3 | | | | | | 6 | | | | | | | | | | | | | | 03 | | | | | | | | | | | |
| | 13C-F4 | | | | | | 6 | | | | | | | | | | | | | | 04 | | | | | | | | | | | |
| | 13C-TS 1 | | | | | | 6 | | | | | | | | | | | | | | 05 | | | | | | | | | | | |
| | 13C-TS 2 | | | | | | 6 | | | | | | | | | | | | | | 06 | | | | | | | | | | | |
| | 13C-F3 DUP | | | | | | 6 | | | | | | | | | | | | | | 07 | | | | | | | | | | | |

| Turnaround Time (Business days) | Data Deliverable Information | Comments / Special Instructions |
|---|---|---|
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input checked="" type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 <small>Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable</small> | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ |

| | | | | | |
|--|------------|---------------|------------|--------------|------------|
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | |
| Relinquished by Sampler: | Date Time: | Received By: | Date Time: | Received By: | Date Time: |
| 1 B. - cy | 8:20 | 1 [Signature] | 8:20 | 2 | |
| Relinquished by Sampler: | Date Time: | Received By: | Date Time: | Received By: | Date Time: |
| 3 | | 3 | | 4 | |
| Relinquished by: | Date Time: | Received By: | Date Time: | Received By: | Date Time: |
| 5 | | 5 | | | |

| | | | | |
|----------------|---|---|---|-------------------|
| Custody Seal # | <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact | Preserved where applicable <input checked="" type="checkbox"/> | On Ice <input checked="" type="checkbox"/> | Cooler Temp. 4.18 |
|----------------|---|---|---|-------------------|

4.1
4

D17735: Chain of Custody
Page 1 of 2

Job Change Order: D17735_10/4/2010

Requested 10/4/2010 **Received Date:** 9/28/2010
Account Name: Marathon Oil **Due Date:** 10/12/2010
Project Roan Pit Closure **Deliverable:** COMMBN
CSR: RR **TAT (Days):** 14

Sample #: D17735-ALL
Change: Per the client, this job should be on a standard 14 day TAT, not a 3 day rush. Thanks.

Above Changes Per: Client **Date:** 10/4/2010

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1

D17735: Chain of Custody
Page 2 of 2

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| V3V403-MB | 3V07503.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|------------|-----------------------|-------------|
| 2037-26-5 | Toluene-D8 | 89% 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% 70-130% |

Blank Spike Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| V3V403-BS | 3V07504.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 52.0 | 104 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 55.1 | 110 | 70-130 |
| 108-88-3 | Toluene | 50 | 52.5 | 105 | 70-130 |
| | m,p-Xylene | 50 | 49.8 | 100 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 49.2 | 98 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | 70-130% |

5.2.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17932-3MS | 3V07506.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| D17932-3MSD | 3V07507.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| D17932-3 | 3V07505.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | D17932-3 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 3940 | 4180 | 106 | 4170 | 106 | 0 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 3940 | 4420 | 112 | 4460 | 113 | 1 | 56-139/30 |
| 108-88-3 | Toluene | ND | 3940 | 4200 | 107 | 4210 | 107 | 0 | 57-144/30 |
| | m,p-Xylene | ND | 3940 | 4010 | 102 | 4080 | 104 | 2 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 3940 | 3970 | 101 | 4040 | 103 | 2 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17932-3 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 85% | 85% | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 95% | 93% | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 82% | 87% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-MB | 3G02000.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 67% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | 17-174% |

Blank Spike Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-BS | 3G02001.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 63.2 | 76 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 62.7 | 75 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 70.3 | 84 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.7 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 71.3 | 86 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 71.9 | 86 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 67.4 | 81 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 72.6 | 87 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 72.2 | 87 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 71.0 | 85 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 77.0 | 92 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 66.5 | 80 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 67.9 | 81 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 60.9 | 73 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 59.3 | 71 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 62.2 | 75 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 67.5 | 81 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 72.2 | 87 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 78% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 72% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 92% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-MS | 3G02003.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| OP2578-MSD | 3G02004.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| D17557-1 | 3G02002.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | D17557-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| 83-32-9 | Acenaphthene | ND | 83.3 | 68.8 | 83 | 64.6 | 77 | 6 | 20-151/30 | |
| 208-96-8 | Acenaphthylene | ND | 83.3 | 68.6 | 82 | 64.7 | 78 | 6 | 23-156/30 | |
| 120-12-7 | Anthracene | ND | 83.3 | 71.3 | 86 | 67.3 | 81 | 6 | 25-149/30 | |
| 56-55-3 | Benzo(a)anthracene | ND | 83.3 | 71.1 | 85 | 67.8 | 81 | 5 | 22-157/30 | |
| 50-32-8 | Benzo(a)pyrene | ND | 83.3 | 62.2 | 75 | 58.1 | 70 | 7 | 23-153/30 | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 83.3 | 66.7 | 80 | 62.5 | 75 | 7 | 22-161/30 | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 83.3 | 63.6 | 76 | 61.4 | 74 | 4 | 20-158/30 | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 83.3 | 68.8 | 83 | 65.0 | 78 | 6 | 17-161/30 | |
| 218-01-9 | Chrysene | ND | 83.3 | 69.3 | 83 | 65.3 | 78 | 6 | 16-159/30 | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 83.3 | 67.2 | 81 | 62.5 | 75 | 7 | 21-154/30 | |
| 206-44-0 | Fluoranthene | ND | 83.3 | 74.7 | 90 | 68.0 | 82 | 9 | 16-140/30 | |
| 86-73-7 | Fluorene | ND | 83.3 | 70.0 | 84 | 65.2 | 78 | 7 | 15-153/30 | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 83.3 | 65.2 | 78 | 61.4 | 74 | 6 | 21-159/30 | |
| 90-12-0 | 1-Methylnaphthalene | ND | 83.3 | 68.4 | 82 | 64.7 | 78 | 6 | 10-148/30 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 83.3 | 65.4 | 79 | 62.0 | 74 | 5 | 10-181/30 | |
| 91-20-3 | Naphthalene | ND | 83.3 | 70.0 | 84 | 66.3 | 79 | 5 | 10-176/30 | |
| 85-01-8 | Phenanthrene | ND | 83.3 | 69.8 | 84 | 64.7 | 78 | 8 | 22-152/30 | |
| 129-00-0 | Pyrene | ND | 83.3 | 72.6 | 87 | 69.1 | 83 | 5 | 10-200/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D17557-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 89% | 82% | 62% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | 75% | 56% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 89% | 84% | 63% | 17-174% |

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-MB | GB7502.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% 60-140% |

7.1.1
7

Method Blank Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB410-MB | GB7528.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% 60-140% |

7.1.2
7

Blank Spike Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-BS | GB7503.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 98.6 | 90 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|-----|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | 60-140% |

7.2.1

7

Blank Spike Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB410-BS | GB7529.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 103 | 94 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|-----|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 91% | 60-140% |

7.2.2
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17733-1MS | GB7505.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1MSD | GB7506.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1 | GB7504.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6

| CAS No. | Compound | D17733-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 16.9 | 120 | 121 | 86 | 135 | 98 | 11 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-1 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 93% | 91% | 100% | 60-140% |

7.3.1
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17735-7MS | GB7531.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| D17735-7MSD | GB7532.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| D17735-7 | GB7530.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17735-7

| CAS No. | Compound | D17735-7 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | 125 | 107 | 86 | 101 | 81 | 6 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17735-7 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 88% | 88% | 81% | 60-140% |

7.3.2
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MB | FD4426.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 116% 63-130% |

Blank Spike Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-BS | FD4427.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 673 | 101 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 110% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17735
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MS | FD4428.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| OP2584-MSD | FD4429.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| D17735-1 | FD4430.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

| CAS No. | Compound | D17735-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | ND | 666 | 636 | 95 | 644 | 97 | 1 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17735-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 119% | 108% | 108% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | -0.0030 | <0.10 |

Associated samples MP3008: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.016 0.33 0.392 80.1N(a) 85-115

Associated samples MP3008: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original | MSD | Spike lot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|----------------------|------|------------------------|----------|------------|-------------|
| Mercury | 0.016 | 0.33 | 0.4 | 78.5N(a) | 0.0 | 20 |

Associated samples MP3008: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.37 | 0.4 | 92.5 | 80-120 |

Associated samples MP3008: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 20 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.11 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.12 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.48 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.16 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.010 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.14 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.30 | <3.0 |

Associated samples MP3055: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.2.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|-------------------------|------|---------------------------|------|--------------|
| Aluminum | anr | | | | |
| Antimony | anr | | | | |
| Arsenic | anr | | | | |
| Barium | 283 | 440 | 198 | 79.3 | 75-125 |
| Beryllium | anr | | | | |
| Boron | | | | | |
| Cadmium | 0.24 | 40.7 | 49.5 | 81.7 | 75-125 |
| Calcium | anr | | | | |
| Chromium | 32.9 | 75.0 | 49.5 | 85.0 | 75-125 |
| Cobalt | anr | | | | |
| Copper | 11.5 | 54.8 | 49.5 | 87.5 | 75-125 |
| Iron | anr | | | | |
| Lead | 10.3 | 94.2 | 99 | 84.7 | 75-125 |
| Lithium | | | | | |
| Magnesium | anr | | | | |
| Manganese | anr | | | | |
| Molybdenum | | | | | |
| Nickel | 14.1 | 55.2 | 49.5 | 83.0 | 75-125 |
| Phosphorus | | | | | |
| Potassium | anr | | | | |
| Selenium | 2.0 | 81.2 | 99 | 80.0 | 75-125 |
| Silicon | | | | | |
| Silver | 0.20 | 16.4 | 19.8 | 81.8 | 75-125 |
| Sodium | anr | | | | |
| Strontium | | | | | |
| Thallium | anr | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | anr | | | | |
| Zinc | 38.5 | 80.0 | 49.5 | 83.8 | 75-125 |

Associated samples MP3055: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|----------|------------|-------------|
| Aluminum | anr | | | | | |
| Antimony | anr | | | | | |
| Arsenic | anr | | | | | |
| Barium | 283 | 420 | 192 | 71.2N(a) | 4.7 | 20 |
| Beryllium | anr | | | | | |
| Boron | | | | | | |
| Cadmium | 0.24 | 39.1 | 48.1 | 80.8 | 4.0 | 20 |
| Calcium | anr | | | | | |
| Chromium | 32.9 | 73.3 | 48.1 | 84.0 | 2.3 | 20 |
| Cobalt | anr | | | | | |
| Copper | 11.5 | 52.5 | 48.1 | 85.3 | 4.3 | 20 |
| Iron | anr | | | | | |
| Lead | 10.3 | 90.8 | 96.2 | 83.7 | 3.7 | 20 |
| Lithium | | | | | | |
| Magnesium | anr | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | | | | | | |
| Nickel | 14.1 | 53.1 | 48.1 | 81.1 | 3.9 | 20 |
| Phosphorus | | | | | | |
| Potassium | anr | | | | | |
| Selenium | 2.0 | 78.0 | 96.2 | 79.0 | 4.0 | 20 |
| Silicon | | | | | | |
| Silver | 0.20 | 15.9 | 19.2 | 81.6 | 3.1 | 20 |
| Sodium | anr | | | | | |
| Strontium | | | | | | |
| Thallium | anr | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | anr | | | | | |
| Zinc | 38.5 | 77.4 | 48.1 | 80.9 | 3.3 | 20 |

Associated samples MP3055: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 169 | 200 | 84.5 | 80-120 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 43.0 | 50 | 86.0 | 80-120 |
| Calcium | anr | | | |
| Chromium | 45.8 | 50 | 91.6 | 80-120 |
| Cobalt | anr | | | |
| Copper | 44.7 | 50 | 89.4 | 80-120 |
| Iron | anr | | | |
| Lead | 90.5 | 100 | 90.5 | 80-120 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 43.3 | 50 | 86.6 | 80-120 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 83.9 | 100 | 83.9 | 80-120 |
| Silicon | | | | |
| Silver | 17.4 | 20 | 87.0 | 80-120 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 43.4 | 50 | 86.8 | 80-120 |

Associated samples MP3055: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 2830 | 3110 | 9.9 | 0-10 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 2.40 | 2.00 | 16.7 (a) | 0-10 |
| Calcium | anr | | | |
| Chromium | 329 | 372 | 13.0*(b) | 0-10 |
| Cobalt | anr | | | |
| Copper | 115 | 116 | 1.0 | 0-10 |
| Iron | anr | | | |
| Lead | 103 | 116 | 11.9*(b) | 0-10 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 141 | 164 | 16.2*(b) | 0-10 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 19.8 | 30.0 | 51.5 (a) | 0-10 |
| Silicon | | | | |
| Silver | 2.00 | 0.00 | 100.0(a) | 0-10 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 385 | 460 | 19.5*(b) | 0-10 |

Associated samples MP3055: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3056
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.12 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3056: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.3.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 3.2 | 83.2 | 99 | 80.8 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3056: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 3.2 | 84.9 | 96.2 | 85.0 | 2.0 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3056: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|---------------|----------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 103 | 100 | 103.0 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3056: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 | | QC | |
|-------|----------|----------|------|--------|
| | Original | SDL 5:25 | %DIF | Limits |

| | | | | |
|------------|------|------|----------|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 32.1 | 37.8 | 17.9*(a) | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3056: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 274 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 109 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -740 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3061: D17735-3A, D17735-4A, D17735-5A, D17735-6A, D17735-7A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

9.4.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 29300 | 170000 | 125000 | 112.6 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3061: D17735-3A, D17735-4A, D17735-5A, D17735-6A, D17735-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 29300 | 169000 | 125000 | 111.8 | 0.6 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 0.0 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3061: D17735-3A, D17735-4A, D17735-5A, D17735-6A, D17735-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 141000 | 125000 | 112.8 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 133000 | 125000 | 106.4 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 132000 | 125000 | 105.6 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3061: D17735-3A, D17735-4A, D17735-5A, D17735-6A, D17735-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17735
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|----|--------------|----------|-----------------|---------------|---------------|--------------|
| Specific Conductivity | GP2898/GN6657 | | | umhos/cm | 9984 | 10200 | 102.6 | 90-110% |
| pH | GN6571 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |

Associated Samples:

Batch GN6571: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

Batch GP2898: D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





ACCUTEST

CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| |
|------------------------|
| Accutest Job #: D17735 |
| Accutest Quote #: |
| AMS P.O. #: |
| Project No.: |

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | |
|---|--------------------|---------------------|--|-----------------------------|--|---|------|-------|------|---|------|----|----------|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | Phone: (508) 481-6200 | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303)425-6854 | | | | | | | | | | | | | | |
| Field ID / Point of Collection | Date | Time | Matrix | # of bottles | Preservation | | | | | | Xcra | eh | Comments | |
| | | | | | HCL | NaOH | HNO3 | H2SO4 | None | | | | | |
| D17735 -1 | 9/27/10 | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -2 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -3 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -4 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -5 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -6 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| -7 | | 10:00 AM | Soil | 1 | | | | | | | X | X | | |
| - | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | | |
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ _____ _____ 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: _____ <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____ | | | | Please use Colorado regulations and RLs. <i>ICE</i> | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | For Subcontract Laboratory Use Only | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: | | | | | | | | | |
| 1 | 9/28/10 1:00 | 1 FedEx | 1 | 1 | Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Preserved where applicable: | | | | | | | | | | |
| 2 | 9/28/10 9:30 | 2 | 2 | <input type="checkbox"/> | | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Temperature °C | On Ice | | | | | | | | | |
| 3 | | 3 | 3 | 1-8 | <input type="checkbox"/> | | | | | | | | | |

D17735: Chain of Custody
Page 1 of 1
Accutest Labs of New England, Inc.

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
 GENERAL CHEMISTRY

Login Number: D17735
 Account: ALMS - Accutest Mountain States
 Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|--------------|-------|-----------------|---------------|---------------|--------------|
| Chromium, Hexavalent | GP12078/GN32952 | 0.50 | 0.0 | mg/kg | 12 | 11.9 | 99.2 | 80-120% |
| Chromium, Hexavalent | GP12078/GN32952 | | | mg/kg | 650 | 660 | 101.5 | 80-120% |

Associated Samples:

Batch GP12078: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

(*) Outside of QC limits

12.1

12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17735
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32947 | D17737-6 | mv | 349 | 338 | 3.2 | 0-20% |
| Redox Potential Vs H2 | GN32958 | D17735-5 | mv | 371 | 363 | 2.2 | 0-20% |

Associated Samples:

Batch GN32947: D17735-1, D17735-2, D17735-3, D17735-4

Batch GN32958: D17735-5, D17735-6, D17735-7

Batch GP12078: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

(*) Outside of QC limits

12.2
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17735
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 12 | 9.2 | 76.7 | 75-125% |
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 723 | 623 | 86.2 | 75-125% |

Associated Samples:

Batch GP12078: D17735-1, D17735-2, D17735-3, D17735-4, D17735-5, D17735-6, D17735-7

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12

Technical Report for

Marathon Oil

Parachute Pit Closure 18A, 13C

Accutest Job Number: D18174

Sampling Date: 10/12/10

Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: Randy March

Total number of pages in report: **102**



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

John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 8 |
| 3.1: D18174-1: 13C-SG1 | 9 |
| 3.2: D18174-2: 13C-AM1 | 15 |
| 3.3: D18174-3: 13C-AM2 | 21 |
| 3.4: D18174-4: 13C-AM2 DUP | 27 |
| 3.5: D18174-5: 13C-AM3 | 33 |
| 3.6: D18174-6: 13C-AM4 | 39 |
| 3.7: D18174-7: 13C-AM5 | 45 |
| Section 4: Misc. Forms | 51 |
| 4.1: Chain of Custody | 52 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 53 |
| 5.1: Method Blank Summary | 54 |
| 5.2: Blank Spike Summary | 55 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 56 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 57 |
| 6.1: Method Blank Summary | 58 |
| 6.2: Blank Spike Summary | 59 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 60 |
| Section 7: GC Volatiles - QC Data Summaries | 61 |
| 7.1: Method Blank Summary | 62 |
| 7.2: Blank Spike Summary | 63 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 64 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 65 |
| 8.1: Method Blank Summary | 66 |
| 8.2: Blank Spike Summary | 67 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 68 |
| Section 9: Metals Analysis - QC Data Summaries | 69 |
| 9.1: Prep QC MP3145: Hg | 70 |
| 9.2: Prep QC MP3146: Ba,Cd,Cr,Cu,Pb,Ni,Ag | 74 |
| 9.3: Prep QC MP3147: As | 79 |
| 9.4: Prep QC MP3158: Se,Zn | 84 |
| Section 10: General Chemistry - QC Data Summaries | 94 |
| 10.1: Method Blank and Spike Results Summary | 95 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 96 |
| 11.1: Chain of Custody | 97 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 99 |
| 12.1: Method Blank and Spike Results Summary | 100 |
| 12.2: Duplicate Results Summary | 101 |
| 12.3: Matrix Spike Results Summary | 102 |



Sample Summary

Marathon Oil

Job No: D18174

Parachute Pit Closure 18A, 13C

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D18174-1 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-SG1 |
| D18174-2 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM1 |
| D18174-3 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM2 |
| D18174-4 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM2 DUP |
| D18174-5 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM3 |
| D18174-6 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM4 |
| D18174-7 | 10/12/10 | 08:00 BY | 10/12/10 | SO | Soil | 13C-AM5 |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D18174

Site: Parachute Pit Closure 18A,13C

Report Dat 10/18/2010 3:00:00 PM

On 10/12/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 17°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D18174 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V3V411 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D18174-1MS and D18174-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2654 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D18173-5MS and D18173-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS) recoveries of Anthracene are outside control limits. Outside control limits due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The matrix spike (MS) recoveries of many analytes are outside control limits. The spike amounts are low relative to the sample amounts. Refer to the lab control or spike blank for recovery information.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB421 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D18173-1MS and D18173-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2651 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D18173-6MS and D18173-6MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3146 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS, D18173-1MSD, and D18173-1SDL were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Cadmium, Lead, and Nickel and the MSD recovery of Copper are outside control limits. The spike recoveries indicates possible matrix interference and/or sample nonhomogeneity. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPDs for Barium, Cadmium, Chromium, Lead, and Nickel are outside control limits for sample MP3146-SDL. The percent difference is acceptable for Cadmium due to low initial sample concentration (< 50 times IDL).
- MP3146-SDL for Barium, Chromium, Lead, and Nickel: Serial dilution indicates possible matrix interference.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3158 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS, D18173-1MSD, and D18173-1SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery of Zinc is outside control limits. Probable cause due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPD for Selenium and Zinc are outside control limits for sample MP3158-SDL. The percent difference for Selenium is acceptable due to low initial sample concentration (< 50 times IDL).
- MP3158-SDL for Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3147 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MSD, D18173-1SDL, and D18173-1MS were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery of Arsenic is outside control limits. The spike recovery indicates a possible matrix interference. Refer to the lab control or spike blank for recovery information.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3145 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS and D18173-1MSD were used as the QC samples for the Mercury analysis.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN33113 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, and D18174-7.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6759 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO

Batch ID: R4743

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: M:GP12142

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D18174

Site: MOILCOGJ: Parachute Pit Closure 18A,13C

Report Date 10/15/2010 3:34:32 PM

7 Sample(s) were collected on 10/12/2010 and were received at Accutest on 10/12/2010 properly preserved, at 2.3 Deg. C and intact. These Samples received an Accutest job number of D18174. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN33113

- Sample(s) M94980-5DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP12142

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18174-1MS, D18174-1DUP were used as the QC samples for Chromium, Hexavalent.
- RPD(s) for Duplicate for Chromium, Hexavalent are outside control limits for sample GP12142-D1. RPD acceptable due to low duplicate and sample concentrations.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D18174).



Sample Results

Report of Analysis

Report of Analysis

| | | | |
|--------------------------|-------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-SG1 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-1 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 85.1 ^a |
| Method: | SW846 8260B | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07638.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 57 | 17 | ug/kg | |
| 108-88-3 | Toluene | ND | 110 | 57 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 110 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 40 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 110 | 40 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-SG1 | | |
| Lab Sample ID: D18174-1 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 85.1 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02147.D | 2 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 13 | 12 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 67 | 14 | ug/kg | |
| 120-12-7 | Anthracene | ND | 13 | 8.6 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 13 | 13 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 13 | 8.4 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 13 | 9.7 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 13 | 8.3 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 13 | 8.4 | ug/kg | |
| 218-01-9 | Chrysene | ND | 13 | 6.7 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 13 | 9.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 13 | 8.2 | ug/kg | |
| 86-73-7 | Fluorene | ND | 13 | 13 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 13 | 8.7 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 13 | 12 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 67 | 20 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 67 | 15 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 13 | 11 | ug/kg | |
| 129-00-0 | Pyrene | ND | 13 | 9.0 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 70% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 68% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-SG1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 85.1 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A,13C | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7705.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 13C-SG1 | |
| Lab Sample ID: D18174-1 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 85.1 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4574.D | 1 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 115% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-SG1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 85.1 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.3 | 0.40 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 206 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 28.8 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 17.5 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 10.5 | 5.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.089 | 0.089 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 18.7 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 48.5 | 3.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-SG1 | |
| Lab Sample ID: D18174-1 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| | Percent Solids: 85.1 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 28.4 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 337 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 85.1 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.06 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|---|--|
| Client Sample ID: 13C-AM1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846 8260B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07641.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 58 | 17 | ug/kg | |
| 108-88-3 | Toluene | ND | 120 | 58 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 41 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 90% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM1 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-2 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 84.0 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02148.D | 5 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | ND | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 86.0 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 44.7 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 135 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 50.2 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 65.6 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 114 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 28.2 | 33 | 25 | ug/kg | J |
| 206-44-0 | Fluoranthene | 145 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | ND | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 53.2 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 60.3 | 170 | 51 | ug/kg | J |
| 91-20-3 | Naphthalene | ND | 170 | 37 | ug/kg | |
| 85-01-8 | Phenanthrene | 107 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 80.3 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 74% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 73% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 13C-AM1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7706.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 13C-AM1 | |
| Lab Sample ID: D18174-2 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 84.0 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4587.D | 1 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 104 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 89% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|---|--|
| Client Sample ID: 13C-AM1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.2 | 0.40 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 309 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 30.9 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 20.9 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 11.0 | 5.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 17.4 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 46.1 | 3.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM1 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.51 | 0.50 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 30.4 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 345 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.36 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-AM2 | | |
| Lab Sample ID: D18174-3 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8260B | | Percent Solids: 86.1 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07642.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 57 | 17 | ug/kg | |
| 108-88-3 | Toluene | ND | 110 | 57 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 110 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 40 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 110 | 40 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-AM2 | | |
| Lab Sample ID: D18174-3 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 86.1 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02168.D | 5 | 10/16/10 | TMB | 10/13/10 | OP2654 | E3G62 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | 50.8 | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | ND | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 590 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 302 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 911 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 306 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 317 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 770 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 173 | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 1070 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | 175 | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 353 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 256 | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 448 | 170 | 51 | ug/kg | |
| 91-20-3 | Naphthalene | 265 | 170 | 37 | ug/kg | |
| 85-01-8 | Phenanthrene | 702 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 507 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 88% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 84% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM2 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.1 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7707.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 86% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM2 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.1 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4590.D | 5 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 497 | 67 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 127% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM2 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.1 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 12.8 | 0.42 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 371 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 23.0 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 15.7 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 9.9 | 5.3 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 15.4 | 3.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 48.3 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|---|
| Client Sample ID: 13C-AM2 Lab Sample ID: D18174-3 Matrix: SO - Soil Project: Parachute Pit Closure 18A,13C | Date Sampled: 10/12/10 Date Received: 10/12/10 Percent Solids: 86.1 ^a |
|---|---|

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.53 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.5 | 1.6 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 328 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 86.1 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.32 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | | |
|--------------------------|-------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM2 DUP | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-4 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 85.3 ^a |
| Method: | SW846 8260B | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07648.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 57 | 17 | ug/kg | |
| 108-88-3 | Toluene | ND | 110 | 57 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 110 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 40 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 110 | 40 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 79% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM2 DUP | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-4 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 85.3 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02169.D | 5 | 10/16/10 | TMB | 10/13/10 | OP2654 | E3G62 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | 42.9 | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 370 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 193 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 591 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 198 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 286 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 480 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 124 | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 557 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | 83.8 | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 229 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 80.0 | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 155 | 170 | 51 | ug/kg | J |
| 91-20-3 | Naphthalene | 73.3 | 170 | 37 | ug/kg | J |
| 85-01-8 | Phenanthrene | 385 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 342 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 30% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 40% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 91% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM2 DUP | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A,13C | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7708.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 15.7 | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 107% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.4
3

| | |
|--|--|
| Client Sample ID: 13C-AM2 DUP | |
| Lab Sample ID: D18174-4 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 85.3 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4591.D | 5 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 546 | 66 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 121% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM2 DUP | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.4 | 0.38 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 854 | 0.96 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 22.1 | 0.96 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 20.6 | 0.96 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 10.0 | 4.8 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 15.4 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 43.9 | 3.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM2 DUP | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.50 | 0.50 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.6 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 309 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 85.3 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.47 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | | |
|--------------------------|-------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM3 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-5 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 82.9 ^a |
| Method: | SW846 8260B | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07649.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 59 | 18 | ug/kg | |
| 108-88-3 | Toluene | ND | 120 | 59 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 41 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 86% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 81% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM3 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-5 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 82.9 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A, 13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02170.D | 5 | 10/16/10 | TMB | 10/13/10 | OP2654 | E3G62 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | ND | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 57.0 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 30.8 | 33 | 21 | ug/kg | J |
| 205-99-2 | Benzo(b)fluoranthene | 98.9 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 33.6 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 49.8 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 74.9 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 89.5 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | ND | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 33.6 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 32.1 | 33 | 29 | ug/kg | J |
| 91-57-6 | 2-Methylnaphthalene | 67.9 | 170 | 51 | ug/kg | J |
| 91-20-3 | Naphthalene | 38.6 | 170 | 37 | ug/kg | J |
| 85-01-8 | Phenanthrene | 58.5 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 48.5 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 62% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 60% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 64% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM3 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.9 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7710.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 89% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM3 | |
| Lab Sample ID: D18174-5 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 82.9 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4592.D | 1 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 93.7 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 112% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

35
3

| | |
|---|--|
| Client Sample ID: 13C-AM3 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.9 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.3 | 0.41 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 326 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 27.2 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 17.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 9.8 | 5.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 16.6 | 3.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 54.6 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM3 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.9 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.72 | 0.49 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 26.5 | 1.5 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 344 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 82.9 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.38 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | | |
|--------------------------|-------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM4 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-6 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 86.5 ^a |
| Method: | SW846 8260B | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07650.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 20.3 | 57 | 17 | ug/kg | J |
| 108-88-3 | Toluene | ND | 110 | 57 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 110 | 23 | ug/kg | |
| | m,p-Xylene | ND | 230 | 40 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 110 | 40 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 80% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-AM4 | | |
| Lab Sample ID: D18174-6 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 86.5 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02183.D | 10 | 10/17/10 | TMB | 10/13/10 | OP2654 | E3G63 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 67 | 62 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 330 | 69 | ug/kg | |
| 120-12-7 | Anthracene | ND | 67 | 43 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 71.4 | 67 | 65 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 67 | 42 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 110 | 67 | 48 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 67 | 42 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 47.6 | 67 | 42 | ug/kg | J |
| 218-01-9 | Chrysene | 98.6 | 67 | 33 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 67 | 49 | ug/kg | |
| 206-44-0 | Fluoranthene | 129 | 67 | 41 | ug/kg | |
| 86-73-7 | Fluorene | ND | 67 | 65 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 67 | 44 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 75.2 | 67 | 59 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 152 | 330 | 100 | ug/kg | J |
| 91-20-3 | Naphthalene | 74.6 | 330 | 74 | ug/kg | J |
| 85-01-8 | Phenanthrene | 118 | 67 | 53 | ug/kg | |
| 129-00-0 | Pyrene | 63.6 | 67 | 45 | ug/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 53% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 58% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 54% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 13C-AM4 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7711.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 92% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 13C-AM4 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4593.D | 1 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 183 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 114% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM4 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 7.4 | 0.38 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 353 | 0.95 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 0.95 | 0.95 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 24.8 | 0.95 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 17.2 | 0.96 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 10.2 | 4.8 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.094 | 0.094 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 18.0 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 49.5 | 3.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

3.6
3

| | |
|---|--|
| Client Sample ID: 13C-AM4 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 86.5 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 24.8 | 1.5 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 319 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 86.5 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.32 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | | |
|--------------------------|-------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM5 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-7 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 81.1 ^a |
| Method: | SW846 8260B | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07652.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 59 | 18 | ug/kg | |
| 108-88-3 | Toluene | ND | 120 | 59 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 24 | ug/kg | |
| | m,p-Xylene | ND | 240 | 42 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 120 | 42 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 85% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 81% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 13C-AM5 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18174-7 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 81.1 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02172.D | 10 | 10/17/10 | TMB | 10/13/10 | OP2654 | E3G62 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 67 | 62 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 330 | 69 | ug/kg | |
| 120-12-7 | Anthracene | ND | 67 | 43 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 67 | 65 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 67 | 42 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 53.1 | 67 | 48 | ug/kg | J |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 67 | 42 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 67 | 42 | ug/kg | |
| 218-01-9 | Chrysene | 40.0 | 67 | 33 | ug/kg | J |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 67 | 49 | ug/kg | |
| 206-44-0 | Fluoranthene | 47.9 | 67 | 41 | ug/kg | J |
| 86-73-7 | Fluorene | ND | 67 | 65 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 67 | 44 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 67 | 59 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 330 | 100 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 330 | 74 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 67 | 53 | ug/kg | |
| 129-00-0 | Pyrene | ND | 67 | 45 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 129% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 117% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 138% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM5 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-7 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.1 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7712.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 81% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 13C-AM5 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-7 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.1 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4594.D | 1 | 10/14/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 40.9 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 114% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-AM5 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-7 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.1 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 9.6 | 0.39 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 215 | 0.98 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 0.98 | 0.98 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 26.5 | 0.98 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 14.1 | 0.98 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 10.6 | 4.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 15.5 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 26 | 26 | mg/kg | 5 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 47.9 | 15 | mg/kg | 5 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 13C-AM5 | | Date Sampled: 10/12/10 |
| Lab Sample ID: D18174-7 | | Date Received: 10/12/10 |
| Matrix: SO - Soil | | Percent Solids: 81.1 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.68 | 0.49 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 25.8 | 1.5 | mg/kg | 1 | 10/15/10 14:55 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 342 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 81.1 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.09 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

4036 Youngfield Street, Wheat Ridge, Colorado 80033
TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
www.accutest.com

| | |
|-------------------|------------------------------|
| FED-EX Tracking # | Bottle Order Control # |
| Accutest Quote # | Accutest Job # D18174 |

| Client / Reporting Information | | Project Information | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | | | | | | | |
|---|--|---|--|--|--|-------------|--|--------------|--|-----------------------------|--|--|--|---|--|--|--|--|--|--------------|--|--|--|--|--|-----------|
| Company Name MARATHON OIL CO | | Project Name PARACHUTE PIT CLOSURE 18A, 13C | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WIP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | | | | | | | | | | |
| Street Address 60 Golden Assoc 4401111 BLVD | | Street | | | | | | | | | | | | | | | | | | | | | | | | |
| City State Zip LAKEWOOD CO 80228 | | City State | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Contact Randy Munch | | Project # | | | | | | | | | | | | | | | | | | | | | | | | |
| Phone # 303-980-0570 | | Client Purchase Order # | | | | | | | | | | | | | | | | | | | | | | | | |
| Sampler(s) Name(s) Ben Yanda | | Project Manager | | | | | | | | | | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | | MECH/DI Vial # | | Collection | | Matrix | | # of bottles | | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | | | | | | |
| | | | | Date | | Time | | Sampled by | | | | | | | | | | | | | | | | | | |
| 13C-SG1 | | | | 10.12 | | 8.00 | | BCY | | 5 | | | | | | | | | | | | | | | | |
| 13C-AM 1 | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 01 |
| 13C-AM 2 | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 02 |
| 13C-AM 2 DUP | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 03 |
| 13C-AM 3 | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 04 |
| 13C-AM 4 | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 05 |
| 13C-AM 5 | | | | 10.12 | | 8.00 | | BCY | | 6 | | | | | | | | | | | | | | | | 06 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 07 |

TPH - GRO
 TPH - DRO
 BTEX
 PAHs
 METALS (910)

| | | | | | | | |
|---|--|--|--|---|--|-------------------------------------|--|
| Turnaround Time (Business days) | | Approved By (Accutest PM): / Date: | | Data Deliverable Information | | Comments / Special instructions | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> US7 Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input checked="" type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | 1-2 days | |
| Emergency & Rush T/A data available VIA Lablink | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | |
| Relinquished by Sampler: | | Date Time: | | Received By: | | Date Time: | |
| 1 B₁-CY2 | | 10.12.2010 | | Jacob Parker | | 10/12/10 | |
| Relinquished by Sampler: | | Date Time: | | Received By: | | Date Time: | |
| 3 | | | | 3 | | | |
| Relinquished by: | | Date Time: | | Received By: | | Date Time: | |
| 5 | | | | 5 | | | |
| Custody Seal # | | Intact | | Preserved where applicable | | On Ice | |
| | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| | | Cooler Temp. | | | | 17.0 | |

D18174: Chain of Custody

Page 1 of 1

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V411-MB1 | 3V07636.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 83% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Blank Spike Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V411-BS1 | 3V07637.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 50.6 | 101 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 53.4 | 107 | 70-130 |
| 108-88-3 | Toluene | 50 | 51.3 | 103 | 70-130 |
| | m,p-Xylene | 50 | 48.7 | 97 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 47.8 | 96 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D18174-1MS | 3V07639.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| D18174-1MSD | 3V07640.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| D18174-1 | 3V07638.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | D18174-1 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 2870 | 2860 | 100 | 3020 | 105 | 5 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 2870 | 3040 | 106 | 3150 | 110 | 4 | 56-139/30 |
| 108-88-3 | Toluene | ND | 2870 | 2880 | 100 | 2980 | 104 | 3 | 57-144/30 |
| | m,p-Xylene | ND | 2870 | 2790 | 97 | 2850 | 99 | 2 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 2870 | 2770 | 96 | 2850 | 99 | 3 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18174-1 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 86% | 85% | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | 92% | 89% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | 89% | 86% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-MB | 3G02108.D | 1 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 95% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 93% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 104% | 17-174% |

Blank Spike Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-BS | 3G02109.D | 1 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 72.6 | 87 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 72.9 | 87 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 76.5 | 92 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.0 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 68.0 | 82 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 72.3 | 87 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 65.8 | 79 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 67.9 | 81 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 71.3 | 86 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 69.2 | 83 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 77.3 | 93 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 72.8 | 87 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 66.4 | 80 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 74.8 | 90 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 72.8 | 87 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 70.4 | 84 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 73.7 | 88 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 71.2 | 85 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 96% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 87% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 94% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-MS | 3G02144.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| OP2654-MSD | 3G02145.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| D18173-5 | 3G02143.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | D18173-5 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----|-------------------|
| 83-32-9 | Acenaphthene | 68.2 | | 83.3 | 125 | 75 | 129 | 80 | 3 | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 83.3 | 73.1 | 88 | 74.2 | 89 | 1 | 23-156/30 |
| 120-12-7 | Anthracene | ND | | 83.3 | 220 | -4* a | 228 | 6* a | 4 | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | 1420 | | 83.3 | 1290 | -444* b | 1370 | -348* b | 6 | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | 734 | | 83.3 | 690 | -163* b | 741 | -102* b | 7 | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | 2090 | | 83.3 | 1800 | -984* b | 1880 | -889* b | 4 | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | 706 | | 83.3 | 649 | -38* b | 671 | -12* b | 3 | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | 904 | | 83.3 | 855 | 19 | 912 | 88 | 6 | 17-161/30 |
| 218-01-9 | Chrysene | 1780 | | 83.3 | 1590 | -372* b | 1680 | -264* b | 6 | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | 510 | | 83.3 | 468 | -11* b | 476 | -1* b | 2 | 21-154/30 |
| 206-44-0 | Fluoranthene | 2320 | | 83.3 | 2010 | -336* b | 2110 | -216* b | 5 | 16-140/30 |
| 86-73-7 | Fluorene | 139 | | 83.3 | 196 | 55 | 210 | 72 | 7 | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 767 | | 83.3 | 760 | -180* b | 785 | -150* b | 3 | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | 242 | | 83.3 | 269 | 48 | 303 | 89 | 12 | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | 467 | | 83.3 | 466 | 35 | 522 | 102 | 11 | 10-181/30 |
| 91-20-3 | Naphthalene | 244 | J | 83.3 | 284 | 77 | 329 | 131 | 15 | 10-176/30 |
| 85-01-8 | Phenanthrene | 1150 | | 83.3 | 1060 | -168* b | 1110 | -108* b | 5 | 22-152/30 |
| 129-00-0 | Pyrene | 944 | | 83.3 | 902 | -454* b | 959 | -386* b | 6 | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-5 | Limits |
|-----------|----------------------|-----|------|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 92% | 100% | 93% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | 80% | 82% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 89% | 93% | 95% | 17-174% |

(a) Outside control limits due to matrix interference.

(b) Outside control limits due to high level in sample relative to spike amount.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB421-MB | GB7695.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB421-BS | GB7696.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 115 | 105 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 102% | 60-140% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D18173-1MS | GB7698.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| D18173-1MSD | GB7699.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| D18173-1 | GB7697.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

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

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | D18173-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 25.6 | 128 | 150 | 97 | 163 | 108 | 8 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 113% | 114% | 105% | 60-140% |

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-MB | FD4562.D | 1 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 116% 63-130% |

Blank Spike Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-BS | FD4563.D | 1 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 766 | 115 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 121% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18174
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-MS | FD4565.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| OP2651-MSD | FD4566.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| D18173-6 | FD4564.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

| CAS No. | Compound | D18173-6 mg/kg | Spike Q | mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| | TPH-DRO (C10-C28) | 546 | 667 | 1200 | 98 | 1290 | 112 | 7 | 70-130/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-6 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 112% | 119% | 121% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | 0.0013 | <0.10 |

Associated samples MP3145: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.043 0.39 0.377 92.0 85-115

Associated samples MP3145: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MSD | SpikeLot HGWSR1 | % Rec | MSD RPD | QC Limit | |
|---------|--------------------------|--------------------|-------|------------|-------------|----|
| Mercury | 0.043 | 0.40 | 0.392 | 91.0 | 2.5 | 20 |

Associated samples MP3145: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.37 | 0.4 | 92.5 | 80-120 |

Associated samples MP3145: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.24 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.13 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 1.0 | .16 | .38 | 0.67 | <1.0 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.15 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | -0.010 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |

Associated samples MP3146: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | | Spike/lot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|-----------------------------|----------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | 543 | 788 | 198 | 123.7 | 75-125 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.48 | 36.8 | 49.5 | 73.4N(a) | 75-125 |
| Calcium | | | | | |
| Chromium | 17.7 | 57.0 | 49.5 | 79.4 | 75-125 |
| Cobalt | | | | | |
| Copper | 29.7 | 69.8 | 49.5 | 81.0 | 75-125 |
| Iron | | | | | |
| Lead | 16.9 | 85.5 | 99 | 69.3N(b) | 75-125 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 14.3 | 47.2 | 49.5 | 66.5N(b) | 75-125 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Silicon | | | | | |
| Silver | 0.0 | 15.9 | 19.8 | 80.3 | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |

Associated samples MP3146: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

(b) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|----------------------------|-----------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | 543 | 850 | 196 | 156.6N(a) | 7.6 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 0.48 | 35.7 | 49 | 71.8N(a) | 3.0 | 20 |
| Calcium | | | | | | |
| Chromium | 17.7 | 55.9 | 49 | 77.9 | 1.9 | 20 |
| Cobalt | | | | | | |
| Copper | 29.7 | 65.6 | 49 | 73.2N(a) | 6.2 | 20 |
| Iron | | | | | | |
| Lead | 16.9 | 83.2 | 98 | 67.6N(b) | 2.7 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 14.3 | 45.5 | 49 | 63.6N(b) | 3.7 | 20 |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Silicon | | | | | | |
| Silver | 0.0 | 15.4 | 19.6 | 78.5 | 3.2 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |

Associated samples MP3146: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

(b) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 172 | 200 | 86.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 41.2 | 50 | 82.4 | 80-120 |
| Calcium | | | | |
| Chromium | 43.8 | 50 | 87.6 | 80-120 |
| Cobalt | | | | |
| Copper | 44.9 | 50 | 89.8 | 80-120 |
| Iron | | | | |
| Lead | 86.3 | 100 | 86.3 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 41.2 | 50 | 82.4 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Silicon | | | | |
| Silver | 17.6 | 20 | 88.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |

Associated samples MP3146: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/13/10

| Metal | D18173-1 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 5430 | 6290 | 15.8*(a) | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 4.80 | 5.50 | 14.6 (b) | 0-10 |
| Calcium | | | | |
| Chromium | 177 | 211 | 18.9*(a) | 0-10 |
| Cobalt | | | | |
| Copper | 297 | 317 | 6.5 | 0-10 |
| Iron | | | | |
| Lead | 169 | 212 | 24.9*(a) | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 143 | 176 | 23.4*(a) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |

Associated samples MP3146: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.073 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3147: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.3.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | | SpikeLot MPICPALL % Rec | QC Limits |
|------------|-------------------------|-----|----------------------------|-----------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 37.7 | 105 | 99 | 68.0N(a) 60-119 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested
 (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit |
|------------|--------------------------|-----|---------------------------|--------------|-------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 37.7 | 103 | 98 | 66.6N(a) 1.9 | 20 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3147: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested
 (a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 95.7 | 100 | 95.7 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 10/13/10

| Metal | D18173-1 | | QC | |
|-------|----------|---------------|--------|--|
| | Original | SDL 10:50%DIF | Limits | |

| | | | | |
|------------|-----|-----|-----|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 377 | 370 | 1.9 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/14/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | | |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | | |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | | |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | | |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | | |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | | |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.35 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | | |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.80 | <3.0 |

Associated samples MP3158: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.4.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | D18173-1 Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|-------------------------|-----|---------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | anr | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 2.7 | 159 | 202 | 77.4 | 75-125 |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 48.6 | 128 | 101 | 78.6 | 75-125 |

Associated samples MP3158: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | D18173-1 Original MSD | Spikelot MPICPAL % Rec | MSD RPD | QC Limit | | |
|------------|--------------------------|---------------------------|------------|-------------|------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | anr | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.7 | 153 | 196 | 76.7 | 3.8 | 20 |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 48.6 | 107 | 98 | 59.6N(a) | 17.9 | 20 |

Associated samples MP3158: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 169 | 200 | 84.5 | 80-120 |
| Silicon | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 84.5 | 100 | 84.5 | 80-120 |

Associated samples MP3158: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18174
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/14/10

| Metal | D18173-1 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 27.4 | 38.0 | 38.7 (a) | 0-10 |
| Silicon | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 486 | 620 | 27.6*(b) | 0-10 |

Associated samples MP3158: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18174
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---------|----------|----|-----------|-------|--------------|------------|------------|-------------|
| pH | GN6769 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |
| pH | GN6769 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |

Associated Samples:

Batch GN6769: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
 303-425-6021 FAX: 303-425-6854

Accutest Job #: **D18174**
 Accutest Quote #:
 AMS P.O. #:
 Project No.:

| Client Information | | | Subcontract Laboratory Information | | | | | | | | | | Analytical Information | | | | | | |
|--|-------------------------------|-----------------------------------|---|---|--|--|------|-------|------|-----|--|-------------------------------------|------------------------|--|--|--|--|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | Phone: (508) 481-6200 | | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303)425-6854 | | | | | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | Collection | | Matrix | # of bottles | Preservation | | | | | XCR | eh | | Comments | | | | | | |
| | Date | Time | | | HCl | NaOH | HNO3 | H2SO4 | None | | | | | | | | | | |
| D18174 -1 | 10/12/10 | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -2 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -3 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -4 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -5 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -6 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -7 | | 8:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | | | | Comments / Remarks | | | | | | |
| <input checked="" type="checkbox"/> 1 - 2 Business Day Rush <input type="checkbox"/> Other _____ (Days) RUSH! 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | Approved By: | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | | | | | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) | | | | | Please use Colorado regulations and RLs. <i>10A</i> | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | For Subcontract Laboratory Use Only | | | | | | | |
| Relinquished by: 1 <i>ZOR</i> | Date & Time: 10/13/10 | Received By: 1 <i>FedEx</i> | Date & Time: 1 | Seal #: | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | | | | | | |
| Relinquished by: 2 <i>FedEx</i> | Date & Time: 10/14/10 9:30 | Received By: 2 <i>Stimberg</i> | Date & Time: 2 | Preserved where applicable: <input type="checkbox"/> | On Ice Temperature °C <i>2.5</i> <input checked="" type="checkbox"/> | | | | | | | | | | | | | | |
| Relinquished by: 3 | Date & Time: | Received By: 3 | Date & Time: 3 | | | | | | | | | | | | | | | | |

11.1
11

D18174: Chain of Custody
 Page 1 of 2
 Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D18174

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 10/14/2010 9:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: N/A

Airbill #'s: N/A

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

| <u>Cooler Temperature</u> | <u>Y or N</u> | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

| <u>Quality Control Preservation</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|-------------------------------------|-------------------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

| <u>Sample Integrity - Instructions</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Empty box for comments.

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18174
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | 0.50 | 0.0 | mg/kg | 12 | 11.6 | 96.7 | 80-120% |
| Chromium, Hexavalent | GP12142/GN33117 | | | mg/kg | 747 | 713 | 95.4 | 80-120% |

Associated Samples:

Batch GP12142: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

(*) Outside of QC limits

12.1
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18174
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|----------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 0.0 | 200.0(a) | 0-20% |
| Redox Potential Vs H2 | GN33113 | M94980-5 | mv | 346 | 345 | 0.3 | 0-20% |

Associated Samples:

Batch GN33113: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

Batch GP12142: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

(*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18174
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 11.9 | 11.5 | 93.0 | 75-125% |
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 645 | 573 | 88.8 | 75-125% |

Associated Samples:

Batch GP12142: D18174-1, D18174-2, D18174-3, D18174-4, D18174-5, D18174-6, D18174-7

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12



10/21/10

Technical Report for

Marathon Oil

Parachute Pit Closure 18A, 13C

PO# 08381544D

Accutest Job Number: D18241

Sampling Date: 10/13/10

Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: Randy March

Total number of pages in report: **20**



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

John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|--|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 5 |
| 3.1: D18241-1: 13C-SG1-AG | 6 |
| Section 4: Misc. Forms | 8 |
| 4.1: Chain of Custody | 9 |
| Section 5: Metals Analysis - QC Data Summaries | 10 |
| 5.1: Prep QC MP3196: Ca,Mg,Na,Sodium Adsorption Ratio | 11 |
| Section 6: General Chemistry - QC Data Summaries | 19 |
| 6.1: Method Blank and Spike Results Summary | 20 |

1

2

3

4

5

6



Sample Summary

Marathon Oil

Job No: D18241

Parachute Pit Closure 18A, 13C
Project No: PO# 08381544D

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|-----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D18241-1 | 10/13/10 | 11:45 RMT | 10/14/10 | SO | Soil | 13C-SG1-AG |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D18241

Site: Parachute Pit Closure 18A,13C

Report Dat 10/21/2010 1:40:27 PM

On 10/14/2010, one (1) sample, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 21.2°C. The sample was intact and properly preserved, unless noted below. An AMS Job Number of D18241 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

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

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP3196

- The sample was digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D18241-1MS and D18241-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method DEPT.OF AG, BOOK N9

Matrix SO

Batch ID: GP2991

- The sample was prepared and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.

Wet Chemistry By Method LADNR29B

Matrix SO

Batch ID: MP3196

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO

Batch ID: GN6813

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

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

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

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

Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|--|---|
| Client Sample ID: 13C-SG1-AG Lab Sample ID: D18241-1 Matrix: SO - Soil Project: Parachute Pit Closure 18A,13C | Date Sampled: 10/13/10 Date Received: 10/14/10 Percent Solids: 83.8 ^a |
|--|---|

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 32.3 | 2.0 | mg/l | 1 | 10/19/10 | 10/19/10 GJ | SW846 6010B ¹ | EPA 200.7 ³ |
| Magnesium | 4.31 | 1.0 | mg/l | 1 | 10/19/10 | 10/19/10 GJ | SW846 6010B ¹ | EPA 200.7 ³ |
| Sodium | 23.9 | 2.0 | mg/l | 1 | 10/19/10 | 10/20/10 GJ | SW846 6010B ² | EPA 200.7 ³ |

- (1) Instrument QC Batch: MA1056
- (2) Instrument QC Batch: MA1058
- (3) Prep QC Batch: MP3196

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 13C-SG1-AG | |
| Lab Sample ID: D18241-1 | Date Sampled: 10/13/10 |
| Matrix: SO - Soil | Date Received: 10/14/10 |
| | Percent Solids: 83.8 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|-----|----------|----|----------------|-----|---------------------|
| Sodium Adsorption Ratio ^b | 1.05 | | ratio | 1 | 10/20/10 15:04 | GJ | LADNR29B |
| Solids, Percent ^a | 83.8 | | % | 1 | 10/18/10 | SWT | SM19 2540B M |
| Specific Conductivity | 340 | 1.0 | umhos/cm | 1 | 10/20/10 | JK | DEPT.OF AG, BOOK N9 |
| pH | 9.22 | | su | 1 | 10/14/10 16:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, Colorado 80033
TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
www.accutest.com

D18241

| Client / Reporting Information | | Project Information | | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | |
|---|--------------------------------|--|-----------------|------------------------------------|---------------|--|--------------|---|------|--|-------|--|----------|---|-----------|--|----------|--------------|----------|--|
| Company Name Golden Associates Inc. | | Project Name Mammoth Pit Closure | | | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | | |
| Street Address 44 Union Blvd, Suite 300 | | Street | | | | | | | | | | | | | | | | | | |
| City State Zip Lakewood CO 80228 | | City State | | | | | | | | | | | | | | | | | | |
| Project Contact Randy March | | Project # 08381544D | | | | | | | | | | | | | | | | | | |
| Phone # 303-980-0540 | | Client Purchase Order # 08381544D | | | | | | | | | | | | | | | | | | |
| Fax # 303-985-2000 | | Street Address | | | | | | | | | | | | | | | | | | |
| Sampler(s) Name(s) Ryan Tolene | | City State Zip | | | | | | | | | | | | | | | | | | |
| Phone # 303-980-0540 | | Attention: | | | | | | | | | | | | | | | | | | |
| Accutest Sample # | Field ID / Point of Collection | MECH/DI Vial # | Collection | | | Matrix | # of bottles | Number of preserved bottles | | | | | | | | | | LAB USE ONLY | | |
| | | | Date | Time | Sampled by | | | HCl | HNO3 | H2O2 | H2SO4 | NONE | DI Water | MEDIA | ENCLOSURE | EC | PH | | SAR | |
| | 13C-SG1-AG | | 10/13/10 | 1145 | RMT SO | 1 | | | | | | | | | | | X | X | X | |
| Turnaround Time (Business days) | | Data Deliverable Information | | | | Comments / Special Instructions | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | Approved By (Accutest PM) / Date: | | | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | | | | | | | | | | |
| Emergency & Rush T/A data available VIA Lablink | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: Ryan Tolene | | Date Time: 10/14/10 0840 | | Received By: [Signature] | | Date Time: 10/14/10 8:30 | | Relinquished By: 2 | | Date Time: 10/14/10 90 | | Received By: [Signature] | | | | | | | | |
| Relinquished by Sampler: | | Date Time: | | Received By: | | Date Time: | | Relinquished By: | | Date Time: | | Received By: | | | | | | | | |
| Relinquished by: | | Date Time: | | Received By: | | Date Time: | | Custody Seal # | | <input type="checkbox"/> Intact <input type="checkbox"/> Not intact | | <input type="checkbox"/> Preserved where applicable <input checked="" type="checkbox"/> Not | | <input type="checkbox"/> On Ice <input checked="" type="checkbox"/> Cooler Temp. 21.2 | | | | | | |

4.1
4

D18241: Chain of Custody

Page 1 of 1

Metals Analysis

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/19/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | -5.5 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | -20 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -870 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3196: D18241-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.1.1

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18241
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/19/10

| Metal | D18241-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|--------|----------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 32300 | 162000 | 125000 | 103.8 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 4310 | 127000 | 125000 | 98.2 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 23900 | 154000 | 125000 | 104.1 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3196: D18241-1

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.1.2

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18241
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/19/10

| Metal | D18241-1 Original MSD | Spikelot MPICPAL % Rec | MSD RPD | QC Limit | | |
|------------|--------------------------|---------------------------|------------|-------------|-----|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 32300 | 166000 | 125000 | 107.0 | 2.4 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 4310 | 127000 | 125000 | 98.2 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 23900 | 157000 | 125000 | 106.5 | 1.9 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3196: D18241-1

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

5.1.2
5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.1.2

5

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18241
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/19/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 128000 | 125000 | 102.4 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 121000 | 125000 | 96.8 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 126000 | 125000 | 100.8 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3196: D18241-1

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3196
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.1.3

5

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18241
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|-----|-----------|----------|--------------|------------|------------|-------------|
| Specific Conductivity | GP2991/GN6852 | 1.0 | <1.0 | umhos/cm | 10003 | 10100 | 100.7 | 90-110% |
| pH | GN6783 | | | su | 8.00 | 7.96 | 99.5 | 99.3-100.7% |
| pH | GN6783 | | | su | 8.00 | 7.96 | 99.5 | 99.3-100.7% |

Associated Samples:
Batch GN6783: D18241-1
Batch GP2991: D18241-1
(*) Outside of QC limits

6.1

6

Technical Report for

Marathon Oil

Roan Pit Closure

Project 083-81544D.0004

Accutest Job Number: D17264

Sampling Date: 09/09/10

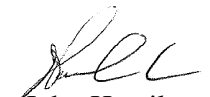
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **118**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|------------|
| Section 1: Sample Summary | 4 |
| Section 2: Case Narrative/Conformance Summary | 5 |
| Section 3: Sample Results | 9 |
| 3.1: D17264-1: 18A-F1 | 10 |
| 3.2: D17264-1A: 18A-F1 | 16 |
| 3.3: D17264-2: 18A-F2 | 18 |
| 3.4: D17264-2A: 18A-F2 | 24 |
| 3.5: D17264-3: 18A-F3 | 26 |
| 3.6: D17264-3A: 18A-F3 | 32 |
| 3.7: D17264-4: 18A-F4 | 34 |
| 3.8: D17264-4A: 18A-F4 | 40 |
| 3.9: D17264-5: 18A-TS1 | 42 |
| 3.10: D17264-5A: 18A-TS1 | 48 |
| 3.11: D17264-6: 18A-TS2 | 50 |
| 3.12: D17264-6A: 18A-TS2 | 56 |
| Section 4: Misc. Forms | 58 |
| 4.1: Chain of Custody | 59 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 60 |
| 5.1: Method Blank Summary | 61 |
| 5.2: Blank Spike Summary | 62 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 63 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 64 |
| 6.1: Method Blank Summary | 65 |
| 6.2: Blank Spike Summary | 66 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 67 |
| Section 7: GC Volatiles - QC Data Summaries | 68 |
| 7.1: Method Blank Summary | 69 |
| 7.2: Blank Spike Summary | 70 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 71 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 72 |
| 8.1: Method Blank Summary | 73 |
| 8.2: Blank Spike Summary | 74 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 75 |
| Section 9: Metals Analysis - QC Data Summaries | 76 |
| 9.1: Prep QC MP2887: Ca,Mg,Na,Sodium Adsorption Ratio | 77 |
| 9.2: Prep QC MP2905: Hg | 85 |
| 9.3: Prep QC MP2923: Ba,Cd,Cr,Cu,Pb,Ni | 89 |
| 9.4: Prep QC MP2924: As | 94 |
| 9.5: Prep QC MP2950: Se,Ag,Zn | 99 |
| Section 10: General Chemistry - QC Data Summaries | 109 |
| 10.1: Method Blank and Spike Results Summary | 110 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 111 |

Table of Contents

-2-

| | |
|---|------------|
| 11.1: Chain of Custody | 112 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 114 |
| 12.1: Method Blank and Spike Results Summary | 115 |
| 12.2: Blank Spike Duplicate Results Summary | 116 |
| 12.3: Duplicate Results Summary | 117 |
| 12.4: Matrix Spike Results Summary | 118 |

1

2

3

4

5

6

7

8

9

10

11

12



Sample Summary

Marathon Oil

Job No: D17264

Roan Pit Closure

Project No: Project 083-81544D.0004

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17264-1 | 09/09/10 | 08:15 RM | 09/10/10 | SO | Soil | 18A-F1 |
| D17264-1A | 09/09/10 | 08:15 RM | 09/10/10 | SO | Soil | 18A-F1 |
| D17264-2 | 09/09/10 | 08:35 RM | 09/10/10 | SO | Soil | 18A-F2 |
| D17264-2A | 09/09/10 | 08:35 RM | 09/10/10 | SO | Soil | 18A-F2 |
| D17264-3 | 09/09/10 | 08:55 RM | 09/10/10 | SO | Soil | 18A-F3 |
| D17264-3A | 09/09/10 | 08:55 RM | 09/10/10 | SO | Soil | 18A-F3 |
| D17264-4 | 09/09/10 | 09:15 RM | 09/10/10 | SO | Soil | 18A-F4 |
| D17264-4A | 09/09/10 | 09:15 RM | 09/10/10 | SO | Soil | 18A-F4 |
| D17264-5 | 09/09/10 | 09:30 RM | 09/10/10 | SO | Soil | 18A-TS1 |
| D17264-5A | 09/09/10 | 09:30 RM | 09/10/10 | SO | Soil | 18A-TS1 |
| D17264-6 | 09/09/10 | 09:40 RM | 09/10/10 | SO | Soil | 18A-TS2 |
| D17264-6A | 09/09/10 | 09:40 RM | 09/10/10 | SO | Soil | 18A-TS2 |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17264

Site: Roan Pit Closure

Report Dat 9/27/2010 8:54:28 AM

On 09/10/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.0°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17264 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V565 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17265-7MS and D17265-7MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2492 |
|------------------|-------------------------|

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17264-2MS and D17264-2MSD were used as the QC samples indicated.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Indeno(1,2,3-cd)pyrene and the MS recovery of Dibenzo(a,h)anthracene are outside control limits. Outside control limits due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The RPD for the MS and MSD recovery of Dibenzo(a,h)anthracene is outside control limits for sample OP2492-MSD. The high RPD is due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB387 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17265-1MS and D17265-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2489 |
|------------------|-------------------------|

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D17244-1MS and D17244-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP2887 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17264-1AMS and D17264-1AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2923 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17358-1MS, D17358-1MSD, and D17358-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Cadmium, Copper, and Nickel are outside control limits for sample MP2923-SD1. The percent difference is acceptable for Cadmium due to low initial sample concentration (< 50 times IDL).
- MP2923-SD1 for Copper and Nickel: Serial dilution indicates possible matrix interference.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2950 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17358-1MS, D17358-1MSD, and D17358-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPDs for Selenium, Silver, and Zinc are outside control limits for sample MP2950-SD1. The percent differences are acceptable for Selenium and Silver due to low initial sample concentration (< 50 times IDL).
- MP2950-SD1 for Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2924 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17358-1AMS, D17358-1AMSD, and D17358-1ASDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2905 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17131-1MS and D17131-1MSD were used as the QC samples for the Mercury analysis.
- The matrix spike duplicate (MSD) recovery of Mercury is outside control limits. Probable cause due to matrix interference. Refer to the lab control or spike blank for recovery information.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN32822 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2887 |
|------------------|-------------------------|

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6355 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4431 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: $(\text{Chromium}) - (\text{Hexavalent Chromium})$

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12015 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17264

Site: MOILCOGJ: Roan Pit Closure

Report Date 9/16/2010 11:59:59 AM

6 Sample(s) were collected on 09/09/2010 and were received at Accutest on 09/10/2010 properly preserved, at 2.1 Deg. C and intact. These Samples received an Accutest job number of D17264. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN32822

- Sample(s) D17166-1DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP12015

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17264-2DUP, D17264-2MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17264).

Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10255.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.062 | 0.019 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.062 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.025 | mg/kg | |
| | m,p-Xylene | ND | 0.25 | 0.043 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-F1 | | |
| Lab Sample ID: D17264-1 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01955.D | 5 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 63% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 67% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7126.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 18A-F1 | |
| Lab Sample ID: D17264-1 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4148.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 107% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

31
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 21.0 | 0.40 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ³ | SW846 3050B ⁷ |
| Barium | 185 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Chromium | 26.1 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Copper | 29.9 | 0.50 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Lead | 17.2 | 5.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Mercury | < 0.094 | 0.094 | mg/kg | 1 | 09/17/10 | 09/17/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 17.1 | 3.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Zinc | 49.3 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA985
- (3) Instrument QC Batch: MA995
- (4) Instrument QC Batch: MA998
- (5) Prep QC Batch: MP2905
- (6) Prep QC Batch: MP2923
- (7) Prep QC Batch: MP2924
- (8) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 25.6 | 1.5 | mg/kg | 1 | 09/22/10 20:54 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 375 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 76.4 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 445 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 8.43 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 53.3 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 11.7 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 13.6 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-1A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 76.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.439 | | ratio | 1 | 09/15/10 16:04 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10256.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-F2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 86.2 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01956.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.0953 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.0499 | 0.067 | 0.042 | mg/kg | J |
| 205-99-2 | Benzo(b)fluoranthene | 0.214 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0623 | 0.067 | 0.042 | mg/kg | J |
| 207-08-9 | Benzo(k)fluoranthene | 0.0629 | 0.067 | 0.042 | mg/kg | J |
| 218-01-9 | Chrysene | 0.164 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.136 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.0756 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 71% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 77% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 80% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7127.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 97% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis



| | |
|--|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4149.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 197 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 114% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 21.1 | 0.39 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ³ | SW846 3050B ⁷ |
| Barium | 374 | 0.98 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Cadmium | < 0.98 | 0.98 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Chromium | 18.3 | 0.98 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Copper | 24.3 | 0.49 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Lead | 12.2 | 4.9 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Mercury | < 0.088 | 0.088 | mg/kg | 1 | 09/17/10 | 09/17/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 13.9 | 2.9 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Zinc | 44.1 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA985
- (3) Instrument QC Batch: MA995
- (4) Instrument QC Batch: MA998
- (5) Prep QC Batch: MP2905
- (6) Prep QC Batch: MP2923
- (7) Prep QC Batch: MP2924
- (8) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 18.3 | 1.5 | mg/kg | 1 | 09/22/10 21:01 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 312 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 86.2 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 11800 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 7.95 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 86.2 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 1340 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 332 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 523 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18A-F2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-2A | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 86.2 ^a |
| Project: Roan Pit Closure | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 3.31 | | ratio | 1 | 09/15/10 16:22 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10257.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.060 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.060 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | ND | 0.24 | 0.042 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 90% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-F3 | | |
| Lab Sample ID: D17264-3 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 79.8 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01973.D | 5 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 70% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 72% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 64% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7128.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 98% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4150.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 19.9 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 103% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 237 | 0.40 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ³ | SW846 3050B ⁷ |
| Barium | 235 | 2.0 | mg/kg | 2 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Cadmium | < 2.0 | 2.0 | mg/kg | 2 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Chromium | 24.1 | 2.0 | mg/kg | 2 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Copper | 76.4 | 5.0 | mg/kg | 10 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Lead | < 50 | 50 | mg/kg | 10 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 09/17/10 | 09/17/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 67.8 | 6.0 | mg/kg | 2 | 09/21/10 | 09/23/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Selenium | 8.0 | 5.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Zinc | 89.9 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA985
- (3) Instrument QC Batch: MA995
- (4) Instrument QC Batch: MA998
- (5) Prep QC Batch: MP2905
- (6) Prep QC Batch: MP2923
- (7) Prep QC Batch: MP2924
- (8) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.69 | 0.50 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.4 | 2.5 | mg/kg | 1 | 09/23/10 08:51 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 378 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 79.8 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 319 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 8.73 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|--|---|
| Client Sample ID: 18A-F3 Lab Sample ID: D17264-3A Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/09/10 Date Received: 09/10/10 Percent Solids: 79.8 ^a |
|--|---|

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 35.5 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 9.17 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 12.0 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-3A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 79.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.464 | | ratio | 1 | 09/15/10 16:29 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10258.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | | 70-130% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-F4 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 85.4 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01960.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0919 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.0819 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0782 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 69% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 84% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7129.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 100% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

37
3

| | |
|--|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4151.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 246 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 115% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|---|
| Client Sample ID: 18A-F4 Lab Sample ID: D17264-4 Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/09/10 Date Received: 09/10/10 Percent Solids: 85.4 ^a |
|---|---|

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 15.3 | 0.40 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ² | SW846 3050B ⁵ |
| Barium | 329 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Chromium | 23.3 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Copper | 26.9 | 0.50 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Lead | 13.5 | 5.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Nickel | 14.7 | 3.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ³ | SW846 3050B ⁴ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁶ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁶ |
| Zinc | 44.8 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁶ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA995
- (3) Instrument QC Batch: MA998
- (4) Prep QC Batch: MP2923
- (5) Prep QC Batch: MP2924
- (6) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.72 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.6 | 1.5 | mg/kg | 1 | 09/22/10 21:21 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 381 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 85.4 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 466 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 8.83 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis



| | |
|----------------------------------|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 63.6 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 14.1 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 12.1 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-4A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 85.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.357 | | ratio | 1 | 09/15/10 16:35 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

3.9
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10259.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.060 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.060 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | ND | 0.24 | 0.042 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 107% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-TS1 | |
| Lab Sample ID: D17264-5 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 80.1 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01961.D | 5 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 72% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 74% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 76% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18A-TS1 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 80.1 ^a |
| Method: SW846 8015B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7130.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4152.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 36.3 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 97% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 19.3 | 0.40 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ³ | SW846 3050B ⁷ |
| Barium | 239 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Chromium | 22.0 | 1.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Copper | 26.5 | 0.50 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Lead | 18.4 | 5.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Mercury | < 0.091 | 0.091 | mg/kg | 1 | 09/17/10 | 09/17/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 14.3 | 3.0 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Zinc | 50.9 | 3.0 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA985
- (3) Instrument QC Batch: MA995
- (4) Instrument QC Batch: MA998
- (5) Prep QC Batch: MP2905
- (6) Prep QC Batch: MP2923
- (7) Prep QC Batch: MP2924
- (8) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.0 | 1.5 | mg/kg | 1 | 09/22/10 21:31 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 382 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 80.1 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 537 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 7.68 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 69.5 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 15.0 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 6.64 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-5A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 80.1 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.188 | | ratio | 1 | 09/15/10 16:52 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS2 | |
| Lab Sample ID: D17264-6 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8260B | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10260.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.059 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.059 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | ND | 0.24 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-TS2 | | |
| Lab Sample ID: D17264-6 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01962.D | 5 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 71% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 69% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 81.9 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7131.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 104% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 81.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4153.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 23.2 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 105% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 23.3 | 0.39 | mg/kg | 5 | 09/21/10 | 09/23/10 GJ | SW846 6020 ³ | SW846 3050B ⁷ |
| Barium | 223 | 0.97 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Chromium | 23.5 | 0.97 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Copper | 27.1 | 0.49 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Lead | 19.4 | 4.9 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 09/17/10 | 09/17/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 13.9 | 2.9 | mg/kg | 1 | 09/21/10 | 09/22/10 JM | SW846 6010B ⁴ | SW846 3050B ⁶ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |
| Zinc | 52.4 | 2.9 | mg/kg | 1 | 09/23/10 | 09/23/10 JM | SW846 6010B ¹ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1000
- (2) Instrument QC Batch: MA985
- (3) Instrument QC Batch: MA995
- (4) Instrument QC Batch: MA998
- (5) Prep QC Batch: MP2905
- (6) Prep QC Batch: MP2923
- (7) Prep QC Batch: MP2924
- (8) Prep QC Batch: MP2950

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18A-TS2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.5 | 1.5 | mg/kg | 1 | 09/22/10 21:37 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 373 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 81.9 | | % | 1 | 09/14/10 | CJ | SM19 2540B M |
| Specific Conductivity | 217 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 7.59 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 31.6 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 6.58 | 1.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 5.32 | 2.0 | mg/l | 1 | 09/15/10 | 09/15/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA979

(2) Prep QC Batch: MP2887

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17264-6A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 81.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.225 | | ratio | 1 | 09/15/10 16:58 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

| Client / Reporting Information | | Project Information | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | |
|--|---------|--|------|--|--|------------|--|------------------|--|---|--|--|--|---|---|------|------|--------|-------------|--|
| Company Name Golden Associates | | Project Name 2010 Pit Closure | | <table border="1"> <tr> <td>TPH-GRO</td><td>TPH-ORO</td><td>BTEX</td><td>PAHs</td><td>Metals</td><td>SAR, EC, PH</td> </tr> </table> | | | | | | | | | | TPH-GRO | TPH-ORO | BTEX | PAHs | Metals | SAR, EC, PH | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED-Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB - Rinse Blank TB-Trip Blank |
| TPH-GRO | TPH-ORO | BTEX | PAHs | | | | | | | | | | | Metals | SAR, EC, PH | | | | | |
| Street Address 44 Union Blvd, Suite 300 | | Street 2010 Pit Closure | | | | | | | | | | | | | | | | | | |
| City State Zip Lakewood, CO 80228 | | City State Lakewood, CO | | Billing Information (if different from Report to) | | | | | | | | | | LAB USE ONLY | | | | | | |
| Project Contact R. March | | Project # 083-81544 D.0004 | | Company Name Marathon Oil Co. | | | | | | | | | | 61 | | | | | | |
| Phone # 303-980-0540 | | Client Purchase Order # | | Street Address 743 Horizon Court, Suite 200 | | | | | | | | | | 02 | | | | | | |
| Sampler(s) Name(s) | | Project Manager Matt Foucheaux | | City State Zip Grand Junction, CO 81506 | | | | | | | | | | 03 | | | | | | |
| Field ID / Point of Collection | | MEQ/HDV Vial # | | Number of preserved Bottles | | | | | | | | | | 04 | | | | | | |
| Date | | Time | | Matrix | | | | | | | | | | 05 | | | | | | |
| 9/9/10 | | 0815 | | RM 50 | | | | | | | | | | 06 | | | | | | |
| " " | | 0835 | | " " | | | | | | | | | | " " | | | | | | |
| " " | | 0855 | | " " | | | | | | | | | | " " | | | | | | |
| " " | | 0915 | | " " | | | | | | | | | | " " | | | | | | |
| " " | | 0930 | | " " | | | | | | | | | | " " | | | | | | |
| " " | | 0940 | | " " | | | | | | | | | | " " | | | | | | |
| Turnaround Time (Business days) | | Approved By (Accutest PM) / Date: | | Data Deliverable Information | | | | | | | | | | Comments / Special Instructions | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6-9 Day RUSH <input type="checkbox"/> 3-5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | Discuss w/ R. March ID dug and per permit | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | | | | | | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | * All analyses per COCCC Table 910-1 | | | | | |
| Emergency & Rush T/A data available VIA Lablink | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: | | Date Time: | | Received By: | | Date Time: | | Relinquished By: | | Date Time: | | Received By: | | | | | | | | |
| 1 R. March | | 9/10/10 0945 | | S. Williams | | 9/10/10 | | 2 | | | | | | | | | | | | |
| 3 | | | | 3 | | | | 4 | | | | | | | | | | | | |
| 5 | | | | 5 | | | | Custody Seal # | | <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact | | <input checked="" type="checkbox"/> Preserved where applicable <input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp. | | | | | | | | |

HD

4.1
4

D17264: Chain of Custody

Page 1 of 1

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V565-MB1 | 5V10244.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | 70-130% |

Blank Spike Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V565-BS1 | 5V10245.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 52.9 | 106 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 56.9 | 114 | 70-130 |
| 108-88-3 | Toluene | 50 | 54.2 | 108 | 70-130 |
| | m,p-Xylene | 50 | 52.7 | 105 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 51.1 | 102 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|------|---------|
| 2037-26-5 | Toluene-D8 | 90% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 102% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17265-7MS | 5V10247.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| D17265-7MSD | 5V10248.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| D17265-7 | 5V10246.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | D17265-7 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 2940 | 3150 | 107 | 3330 | 113 | 6 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 2940 | 3380 | 115 | 3530 | 120 | 4 | 56-139/30 |
| 108-88-3 | Toluene | ND | 2940 | 3190 | 109 | 3320 | 113 | 4 | 57-144/30 |
| | m,p-Xylene | ND | 2940 | 3250 | 111 | 3380 | 115 | 4 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 2940 | 3120 | 106 | 3220 | 110 | 3 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17265-7 | Limits |
|------------|-----------------------|------|------|----------|---------|
| 2037-26-5 | Toluene-D8 | 89% | 89% | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 105% | 107% | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | 86% | 91% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-MB | 3G01953.D | 1 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 63% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 73% | 17-174% |

Blank Spike Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-BS | 3G01954.D | 1 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|-------------|-----------|-------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 52.4 | 63 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 50.8 | 61 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 55.5 | 67 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 52.6 | 63 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 50.1 | 60 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 50.1 | 60 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 50.0 | 60 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 52.0 | 62 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 53.3 | 64 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 50.0 | 60 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 55.4 | 66 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 51.3 | 62 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 48.9 | 59 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 52.3 | 63 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 50.3 | 60 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 52.0 | 62 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 53.8 | 65 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 50.6 | 61 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 63% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 59% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 63% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-MS | 3G01957.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| OP2492-MSD | 3G01958.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| D17264-2 | 3G01956.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | D17264-2 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|--------|-------------------|
| 83-32-9 | Acenaphthene | ND | | 83.3 | 81.8 | 98 | 80.4 | 97 | 2 | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 83.3 | 72.1 | 87 | 75.2 | 90 | 4 | 23-156/30 |
| 120-12-7 | Anthracene | ND | | 83.3 | 78.1 | 94 | 80.2 | 96 | 3 | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | 95.3 | | 83.3 | 186 | 109 | 189 | 113 | 2 | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | 49.9 | J | 83.3 | 128 | 94 | 127 | 93 | 1 | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | 214 | | 83.3 | 325 | 133 | 331 | 140 | 2 | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | 62.3 | J | 83.3 | 136 | 88 | 130 | 81 | 5 | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | 62.9 | J | 83.3 | 141 | 94 | 129 | 79 | 9 | 17-161/30 |
| 218-01-9 | Chrysene | 164 | | 83.3 | 256 | 110 | 254 | 108 | 1 | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | | 83.3 | ND | 0* a | 104 | 125 | 200* b | 21-154/30 |
| 206-44-0 | Fluoranthene | 136 | | 83.3 | 241 | 126 | 237 | 121 | 2 | 16-140/30 |
| 86-73-7 | Fluorene | ND | | 83.3 | 76.3 | 92 | 78.3 | 94 | 3 | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | | 83.3 | 135 | 162* a | 133 | 160* b | 1 | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | ND | | 83.3 | 87.5 | 105 | 88.9 | 107 | 2 | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | ND | | 83.3 | 110 | 132 | 110 | 132 | 0 | 10-181/30 |
| 91-20-3 | Naphthalene | ND | | 83.3 | 80.7 | 97 | 84.4 | 101 | 4 | 10-176/30 |
| 85-01-8 | Phenanthrene | ND | | 83.3 | 111 | 133 | 108 | 130 | 3 | 22-152/30 |
| 129-00-0 | Pyrene | 75.6 | | 83.3 | 165 | 107 | 174 | 118 | 5 | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17264-2 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 68% | 71% | 71% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | 77% | 77% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 90% | 92% | 80% | 17-174% |

(a) Outside control limits due to matrix interference. Refer to Blank Spike.

(b) High RPD due to possible sample nonhomogeneity.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB387-MB | GB7115.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 89% 60-140% |

Blank Spike Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB387-BS | GB7116.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 94.9 | 86 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 109% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17265-1MS | GB7118.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| D17265-1MSD | GB7119.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| D17265-1 | GB7117.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | D17265-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | 127 | 116 | 91 | 121 | 95 | 4 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17265-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 113% | 106% | 93% | 60-140% |

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-MB | FE4138.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 105% 63-130% |

Blank Spike Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-BS | FE4139.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 727 | 109 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 107% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17264
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-MS | FE4140.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| OP2489-MSD | FE4141.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| D17244-1 | FE4142.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

| CAS No. | Compound | D17244-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | ND | 774 | 816 | 105 | 876 | 113 | 7 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17244-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 109% | 116% | 108% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2887
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 09/15/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 44.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 54.0 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -290 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP2887: D17264-1A, D17264-2A, D17264-3A, D17264-4A, D17264-5A, D17264-6A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2887
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2887
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/15/10

| Metal | D17264-1A Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|--------------------------|--------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 53300 | 176000 | 125000 | 98.2 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 11700 | 133000 | 125000 | 97.0 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 13600 | 137000 | 125000 | 98.7 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP2887: D17264-1A, D17264-2A, D17264-3A, D17264-4A, D17264-5A, D17264-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.12
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2887
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2887
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/15/10

| Metal | D17264-1A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 53300 | 176000 | 125000 | 98.2 | 0.0 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 11700 | 132000 | 125000 | 96.2 | 0.8 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 13600 | 136000 | 125000 | 97.9 | 0.7 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP2887: D17264-1A, D17264-2A, D17264-3A, D17264-4A, D17264-5A, D17264-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2887
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2887
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/15/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 130000 | 125000 | 104.0 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 126000 | 125000 | 100.8 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 128000 | 125000 | 102.4 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2887: D17264-1A, D17264-2A, D17264-3A, D17264-4A, D17264-5A, D17264-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2887
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2905
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/17/10

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|-------|--------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .0014 | 0.0040 | <0.10 |

Associated samples MP2905: D17264-1, D17264-2, D17264-3, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2905
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/17/10

| Metal | D17131-1 Original MS | SpikeLot HGWSR1 | % Rec | QC Limits |
|---------|-------------------------|--------------------|-------|--------------|
| Mercury | 0.025 0.59 | 0.5 | 113.0 | 85-115 |

Associated samples MP2905: D17264-1, D17264-2, D17264-3, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2905
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/17/10

| Metal | D17131-1 Original MSD | Spike HGWSR1 | lot % Rec | MSD RPD | QC Limit |
|---------|--------------------------|-----------------|--------------|---------------|-------------|
| Mercury | 0.025 | 0.58 | 0.463 | 119.9N(a) 1.7 | 20 |

Associated samples MP2905: D17264-1, D17264-2, D17264-3, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2905
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/17/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.48 | 0.4 | 120.0 | 80-120 |

Associated samples MP2905: D17264-1, D17264-2, D17264-3, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2923
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/21/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.13 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.020 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.070 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.070 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.050 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.020 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Silicon | 5.0 | 1.2 | .68 | | |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |

Associated samples MP2923: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.3.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2923
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/21/10

| Metal | D17358-1 Original MS | | SpikeLot MPICPALL % Rec | QC Limits | |
|------------|-------------------------|------|----------------------------|--------------|--------|
| Aluminum | anr | | | | |
| Arsenic | anr | | | | |
| Barium | 14.7 | 193 | 201 | 88.6 | 75-125 |
| Beryllium | anr | | | | |
| Boron | anr | | | | |
| Cadmium | 0.17 | 40.9 | 50.3 | 80.9 | 75-125 |
| Calcium | anr | | | | |
| Chromium | 6.4 | 48.7 | 50.3 | 84.0 | 75-125 |
| Cobalt | anr | | | | |
| Copper | 8.2 | 54.4 | 50.3 | 91.8 | 75-125 |
| Iron | anr | | | | |
| Lead | 27.4 | 110 | 101 | 82.1 | 75-125 |
| Lithium | anr | | | | |
| Magnesium | anr | | | | |
| Manganese | anr | | | | |
| Molybdenum | anr | | | | |
| Nickel | 2.0 | 41.9 | 50.3 | 79.3 | 75-125 |
| Phosphorus | anr | | | | |
| Potassium | anr | | | | |
| Silicon | | | | | |
| Sodium | anr | | | | |
| Strontium | anr | | | | |
| Thallium | anr | | | | |
| Titanium | anr | | | | |
| Uranium | anr | | | | |
| Vanadium | anr | | | | |

Associated samples MP2923: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2923
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/21/10

| Metal | D17358-1 Original | MSD | SpikeLot MPICPAL | % Rec | MSD RPD | QC Limit |
|------------|----------------------|------|---------------------|-------|------------|-------------|
| Aluminum | anr | | | | | |
| Arsenic | anr | | | | | |
| Barium | 14.7 | 196 | 205 | 88.3 | 1.5 | 20 |
| Beryllium | anr | | | | | |
| Boron | anr | | | | | |
| Cadmium | 0.17 | 40.1 | 51.3 | 77.8 | 2.0 | 20 |
| Calcium | anr | | | | | |
| Chromium | 6.4 | 47.1 | 51.3 | 79.3 | 3.3 | 20 |
| Cobalt | anr | | | | | |
| Copper | 8.2 | 55.5 | 51.3 | 92.1 | 2.0 | 20 |
| Iron | anr | | | | | |
| Lead | 27.4 | 109 | 103 | 79.5 | 0.9 | 20 |
| Lithium | anr | | | | | |
| Magnesium | anr | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | anr | | | | | |
| Nickel | 2.0 | 41.1 | 51.3 | 76.2 | 1.9 | 20 |
| Phosphorus | anr | | | | | |
| Potassium | anr | | | | | |
| Silicon | | | | | | |
| Sodium | anr | | | | | |
| Strontium | anr | | | | | |
| Thallium | anr | | | | | |
| Titanium | anr | | | | | |
| Uranium | anr | | | | | |
| Vanadium | anr | | | | | |

Associated samples MP2923: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2923
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/21/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | anr | | | |
| Arsenic | anr | | | |
| Barium | 174 | 200 | 87.0 | 80-120 |
| Beryllium | anr | | | |
| Boron | anr | | | |
| Cadmium | 40.1 | 50 | 80.2 | 80-120 |
| Calcium | anr | | | |
| Chromium | 42.3 | 50 | 84.6 | 80-120 |
| Cobalt | anr | | | |
| Copper | 45.4 | 50 | 90.8 | 80-120 |
| Iron | anr | | | |
| Lead | 81.6 | 100 | 81.6 | 80-120 |
| Lithium | anr | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | anr | | | |
| Nickel | 40.0 | 50 | 80.0 | 80-120 |
| Phosphorus | anr | | | |
| Potassium | anr | | | |
| Silicon | | | | |
| Sodium | anr | | | |
| Strontium | anr | | | |
| Thallium | anr | | | |
| Titanium | anr | | | |
| Uranium | anr | | | |
| Vanadium | anr | | | |

Associated samples MP2923: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2923
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 09/21/10

| Metal | D17358-1 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | anr | | | |
| Arsenic | anr | | | |
| Barium | 147 | 155 | 5.2 | 0-10 |
| Beryllium | anr | | | |
| Boron | anr | | | |
| Cadmium | 1.70 | 1.50 | 11.8 (a) | 0-10 |
| Calcium | anr | | | |
| Chromium | 64.6 | 68.0 | 5.3 | 0-10 |
| Cobalt | anr | | | |
| Copper | 82.6 | 71.5 | 13.4*(b) | 0-10 |
| Iron | anr | | | |
| Lead | 275 | 301 | 9.5 | 0-10 |
| Lithium | anr | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | anr | | | |
| Nickel | 20.2 | 22.5 | 11.4*(b) | 0-10 |
| Phosphorus | anr | | | |
| Potassium | anr | | | |
| Silicon | | | | |
| Sodium | anr | | | |
| Strontium | anr | | | |
| Thallium | anr | | | |
| Titanium | anr | | | |
| Uranium | anr | | | |
| Vanadium | anr | | | |

Associated samples MP2923: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

(b) Serial dilution indicates possible matrix interference.

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2924
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 09/21/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|------|-----------|-------|
| Aluminum | 25 | .14 | .89 | | |
| Antimony | 0.20 | .001 | .045 | | |
| Arsenic | 0.40 | .049 | .26 | -0.020 | <0.40 |
| Barium | 1.0 | .0035 | .17 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 2 | | |
| Calcium | 200 | 1.8 | 6.1 | | |
| Chromium | 1.0 | .021 | .23 | | |
| Cobalt | 0.10 | .0033 | .088 | | |
| Copper | 1.0 | .011 | .14 | | |
| Iron | 20 | .81 | 6.1 | | |
| Lead | 0.25 | .0012 | .18 | | |
| Magnesium | 50 | .067 | 1.3 | | |
| Manganese | 0.50 | .007 | .089 | | |
| Molybdenum | 0.50 | .0044 | .2 | | |
| Nickel | 1.0 | .0029 | .074 | | |
| Phosphorus | 30 | 1.8 | 5.6 | | |
| Potassium | 100 | 2 | 9.1 | | |
| Selenium | 0.20 | .075 | .14 | | |
| Silver | 0.050 | .0008 | .029 | | |
| Sodium | 250 | .8 | 1.8 | | |
| Strontium | 10 | .004 | .047 | | |
| Thallium | 0.10 | .015 | .071 | | |
| Tin | 5.0 | .006 | .17 | | |
| Titanium | 1.0 | .035 | .071 | | |
| Uranium | 0.25 | .00038 | .12 | | |
| Vanadium | 2.0 | .052 | .99 | | |
| Zinc | 5.0 | .039 | .53 | | |

Associated samples MP2924: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.4.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2924
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/21/10

| Metal | D17358-1A Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|--------------------------|-----|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 5.6 | 102 | 101 | 95.8 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | anr | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | anr | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP2924: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.4.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2924
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/21/10

| Metal | D17358-1A Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit | |
|------------|---------------------------|------|---------------------------|------------|-------------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 5.6 | 98.2 | 103 | 90.2 | 3.8 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | anr | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | anr | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP2924: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.4.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2924
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/21/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 95.4 | 100 | 95.4 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | anr | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | anr | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2924: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.4.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2924
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 09/21/10

| Metal | D17358-1A | | | QC |
|-------|-----------|-----|-----------|--------|
| | Original | SDL | 5:25 %DIF | Limits |

| | | | | |
|------------|------|------|-----|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 56.1 | 58.9 | 5.0 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | anr | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | anr | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2924: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.4.4
9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/23/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | | |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | | |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | | |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | | |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | | |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | | |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | -0.20 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.20 | <3.0 |

Associated samples MP2950: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.5.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2950
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/23/10

| Metal | D17358-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | anr | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | anr | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 2.0 | 77.5 | 96 | 78.7 | 75-125 |
| Silicon | | | | | |
| Silver | 0.096 | 14.8 | 19.2 | 76.6 | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | anr | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 40.9 | 79.4 | 48 | 80.2 | 75-125 |

Associated samples MP2950: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2950
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/23/10

| Metal | D17358-1 Original MSD | Spikelot MPICPAL % Rec | MSD RPD | QC Limit | | |
|------------|--------------------------|---------------------------|------------|-------------|-----|----|
| Aluminum | | | | | | |
| Antimony | anr | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | anr | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.0 | 82.0 | 99.7 | 80.3 | 5.6 | 20 |
| Silicon | | | | | | |
| Silver | 0.096 | 15.8 | 19.9 | 78.8 | 6.5 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | anr | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 40.9 | 83.7 | 49.8 | 85.9 | 5.3 | 20 |

Associated samples MP2950: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2950
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/23/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|---------------|----------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | anr | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 92.4 | 100 | 92.4 | 80-120 |
| Silicon | | | | |
| Silver | 18.0 | 20 | 90.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | anr | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 45.1 | 50 | 90.2 | 80-120 |

Associated samples MP2950: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17264
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2950
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 09/23/10

| Metal | D17358-1 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | | | | |
| Antimony | anr | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 20.6 | 35.0 | 69.9 (a) | 0-10 |
| Silicon | | | | |
| Silver | 1.00 | 0.00 | 100.0(a) | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | anr | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 426 | 495 | 16.2*(b) | 0-10 |

Associated samples MP2950: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2950
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17264
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|----|--------------|----------|-----------------|---------------|---------------|--------------|
| Specific Conductivity | GP2768/GN6342 | | | umhos/cm | 9984 | 10100 | 101.5 | 90-110% |
| pH | GN6322 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |
| pH | GN6322 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |

Associated Samples:

Batch GN6322: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Batch GP2768: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| | |
|-------------------|--------|
| Accutest Job #: | D17264 |
| Accutest Quote #: | |
| AMS P.O. #: | |
| Project No.: | |

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | | |
|--|-------------|--------------|---|--------------|--------------|------|------|-------|------|------------------------|--------|---|--|--|----------|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | X C R A | E H | | | | Comments |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | Phone: (508) 481-6200 | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | Date | Time | Collection | | Preservation | | | | | | | | | | |
| | | | Matrix | # of bottles | HCL | NaOH | HNO3 | H2SO4 | None | X | X | | | | |
| D17264 -1 | 9/9/10 | 8:15 AM | Soil | 1 | | | | | | | X | X | | | |
| -2 | | 8:35 AM | Soil | 1 | | | | | | | X | X | | | |
| -3 | | 8:55 AM | Soil | 1 | | | | | | | X | X | | | |
| -4 | | 9:15 AM | Soil | 1 | | | | | | | X | X | | | |
| -5 | | 9:30 AM | Soil | 1 | | | | | | | X | X | | | |
| -6 | | 9:40 AM | Soil | 1 | | | | | | | X | X | | | |

| Turnaround Information | Data Deliverable Information | Comments / Remarks |
|---|--|--|
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: _____ <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) _____ |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | Please use Colorado regulations and RLs. 28 |

| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | For Subcontract Laboratory Use Only | |
|--|------------------------------|---------------------------|-------------------|---|--|
| Relinquished by: 1 | Date & Time: 9/10/10 1650 | Received By: 1 Feak | Date & Time: 1 | Seal #: | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> |
| Relinquished by: 2 | Date & Time: 9/10/10 1055 | Received By: 2 Willard | Date & Time: 2 | Preserved Where applicable: <input type="checkbox"/> | |
| Relinquished by: 3 | Date & Time: | Received By: 3 | Date & Time: 3 | Temperature °C 2.12 | On Ice <input checked="" type="checkbox"/> 2.12 |

D17264: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D17264

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 9/11/2010 10:55:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XCRA/EH

Airbill #'s: N/A

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

| <u>Cooler Temperature</u> | <u>Y</u> | <u>or</u> | <u>N</u> |
|------------------------------|-------------------------------------|-----------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> |
| 2. Cooler temp verification: | | | Infrared gun |
| 3. Cooler media: | | | Ice (bag) |

| <u>Quality Control Preservation</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|-------------------------------------|-------------------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

| <u>Sample Integrity - Instructions</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Empty box for comments.

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

11.1
11

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
 GENERAL CHEMISTRY

Login Number: D17264
 Account: ALMS - Accutest Mountain States
 Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | 0.50 | 0.0 | mg/kg | 12 | 11.7 | 97.5 | 80-120% |
| Chromium, Hexavalent | GP12015/GN32820 | | | mg/kg | 1140 | 1010 | 88.6 | 80-120% |

Associated Samples:

Batch GP12015: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

(*) Outside of QC limits

12.1
 12

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17264
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | Units | Spike Amount | BSD Result | RPD | QC Limit |
|----------------------|-----------------|-------|--------------|------------|-----|----------|
| Chromium, Hexavalent | GP12015/GN32820 | mg/kg | 12 | 11.7 | 0.0 | |

Associated Samples:

Batch GP12015: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

(*) Outside of QC limits

12.2
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17264
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32822 | D17166-1 | mv | 313 | 313 | 0.0 | 0-20% |

Associated Samples:

Batch GN32822: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

Batch GP12015: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

(*) Outside of QC limits

12.3
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17264
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 11.8 | 9.7 | 82.6 | 75-125% |
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 955 | 924 | 96.8 | 75-125% |

Associated Samples:

Batch GP12015: D17264-1, D17264-2, D17264-3, D17264-4, D17264-5, D17264-6

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.4
12

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D17733

Sampling Date: 09/27/10

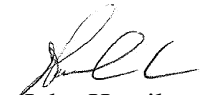
Report to:

Randy_March@golder.com

Total number of pages in report: **99**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 8 |
| 3.1: D17733-1: 18A-AM1 | 9 |
| 3.2: D17733-2: 18A-AM1 DUP | 15 |
| 3.3: D17733-3: 18A-AM2 | 21 |
| 3.4: D17733-4: 18A-AM3 | 27 |
| 3.5: D17733-5: 18A-AM4 | 33 |
| 3.6: D17733-6: 18A-AM5 | 39 |
| 3.7: D17733-7: 18A-SG1 | 45 |
| Section 4: Misc. Forms | 51 |
| 4.1: Chain of Custody | 52 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 53 |
| 5.1: Method Blank Summary | 54 |
| 5.2: Blank Spike Summary | 56 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 58 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 60 |
| 6.1: Method Blank Summary | 61 |
| 6.2: Blank Spike Summary | 62 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 63 |
| Section 7: GC Volatiles - QC Data Summaries | 64 |
| 7.1: Method Blank Summary | 65 |
| 7.2: Blank Spike Summary | 66 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 67 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 68 |
| 8.1: Method Blank Summary | 69 |
| 8.2: Blank Spike Summary | 70 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 71 |
| Section 9: Metals Analysis - QC Data Summaries | 72 |
| 9.1: Prep QC MP3004: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 73 |
| 9.2: Prep QC MP3007: Hg | 83 |
| 9.3: Prep QC MP3009: As | 87 |
| Section 10: General Chemistry - QC Data Summaries | 92 |
| 10.1: Method Blank and Spike Results Summary | 93 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 94 |
| 11.1: Chain of Custody | 95 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 96 |
| 12.1: Method Blank and Spike Results Summary | 97 |
| 12.2: Duplicate Results Summary | 98 |
| 12.3: Matrix Spike Results Summary | 99 |



Sample Summary

Marathon Oil

Job No: D17733

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|---------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17733-1 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM1 |
| D17733-2 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM1 DUP |
| D17733-3 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM2 |
| D17733-4 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM3 |
| D17733-5 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM4 |
| D17733-6 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-AM5 |
| D17733-7 | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-SG1 |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17733

Site: Roan Pit Closure

Report Dat 10/1/2010 3:51:16 PM

On 09/28/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17733 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V582 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS and D17733-1MSD were used as the QC samples indicated.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V584 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17733-2MS and D17733-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2578 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D17557-1MS and D17557-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB409 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS and D17733-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2584 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D17735-1MS and D17735-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3004 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS, D17733-1MSD, and D17733-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recoveries of Barium, Nickel, and Zinc and the matrix spike duplicate recoveries of Cadmium, Lead, Nickel, Selenium, Silver, and Zinc are outside control limits. The spike recoveries indicates possible matrix interference and/or sample nonhomogeneity. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPD(s) for Cadmium, Chromium, Lead, Nickel, Selenium, and Zinc are outside control limits for sample MP3004-SD1. The percent differences are acceptable for Cadmium and Selenium due to low initial sample concentration (< 50 times IDL).
- MP3004-SD1 for Chromium, Lead, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3009 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS, D17733-1MSD, and D17733-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP3009-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3007 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17557-1MS and D17557-1MSD were used as the QC samples for the Mercury analysis.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN32947 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, and D17733-7
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6563 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4548 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: M:GP12078

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17733

Site: MOILCOGJ: Roan Pit Closure

Report Date 10/1/2010 10:38:47 AM

7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/27/2010 and were received at Accutest on 09/28/2010 properly preserved, at 1.7 Deg. C and intact. These Samples received an Accutest job number of D17733. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN32947 |
|------------------|--------------------------|

- Sample(s) D17737-6DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12078 |
|------------------|--------------------------|

- All samples were distilled and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17735-4DUP, D17735-4MS were used as the QC samples for Chromium, Hexavalent.

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12082 |
|------------------|--------------------------|

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17733-6DUP, D17733-6MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17733).

Sample Results

Report of Analysis

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM1 | |
| Lab Sample ID: D17733-1 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10618.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0453 | 0.055 | 0.016 | mg/kg | J |
| 108-88-3 | Toluene | 0.0802 | 0.11 | 0.055 | mg/kg | J |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | 0.0860 | 0.22 | 0.038 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 78% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 81% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM1 | |
| Lab Sample ID: D17733-1 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02005.D | 10 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

| Run #1 | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|------|-------|-------|---|
| 83-32-9 | Acenaphthene | 0.239 | 0.13 | 0.12 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.66 | 0.14 | mg/kg | |
| 120-12-7 | Anthracene | 0.844 | 0.13 | 0.086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 5.54 | 0.13 | 0.13 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 2.82 | 0.13 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 7.28 | 0.13 | 0.096 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 2.61 | 0.13 | 0.083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 3.98 | 0.13 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 6.38 | 0.13 | 0.066 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 1.56 | 0.13 | 0.098 | mg/kg | |
| 206-44-0 | Fluoranthene | 9.07 | 0.13 | 0.082 | mg/kg | |
| 86-73-7 | Fluorene | 0.672 | 0.13 | 0.13 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 2.89 | 0.13 | 0.087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 1.04 | 0.13 | 0.12 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 1.96 | 0.66 | 0.20 | mg/kg | |
| 91-20-3 | Naphthalene | 1.01 | 0.66 | 0.15 | mg/kg | |
| 85-01-8 | Phenanthrene | 5.26 | 0.13 | 0.11 | mg/kg | |
| 129-00-0 | Pyrene | 3.88 | 0.13 | 0.090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 116% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 102% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 125% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7504.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 16.9 | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 100% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 18A-AM1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4433.D | 10 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 1650 | 130 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 117% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 18A-AM1**Lab Sample ID:** D17733-1**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 09/27/10**Date Received:** 09/28/10**Percent Solids:** 90.5 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.5 | 0.38 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 989 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 19.5 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 25.7 | 0.48 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 13.3 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 13.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 46.4 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

(1) Instrument QC Batch: MA1008

(2) Instrument QC Batch: MA1009

(3) Instrument QC Batch: MA1011

(4) Prep QC Batch: MP3004

(5) Prep QC Batch: MP3007

(6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.5 | 1.5 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 337 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.5 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.45 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|--------------------------------------|--|
| Client Sample ID: 18A-AM1 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.6 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10662.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.290 | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | 0.542 | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.0864 | 0.12 | 0.023 | mg/kg | J |
| | m,p-Xylene | 0.400 | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | 0.0698 | 0.12 | 0.040 | mg/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 73% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 76% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 90% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM1 DUP | |
| Lab Sample ID: D17733-2 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 84.6 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02006.D | 10 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

| Run #1 | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.13 | 0.12 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.67 | 0.14 | mg/kg | |
| 120-12-7 | Anthracene | 0.343 | 0.13 | 0.086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 2.80 | 0.13 | 0.13 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 1.43 | 0.13 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 3.81 | 0.13 | 0.097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 1.40 | 0.13 | 0.083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 1.74 | 0.13 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 3.38 | 0.13 | 0.067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.926 | 0.13 | 0.099 | mg/kg | |
| 206-44-0 | Fluoranthene | 4.69 | 0.13 | 0.082 | mg/kg | |
| 86-73-7 | Fluorene | 0.268 | 0.13 | 0.13 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.30 | 0.13 | 0.087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.498 | 0.13 | 0.12 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.933 | 0.67 | 0.20 | mg/kg | |
| 91-20-3 | Naphthalene | 0.466 | 0.67 | 0.15 | mg/kg | J |
| 85-01-8 | Phenanthrene | 2.20 | 0.13 | 0.11 | mg/kg | |
| 129-00-0 | Pyrene | 2.01 | 0.13 | 0.090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 107% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 107% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 126% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

32
3

| | |
|--------------------------------------|--|
| Client Sample ID: 18A-AM1 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.6 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7507.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 25.6 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM1 DUP | |
| Lab Sample ID: D17733-2 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 84.6 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4435.D | 10 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 768 | 130 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 121% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: 18A-AM1 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.6 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 30.0 | 0.38 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 956 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.95 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 26.6 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 29.8 | 0.48 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 35.8 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 14.3 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 60.3 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1008
- (2) Instrument QC Batch: MA1009
- (3) Instrument QC Batch: MA1011
- (4) Prep QC Batch: MP3004
- (5) Prep QC Batch: MP3007
- (6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

32
3

| | |
|--------------------------------------|--|
| Client Sample ID: 18A-AM1 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.6 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 26.6 | 1.4 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 330 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.6 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.20 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10622.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0907 | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | 0.119 | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.0348 | 0.11 | 0.023 | mg/kg | J |
| | m,p-Xylene | 0.127 | 0.23 | 0.040 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 77% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 82% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM2 | |
| Lab Sample ID: D17733-3 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 85.3 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02007.D | 10 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

| Run #1 | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|------|-------|-------|---|
| 83-32-9 | Acenaphthene | 0.169 | 0.13 | 0.12 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.67 | 0.14 | mg/kg | |
| 120-12-7 | Anthracene | 0.554 | 0.13 | 0.086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 4.59 | 0.13 | 0.13 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 2.43 | 0.13 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 6.40 | 0.13 | 0.097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 2.27 | 0.13 | 0.083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 2.39 | 0.13 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 5.41 | 0.13 | 0.067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 1.53 | 0.13 | 0.099 | mg/kg | |
| 206-44-0 | Fluoranthene | 7.71 | 0.13 | 0.082 | mg/kg | |
| 86-73-7 | Fluorene | 0.506 | 0.13 | 0.13 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 2.56 | 0.13 | 0.087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 1.14 | 0.13 | 0.12 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 1.91 | 0.67 | 0.20 | mg/kg | |
| 91-20-3 | Naphthalene | 0.983 | 0.67 | 0.15 | mg/kg | |
| 85-01-8 | Phenanthrene | 4.09 | 0.13 | 0.11 | mg/kg | |
| 129-00-0 | Pyrene | 3.70 | 0.13 | 0.090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 115% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 107% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 135% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7508.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 12.5 | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-AM2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4437.D | 10 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 844 | 130 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 119% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 8.4 | 0.41 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 822 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 15.8 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 20.1 | 0.51 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 11.1 | 5.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 12.3 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 42.0 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1008
- (2) Instrument QC Batch: MA1009
- (3) Instrument QC Batch: MA1011
- (4) Prep QC Batch: MP3004
- (5) Prep QC Batch: MP3007
- (6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 85.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 15.8 | 1.5 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 326 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 85.3 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.35 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

3.4
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 78.3 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10623.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0990 | 0.061 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | 0.135 | 0.12 | 0.061 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.0355 | 0.12 | 0.024 | mg/kg | J |
| | m,p-Xylene | 0.155 | 0.24 | 0.043 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 75% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 80% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM3 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 78.3 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02008.D | 10 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

| Run #1 | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|------|-------|-------|---|
| 83-32-9 | Acenaphthene | 0.135 | 0.13 | 0.12 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.67 | 0.14 | mg/kg | |
| 120-12-7 | Anthracene | 0.358 | 0.13 | 0.086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 2.57 | 0.13 | 0.13 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 1.26 | 0.13 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 3.93 | 0.13 | 0.097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 1.17 | 0.13 | 0.083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 1.60 | 0.13 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 2.99 | 0.13 | 0.067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.771 | 0.13 | 0.099 | mg/kg | |
| 206-44-0 | Fluoranthene | 3.85 | 0.13 | 0.082 | mg/kg | |
| 86-73-7 | Fluorene | 0.287 | 0.13 | 0.13 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.33 | 0.13 | 0.087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.570 | 0.13 | 0.12 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 1.04 | 0.67 | 0.20 | mg/kg | |
| 91-20-3 | Naphthalene | 0.526 | 0.67 | 0.15 | mg/kg | J |
| 85-01-8 | Phenanthrene | 2.22 | 0.13 | 0.11 | mg/kg | |
| 129-00-0 | Pyrene | 1.78 | 0.13 | 0.090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 114% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 98% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 113% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.4
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 78.3 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7509.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 28.2 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 100% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.4
3

| | |
|--|--|
| Client Sample ID: 18A-AM3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 78.3 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4439.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 890 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 121% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 78.3 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 4.8 | 0.42 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 946 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 18.1 | 1.0 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 15.3 | 0.52 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 7.9 | 5.2 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 7.4 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 34.8 | 3.1 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1008
- (2) Instrument QC Batch: MA1009
- (3) Instrument QC Batch: MA1011
- (4) Prep QC Batch: MP3004
- (5) Prep QC Batch: MP3007
- (6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 78.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 18.1 | 1.5 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 321 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 78.3 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.23 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM4 | |
| Lab Sample ID: D17733-5 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 92.3 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10665.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.696 | 0.054 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | 1.28 | 0.11 | 0.054 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.240 | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | 1.08 | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | 0.198 | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 72% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 77% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM4 | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17733-5 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 92.3 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02009.D | 10 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | 3G02029.D | 20 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | 30.1 g | 2.0 ml |

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|-------------------|------|-------|-------|---|
| 83-32-9 | Acenaphthene | 0.306 | 0.13 | 0.12 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.67 | 0.14 | mg/kg | |
| 120-12-7 | Anthracene | 0.886 | 0.13 | 0.086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 6.95 | 0.13 | 0.13 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 3.70 | 0.13 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 8.52 ^b | 0.27 | 0.19 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 3.55 | 0.13 | 0.083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 5.03 | 0.13 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 8.06 | 0.13 | 0.067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 2.15 | 0.13 | 0.098 | mg/kg | |
| 206-44-0 | Fluoranthene | 9.55 ^b | 0.27 | 0.16 | mg/kg | |
| 86-73-7 | Fluorene | 0.729 | 0.13 | 0.13 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 4.21 | 0.13 | 0.087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 1.14 | 0.13 | 0.12 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 1.99 | 0.67 | 0.20 | mg/kg | |
| 91-20-3 | Naphthalene | 0.968 | 0.67 | 0.15 | mg/kg | |
| 85-01-8 | Phenanthrene | 5.87 | 0.13 | 0.11 | mg/kg | |
| 129-00-0 | Pyrene | 5.54 | 0.13 | 0.090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 143% | 15% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 111% | 109% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 131% | 115% | 17-174% |

(a) All results reported on wet weight basis.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 92.3 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7510.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 26.7 | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 111% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 18A-AM4 | |
| Lab Sample ID: D17733-5 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 92.3 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4440.D | 20 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 3010 | 270 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 113% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 18A-AM4**Lab Sample ID:** D17733-5**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 09/27/10**Date Received:** 09/28/10**Percent Solids:** 92.3 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 19.2 | 0.38 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 666 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.95 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 22.8 | 0.95 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 25.8 | 0.48 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 15.3 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 12.4 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 42.4 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

(1) Instrument QC Batch: MA1008

(2) Instrument QC Batch: MA1009

(3) Instrument QC Batch: MA1011

(4) Prep QC Batch: MP3004

(5) Prep QC Batch: MP3007

(6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM4 | |
| Lab Sample ID: D17733-5 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 92.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.8 | 1.5 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 277 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 92.3 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.41 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM5 | |
| Lab Sample ID: D17733-6 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 89.6 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10625.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 76% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 80% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM5 | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17733-6 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 89.6 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02030.D | 10 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | 0.0606 | 0.067 | 0.043 | mg/kg | J |
| 56-55-3 | Benzo(a)anthracene | 0.250 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.128 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.379 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.128 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.153 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.302 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0863 | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.336 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.147 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.0712 | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.124 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.226 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.171 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 22% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.6
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM5 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.6 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7511.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

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

(a) All results reported on wet weight basis.

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 18A-AM5 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.6 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4441.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 220 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 109% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM5 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.6 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 22.4 | 0.39 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 443 | 0.98 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.98 | 0.98 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 24.0 | 0.98 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 28.1 | 0.49 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 17.6 | 4.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 14.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 55.0 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1008
- (2) Instrument QC Batch: MA1009
- (3) Instrument QC Batch: MA1011
- (4) Prep QC Batch: MP3004
- (5) Prep QC Batch: MP3007
- (6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-AM5 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.6 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 24.0 | 1.5 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 317 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 89.6 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 8.82 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10626.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 77% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 81% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-SG1 | |
| Lab Sample ID: D17733-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 83.3 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02031.D | 10 | 09/30/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | 0.105 | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.535 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.280 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.865 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.271 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.301 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.645 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.195 | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.786 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.0685 | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.276 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.139 | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.245 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.121 | 0.33 | 0.074 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.492 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.370 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 29% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 74% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 84% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7512.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 74% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4442.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 445 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 117% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 9.1 | 0.38 | mg/kg | 5 | 09/29/10 | 09/29/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 913 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 19.3 | 0.96 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 23.6 | 0.48 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 12.3 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.086 | 0.086 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ² | SW846 7471A ⁵ |
| Nickel | 13.5 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 44.5 | 2.9 | mg/kg | 1 | 09/28/10 | 09/29/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1008
- (2) Instrument QC Batch: MA1009
- (3) Instrument QC Batch: MA1011
- (4) Prep QC Batch: MP3004
- (5) Prep QC Batch: MP3007
- (6) Prep QC Batch: MP3009

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.3 | 1.5 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 342 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 83.3 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| pH | 9.10 | | su | 1 | 09/28/10 10:00 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

| Client / Reporting Information | | | Project Information | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | | | |
|---|--------------------------------|----------------|--|------------------|--------------|--|--------------|-----------------------------|---|--------------|------------|------------------|------------|--------------|------------|--|------|--------------|------|--------|--|--|--|--|
| Company Name: MARATHON | | | Project Name: | | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OJ - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | | | | | | |
| Street Address: | | | Street: | | | | | | | | | | | | | | | | | | | | | |
| City State Zip: | | | City State: | | | | | | | | | | | | | | | | | | | | | |
| Project Contact: | | | Project #: | | | | | | | | | | | | | | | | | | | | | |
| Phone # Fax #: | | | Client Purchase Order #: | | | | | | | | | | | | | | | | | | | | | |
| Sampler(s) Name(s): | | | Project Manager: | | | | | | | | | | | | | | | | | | | | | |
| Account Sample # | Field ID / Point of Collection | MEOH/DI Vial # | Collection | | Sampled by | Matrix | # of bottles | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | | | | | | |
| | | | Date | Time | | | | HCl | HNO3 | H2SO4 | HNO2 | DI Water | HNO3 | ENCORE | TPH - GRO | TPH - DRO | BTEX | | PAHS | METALS | | | | |
| | 18A - AM 1 | | 9/27 | 1050 | BY | S | | | | | | | | | | | | | | | | | | |
| | 18A - AM 1 DUP | | | | | | | | | | | | | | | | | | | | | | | |
| | 18A - AM 2 | | | | | | | | | | | | | | | | | | | | | | | |
| | 18A - AM 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | 18A - AM 4 | | | | | | | | | | | | | | | | | | | | | | | |
| | 18A - AM 5 | | | | | | | | | | | | | | | | | | | | | | | |
| | 18A - BP 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Turnaround Time (Business days): | | | Data Deliverable Information: | | | Comments / Special Instructions: | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input checked="" type="checkbox"/> 3 - 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | | Approved By (Accutest PM): / Date: _____ _____ | | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ | | | | | | | | | | | | | | | |
| Emergency & Rush T/A data available VIA Lablink | | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | | | | | | | | | |
| 1 | By em | 8:20 | | 1 | 9/28/10 | 2 | | 3 | 8:30 | 4 | | 5 | | 6 | | | | | | | | | | |
| Relinquished by: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | | | | | | | | | |
| 3 | | | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | | | | | | | | | |
| Relinquished by: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | Relinquished By: | Date Time: | Received By: | Date Time: | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Custody Seal # | Intact | Not intact | Preserved where applicable | On Ice | Cooler Temp. | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 4.18 | | | | | | | | | |

4.1
4

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V582-MB1 | 5V10614.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-1, D17733-3, D17733-4, D17733-6, D17733-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|------------|-----------------------|-------------|
| 2037-26-5 | Toluene-D8 | 76% 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 74% 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% 70-130% |

Method Blank Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V584-MB1 | 5V10659.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-2, D17733-5

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|------------|-----------------------|--------|---------|
| 2037-26-5 | Toluene-D8 | 80% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 76% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | 70-130% |

Blank Spike Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V582-BS1 | 5V10617.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-1, D17733-3, D17733-4, D17733-6, D17733-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 50.0 | 100 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 51.7 | 103 | 70-130 |
| 108-88-3 | Toluene | 50 | 50.5 | 101 | 70-130 |
| | m,p-Xylene | 50 | 47.0 | 94 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 47.8 | 96 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 76% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 86% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 93% | 70-130% |

Blank Spike Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V584-BS1 | 5V10660.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-2, D17733-5

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 51.3 | 103 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 52.8 | 106 | 70-130 |
| 108-88-3 | Toluene | 50 | 53.0 | 106 | 70-130 |
| | m,p-Xylene | 50 | 48.8 | 98 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 48.3 | 97 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 79% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17733-1MS | 5V10619.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| D17733-1MSD | 5V10620.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| D17733-1 | 5V10618.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-1, D17733-3, D17733-4, D17733-6, D17733-7

| CAS No. | Compound | D17733-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | 45.3 | J | 2740 | 2940 | 106 | 3130 | 113 | 6 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | | 2740 | 2850 | 104 | 3110 | 114 | 9 | 56-139/30 |
| 108-88-3 | Toluene | 80.2 | J | 2740 | 2900 | 103 | 3150 | 112 | 8 | 57-144/30 |
| | m,p-Xylene | 86.0 | J | 2740 | 2730 | 97 | 2930 | 104 | 7 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | | 2740 | 2700 | 99 | 2890 | 106 | 7 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-1 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 74% | 75% | 78% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | 91% | 81% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | 97% | 95% | 70-130% |

5.3.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17733-2MS | 5V10663.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |
| D17733-2MSD | 5V10664.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |
| D17733-2 | 5V10662.D | 1 | 09/29/10 | DC | n/a | n/a | V5V584 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17733-2, D17733-5

| CAS No. | Compound | D17733-2 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | 290 | | 3340 | 106 | 3300 | 104 | 1 | 55-140/30 |
| 100-41-4 | Ethylbenzene | 86.4 | J | 3310 | 112 | 3230 | 109 | 2 | 56-139/30 |
| 108-88-3 | Toluene | 542 | | 3800 | 113 | 3660 | 108 | 4 | 57-144/30 |
| | m,p-Xylene | 400 | | 3500 | 107 | 3400 | 104 | 3 | 47-130/30 |
| 95-47-6 | o-Xylene | 69.8 | J | 3060 | 104 | 2990 | 101 | 2 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-2 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 79% | 77% | 73% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | 92% | 76% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 93% | 90% | 70-130% |

5.3.2
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-MB | 3G02000.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 67% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | 17-174% |

Blank Spike Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-BS | 3G02001.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 63.2 | 76 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 62.7 | 75 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 70.3 | 84 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.7 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 71.3 | 86 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 71.9 | 86 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 67.4 | 81 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 72.6 | 87 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 72.2 | 87 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 71.0 | 85 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 77.0 | 92 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 66.5 | 80 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 67.9 | 81 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 60.9 | 73 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 59.3 | 71 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 62.2 | 75 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 67.5 | 81 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 72.2 | 87 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 78% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 72% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 92% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2578-MS | 3G02003.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| OP2578-MSD | 3G02004.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |
| D17557-1 | 3G02002.D | 1 | 09/29/10 | TMB | 09/28/10 | OP2578 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | D17557-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| 83-32-9 | Acenaphthene | ND | 83.3 | 68.8 | 83 | 64.6 | 77 | 6 | 20-151/30 | |
| 208-96-8 | Acenaphthylene | ND | 83.3 | 68.6 | 82 | 64.7 | 78 | 6 | 23-156/30 | |
| 120-12-7 | Anthracene | ND | 83.3 | 71.3 | 86 | 67.3 | 81 | 6 | 25-149/30 | |
| 56-55-3 | Benzo(a)anthracene | ND | 83.3 | 71.1 | 85 | 67.8 | 81 | 5 | 22-157/30 | |
| 50-32-8 | Benzo(a)pyrene | ND | 83.3 | 62.2 | 75 | 58.1 | 70 | 7 | 23-153/30 | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 83.3 | 66.7 | 80 | 62.5 | 75 | 7 | 22-161/30 | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 83.3 | 63.6 | 76 | 61.4 | 74 | 4 | 20-158/30 | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 83.3 | 68.8 | 83 | 65.0 | 78 | 6 | 17-161/30 | |
| 218-01-9 | Chrysene | ND | 83.3 | 69.3 | 83 | 65.3 | 78 | 6 | 16-159/30 | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 83.3 | 67.2 | 81 | 62.5 | 75 | 7 | 21-154/30 | |
| 206-44-0 | Fluoranthene | ND | 83.3 | 74.7 | 90 | 68.0 | 82 | 9 | 16-140/30 | |
| 86-73-7 | Fluorene | ND | 83.3 | 70.0 | 84 | 65.2 | 78 | 7 | 15-153/30 | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 83.3 | 65.2 | 78 | 61.4 | 74 | 6 | 21-159/30 | |
| 90-12-0 | 1-Methylnaphthalene | ND | 83.3 | 68.4 | 82 | 64.7 | 78 | 6 | 10-148/30 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 83.3 | 65.4 | 79 | 62.0 | 74 | 5 | 10-181/30 | |
| 91-20-3 | Naphthalene | ND | 83.3 | 70.0 | 84 | 66.3 | 79 | 5 | 10-176/30 | |
| 85-01-8 | Phenanthrene | ND | 83.3 | 69.8 | 84 | 64.7 | 78 | 8 | 22-152/30 | |
| 129-00-0 | Pyrene | ND | 83.3 | 72.6 | 87 | 69.1 | 83 | 5 | 10-200/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D17557-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 89% | 82% | 62% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | 75% | 56% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 89% | 84% | 63% | 17-174% |

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-MB | GB7502.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-BS | GB7503.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 98.6 | 90 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|-----|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17733-1MS | GB7505.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1MSD | GB7506.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1 | GB7504.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | D17733-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 16.9 | 120 | 121 | 86 | 135 | 98 | 11 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-1 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 93% | 91% | 100% | 60-140% |

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MB | FD4426.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 116% 63-130% |

Blank Spike Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-BS | FD4427.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 673 | 101 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 110% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17733
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MS | FD4428.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| OP2584-MSD | FD4429.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| D17735-1 | FD4430.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

| CAS No. | Compound | D17735-1 mg/kg | Spike Q | mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| | TPH-DRO (C10-C28) | ND | 666 | 636 | 95 | 644 | 97 | 1 | 70-130/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D17735-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 119% | 108% | 108% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.11 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.090 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.11 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.11 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.030 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.030 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.20 | <3.0 |

Associated samples MP3004: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.1.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3004
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17733-1 Original MS | | SpikeLot MPICPAL % Rec | QC Limits |
|------------|-------------------------|------|---------------------------|------------------|
| Aluminum | anr | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 989 | 1660 | 396 | 169.4N(a) 75-125 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 0.28 | 75.2 | 99 | 75.7 75-125 |
| Calcium | | | | |
| Chromium | 19.5 | 96.0 | 99 | 77.3 75-125 |
| Cobalt | | | | |
| Copper | 25.7 | 113 | 99 | 88.2 75-125 |
| Iron | | | | |
| Lead | 13.3 | 162 | 198 | 75.1 75-125 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 13.9 | 86.0 | 99 | 72.8N(a) 75-125 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 2.1 | 152 | 198 | 75.7 75-125 |
| Silicon | | | | |
| Silver | 0.0 | 30.0 | 39.6 | 75.8 75-125 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 46.4 | 120 | 99 | 74.3N(a) 75-125 |

Associated samples MP3004: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3004
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17733-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit | |
|------------|--------------------------|------|---------------------------|------------|-------------|----|
| Aluminum | anr | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | 989 | 1370 | 408 | 93.3 | 19.1 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 0.28 | 74.8 | 102 | 73.0N(a) | 0.5 | 20 |
| Calcium | | | | | | |
| Chromium | 19.5 | 96.3 | 102 | 75.3 | 0.3 | 20 |
| Cobalt | | | | | | |
| Copper | 25.7 | 109 | 102 | 81.6 | 3.6 | 20 |
| Iron | | | | | | |
| Lead | 13.3 | 157 | 204 | 70.4N(a) | 3.1 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 13.9 | 82.1 | 102 | 66.8N(a) | 4.6 | 20 |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.1 | 152 | 204 | 73.5N(a) | 0.0 | 20 |
| Silicon | | | | | | |
| Silver | 0.0 | 29.7 | 40.8 | 72.8N(a) | 1.0 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 46.4 | 108 | 102 | 60.4N(a) | 10.5 | 20 |

Associated samples MP3004: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3004
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | anr | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 360 | 400 | 90.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 85.9 | 100 | 85.9 | 80-120 |
| Calcium | | | | |
| Chromium | 91.3 | 100 | 91.3 | 80-120 |
| Cobalt | | | | |
| Copper | 95.4 | 100 | 95.4 | 80-120 |
| Iron | | | | |
| Lead | 177 | 200 | 88.5 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 85.4 | 100 | 85.4 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 171 | 200 | 85.5 | 80-120 |
| Silicon | | | | |
| Silver | 33.4 | 40 | 83.5 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 84.7 | 100 | 84.7 | 80-120 |

Associated samples MP3004: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3004
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 09/28/10

| Metal | D17733-1 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|-------|----------|--------------|
| Aluminum | anr | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 10300 | 11200 | 8.8 | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 2.90 | 2.50 | 13.8 (a) | 0-10 |
| Calcium | | | | |
| Chromium | 203 | 236 | 16.1*(b) | 0-10 |
| Cobalt | | | | |
| Copper | 268 | 287 | 7.2 | 0-10 |
| Iron | | | | |
| Lead | 138 | 161 | 16.5*(b) | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 145 | 175 | 20.5*(b) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 21.4 | 29.0 | 35.5 (a) | 0-10 |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 483 | 600 | 24.2*(b) | 0-10 |

Associated samples MP3004: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3004
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3007
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|------|---------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .013 | -0.0032 | <0.10 |

Associated samples MP3007: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3007
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17557-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.0 0.38 0.378 100.5 85-115

Associated samples MP3007: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3007
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17557-1 Original MSD | SpikeLot HGWSR1 | % Rec | MSD RPD | QC Limit | |
|---------|--------------------------|--------------------|-------|------------|-------------|----|
| Mercury | 0.0 | 0.39 | 0.385 | 101.2 | 2.6 | 20 |

Associated samples MP3007: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3007
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|-------|---------------|--------------------|-------|--------------|
|-------|---------------|--------------------|-------|--------------|

Mercury 0.39 0.4 97.5 80-120

Associated samples MP3007: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3009
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 09/29/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|------|-----------|-------|
| Aluminum | 25 | .14 | .89 | | |
| Antimony | 0.20 | .001 | .045 | | |
| Arsenic | 0.40 | .049 | .26 | -0.15 | <0.40 |
| Barium | 1.0 | .0035 | .17 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 2 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 6.1 | | |
| Chromium | 1.0 | .021 | .23 | | |
| Cobalt | 0.10 | .0033 | .088 | | |
| Copper | 1.0 | .011 | .14 | | |
| Iron | 20 | .81 | 6.1 | | |
| Lead | 0.25 | .0012 | .18 | | |
| Magnesium | 50 | .067 | 1.3 | | |
| Manganese | 0.50 | .007 | .089 | | |
| Molybdenum | 0.50 | .0044 | .2 | | |
| Nickel | 1.0 | .0029 | .074 | | |
| Phosphorus | 30 | 1.8 | 5.6 | | |
| Potassium | 100 | 2 | 9.1 | | |
| Selenium | 0.20 | .075 | .14 | | |
| Silver | 0.050 | .0008 | .029 | | |
| Sodium | 250 | .8 | 1.8 | | |
| Strontium | 10 | .004 | .047 | | |
| Thallium | 0.10 | .015 | .071 | | |
| Tin | 5.0 | .006 | .17 | | |
| Titanium | 1.0 | .035 | .071 | | |
| Uranium | 0.25 | .00038 | .12 | | |
| Vanadium | 2.0 | .052 | .99 | | |
| Zinc | 5.0 | .039 | .53 | | |

Associated samples MP3009: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.3.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3009
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17733-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|-----|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 10.5 | 190 | 198 | 90.6 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3009: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3009
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17733-1 Original | MSD | Spike/lot MPICPALL | % Rec | MSD RPD | QC Limit |
|------------|----------------------|-----|-----------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 10.5 | 191 | 204 | 88.4 | 0.5 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3009: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3009
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|---------------|----------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 185 | 200 | 92.5 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3009: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3009
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 09/29/10

| Metal | D17733-1 | | | QC |
|-------|----------|----------|------|--------|
| | Original | SDL 5:25 | %DIF | Limits |

| | | | | |
|------------|-----|-----|----------|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 110 | 127 | 15.4*(a) | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3009: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

9.3.4
 9

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
 GENERAL CHEMISTRY

Login Number: D17733
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---------|----------|----|--------------|-------|-----------------|---------------|---------------|--------------|
| pH | GN6569 | | | su | 8.00 | 8.04 | 100.5 | 99.3-100.7% |

Associated Samples:

Batch GN6569: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #: **D17733**
 Accutest Quote #:
 AMS P.O. #:
 Project No.:

| Client Information | | | Subcontract Laboratory Information | | | | | | | | | | Analytical Information | | | | | | |
|--|-------------------------------------|--------------------------------|--|---|--|--|------|------|-------|------|--|-------------------------------------|------------------------|----------|--|---|--|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | | | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | | Collection | | Matrix | # of bottles | Preservation | | | | | | XCR | eh | Comments | | | | | |
| Date | Time | | | | | HCl | NaOH | HNO3 | H2SO4 | None | | | | | | | | | |
| D17733 -1 | 9/27/10 | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| -2 | | 10:50 | | Soil | 1 | | | | | | | X | X | | | | | | |
| -3 | | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| -4 | | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| -5 | | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| -6 | | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| -7 | | 10:50 AM | | Soil | 1 | | | | | | | X | X | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | | | | Comments / Remarks | | | | | | |
| <input checked="" type="checkbox"/> 1 - 2 Business Day Rush <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | | | | | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) _____ | | | | | Please use Colorado regulations and RLs. <i>100</i> | | | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | For Subcontract Laboratory Use Only | | | | | | | |
| Relinquished by: 1 | Date & Time: 9/28/10 1:50 | Received By: 1 FedEx | Date & Time: 1 | Seal #: | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | | | | | | |
| Relinquished by: 2 | Date & Time: 9/28/10 9:30 | Received By: 2 | Date & Time: 2 | Preserved where applicable: <input type="checkbox"/> | On Ice <input checked="" type="checkbox"/> | | | | | | | | | | | | | | |
| Relinquished by: 3 | Date & Time: | Received By: 3 | Date & Time: 3 | Temperature °C 18 | | | | | | | | | | | | | | | |

D17733: Chain of Custody
Page 1 of 1
Accutest Labs of New England, Inc.

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17733
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | 0.50 | 0.0 | mg/kg | 12 | 11.9 | 99.2 | 80-120% |
| Chromium, Hexavalent | GP12078/GN32952 | | | mg/kg | 650 | 660 | 101.5 | 80-120% |
| Chromium, Hexavalent | GP12082/GN32961 | 0.50 | 0.0 | mg/kg | 12 | 11.2 | 93.3 | 80-120% |
| Chromium, Hexavalent | GP12082/GN32961 | | | mg/kg | 657 | 623 | 94.8 | 80-120% |

Associated Samples:

Batch GP12078: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-7

Batch GP12082: D17733-6

(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17733
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32947 | D17737-6 | mv | 349 | 338 | 3.2 | 0-20% |

Associated Samples:

Batch GN32947: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-6, D17733-7

Batch GP12078: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-7

Batch GP12082: D17733-6

(*) Outside of QC limits

12.2
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17733
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|-------|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 12 | 9.2 | 76.7 | 75-125% |
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 723 | 623 | 86.2 | 75-125% |
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 11.9 | 10.6 | 89.1 | 75-125% |
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 1040 | 1090 | 104.8 | 75-125% |

Associated Samples:

Batch GP12078: D17733-1, D17733-2, D17733-3, D17733-4, D17733-5, D17733-7

Batch GP12082: D17733-6

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D17733R

Sampling Date: 09/27/10

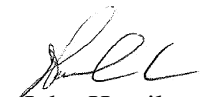
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **21**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|--|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 5 |
| 3.1: D17733-7R: 18A-SG1 | 6 |
| Section 4: Misc. Forms | 8 |
| 4.1: Chain of Custody | 9 |
| Section 5: Metals Analysis - QC Data Summaries | 11 |
| 5.1: Prep QC MP3209: Ca,Mg,Na,Sodium Adsorption Ratio | 12 |
| Section 6: General Chemistry - QC Data Summaries | 20 |
| 6.1: Method Blank and Spike Results Summary | 21 |

1

2

3

4

5

6



Sample Summary

Marathon Oil

Job No: D17733R

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|---------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17733-7R | 09/27/10 | 10:50 | 09/28/10 | SO | Soil | 18A-SG1 |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17733R

Site: Roan Pit Closure

Report Dat 10/22/2010 5:11:04 PM

On 09/28/2010, one (1) sample, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.1°C. The sample was intact and properly preserved, unless noted below. An AMS Job Number of D17733R was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

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

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP3209

- The sample was digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D17733-7RMS and D17733-7RMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method DEPT.OF AG, BOOK N9

Matrix SO

Batch ID: GP2991

- The sample was prepared and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.

Wet Chemistry By Method LADNR29B

Matrix SO

Batch ID: MP3209

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L})+(\text{Mg meq/L})/2]}$

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

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

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

Sample Results

Report of Analysis

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7R | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 86.0 | 2.0 | mg/l | 1 | 10/20/10 | 10/21/10 GJ | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 17.0 | 1.0 | mg/l | 1 | 10/20/10 | 10/21/10 GJ | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 99.2 | 2.0 | mg/l | 1 | 10/20/10 | 10/21/10 GJ | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1061

(2) Prep QC Batch: MP3209

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18A-SG1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17733-7R | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|-----|----------|----|----------------|----|---------------------|
| Sodium Adsorption Ratio ^b | 2.56 | | ratio | 1 | 10/21/10 15:11 | GJ | LADNR29B |
| Specific Conductivity | 1020 | 1.0 | umhos/cm | 1 | 10/20/10 | JK | DEPT.OF AG, BOOK N9 |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

| Client / Reporting Information | | Project Information | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | |
|--|--|------------------------------------|--|--|------|-----------------------------|--------|-------------------------------------|-----|------------------------|------|---------------------------------|------|--|-------|--------------|----|
| Company Name: MARATHON | | Project Name: | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OF - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | |
| Street Address: | | Street: | | | | | | | | | | | | | | | |
| City State Zip: | | City State: | | | | | | | | | | | | | | | |
| Project Contact: | | Project #: | | | | | | | | | | | | | | | |
| Phone # Fax #: | | Client Purchase Order #: | | | | | | | | | | | | | | | |
| Sampler(s) Name(s): | | Project Manager: | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | | MEOH/DI/Vial # | | Collection | | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | |
| | | | | Date | Time | Sampled by | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | H2O2 | DI Water | MEDIA | ENVELOPE | |
| 18A-AM1 | | | | 9/27 | 1050 | BY | S | | | | | | | | | | 01 |
| 18A-AM1 DUP | | | | | | | | | | | | | | | | | 02 |
| 18A-AM2 | | | | | | | | | | | | | | | | | 03 |
| 18A-AM3 | | | | | | | | | | | | | | | | | 04 |
| 18A-AM4 | | | | | | | | | | | | | | | | | 05 |
| 18A-AMS | | | | | | | | | | | | | | | | | 06 |
| 18A-BP1 | | | | | | | | | | | | | | | | | 07 |
| Turnaround Time (Business days) | | Approved By (Accutest PM): / Date: | | Data Deliverable Information | | | | | | | | | | Comments / Special Instructions | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 5 - 9 Day RUSH <input checked="" type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | | | | | | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | |
| Emergency & Rush T/A data available V/A Lablink | | | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | |
| Relinquished by Sampler: B. em | | Date Time: 8:20 | | Received By: [Signature] | | Date Time: 9/28/10 | | Relinquished By: [Signature] | | Date Time: 8:20 | | Received By: [Signature] | | | | | |
| Relinquished by Sampler: [Signature] | | Date Time: | | Received By: [Signature] | | Date Time: | | Relinquished By: [Signature] | | Date Time: | | Received By: [Signature] | | | | | |
| Relinquished by: [Signature] | | Date Time: | | Received By: [Signature] | | Date Time: | | Relinquished By: [Signature] | | Date Time: | | Received By: [Signature] | | | | | |
| Custody Seal # | | | | <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact | | | | | | | | | | Preserved when applicable <input checked="" type="checkbox"/> On Ice Cooler Temp: 4.12 | | | |

4.1
4

Job Change Order: D17733_10/19/2010

Requested Date: 10/19/2010 **Received Date:** 9/28/2010
Account Name: Marathon Oil **Due Date:** 10/1/2010
Project Description: Roan Pit Closure **Deliverable:** COMIMBN
CSR: AK **TAT (Days):** 3

Change: Please relog on R sample for SAR and SOON.

Sample #:
D17733-7

18A-SG1

Above Changes

Ben Yanda

Date: 10/19/2010

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service.

Page 1 of 1

D17733R: Chain of Custody

Page 2 of 2

Metals Analysis

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3209
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/20/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 27.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 39.5 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -960 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3209: D17733-7R

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3209
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.1.1
5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733R
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3209
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/20/10

| Metal | D17733-7R Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|--------------------------|--------|----------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 86000 | 224000 | 125000 | 110.4 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 17000 | 146000 | 125000 | 103.2 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 99200 | 233000 | 125000 | 107.0 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3209: D17733-7R

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

5.1.2
5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3209
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.1.2

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733R
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3209
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/20/10

| Metal | D17733-7R Original MSD | Spikelot MPICPAL % Rec | MSD RPD | QC Limit | | |
|------------|---------------------------|---------------------------|------------|-------------|-----|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 86000 | 225000 | 125000 | 111.2 | 0.4 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 17000 | 147000 | 125000 | 104.0 | 0.7 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 99200 | 232000 | 125000 | 106.2 | 0.4 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3209: D17733-7R

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

5.1.2
5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3209
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.1.2
5

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733R
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3209
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/20/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 137000 | 125000 | 109.6 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 129000 | 125000 | 103.2 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 130000 | 125000 | 104.0 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3209: D17733-7R

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3209
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.1.3

5

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17733R
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|-----|-----------|----------|--------------|------------|------------|-----------|
| Specific Conductivity | GP2991/GN6852 | 1.0 | <1.0 | umhos/cm | 10003 | 10100 | 100.7 | 90-110% |

Associated Samples:
Batch GP2991: D17733-7R
(*) Outside of QC limits

6.1

6

Technical Report for

Marathon Oil

Parachute Pit Closure 18A, 13C

Accutest Job Number: D18173

Sampling Date: 10/12/10

Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: Randy March

Total number of pages in report: **96**



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

John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 8 |
| 3.1: D18173-1: 18A-AM6 | 9 |
| 3.2: D18173-2: 18A-AM7 | 15 |
| 3.3: D18173-3: 18A-AM8 | 21 |
| 3.4: D18173-4: 18A-AM9 | 27 |
| 3.5: D18173-5: 18A-AM10 | 33 |
| 3.6: D18173-6: 18A-AM10 DUP | 39 |
| Section 4: Misc. Forms | 45 |
| 4.1: Chain of Custody | 46 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 47 |
| 5.1: Method Blank Summary | 48 |
| 5.2: Blank Spike Summary | 49 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 50 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 51 |
| 6.1: Method Blank Summary | 52 |
| 6.2: Blank Spike Summary | 53 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 54 |
| Section 7: GC Volatiles - QC Data Summaries | 55 |
| 7.1: Method Blank Summary | 56 |
| 7.2: Blank Spike Summary | 57 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 58 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 59 |
| 8.1: Method Blank Summary | 60 |
| 8.2: Blank Spike Summary | 61 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 62 |
| Section 9: Metals Analysis - QC Data Summaries | 63 |
| 9.1: Prep QC MP3145: Hg | 64 |
| 9.2: Prep QC MP3146: Ba,Cd,Cr,Cu,Pb,Ni,Ag | 68 |
| 9.3: Prep QC MP3147: As | 73 |
| 9.4: Prep QC MP3158: Se,Zn | 78 |
| Section 10: General Chemistry - QC Data Summaries | 88 |
| 10.1: Method Blank and Spike Results Summary | 89 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 90 |
| 11.1: Chain of Custody | 91 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 93 |
| 12.1: Method Blank and Spike Results Summary | 94 |
| 12.2: Duplicate Results Summary | 95 |
| 12.3: Matrix Spike Results Summary | 96 |



Sample Summary

Marathon Oil

Job No: D18173

Parachute Pit Closure 18A, 13C

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D18173-1 | 10/12/10 | 09:00 RY | 10/12/10 | SO | Soil | 18A-AM6 |
| D18173-2 | 10/12/10 | 09:00 RY | 10/12/10 | SO | Soil | 18A-AM7 |
| D18173-3 | 10/12/10 | 09:00 RY | 10/12/10 | SO | Soil | 18A-AM8 |
| D18173-4 | 10/12/10 | 12:00 RY | 10/12/10 | SO | Soil | 18A-AM9 |
| D18173-5 | 10/12/10 | 12:00 RY | 10/12/10 | SO | Soil | 18A-AM10 |
| D18173-6 | 10/12/10 | 12:00 RY | 10/12/10 | SO | Soil | 18A-AM10 DUP |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D18173

Site: Parachute Pit Closure 18A,13C

Report Dat 10/18/2010 10:39:13 A

On 10/12/2010, 6 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 17 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D18173 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V3V411 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D18174-1MS and D18174-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2654 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D18173-5MS and D18173-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries for Anthracene are outside control limits. Outside control limits due to matrix interference.
- The matrix spike (MS) recoveries of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB421 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D18173-1MS and D18173-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2651 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-6MS and D18173-6MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3146 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS, D18173-1MSD, and D18173-1SDL were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries for Cadmium, Lead, Nickel and MSD for Copper are outside control limits. The spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- The serial dilution RPDs for Cadmium, Barium, Chromium, Lead, and Nickel are outside control limits for sample MP3146-SDL. The percent difference acceptable is due to low initial sample concentration (< 50 times IDL).

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3158 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS, D18173-1MSD, and D18173-1SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery of Zinc is outside control limits. Probable cause due to matrix interference.
- The serial dilution RPDs for Selenium and Zinc are outside control limits for sample MP3158-SDL. The percent difference acceptable is due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3147 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MSD, D18173-1SDL, and D18173-1MS were used as the QC samples for the metals analysis.
- MP3147-S1 for Arsenic: Spike recovery indicates possible matrix interference.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3145 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D18173-1MS and D18173-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN33113 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D18173-1 through D18173-6.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6759 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4737 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Chromium, Hexavalent)

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4738 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12142 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D18173

Site: MOILCOGJ: Parachute Pit Closure 18A,13C

Report Date 10/15/2010 3:33:45 PM

6 Sample(s) were collected on 10/12/2010 and were received at Accutest on 10/12/2010 properly preserved, at 2.3 Deg. C and intact. These Samples received an Accutest job number of D18173. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN33113 |
|------------------|--------------------------|

- Sample(s) M94980-5DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12142 |
|------------------|--------------------------|

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18174-1MS, D18174-1DUP were used as the QC samples for Chromium, Hexavalent.
- RPD(s) for Duplicate for Chromium, Hexavalent are outside control limits for sample GP12142-D1. RPD acceptable due to low duplicate and sample concentrations.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D18173).



Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|---|--|
| Client Sample ID: 18A-AM6 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846 8260B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07643.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 31.7 | 58 | 17 | ug/kg | J |
| 108-88-3 | Toluene | ND | 120 | 58 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 23 | ug/kg | |
| | m,p-Xylene | 77.6 | 230 | 41 | ug/kg | J |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM6 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18173-1 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 84.0 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02110.D | 5 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | 52.8 | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | 191 | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 1040 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 507 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1620 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 487 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 476 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 1210 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 346 | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 1780 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | 141 | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 593 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 358 | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 649 | 170 | 51 | ug/kg | |
| 91-20-3 | Naphthalene | 319 | 170 | 37 | ug/kg | |
| 85-01-8 | Phenanthrene | 1060 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 761 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 121% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 84% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 98% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

| | |
|---|--|
| Client Sample ID: 18A-AM6 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7697.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 25.6 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 18A-AM6 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4567.D | 5 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 414 | 66 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 109% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM6 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 37.7 | 0.80 | mg/kg | 10 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 543 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 17.7 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 29.7 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 16.9 | 5.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 14.3 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 48.6 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM6 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-1 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 17.7 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 350 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.33 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|---|--|
| Client Sample ID: 18A-AM7 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.8 ^a |
| Method: SW846 8260B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07644.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 24.1 | 59 | 18 | ug/kg | J |
| 108-88-3 | Toluene | ND | 120 | 59 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 24 | ug/kg | |
| | m,p-Xylene | 60.1 | 240 | 41 | ug/kg | J |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 85% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 82% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | | |
|--|--|--|
| Client Sample ID: 18A-AM7 | | |
| Lab Sample ID: D18173-2 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 81.8 ^a |
| Project: Parachute Pit Closure 18A, 13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02111.D | 5 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | 187 | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 1100 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 543 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1510 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 506 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 702 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 1270 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 318 | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 1700 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | 130 | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 647 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 229 | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 438 | 170 | 51 | ug/kg | |
| 91-20-3 | Naphthalene | 182 | 170 | 37 | ug/kg | |
| 85-01-8 | Phenanthrene | 939 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 828 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 134% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 88% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 107% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM7 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.8 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7700.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 92% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM7 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.8 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4568.D | 5 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 467 | 67 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 105% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|---|--|
| Client Sample ID: 18A-AM7 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-2 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.8 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 19.4 | 0.42 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 731 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 18.5 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 25.2 | 1.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 14.9 | 5.3 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 13.4 | 3.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.3 | 5.3 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 64.8 | 3.2 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM7 | |
| Lab Sample ID: D18173-2 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| | Percent Solids: 81.8 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 18.5 | 1.6 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 351 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 81.8 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.41 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM8 | | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | | Date Received: 10/12/10 |
| Matrix: SO - Soil | | Percent Solids: 82.6 ^a |
| Method: SW846 8260B | | |
| Project: Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07645.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 21.8 | 59 | 18 | ug/kg | J |
| 108-88-3 | Toluene | ND | 120 | 59 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 23 | ug/kg | |
| | m,p-Xylene | 57.3 | 230 | 41 | ug/kg | J |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM8 | | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | | Date Received: 10/12/10 |
| Matrix: SO - Soil | | Percent Solids: 82.6 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Parachute Pit Closure 18A,13C | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02141.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | 83.3 | 67 | 62 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 330 | 69 | ug/kg | |
| 120-12-7 | Anthracene | ND | 67 | 43 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 1540 | 67 | 65 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 793 | 67 | 42 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 2230 | 67 | 48 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 801 | 67 | 42 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 813 | 67 | 42 | ug/kg | |
| 218-01-9 | Chrysene | 1920 | 67 | 33 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 538 | 67 | 49 | ug/kg | |
| 206-44-0 | Fluoranthene | 2450 | 67 | 41 | ug/kg | |
| 86-73-7 | Fluorene | 187 | 67 | 65 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 793 | 67 | 44 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 356 | 67 | 59 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 668 | 330 | 100 | ug/kg | |
| 91-20-3 | Naphthalene | 347 | 330 | 74 | ug/kg | |
| 85-01-8 | Phenanthrene | 1360 | 67 | 53 | ug/kg | |
| 129-00-0 | Pyrene | 1010 | 67 | 45 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 92% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 85% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 90% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM8 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7701.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 17.1 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 104% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-AM8 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4569.D | 5 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 569 | 66 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 100% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM8 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 16.8 | 0.42 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 849 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 21.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 27.8 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 14.4 | 5.2 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.088 | 0.088 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 13.4 | 3.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 56.4 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM8 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-3 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.0 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 332 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 82.6 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.39 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM9 | | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-4 | | Date Received: 10/12/10 |
| Matrix: SO - Soil | | Percent Solids: 81.5 ^a |
| Method: SW846 8260B | | |
| Project: Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07651.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 232 | 59 | 18 | ug/kg | |
| 108-88-3 | Toluene | 369 | 120 | 59 | ug/kg | |
| 100-41-4 | Ethylbenzene | 56.3 | 120 | 24 | ug/kg | J |
| | m,p-Xylene | 349 | 240 | 41 | ug/kg | |
| 95-47-6 | o-Xylene | 67.7 | 120 | 41 | ug/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 89% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 80% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|--|--|--|
| Client Sample ID: 18A-AM9 | | |
| Lab Sample ID: D18173-4 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 81.5 ^a |
| Project: Parachute Pit Closure 18A, 13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02142.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | 117 | 66 | 62 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 330 | 68 | ug/kg | |
| 120-12-7 | Anthracene | ND | 66 | 43 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 2740 | 66 | 65 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 1390 | 66 | 42 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 3860 | 66 | 48 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 1360 | 66 | 42 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 1500 | 66 | 42 | ug/kg | |
| 218-01-9 | Chrysene | 3390 | 66 | 33 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 961 | 66 | 49 | ug/kg | |
| 206-44-0 | Fluoranthene | 4440 | 66 | 41 | ug/kg | |
| 86-73-7 | Fluorene | 319 | 66 | 65 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1360 | 66 | 44 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 616 | 66 | 59 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 1160 | 330 | 100 | ug/kg | |
| 91-20-3 | Naphthalene | 651 | 330 | 73 | ug/kg | |
| 85-01-8 | Phenanthrene | 2330 | 66 | 53 | ug/kg | |
| 129-00-0 | Pyrene | 1830 | 66 | 45 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 104% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 99% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.4
3

| | |
|--|--|
| Client Sample ID: 18A-AM9 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.5 ^a |
| Method: SW846 8015B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7702.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 25.6 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 97% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.4
3

| | |
|--|--|
| Client Sample ID: 18A-AM9 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4570.D | 5 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 847 | 66 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 120% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM9 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.5 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.6 | 0.40 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 1210 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 16.7 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 25.8 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 11.4 | 5.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.094 | 0.094 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 11.8 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 47.9 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM9 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-4 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.5 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 16.7 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 336 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 81.5 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.56 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM10 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.2 ^a |
| Method: SW846 8260B | |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07646.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 27.0 | 58 | 17 | ug/kg | J |
| 108-88-3 | Toluene | ND | 120 | 58 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 23 | ug/kg | |
| | m,p-Xylene | 79.0 | 230 | 41 | ug/kg | J |
| 95-47-6 | o-Xylene | ND | 120 | 41 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 80% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM10 | Date Sampled: | 10/12/10 |
| Lab Sample ID: | D18173-5 | Date Received: | 10/12/10 |
| Matrix: | SO - Soil | Percent Solids: | 84.2 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Parachute Pit Closure 18A,13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02143.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | 68.2 | 67 | 62 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 330 | 69 | ug/kg | |
| 120-12-7 | Anthracene | ND | 67 | 43 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 1420 | 67 | 65 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 734 | 67 | 42 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 2090 | 67 | 48 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 706 | 67 | 42 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 904 | 67 | 42 | ug/kg | |
| 218-01-9 | Chrysene | 1780 | 67 | 33 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 510 | 67 | 49 | ug/kg | |
| 206-44-0 | Fluoranthene | 2320 | 67 | 41 | ug/kg | |
| 86-73-7 | Fluorene | 139 | 67 | 65 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 767 | 67 | 44 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 242 | 67 | 59 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 467 | 330 | 100 | ug/kg | |
| 91-20-3 | Naphthalene | 244 | 330 | 74 | ug/kg | J |
| 85-01-8 | Phenanthrene | 1150 | 67 | 53 | ug/kg | |
| 129-00-0 | Pyrene | 944 | 67 | 45 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 93% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 82% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 95% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM10 | |
| Lab Sample ID: D18173-5 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846 8015B | Percent Solids: 84.2 ^a |
| Project: Parachute Pit Closure 18A,13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7703.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 30.6 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 109% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 18A-AM10 | |
| Lab Sample ID: D18173-5 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 84.2 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4571.D | 5 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 428 | 67 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 93% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM10 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.2 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 12.5 | 0.39 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 767 | 0.97 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 23.1 | 0.97 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 23.4 | 0.98 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 12.5 | 4.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.089 | 0.089 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 12.4 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 50.8 | 3.0 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

3.5
3

| | |
|---|--|
| Client Sample ID: 18A-AM10 | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-5 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 84.2 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.1 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 339 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.2 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.59 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM10 DUP | | |
| Lab Sample ID: D18173-6 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8260B | | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A,13C | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07647.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | 30.5 | 60 | 18 | ug/kg | J |
| 108-88-3 | Toluene | ND | 120 | 60 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 120 | 24 | ug/kg | |
| | m,p-Xylene | 76.2 | 240 | 42 | ug/kg | J |
| 95-47-6 | o-Xylene | ND | 120 | 42 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 79% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|--|--|--|
| Client Sample ID: 18A-AM10 DUP | | |
| Lab Sample ID: D18173-6 | | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | | Date Received: 10/12/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A, 13C | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02146.D | 5 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 33 | 31 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 170 | 34 | ug/kg | |
| 120-12-7 | Anthracene | ND | 33 | 21 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 80.9 | 33 | 33 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 44.6 | 33 | 21 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 147 | 33 | 24 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 46.1 | 33 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 53.6 | 33 | 21 | ug/kg | |
| 218-01-9 | Chrysene | 109 | 33 | 17 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 35.8 | 33 | 25 | ug/kg | |
| 206-44-0 | Fluoranthene | 126 | 33 | 20 | ug/kg | |
| 86-73-7 | Fluorene | ND | 33 | 33 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 51.3 | 33 | 22 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | 65.3 | 33 | 29 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | 135 | 170 | 51 | ug/kg | J |
| 91-20-3 | Naphthalene | 72.9 | 170 | 37 | ug/kg | J |
| 85-01-8 | Phenanthrene | 115 | 33 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 78.8 | 33 | 22 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 59% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 52% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 62% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 18A-AM10 DUP | |
| Lab Sample ID: D18173-6 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846 8015B | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7704.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 13.8 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 18A-AM10 DUP | |
| Lab Sample ID: D18173-6 | Date Sampled: 10/12/10 |
| Matrix: SO - Soil | Date Received: 10/12/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A, 13C | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4564.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 546 | 130 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 121% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM10 DUP | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 17.1 | 0.40 | mg/kg | 5 | 10/13/10 | 10/14/10 GJ | SW846 6020 ⁴ | SW846 3050B ⁷ |
| Barium | 506 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Chromium | 20.4 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Copper | 24.8 | 1.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Lead | 12.8 | 5.1 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Mercury | < 0.086 | 0.086 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 7471A ¹ | SW846 7471A ⁵ |
| Nickel | 11.6 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/13/10 | 10/13/10 JM | SW846 6010B ² | SW846 3050B ⁶ |
| Zinc | 39.2 | 3.1 | mg/kg | 1 | 10/14/10 | 10/14/10 JM | SW846 6010B ³ | SW846 3050B ⁸ |

- (1) Instrument QC Batch: MA1038
- (2) Instrument QC Batch: MA1042
- (3) Instrument QC Batch: MA1043
- (4) Instrument QC Batch: MA1044
- (5) Prep QC Batch: MP3145
- (6) Prep QC Batch: MP3146
- (7) Prep QC Batch: MP3147
- (8) Prep QC Batch: MP3158

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18A-AM10 DUP | Date Sampled: 10/12/10 |
| Lab Sample ID: D18173-6 | Date Received: 10/12/10 |
| Matrix: SO - Soil | Percent Solids: 81.0 ^a |
| Project: Parachute Pit Closure 18A,13C | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.4 | 1.5 | mg/kg | 1 | 10/15/10 14:51 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 317 | | mv | 1 | 10/15/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 81 | | % | 1 | 10/13/10 | CJ | SM19 2540B M |
| pH | 9.59 | | su | 1 | 10/13/10 14:00 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

4036 Youngfield Street, Wheat Ridge, Colorado 80033
 TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
 www.accutest.com

FED-EX Tracking # _____ Bottle Order Control # _____
 Accutest Quote # _____ Accutest Job # **D18173**

| Client / Reporting Information | | Project Information | | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | | Matrix Codes | |
|--|--------------------------------|---|-------|-------|--|---|--------------|----|---------------------------|-----|---|------|-----|--|----|------|--|--------------|
| Company Name: Marathon Oil CO Street Address: 90 Golden Assoc 44 Union Blvd City: CARLETON CO State: CO Zip: 80228 Project Contact: R. MARCO E-mail: RMARCO@gojira.com Phone #: 303.980.0540 Fax #: _____ Sampler(s) Name(s): Ben Yanda Phone #: 303.895.7921 | | Project Name: PARACHUTE Pit Closure 18A, 13C Billing Information (if different from Report to) Company Name: _____ Street Address: _____ City: _____ State: _____ Zip: _____ Client Purchase Order #: _____ Project Manager: _____ Attention: _____ | | | | TGM - GRO TGM - DRO BTEX PAHs Metals (910) | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | |
| Accutest Sample # | Field ID / Point of Collection | MECHDI Viol # | Date | Time | Sampled by | Matrix | # of bottles | IC | NH3 | H2S | H2SO4 | HNO3 | NO3 | NO2 | CO | METH | ENCODE | LAB USE ONLY |
| | 18A - AM6 | | 10.12 | 9.00 | | | 5 | | | | | | | | | | | 01 |
| | 18A - AM7 | | 10.12 | 9.00 | | | 5 | | | | | | | | | | | 02 |
| | 18A - AM8 | | 10.12 | 4.00 | | | 5 | | | | | | | | | | | 03 |
| | 18A - AM9 | | 10.12 | 12.00 | | | 5 | | | | | | | | | | | 04 |
| | 18A - AM10 | | 10.12 | 12.00 | | | 5 | | | | | | | | | | | 05 |
| | 18A - AM10 DUP | | 10.12 | 12.00 | | | 5 | | | | | | | | | | | 06 |
| Turnaround Time (Business days) | | Data Deliverable Information | | | | Comments / Special Instructions | | | | | | | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input checked="" type="checkbox"/> 1 Day EMERGENCY 1-2 days | | Approved By (Accutest PM) / Date: _____ <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ | | | | | | | | | | | | |
| Emergency & Rush T/A data available VIA Lablink | | | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: 1 B. - CYL | | Date Time: 10.12.2010 | | | Received By: Jacob Potter 10/12/10 1735 | | | | Relinquished By: 2 | | Date Time: _____ | | | Received By: _____ | | | | |
| Relinquished by Sampler: 3 | | Date Time: _____ | | | Received By: 3 | | | | Relinquished By: 4 | | Date Time: _____ | | | Received By: _____ | | | | |
| Relinquished by: 5 | | Date Time: _____ | | | Received By: 5 | | | | Custody Seal # | | <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact | | | Preserved where applicable <input checked="" type="checkbox"/> On Ice Cooler Temp. 17.0 | | | | |

4.1
4

D18173: Chain of Custody

Page 1 of 1

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V411-MB1 | 3V07636.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 83% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Blank Spike Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V411-BS1 | 3V07637.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 50.6 | 101 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 53.4 | 107 | 70-130 |
| 108-88-3 | Toluene | 50 | 51.3 | 103 | 70-130 |
| | m,p-Xylene | 50 | 48.7 | 97 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 47.8 | 96 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D18174-1MS | 3V07639.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| D18174-1MSD | 3V07640.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |
| D18174-1 | 3V07638.D | 1 | 10/13/10 | DC | n/a | n/a | V3V411 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | D18174-1 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 2870 | 2860 | 100 | 3020 | 105 | 5 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 2870 | 3040 | 106 | 3150 | 110 | 4 | 56-139/30 |
| 108-88-3 | Toluene | ND | 2870 | 2880 | 100 | 2980 | 104 | 3 | 57-144/30 |
| | m,p-Xylene | ND | 2870 | 2790 | 97 | 2850 | 99 | 2 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 2870 | 2770 | 96 | 2850 | 99 | 3 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18174-1 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 86% | 85% | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | 92% | 89% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | 89% | 86% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-MB | 3G02108.D | 1 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 95% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 93% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 104% | 17-174% |

Blank Spike Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-BS | 3G02109.D | 1 | 10/14/10 | TMB | 10/13/10 | OP2654 | E3G60 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|-------------|-----------|-------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 72.6 | 87 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 72.9 | 87 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 76.5 | 92 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.0 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 68.0 | 82 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 72.3 | 87 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 65.8 | 79 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 67.9 | 81 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 71.3 | 86 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 69.2 | 83 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 77.3 | 93 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 72.8 | 87 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 66.4 | 80 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 74.8 | 90 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 72.8 | 87 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 70.4 | 84 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 73.7 | 88 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 71.2 | 85 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 96% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 87% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 94% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2654-MS | 3G02144.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| OP2654-MSD | 3G02145.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |
| D18173-5 | 3G02143.D | 10 | 10/15/10 | TMB | 10/13/10 | OP2654 | E3G61 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | D18173-5 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----|-------------------|
| 83-32-9 | Acenaphthene | 68.2 | | 83.3 | 125 | 75 | 129 | 80 | 3 | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 83.3 | 73.1 | 88 | 74.2 | 89 | 1 | 23-156/30 |
| 120-12-7 | Anthracene | ND | | 83.3 | 220 | -4* a | 228 | 6* a | 4 | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | 1420 | | 83.3 | 1290 | -444* b | 1370 | -348* b | 6 | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | 734 | | 83.3 | 690 | -163* b | 741 | -102* b | 7 | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | 2090 | | 83.3 | 1800 | -984* b | 1880 | -889* b | 4 | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | 706 | | 83.3 | 649 | -38* b | 671 | -12* b | 3 | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | 904 | | 83.3 | 855 | 19 | 912 | 88 | 6 | 17-161/30 |
| 218-01-9 | Chrysene | 1780 | | 83.3 | 1590 | -372* b | 1680 | -264* b | 6 | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | 510 | | 83.3 | 468 | -11* b | 476 | -1* b | 2 | 21-154/30 |
| 206-44-0 | Fluoranthene | 2320 | | 83.3 | 2010 | -336* b | 2110 | -216* b | 5 | 16-140/30 |
| 86-73-7 | Fluorene | 139 | | 83.3 | 196 | 55 | 210 | 72 | 7 | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 767 | | 83.3 | 760 | -180* b | 785 | -150* b | 3 | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | 242 | | 83.3 | 269 | 48 | 303 | 89 | 12 | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | 467 | | 83.3 | 466 | 35 | 522 | 102 | 11 | 10-181/30 |
| 91-20-3 | Naphthalene | 244 | J | 83.3 | 284 | 77 | 329 | 131 | 15 | 10-176/30 |
| 85-01-8 | Phenanthrene | 1150 | | 83.3 | 1060 | -168* b | 1110 | -108* b | 5 | 22-152/30 |
| 129-00-0 | Pyrene | 944 | | 83.3 | 902 | -454* b | 959 | -386* b | 6 | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-5 | Limits |
|-----------|----------------------|-----|------|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 92% | 100% | 93% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | 80% | 82% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 89% | 93% | 95% | 17-174% |

(a) Outside control limits due to matrix interference.

(b) Outside control limits due to high level in sample relative to spike amount.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB421-MB | GB7695.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB421-BS | GB7696.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 115 | 105 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 102% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D18173-1MS | GB7698.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| D18173-1MSD | GB7699.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |
| D18173-1 | GB7697.D | 1 | 10/13/10 | BR | n/a | n/a | GGB421 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | D18173-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 25.6 | 128 | 150 | 97 | 163 | 108 | 8 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 113% | 114% | 105% | 60-140% |

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-MB | FD4562.D | 1 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 116% 63-130% |

Blank Spike Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-BS | FD4563.D | 1 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 766 | 115 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 121% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18173
Account: MOILCOGJ Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2651-MS | FD4565.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| OP2651-MSD | FD4566.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |
| D18173-6 | FD4564.D | 10 | 10/13/10 | JB | 10/13/10 | OP2651 | GFD198 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

| CAS No. | Compound | D18173-6 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 546 | 667 | 1200 | 98 | 1290 | 112 | 7 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18173-6 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 112% | 119% | 121% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|------|--------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .013 | 0.0013 | <0.10 |

Associated samples MP3145: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|-------------------------|--------------------|-------|--------------|
| Mercury | 0.043 | 0.39 | 0.377 | 92.0 85-115 |

Associated samples MP3145: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original | MSD | Spike lot | HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|----------------------|------|--------------|--------|-------|------------|-------------|
| Mercury | 0.043 | 0.40 | 0.392 | 91.0 | 2.5 | 20 | |

Associated samples MP3145: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3145
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.37 | 0.4 | 92.5 | 80-120 |

Associated samples MP3145: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.24 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.13 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 1.0 | .16 | .38 | 0.67 | <1.0 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.15 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | -0.010 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |

Associated samples MP3146: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|----------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | 543 | 788 | 198 | 123.7 | 75-125 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.48 | 36.8 | 49.5 | 73.4N(a) | 75-125 |
| Calcium | | | | | |
| Chromium | 17.7 | 57.0 | 49.5 | 79.4 | 75-125 |
| Cobalt | | | | | |
| Copper | 29.7 | 69.8 | 49.5 | 81.0 | 75-125 |
| Iron | | | | | |
| Lead | 16.9 | 85.5 | 99 | 69.3N(b) | 75-125 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 14.3 | 47.2 | 49.5 | 66.5N(b) | 75-125 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Silicon | | | | | |
| Silver | 0.0 | 15.9 | 19.8 | 80.3 | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |

Associated samples MP3146: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

(b) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|---------------|-------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | 543 | 850 | 196 | 156.6N(a) 7.6 | 20 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.48 | 35.7 | 49 | 71.8N(a) 3.0 | 20 |
| Calcium | | | | | |
| Chromium | 17.7 | 55.9 | 49 | 77.9 1.9 | 20 |
| Cobalt | | | | | |
| Copper | 29.7 | 65.6 | 49 | 73.2N(a) 6.2 | 20 |
| Iron | | | | | |
| Lead | 16.9 | 83.2 | 98 | 67.6N(b) 2.7 | 20 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 14.3 | 45.5 | 49 | 63.6N(b) 3.7 | 20 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Silicon | | | | | |
| Silver | 0.0 | 15.4 | 19.6 | 78.5 3.2 | 20 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |

Associated samples MP3146: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

(b) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 172 | 200 | 86.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 41.2 | 50 | 82.4 | 80-120 |
| Calcium | | | | |
| Chromium | 43.8 | 50 | 87.6 | 80-120 |
| Cobalt | | | | |
| Copper | 44.9 | 50 | 89.8 | 80-120 |
| Iron | | | | |
| Lead | 86.3 | 100 | 86.3 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 41.2 | 50 | 82.4 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Silicon | | | | |
| Silver | 17.6 | 20 | 88.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |

Associated samples MP3146: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3146
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/13/10

| Metal | D18173-1 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | 5430 | 6290 | 15.8*(a) | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 4.80 | 5.50 | 14.6 (b) | 0-10 |
| Calcium | | | | |
| Chromium | 177 | 211 | 18.9*(a) | 0-10 |
| Cobalt | | | | |
| Copper | 297 | 317 | 6.5 | 0-10 |
| Iron | | | | |
| Lead | 169 | 212 | 24.9*(a) | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 143 | 176 | 23.4*(a) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |

Associated samples MP3146: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 10/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.073 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3147: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.3.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MS | | SpikeLot MPICPAL % Rec | QC Limits |
|------------|-------------------------|-----|---------------------------|-----------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 37.7 | 105 | 99 | 68.0N(a) 60-119 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested
 (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | D18173-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit |
|------------|--------------------------|-----|---------------------------|--------------|-------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 37.7 | 103 | 98 | 66.6N(a) 1.9 | 20 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3147: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested
 (a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/13/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|---------------|----------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 95.7 | 100 | 95.7 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3147
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 10/13/10

| Metal | D18173-1 | | QC | |
|-------|----------|---------------|--------|--|
| | Original | SDL 10:50%DIF | Limits | |

| | | | | |
|------------|-----|-----|-----|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 377 | 370 | 1.9 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3147: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/14/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | | |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | | |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | | |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | | |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | | |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | | |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.35 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | | |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.80 | <3.0 |

Associated samples MP3158: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.4.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | D18173-1 Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|-------------------------|-----|---------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | anr | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 2.7 | 159 | 202 | 77.4 | 75-125 |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 48.6 | 128 | 101 | 78.6 | 75-125 |

Associated samples MP3158: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | D18173-1 Original MSD | Spikelot MPICPAL % Rec | MSD RPD | QC Limit | | |
|------------|--------------------------|---------------------------|------------|-------------|------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | anr | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.7 | 153 | 196 | 76.7 | 3.8 | 20 |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 48.6 | 107 | 98 | 59.6N(a) | 17.9 | 20 |

Associated samples MP3158: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/14/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 169 | 200 | 84.5 | 80-120 |
| Silicon | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 84.5 | 100 | 84.5 | 80-120 |

Associated samples MP3158: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18173
 Account: MOILCOGJ - Marathon Oil
 Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/14/10

| Metal | D18173-1 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | anr | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 27.4 | 38.0 | 38.7 (a) | 0-10 |
| Silicon | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 486 | 620 | 27.6*(b) | 0-10 |

Associated samples MP3158: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

QC Batch ID: MP3158
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18173
Account: MOILCOGJ - Marathon Oil
Project: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---------|----------|----|-----------|-------|--------------|------------|------------|-------------|
| pH | GN6768 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |
| pH | GN6768 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |

Associated Samples:

Batch GN6768: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #: **D18173**
 Accutest Quote #:
 AMS P.O. #:
 Project No.:

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | |
|--|-------------------------------|-------------------|---|---|--------------|--|------|-------|-------------------------------------|---|----|----------|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | |
| Send Report to: Any questions contact: Tiffany Pham Amanda Kissell | | | Contact: Sample Management | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | |
| Collection | | | Preservation | | | | | | | | | | |
| Field ID / Point of Collection | Date | Time | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | None | XCR | eh | Comments | |
| D18173 -1 | 10/12/10 | 9:00 AM | Soil | 1 | | | | | | X | X | | |
| -2 | | 9:00 AM | Soil | 1 | | | | | | X | X | | |
| -3 | | 9:00 AM | Soil | 1 | | | | | | X | X | | |
| -4 | | 12:00 PM | Soil | 1 | | | | | | X | X | | |
| -5 | | 12:00 PM | Soil | 1 | | | | | | X | X | | |
| -6 | | 12:00 PM | Soil | 1 | | | | | | X | X | | |
| - | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | |
| <input checked="" type="checkbox"/> 1 - 2 Business Day Rush <input type="checkbox"/> Other _____ (Days) RUSH! 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____ | | | | | | | Please use Colorado regulations and RLs. 148 | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | For Subcontract Laboratory Use Only | | | | |
| Relinquished by: 1 | Date & Time: 10/13/10 | Received By: 1 | Date & Time: 1 | Seal #: | | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | |
| Relinquished by: 2 | Date & Time: 10/12/10 9:30 | Received By: 2 | Date & Time: 2 | Preserved where applicable: <input type="checkbox"/> | | On Ice <input checked="" type="checkbox"/> | | | | | | | |
| Relinquished by: 3 | Date & Time: | Received By: 3 | Date & Time: 3 | Temperature °C: 23 | | | | | | | | | |

D18173: Chain of Custody
 Page 1 of 2
 Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D18173

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 10/14/2010 9:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: N/A

Airbill #'s: N/A

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

| <u>Cooler Temperature</u> | <u>Y or N</u> | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

| <u>Quality Control Preservation</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|-------------------------------------|-------------------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 3. Samples preserved property: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

| <u>Sample Integrity - Instructions</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Empty box for comments.

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18173
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | 0.50 | 0.0 | mg/kg | 12 | 11.6 | 96.7 | 80-120% |
| Chromium, Hexavalent | GP12142/GN33117 | | | mg/kg | 747 | 713 | 95.4 | 80-120% |

Associated Samples:

Batch GP12142: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

(*) Outside of QC limits

12.1
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18173
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|----------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 0.0 | 200.0(a) | 0-20% |
| Redox Potential Vs H2 | GN33113 | M94980-5 | mv | 346 | 345 | 0.3 | 0-20% |

Associated Samples:

Batch GN33113: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

Batch GP12142: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

(*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18173
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Parachute Pit Closure 18A,13C

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 11.9 | 11.5 | 93.0 | 75-125% |
| Chromium, Hexavalent | GP12142/GN33117 | D18174-1 | mg/kg | 0.43 | 645 | 573 | 88.8 | 75-125% |

Associated Samples:

Batch GP12142: D18173-1, D18173-2, D18173-3, D18173-4, D18173-5, D18173-6

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D18611

Sampling Date: 10/29/10

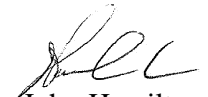
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **93**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|-----------|
| Section 1: Sample Summary | 3 |
| Section 2: Case Narrative/Conformance Summary | 4 |
| Section 3: Sample Results | 8 |
| 3.1: D18611-1: 18A-AM 11 | 9 |
| 3.2: D18611-2: 18A-AM 11 DUP | 15 |
| 3.3: D18611-3: 18A-AM 12 | 21 |
| 3.4: D18611-4: 18A-AM 13 | 27 |
| 3.5: D18611-5: 18A-AM 14 | 33 |
| 3.6: D18611-6: 18A-AM 15 | 39 |
| Section 4: Misc. Forms | 45 |
| 4.1: Chain of Custody | 46 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 48 |
| 5.1: Method Blank Summary | 49 |
| 5.2: Blank Spike Summary | 50 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 51 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 52 |
| 6.1: Method Blank Summary | 53 |
| 6.2: Blank Spike Summary | 54 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 55 |
| Section 7: GC Volatiles - QC Data Summaries | 56 |
| 7.1: Method Blank Summary | 57 |
| 7.2: Blank Spike Summary | 58 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 59 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 60 |
| 8.1: Method Blank Summary | 61 |
| 8.2: Blank Spike Summary | 62 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 63 |
| Section 9: Metals Analysis - QC Data Summaries | 64 |
| 9.1: Prep QC MP3310: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 65 |
| 9.2: Prep QC MP3311: As | 75 |
| 9.3: Prep QC MP3318: Hg | 80 |
| Section 10: General Chemistry - QC Data Summaries | 84 |
| 10.1: Method Blank and Spike Results Summary | 85 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 86 |
| 11.1: Chain of Custody | 87 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 89 |
| 12.1: Method Blank and Spike Results Summary | 90 |
| 12.2: Blank Spike Duplicate Results Summary | 91 |
| 12.3: Duplicate Results Summary | 92 |
| 12.4: Matrix Spike Results Summary | 93 |



Sample Summary

Marathon Oil

Job No: D18611

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D18611-1 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 11 |
| D18611-2 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 11 DUP |
| D18611-3 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 12 |
| D18611-4 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 13 |
| D18611-5 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 14 |
| D18611-6 | 10/29/10 | 10:00 BY | 10/29/10 | SO | Soil | 18A-AM 15 |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D18611

Site: Roan Pit Closure

Report Dat 11/15/2010 3:01:23 PM

On 10/29/2010, 6 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 5.9 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D18611 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V3V418 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Sample(s) D18611-1MS, D18611-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2738 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D18583-1MS, D18583-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of multiple analytes are outside control limits. Outside control limits due to matrix interference. Refer to Blank Spike.
- The RPD(s) for the MS and MSD recoveries of several analytes are outside control limits for sample OP2738-MSD. Probable cause due to sample homogeneity.
- D18611-2: Dilution required due to matrix interference.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGA523 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18611-1MS, D18611-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2733 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D18611-1MS, D18611-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3310 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18583-1MS, D18583-1MSD, D18583-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recoveries of Selenium and Zinc are outside control limits. Spike recovery indicates possible matrix interference.
- The matrix spike duplicate (MSD) recoveries of Selenium, Zinc, and Barium are outside control limits. Spike recovery indicates possible matrix interference.
- The matrix spike (MS) recovery of Barium is outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The RPD for the MS and MSD recoveries of Barium is outside control limits for sample MP3310-S2. High RPD due to possible sample nonhomogeneity.
- The serial dilution RPDs for Cadmium, Copper, Selenium, and Zinc are outside control limits for sample MP3310-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3311 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18583-1MS, D18583-1MSD, D18583-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP3311-SD1. Probable cause due to sample homogeneity.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3318 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18340-1MSD, D18340-1MS were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery of Mercury is outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

Wet Chemistry By Method ASTM D1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN33330 |
|------------------|----------------------------|

- The data for ASTM D1498-76M meets quality control requirements.
- Redox Potential Vs H₂: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN7018 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R5301 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12257 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN7015 |
|------------------|-------------------------|

- The following samples were run outside of holding time for method SW846 9045C: D18611-1 through D18611-6.

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

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

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D18611

Site: MOILCOGJ: Roan Pit Closure

Report Date 11/12/2010 10:39:37 AM

6 Sample(s) were collected on 10/29/2010 and were received at Accutest on 10/29/2010 properly preserved, at 2.3 Deg. C and intact. These Samples received an Accutest job number of D18611. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM D1498-76M

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN33330 |
|------------------|--------------------------|

- Sample(s) D18583-1DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12257 |
|------------------|--------------------------|

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D18583-2DUP, D18583-2MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D18611).

Sample Results

Report of Analysis

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 11 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-1 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07726.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM 11 | | |
| Lab Sample ID: D18611-1 | | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | | Date Received: 10/29/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 91.0 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02260.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.218 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.114 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.390 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.108 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.160 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.268 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0660 | 0.067 | 0.049 | mg/kg | J |
| 206-44-0 | Fluoranthene | 0.292 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.136 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.179 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.167 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 60% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 90% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 11 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-1 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9596.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 94% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 18A-AM 11 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-1 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4642.D | 2 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 158 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 118% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 18A-AM 11**Lab Sample ID:** D18611-1**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 10/29/10**Date Received:** 10/29/10**Percent Solids:** 91.0 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 26.6 | 0.42 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 307 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 19.9 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 28.2 | 0.52 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 16.8 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 19.3 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 55.0 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

(1) Instrument QC Batch: MA1097

(2) Instrument QC Batch: MA1098

(3) Instrument QC Batch: MA1113

(4) Prep QC Batch: MP3310

(5) Prep QC Batch: MP3311

(6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

3.1
3

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 11 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-1 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.40 | 0.40 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.7 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 301 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 91 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.00 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM 11 DUP | |
| Lab Sample ID: D18611-2 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8260B | Percent Solids: 87.0 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07729.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM 11 DUP | Date Sampled: | 10/29/10 |
| Lab Sample ID: | D18611-2 | Date Received: | 10/29/10 |
| Matrix: | SO - Soil | Percent Solids: | 87.0 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---------------------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 ^b | 3G02261.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 60% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 89% | | 17-174% |

(a) All results reported on wet weight basis.

(b) Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM 11 DUP | |
| Lab Sample ID: D18611-2 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8015B | Percent Solids: 87.0 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9599.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 97% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 18A-AM 11 DUP | |
| Lab Sample ID: D18611-2 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 87.0 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4717.D | 2 | 11/06/10 | JB | 11/03/10 | OP2733 | GFE251 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 95.8 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 110% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|---|
| Client Sample ID: 18A-AM 11 DUP Lab Sample ID: D18611-2 Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 10/29/10 Date Received: 10/29/10 Percent Solids: 87.0 ^a |
|--|---|

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 18.5 | 0.39 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 262 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 20.0 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 25.9 | 0.49 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 14.6 | 4.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 14.3 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 39.9 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1097
- (2) Instrument QC Batch: MA1098
- (3) Instrument QC Batch: MA1113
- (4) Prep QC Batch: MP3310
- (5) Prep QC Batch: MP3311
- (6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-AM 11 DUP | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-2 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 87.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.39 | 0.39 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.0 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 354 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 87 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.01 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 12 | |
| Lab Sample ID: D18611-3 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8260B | Percent Solids: 86.4 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07730.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0270 | 0.057 | 0.017 | mg/kg | J |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | 0.0507 | 0.23 | 0.040 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 84% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM 12 | | |
| Lab Sample ID: D18611-3 | | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | | Date Received: 10/29/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 86.4 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02262.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | 0.0629 | 0.067 | 0.043 | mg/kg | J |
| 56-55-3 | Benzo(a)anthracene | 0.484 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.263 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.803 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.243 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.306 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.621 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.192 | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.628 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.272 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.101 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.276 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.384 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 49% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 49% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 75% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 12 | |
| Lab Sample ID: D18611-3 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8015B | Percent Solids: 86.4 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9600.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 102% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18A-AM 12 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-3 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.4 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4718.D | 2 | 11/06/10 | JB | 11/03/10 | OP2733 | GFE251 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 230 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 108% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 12 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-3 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 18.0 | 0.39 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 475 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 21.0 | 0.97 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 25.2 | 0.49 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 15.4 | 4.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 14.0 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 41.8 | 2.9 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1097
- (2) Instrument QC Batch: MA1098
- (3) Instrument QC Batch: MA1113
- (4) Prep QC Batch: MP3310
- (5) Prep QC Batch: MP3311
- (6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 12 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-3 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.40 | 0.40 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.6 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 300 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 86.4 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.10 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

3.4
3

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 13 | |
| Lab Sample ID: D18611-4 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8260B | Percent Solids: 85.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07731.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 89% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM 13 | Date Sampled: | 10/29/10 |
| Lab Sample ID: | D18611-4 | Date Received: | 10/29/10 |
| Matrix: | SO - Soil | Percent Solids: | 85.5 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02263.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.188 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.105 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.309 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.110 | 0.066 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.143 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.238 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0616 | 0.066 | 0.049 | mg/kg | J |
| 206-44-0 | Fluoranthene | 0.244 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0991 | 0.066 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.121 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.152 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 58% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 56% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 81% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 13 | |
| Lab Sample ID: D18611-4 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8015B | Percent Solids: 85.5 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9601.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.4
3

| | |
|--|--|
| Client Sample ID: 18A-AM 13 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-4 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 85.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4719.D | 2 | 11/06/10 | JB | 11/03/10 | OP2733 | GFE251 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 82.9 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 102% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 18A-AM 13**Lab Sample ID:** D18611-4**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 10/29/10**Date Received:** 10/29/10**Percent Solids:** 85.5 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 20.3 | 0.41 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 353 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 21.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 29.1 | 0.52 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 16.1 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.094 | 0.094 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 15.0 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 40.6 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

(1) Instrument QC Batch: MA1097

(2) Instrument QC Batch: MA1098

(3) Instrument QC Batch: MA1113

(4) Prep QC Batch: MP3310

(5) Prep QC Batch: MP3311

(6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 13 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-4 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 85.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.40 | 0.40 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.7 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 337 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 85.5 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.14 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 14 | |
| Lab Sample ID: D18611-5 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| Method: SW846 8260B | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07732.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0249 | 0.057 | 0.017 | mg/kg | J |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | 0.0519 | 0.23 | 0.040 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18A-AM 14 | | |
| Lab Sample ID: D18611-5 | | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | | Date Received: 10/29/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02264.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | 0.0793 | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.663 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.347 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1.04 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.328 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.375 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.851 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.224 | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.813 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.384 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.100 | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.184 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.118 | 0.33 | 0.074 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.483 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.522 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 61% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 93% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|------------------------------------|--|--|
| Client Sample ID: 18A-AM 14 | | |
| Lab Sample ID: D18611-5 | | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | | Date Received: 10/29/10 |
| Method: SW846 8015B | | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9602.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 104% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 18A-AM 14 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-5 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4720.D | 2 | 11/06/10 | JB | 11/03/10 | OP2733 | GFE251 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 307 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 105% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 14 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-5 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 15.9 | 0.42 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 574 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 21.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 27.1 | 0.52 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 14.7 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 14.2 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 38.9 | 3.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1097
- (2) Instrument QC Batch: MA1098
- (3) Instrument QC Batch: MA1113
- (4) Prep QC Batch: MP3310
- (5) Prep QC Batch: MP3311
- (6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 14 | |
| Lab Sample ID: D18611-5 | Date Sampled: 10/29/10 |
| Matrix: SO - Soil | Date Received: 10/29/10 |
| | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.89 | 0.40 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.1 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 334 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 86.3 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.35 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 15 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-6 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07733.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18A-AM 15 | Date Sampled: | 10/29/10 |
| Lab Sample ID: | D18611-6 | Date Received: | 10/29/10 |
| Matrix: | SO - Soil | Percent Solids: | 86.3 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02265.D | 10 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | 0.0441 | 0.067 | 0.043 | mg/kg | J |
| 56-55-3 | Benzo(a)anthracene | 0.283 | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.147 | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.431 | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.130 | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.162 | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.341 | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0857 | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.349 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.159 | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.230 | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.217 | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 57% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 55% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 93% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.6
3

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 15 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-6 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GA9603.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: 18A-AM 15 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-6 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4721.D | 2 | 11/06/10 | JB | 11/03/10 | OP2733 | GFE251 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 180 | 27 | 17 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 100% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 15 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-6 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 25.0 | 0.40 | mg/kg | 5 | 11/03/10 | 11/10/10 JM | SW846 6020 ³ | SW846 3050B ⁵ |
| Barium | 352 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Chromium | 21.8 | 1.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Copper | 30.6 | 0.51 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Lead | 17.4 | 5.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 11/04/10 | 11/04/10 JY | SW846 7471A ² | SW846 7471A ⁶ |
| Nickel | 19.9 | 3.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |
| Zinc | 48.0 | 3.0 | mg/kg | 1 | 11/03/10 | 11/04/10 JM | SW846 6010B ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA1097
- (2) Instrument QC Batch: MA1098
- (3) Instrument QC Batch: MA1113
- (4) Prep QC Batch: MP3310
- (5) Prep QC Batch: MP3311
- (6) Prep QC Batch: MP3318

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|------------------------------------|--|
| Client Sample ID: 18A-AM 15 | Date Sampled: 10/29/10 |
| Lab Sample ID: D18611-6 | Date Received: 10/29/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.40 | 0.40 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.8 | 1.4 | mg/kg | 1 | 11/11/10 14:45 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 295 | | mv | 1 | 11/04/10 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 86.3 | | % | 1 | 11/01/10 | SWT | SM19 2540B M |
| pH | 9.17 | | su | 1 | 11/01/10 10:45 | JK | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

FED-EX Tracking # _____ Bottle Order Control # _____
Accutest Quote # _____ Accutest Job # _____

| Client / Reporting Information | | Project Information | | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | |
|---|--|--|--|--------------------------------------|--|--|--|------------------|--|---|--|-------------------------|--|------------|--|---|--|--|--|
| Company Name MARATHON (PARACHUTE) | | Project Name Roan Plater Pit closure | | | | <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>Requested Analysis (see TEST CODE sheet)</p> <p>V8240BTX B8870SIM PAH ALS MS Ba, Cd, Cr3, XXCFA Cu, Pb, Hg, Ni, Se, Ag, Zn, Cr VBI5GRO B8801S DRD</p> </div> <div style="width: 35%; border: 1px solid black; padding: 5px;"> <p>Matrix Codes</p> <p>DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED-Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB - Rinse Blank TB-Tap Blank</p> </div> </div> | | | | | | | | | | <p>LAB USE ONLY</p> <p>01 02 03 04 05 06 07 <i>(Signature)</i></p> | | | |
| Street Address 40 Golden 44 Union Suite 300 | | Street Golden CO 80228 | | | | | | | | | | | | | | | | | |
| City State Zip Golden CO 80228 | | City State Zip | | | | | | | | | | | | | | | | | |
| Project Contact R. March Rmarch@Golden.com | | Project # | | | | | | | | | | | | | | | | | |
| Phone # 303 330 0401 | | Client Purchase Order # | | | | | | | | | | | | | | | | | |
| Samples (Name(s)) Ben Yanda | | Project Manager | | | | | | | | | | | | | | | | | |
| Turnaround Time (Business days) | | Data Deliverable Information | | | | Comments / Special Instructions | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | Approved By (Accutest PM): Amanda Kessell | | | | <input type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | | | | *NO SAR/SCAN/PT Needed. | | | |
| Emergency & Rush T/A data available VIA Lablink | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: 1 B. [Signature] | | Date Time: 9:30 10/29 | | Received By: 1 [Signature] | | Date Time: 2:44:00 PM | | Relinquished By: | | Date Time: | | Received By: | | Date Time: | | Received By: | | | |
| Relinquished by Sampler: 3 [Signature] | | Date Time: | | Received By: | | Date Time: | | Relinquished By: | | Date Time: | | Received By: | | Date Time: | | Received By: | | | |
| Relinquished by: 5 [Signature] | | Date Time: | | Received By: | | Date Time: | | Relinquished By: | | Date Time: | | Received By: | | Date Time: | | Received By: | | | |
| Custody Seal # | | <input checked="" type="checkbox"/> Intact | | <input type="checkbox"/> Not Intact | | Preserved where applicable | | | | <input checked="" type="checkbox"/> On Ice | | Cooler Temp. 5.9 | | | | | | | |

4.1
4

D18611: Chain of Custody

Page 1 of 2



CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #: D18611
Accutest Quote #:
AMS P.O. #:
Project No.:

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | | | | | | | |
|---|--------------------|---------------------|--|--------|--------------------|--|------|---|-------------------------------------|--|---|-----|----------|--|--|--|--|--|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG C | | | | | | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | | State MA | Zip 01752 | | | | | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | Phone: (508) 481-6200 | | | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303)425-6854 | | | | | | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | Collection | | | Matrix | # of bottles | Preservation | | | | | XCRA | LEI | Comments | | | | | | | |
| | Date | Time | | | | HCL | NaOH | HNO3 | H2SO4 | None | | | | | | | | | | |
| D18611 -1 | 10/29/10 | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| -2 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| -3 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| -4 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| -5 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| -6 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | | | | | | | | |
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____ | | | | | Please use Colorado regulations and RLs. | | | | | | | | | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | | | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | For Subcontract Laboratory Use Only | | | | | | | | | | | |
| Relinquished by: 1 | Date & Time: | | Received By: 1 | | | Date & Time: | | Seal #: | | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | | |
| Relinquished by: 2 | Date & Time: | | Received By: 2 | | | Date & Time: | | Preserved where applicable: <input type="checkbox"/> | | | | | | | | | | | | |
| Relinquished by: 3 | Date & Time: | | Received By: 3 | | | Date & Time: | | Temperature °C _____ On Ice <input type="checkbox"/> | | | | | | | | | | | | |

4.1
4

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V418-MB1 | 3V07724.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | 70-130% |

| CAS No. | Tentatively Identified Compounds | R. T. | Est. Conc. | Units | Q |
|----------|----------------------------------|-------|------------|-------|----|
| 56-40-6 | Glycine | 4.31 | 300 | ug/kg | JN |
| 124-38-9 | Carbon dioxide | 4.43 | 2400 | ug/kg | JN |
| | Total TIC, Volatile | | 300 | ug/kg | J |

5.1.1
5

Blank Spike Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V3V418-BS1 | 3V07725.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 48.6 | 97 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 52.8 | 106 | 70-130 |
| 108-88-3 | Toluene | 50 | 50.0 | 100 | 70-130 |
| | m,p-Xylene | 50 | 46.6 | 93 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 47.2 | 94 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D18611-1MS | 3V07727.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| D18611-1MSD | 3V07728.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |
| D18611-1 | 3V07726.D | 1 | 11/01/10 | DC | n/a | n/a | V3V418 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | D18611-1 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 2730 | 2810 | 103 | 2800 | 103 | 0 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 2730 | 3010 | 110 | 3040 | 112 | 1 | 56-139/30 |
| 108-88-3 | Toluene | ND | 2730 | 2810 | 103 | 2800 | 103 | 0 | 57-144/30 |
| | m,p-Xylene | ND | 2730 | 2660 | 98 | 2690 | 99 | 1 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 2730 | 2710 | 99 | 2740 | 101 | 1 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18611-1 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 86% | 86% | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | 94% | 92% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 89% | 87% | 88% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2738-MB | 3G02254.D | 1 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 78% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 64% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 85% | 17-174% |

Blank Spike Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2738-BS | 3G02255.D | 1 | 11/05/10 | TMB | 11/04/10 | OP2738 | E3G67 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 52.5 | 63 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 53.5 | 64 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 54.0 | 65 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 57.1 | 69 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 58.1 | 70 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 57.6 | 69 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 52.2 | 63 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 54.0 | 65 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 56.7 | 68 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 54.9 | 66 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 56.7 | 68 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 55.9 | 67 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 57.0 | 68 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 52.4 | 63 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 51.6 | 62 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 58.5 | 70 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 51.3 | 62 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 59.9 | 72 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 81% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 65% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 85% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2738-MS | 3G02272.D | 10 | 11/08/10 | TMB | 11/04/10 | OP2738 | E3G68 |
| OP2738-MSD | 3G02273.D | 10 | 11/08/10 | TMB | 11/04/10 | OP2738 | E3G68 |
| D18583-1 | 3G02271.D | 10 | 11/08/10 | TMB | 11/04/10 | OP2738 | E3G68 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | D18583-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|--------|-------------------|
| 83-32-9 | Acenaphthene | ND | | 97.9 | 817 | 834* a | 959 | 979* a | 16 a | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 97.9 | 255 | 260* a | 296 | 302* a | 15 a | 23-156/30 |
| 120-12-7 | Anthracene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | ND | | 97.9 | ND | 0* a | 122 | 125 a | 200* a | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 17-161/30 |
| 218-01-9 | Chrysene | 116 | J | 97.9 | 194 | 80 a | 221 | 107 a | 13 a | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 21-154/30 |
| 206-44-0 | Fluoranthene | ND | | 97.9 | ND | 0* a | ND | 0* a | nc | 16-140/30 |
| 86-73-7 | Fluorene | 4370 | | 97.9 | 5100 | 745* a | 6610 | 2287* a | 26 a | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | | 97.9 | 107 | 109 a | 115 | 117 a | 7 a | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | 3830 | | 97.9 | 5430 | 1634* a | 7510 | 3758* a | 32* a | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | 8800 | | 97.9 | 14900 | 6229* a | 20700 | 12152* | 43* a | 10-181/30 |
| 91-20-3 | Naphthalene | 971 | | 97.9 | 1100 | 132 a | 1540 | 581* a | 33* a | 10-176/30 |
| 85-01-8 | Phenanthrene | 4210 | | 97.9 | 3880 | -337* a | 4900 | 705* a | 23 a | 22-152/30 |
| 129-00-0 | Pyrene | ND | | 97.9 | 176 | 180 a | 211 | 215* a | 18 a | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18583-1 | Limits |
|-----------|----------------------|-----|------|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 82% | 165% | 111% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 89% | 109% | 111% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 77% | 81% | 75% | 17-174% |

(a) Outside control limits due to matrix interference. Refer to Blank Spike.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGA523-MB | GA9594.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 91% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGA523-BS | GA9595.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 110 | 100 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D18611-1MS | GA9597.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| D18611-1MSD | GA9598.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |
| D18611-1 | GA9596.D | 1 | 10/30/10 | BR | n/a | n/a | GGA523 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | D18611-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | 120 | 123 | 103 | 121 | 101 | 2 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18611-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 111% | 102% | 94% | 60-140% |

7.3.1
7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2733-MB | FE4638.D | 1 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|-------------------|--------|----|-----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | 8.7 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl | 91% 63-130% |

Blank Spike Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2733-BS | FE4639.D | 1 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 591 | 89 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl | 92% | 63-130% |

8.2.1

8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D18611
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2733-MS | FE4640.D | 2 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |
| OP2733-MSD | FE4641.D | 2 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |
| D18611-1 | FE4642.D | 2 | 11/04/10 | JB | 11/03/10 | OP2733 | GFE250 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

| CAS No. | Compound | D18611-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 158 | 666 | 867 | 106 | 828 | 101 | 5 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D18611-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 118% | 108% | 118% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 11/03/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.11 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.15 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.090 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.23 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | -0.10 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | -0.91 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.50 | <3.0 |

Associated samples MP3310: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3310
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 11/03/10

| Metal | D18583-1 Original MS | | SpikeLot MPICPALL % Rec | QC Limits |
|------------|-------------------------|------|----------------------------|-----------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 1140 | 938 | 235 | -86.0(a) 75-125 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 0.16 | 49.9 | 58.8 | 84.7 75-125 |
| Calcium | | | | |
| Chromium | 15.2 | 67.4 | 58.8 | 88.8 75-125 |
| Cobalt | | | | |
| Copper | 9.4 | 68.6 | 58.8 | 100.8 75-125 |
| Iron | | | | |
| Lead | 5.2 | 106 | 118 | 85.8 75-125 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 9.8 | 59.3 | 58.8 | 84.2 75-125 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 0.79 | 86.8 | 118 | 73.2N(b) 75-125 |
| Silicon | | | | |
| Silver | 0.0 | 19.6 | 23.5 | 83.4 75-125 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 25.8 | 68.7 | 58.8 | 73.0N(b) 75-125 |

Associated samples MP3310: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.12
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- (b) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3310
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 11/03/10

| Metal | D18583-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|--------------------|-------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | anr | | | | |
| Barium | 1140 | 694 | 235 | -189.8(a) 29.9 (b) | 20 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.16 | 50.6 | 58.8 | 85.8 | 1.4 20 |
| Calcium | | | | | |
| Chromium | 15.2 | 65.0 | 58.8 | 84.8 | 3.6 20 |
| Cobalt | | | | | |
| Copper | 9.4 | 68.0 | 58.8 | 99.7 | 0.9 20 |
| Iron | | | | | |
| Lead | 5.2 | 108 | 118 | 87.5 | 1.9 20 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 9.8 | 58.7 | 58.8 | 83.2 | 1.0 20 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 0.79 | 86.9 | 118 | 73.3N(c) | 0.1 20 |
| Silicon | | | | | |
| Silver | 0.0 | 20.3 | 23.5 | 86.4 | 3.5 20 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 25.8 | 68.7 | 58.8 | 73.0N(c) | 0.0 20 |

Associated samples MP3310: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- (b) High RPD due to possible sample nonhomogeneity.
- (c) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3310
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 11/03/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 178 | 200 | 89.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 47.2 | 50 | 94.4 | 80-120 |
| Calcium | | | | |
| Chromium | 46.7 | 50 | 93.4 | 80-120 |
| Cobalt | | | | |
| Copper | 51.3 | 50 | 102.6 | 80-120 |
| Iron | | | | |
| Lead | 94.9 | 100 | 94.9 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 46.7 | 50 | 93.4 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 80.8 | 100 | 80.8 | 80-120 |
| Silicon | | | | |
| Silver | 19.2 | 20 | 96.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 40.9 | 50 | 81.8 | 80-120 |

Associated samples MP3310: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3310
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 11/03/10

| Metal | D18583-1 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 9440 | 9740 | 3.1 | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 1.30 | 0.00 | 100.0(a) | 0-10 |
| Calcium | | | | |
| Chromium | 125 | 136 | 8.7 | 0-10 |
| Cobalt | | | | |
| Copper | 77.6 | 68.5 | 11.7 (a) | 0-10 |
| Iron | | | | |
| Lead | 42.9 | 43.0 | 0.2 | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 81.2 | 88.5 | 9.0 | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 6.50 | 0.00 | 100.0(a) | 0-10 |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 213 | 250 | 17.4*(b) | 0-10 |

Associated samples MP3310: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3310
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3311
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 11/03/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.11 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3311: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3311
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 11/03/10

| Metal | D18583-1 Original MS | | SpikeLot MPICPALL % Rec | QC Limits |
|------------|-------------------------|-----|----------------------------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 9.3 | 117 | 118 | 91.7 60-119 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Tin | | | | |
| Titanium | anr | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3311: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3311
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 11/03/10

| Metal | D18583-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit | |
|------------|--------------------------|-----|---------------------------|------------|-------------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 9.3 | 117 | 118 | 91.7 | 0.0 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Tin | | | | | | |
| Titanium | anr | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3311: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.2.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3311
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 11/03/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 95.3 | 100 | 95.3 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Tin | | | | |
| Titanium | anr | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3311: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3311
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 11/03/10

| Metal | D18583-1 Original | SDL 5:25 | %DIF | QC Limits |
|------------|----------------------|----------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 77.1 | 89.2 | 15.7*(a) | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Tin | | | | |
| Titanium | anr | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3311: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

9.2.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3318
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 11/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | -0.0039 | <0.10 |

Associated samples MP3318: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3318
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 11/04/10

| Metal | D18340-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 7.4 6.5 0.333 -270.0(a 85-115

Associated samples MP3318: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3318
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 11/04/10

| Metal | D18340-1 Original MSD | Spikelot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|--------------------------|--------------------|-------|---------------|-------------|
| Mercury | 7.4 | 7.9 | 0.345 | 145.0(a) 19.4 | 20 |

Associated samples MP3318: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D18611
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3318
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 11/04/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.39 | 0.4 | 97.5 | 80-120 |

Associated samples MP3318: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
 GENERAL CHEMISTRY

Login Number: D18611
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|---------|----------|----|-----------|-------|--------------|------------|------------|-------------|
| pH | GN7015 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |
| pH | GN7015 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |

Associated Samples:

Batch GN7015: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #: D18611
Accutest Quote #:
AMS P.O. #:
Project No.:

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | | | |
|---|--------------------|---------------------|---|--|--------------|---|------|--|-------|--|------|----|--|--|----------|----------|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | XCRA | EH | | | | Comments | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG C | | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303)425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | | | |
| Field ID / Point of Collection | | Collection | | Matrix | # of bottles | Preservation | | | | | XCRA | EH | | | | Comments |
| Date | Time | | | | | HCL | NaOH | HNO3 | H2SO4 | None | | | | | | |
| D18611 -1 | 10/29/10 | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| -2 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| -3 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| -4 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| -5 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| -6 | | 10:00 AM | | Soil | 1 | | | | | | X | X | | | | |
| - | | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | | | | |
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: _____ <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) _____ | | Please use Colorado regulations and RLs. <i>9D</i> | | | | | | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | For Subcontract Laboratory Use Only | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: | | | | | | | | | | | |
| 1 <i>J.Dell</i> | 11/11/10 | 1 <i>FedEx</i> | 1 | Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Preserved where applicable: | | | | | | | | | | | | |
| 2 <i>FedEx</i> | 11/12/10 10:30 | 2 <i>AMS</i> | 2 | <input type="checkbox"/> | | | | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Temperature °C | | On Ice | | | | | | | | | | |
| 3 | | 3 | 3 | 2.3 | | <input checked="" type="checkbox"/> | | | | | | | | | | |

11.1
11

D18611: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D18611

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 11/2/2010 10:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: N/A

Airbill #'s: N/A

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

| <u>Cooler Temperature</u> | <u>Y or N</u> | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

| <u>Quality Control Preservation</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|-------------------------------------|-------------------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 3. Samples preserved property: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

| <u>Sample Integrity - Instructions</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

11.1
11

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18611
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12257/GN33401 | 0.40 | 0.0 | mg/kg | 12 | 12.0 | 100.0 | 80-120% |
| Chromium, Hexavalent | GP12257/GN33401 | | | mg/kg | 676 | 741 | 109.6 | 80-120% |

Associated Samples:

Batch GP12257: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18611
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | Units | Spike Amount | BSD Result | RPD | QC Limit |
|---------|----------|-------|--------------|------------|-----|----------|
|---------|----------|-------|--------------|------------|-----|----------|

| | | | | | | |
|----------------------|-----------------|-------|----|------|-----|--|
| Chromium, Hexavalent | GP12257/GN33401 | mg/kg | 12 | 11.4 | 5.1 | |
|----------------------|-----------------|-------|----|------|-----|--|

Associated Samples:

Batch GP12257: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6
(*) Outside of QC limits

12.2
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18611
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12257/GN33401 | D18583-2 | mg/kg | 0.37 | 0.40 | 7.8 | 0-20% |
| Redox Potential Vs H2 | GN33330 | D18583-1 | mv | 364 | 362 | 0.6 | 0-20% |

Associated Samples:

Batch GN33330: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

Batch GP12257: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D18611
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|-------|-----------|
| Chromium, Hexavalent | GP12257/GN33401 | D18583-2 | mg/kg | 0.37 | 13.9 | 12.1 | 84.6 | 75-125% |
| Chromium, Hexavalent | GP12257/GN33401 | D18583-2 | mg/kg | 0.37 | 806 | 927 | 115.0 | 75-125% |

Associated Samples:

Batch GP12257: D18611-1, D18611-2, D18611-3, D18611-4, D18611-5, D18611-6

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



Technical Report for

Marathon Oil

Roan Pit Closure

2010 Pit Closure

Accutest Job Number: D17265

Sampling Date: 09/09/10

Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **131**



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

Jesse L. Smith
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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



Table of Contents

-1-

| | |
|--|------------|
| Section 1: Sample Summary | 4 |
| Section 2: Case Narrative/Conformance Summary | 6 |
| Section 3: Sample Results | 10 |
| 3.1: D17265-1: 18C-F1 | 11 |
| 3.2: D17265-1A: 18C-F1 | 17 |
| 3.3: D17265-2: 18C-F2 | 19 |
| 3.4: D17265-2A: 18C-F2 | 25 |
| 3.5: D17265-3: 18C-F3 | 27 |
| 3.6: D17265-3A: 18C-F3 | 33 |
| 3.7: D17265-4: 18C-F4 | 35 |
| 3.8: D17265-4A: 18C-F4 | 41 |
| 3.9: D17265-5: 18C-TS1 | 43 |
| 3.10: D17265-5A: 18C-TS1 | 49 |
| 3.11: D17265-6: 18C-TS2 | 51 |
| 3.12: D17265-6A: 18C-TS2 | 57 |
| 3.13: D17265-7: 18C-SG | 59 |
| 3.14: D17265-7A: 18C-SG | 65 |
| Section 4: Misc. Forms | 67 |
| 4.1: Chain of Custody | 68 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 70 |
| 5.1: Method Blank Summary | 71 |
| 5.2: Blank Spike Summary | 72 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 73 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 74 |
| 6.1: Method Blank Summary | 75 |
| 6.2: Blank Spike Summary | 76 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 77 |
| Section 7: GC Volatiles - QC Data Summaries | 78 |
| 7.1: Method Blank Summary | 79 |
| 7.2: Blank Spike Summary | 80 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 81 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 82 |
| 8.1: Method Blank Summary | 83 |
| 8.2: Blank Spike Summary | 84 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 85 |
| Section 9: Metals Analysis - QC Data Summaries | 86 |
| 9.1: Prep QC MP2852: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 87 |
| 9.2: Prep QC MP2853: As | 97 |
| 9.3: Prep QC MP2854: Ca,Mg,Na,Sodium Adsorption Ratio | 102 |
| 9.4: Prep QC MP2858: Ca,Mg,Na,Sodium Adsorption Ratio | 110 |
| 9.5: Prep QC MP2869: Hg | 118 |
| Section 10: General Chemistry - QC Data Summaries | 122 |

Table of Contents

-2-

| | |
|---|------------|
| 10.1: Method Blank and Spike Results Summary | 123 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 124 |
| 11.1: Chain of Custody | 125 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 127 |
| 12.1: Method Blank and Spike Results Summary | 128 |
| 12.2: Blank Spike Duplicate Results Summary | 129 |
| 12.3: Duplicate Results Summary | 130 |
| 12.4: Matrix Spike Results Summary | 131 |

1

2

3

4

5

6

7

8

9

10

11

12



Sample Summary

Marathon Oil

Job No: D17265

Roan Pit Closure

Project No: 2010 Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17265-1 | 09/09/10 | 10:45 RM | 09/10/10 | SO | Soil | 18C-F1 |
| D17265-1A | 09/09/10 | 10:45 RM | 09/10/10 | SO | Soil | 18C-F1 |
| D17265-2 | 09/09/10 | 10:55 RM | 09/10/10 | SO | Soil | 18C-F2 |
| D17265-2A | 09/09/10 | 10:55 RM | 09/10/10 | SO | Soil | 18C-F2 |
| D17265-3 | 09/09/10 | 11:05 RM | 09/10/10 | SO | Soil | 18C-F3 |
| D17265-3A | 09/09/10 | 11:05 RM | 09/10/10 | SO | Soil | 18C-F3 |
| D17265-4 | 09/09/10 | 11:15 RM | 09/10/10 | SO | Soil | 18C-F4 |
| D17265-4A | 09/09/10 | 11:15 RM | 09/10/10 | SO | Soil | 18C-F4 |
| D17265-5 | 09/09/10 | 11:25 RM | 09/10/10 | SO | Soil | 18C-TS1 |
| D17265-5A | 09/09/10 | 11:25 RM | 09/10/10 | SO | Soil | 18C-TS1 |
| D17265-6 | 09/09/10 | 11:35 RM | 09/10/10 | SO | Soil | 18C-TS2 |
| D17265-6A | 09/09/10 | 11:35 RM | 09/10/10 | SO | Soil | 18C-TS2 |
| D17265-7 | 09/09/10 | 15:45 RM | 09/10/10 | SO | Soil | 18C-SG |

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



Sample Summary (continued)

Marathon Oil

Job No: D17265

Roan Pit Closure
Project No: 2010 Pit Closure

| Sample Number | Collected | | Matrix | | | Client Sample ID |
|---------------|-----------|----------|----------|------|------|------------------|
| | Date | Time By | Received | Code | Type | |
| D17265-7A | 09/09/10 | 15:45 RM | 09/10/10 | SO | Soil | 18C-SG |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17265

Site: Roan Pit Closure

Report Dat 9/14/2010 3:43:06 PM

On 09/10/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.0°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17265 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V565 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17265-7MS and D17265-7MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2492 |
|------------------|-------------------------|

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D17264-2MS and D17264-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Indeno(1,2,3-cd)pyrene and the MS recovery of Dibenzo(a,h)anthracene are outside control limits due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The RPD for the MS and MSD recovery of Dibenzo(a,h)anthracene is outside control limits for sample OP2492-MSD. The high RPD is due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB387 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17265-1MS and D17265-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2489 |
|------------------|-------------------------|

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17244-1MS and D17244-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP2854 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17132-8AMS and D17132-8AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP2858 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17265-5AMS and D17265-5AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2852 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17265-1MS, D17265-1MSD, and D17265-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recoveries of Cadmium, Lead, Nickel, Selenium, Silver, and Zinc are outside control limits. Spike recovery indicates possible matrix interference. Refer to the lab control or spike blank for recovery information.
- The matrix spike duplicate (MSD) recoveries of Barium, Selenium, and Zinc are outside control limits. Spike recovery indicates possible matrix interference. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPDs for Barium, Cadmium, Chromium, Copper, Lead, Nickel, and Zinc are outside control limits for sample MP2852-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2853 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17265-1MS, D17265-1MSD, and D17265-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2869 |
|------------------|-------------------------|

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17053-1MSD and D17053-1MS were used as the QC samples for the Mercury analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Mercury are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to the lab control or spike blank for recovery information.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN32822 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP2854 |
|------------------|-------------------------|

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6331 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4278 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium, : Calculated as: $(\text{Chromium}) - (\text{Hexavalent Chromium})$

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12015 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17265

Site: MOILCOGJ: Roan Pit Closure

Report Date 9/14/2010 4:03:48 PM

7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/09/2010 and were received at Accutest on 09/10/2010 properly preserved, at 2.1 Deg. C and intact. These Samples received an Accutest job number of D17265. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP12015

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17264-2DUP, D17264-2MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17265).



Sample Results

Report of Analysis

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-F1 | | |
| Lab Sample ID: D17265-1 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8260B | | Percent Solids: 84.7 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10249.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 90% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18C-F1 | |
| Lab Sample ID: D17265-1 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 84.7 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01967.D | 1 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.0067 | 0.0062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.033 | 0.0069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.0067 | 0.0043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.0067 | 0.0065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.0067 | 0.0042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.0067 | 0.0048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.0067 | 0.0042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.0067 | 0.0042 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.0067 | 0.0033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.0067 | 0.0049 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.0067 | 0.0041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.0067 | 0.0065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.0067 | 0.0044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.0067 | 0.0059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.033 | 0.010 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.033 | 0.0074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.0067 | 0.0053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.0067 | 0.0045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 62% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 68% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 84.7 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7117.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 93% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 18C-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 84.7 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4155.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 106% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 84.7 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 16.3 | 0.33 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 224 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | 1.2 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 20.3 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 19.0 | 0.82 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 9.5 | 4.1 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 17.5 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 4.1 | 4.1 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.4 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 56.3 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-F1 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 84.7 ^a |
| Project: Roan Pit Closure | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.58 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.7 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 349 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.7 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 205 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 8.92 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 16.8 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 2.26 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 23.4 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-1A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 1.42 | | ratio | 1 | 09/14/10 14:19 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-F2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 87.2 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10250.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.056 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.056 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 93% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18C-F2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 87.2 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01968.D | 5 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 75% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 75% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 67% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 87.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7120.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18C-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 87.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4156.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 21.1 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 109% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|---|
| Client Sample ID: 18C-F2 Lab Sample ID: D17265-2 Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/09/10 Date Received: 09/10/10 Percent Solids: 87.2 ^a |
|---|---|

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 11.6 | 0.32 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 251 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | < 0.81 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 22.6 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 19.7 | 0.80 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 11.5 | 4.0 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 20.0 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 4.0 | 4.0 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.4 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 58.0 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 87.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.62 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.0 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 363 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 87.2 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 243 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 9.08 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 21.7 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 2.99 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 30.9 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-2A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 1.65 | | ratio | 1 | 09/14/10 14:25 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-F3 | | |
| Lab Sample ID: D17265-3 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8260B | | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10251.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18C-F3 | | |
| Lab Sample ID: D17265-3 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01969.D | 5 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 62% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 63% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 58% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7121.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 104% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: 18C-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-3 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 84.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4157.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 15.6 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 104% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|---|
| Client Sample ID: 18C-F3 Lab Sample ID: D17265-3 Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/09/10 Date Received: 09/10/10 Percent Solids: 84.9 ^a |
|---|---|

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 24.6 | 0.33 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 241 | 0.83 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | 1.0 | 0.83 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 21.4 | 0.83 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 20.0 | 0.84 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 11.3 | 4.2 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 20.4 | 2.5 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 4.2 | 4.2 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.5 | 2.5 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 59.7 | 2.5 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F3 | |
| Lab Sample ID: D17265-3 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| | Percent Solids: 84.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.9 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 367 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.9 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 277 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 9.12 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-3A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 28.7 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 3.25 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 30.0 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F3 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-3A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 1.41 | | ratio | 1 | 09/14/10 14:31 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F4 | |
| Lab Sample ID: D17265-4 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8260B | Percent Solids: 83.9 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10252.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 90% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18C-F4 | | |
| Lab Sample ID: D17265-4 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 83.9 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01970.D | 5 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 65% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 70% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 69% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-F4 | | |
| Lab Sample ID: D17265-4 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8015B | | Percent Solids: 83.9 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7122.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 95% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

37
3

| | |
|--|--|
| Client Sample ID: 18C-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-4 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4158.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 19.8 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 110% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

37
3

| | |
|---|---|
| Client Sample ID: 18C-F4 Lab Sample ID: D17265-4 Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/09/10 Date Received: 09/10/10 Percent Solids: 83.9 ^a |
|---|---|

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 13.3 | 0.31 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 234 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | 0.93 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 22.1 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 19.2 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 10.7 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.089 | 0.089 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 18.7 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 3.9 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.3 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 58.7 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-F4 | |
| Lab Sample ID: D17265-4 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| | Percent Solids: 83.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.54 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.6 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 372 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 83.9 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 182 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 9.13 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-4A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 16.9 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 1.94 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 20.0 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-F4 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-4A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 1.23 | | ratio | 1 | 09/14/10 14:37 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10253.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 85% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 90% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18C-TS1 | Date Sampled: | 09/09/10 |
| Lab Sample ID: | D17265-5 | Date Received: | 09/10/10 |
| Matrix: | SO - Soil | Percent Solids: | 83.2 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01971.D | 10 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.066 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 68% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 74% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 74% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7123.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 91% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4159.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 14.9 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 112% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 6.0 | 0.33 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 197 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | < 0.81 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 19.4 | 0.81 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 15.2 | 0.82 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 11.9 | 4.1 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.086 | 0.086 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 11.8 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 4.1 | 4.1 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.4 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 49.2 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.4 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 379 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 83.2 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 199 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 7.05 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 24.6 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 4.36 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 8.03 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-TS1 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-5A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 0.392 | | ratio | 1 | 09/14/10 13:25 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-TS2 | | |
| Lab Sample ID: D17265-6 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8260B | | Percent Solids: 88.8 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10254.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.056 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.056 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 83% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 86% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 89% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 18C-TS2 | |
| Lab Sample ID: D17265-6 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 88.8 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01972.D | 10 | 09/14/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.067 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.067 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 77% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 77% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 72% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-TS2 | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 88.8 ^a |
| Method: SW846 8015B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7124.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 96% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18C-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 88.8 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4160.D | 1 | 09/12/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 15.2 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 104% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 88.8 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 6.5 | 0.32 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 203 | 0.79 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | < 0.79 | 0.79 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 19.8 | 0.79 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 15.6 | 0.80 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 11.7 | 4.0 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 12.7 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 4.0 | 4.0 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.4 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 51.7 | 2.4 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA970
- (2) Instrument QC Batch: MA971
- (3) Instrument QC Batch: MA974
- (4) Prep QC Batch: MP2852
- (5) Prep QC Batch: MP2853
- (6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 88.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 19.8 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 393 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 88.8 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 230 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 6.79 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 25.7 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 4.72 | 1.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 9.42 | 2.0 | mg/l | 1 | 09/13/10 | 09/14/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA975

(2) Prep QC Batch: MP2858

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-TS2 | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-6A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 0.448 | | ratio | 1 | 09/14/10 14:43 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-SG | | |
| Lab Sample ID: D17265-7 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8260B | | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10246.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.059 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.059 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 18C-SG | | |
| Lab Sample ID: D17265-7 | | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | | Date Received: 09/10/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01959.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0539 | 0.067 | 0.048 | mg/kg | J |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.0526 | 0.067 | 0.033 | mg/kg | J |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0744 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 72% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 74% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7125.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 95% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4143.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 170 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 118% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|------------------|------------------------|-------------------|
| Client Sample ID: | 18C-SG | Date Sampled: | 09/09/10 |
| Lab Sample ID: | D17265-7 | Date Received: | 09/10/10 |
| Matrix: | SO - Soil | Percent Solids: | 82.6 ^a |
| Project: | Roan Pit Closure | | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 36.1 | 0.31 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁵ |
| Barium | 425 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Cadmium | < 0.78 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Chromium | 12.8 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Copper | 25.4 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Lead | 14.0 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Mercury | < 0.091 | 0.091 | mg/kg | 1 | 09/14/10 | 09/14/10 JM | SW846 7471A ³ | SW846 7471A ⁶ |
| Nickel | 14.0 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Selenium | < 3.9 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Silver | < 2.3 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |
| Zinc | 53.0 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ⁴ |

(1) Instrument QC Batch: MA970

(2) Instrument QC Batch: MA971

(3) Instrument QC Batch: MA974

(4) Prep QC Batch: MP2852

(5) Prep QC Batch: MP2853

(6) Prep QC Batch: MP2869

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 12.8 | 1.3 | mg/kg | 1 | 09/13/10 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 370 | | mv | 1 | 09/13/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 82.6 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 1160 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT.OF AG, BOOK N9 |
| pH | 8.48 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 55.5 | 2.0 | mg/l | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 22.7 | 1.0 | mg/l | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 185 | 2.0 | mg/l | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA971

(2) Prep QC Batch: MP2854

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--------------------------------|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7A | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: n/a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^a | 5.28 | | ratio | 1 | 09/12/10 14:08 | JM | LADNR29B |

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

| Client / Reporting Information | | | Project Information | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | | | | | | | | | | | | | | | | |
|--|--------------------------------|------|--|---------------|-------------|--|--------------|----------|---|------------|-------|---|------------|------|--------------|----------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Company Name <i>Golden Associates</i> | | | Project Name <i>2010 Pit Closure</i> | | | <table border="1"> <tr> <td>TPH - GPO</td> <td>TPH - DCO</td> <td>BTEX</td> <td>PAHs</td> <td>Metals</td> <td>SAR, EC, pH</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | | | TPH - GPO | TPH - DCO | BTEX | PAHs | Metals | SAR, EC, pH | | | | | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank |
| TPH - GPO | TPH - DCO | BTEX | PAHs | Metals | SAR, EC, pH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Street Address | | | Street | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| City State Zip | | | City State | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Contact | | | Project # | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Billing Information (if different from Report to) | | | Company Name <i>Marathon Oil Co.</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phone # Fax # | | | Client Purchase Order # | | | City State Zip | | | Street Address | | | Attention: | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sampler(s) Name(s) | | | Phone # | | | Project Manager | | | Matrix | | | Number of preserved Bottles | | | LAB USE ONLY | | | | | | | | | | | | | | | | | | | | | | |
| Accutest Sample # | Field ID / Point of Collection | | MEQH/DI Vial # | Date | Time | Sampled by | # of bottles | HCl | MCHL | HMDS | H2SO4 | NONE | DI Wash | MEDH | ENCCHE | X | X | X | X | X | X | 01 | | | | | | | | | | | | | | | |
| | <i>18C-F1</i> | | | <i>9/9/10</i> | <i>1045</i> | <i>RM</i> | <i>50</i> | <i>6</i> | | | | | | | | X | X | X | X | X | X | 01 | | | | | | | | | | | | | | | |
| | <i>18C-F2</i> | | | " | <i>1055</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 02 | | | | | | | | | | | | | | | |
| | <i>18C-F3</i> | | | " | <i>1105</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 03 | | | | | | | | | | | | | | | |
| | <i>18C-F4</i> | | | " | <i>1115</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 04 | | | | | | | | | | | | | | | |
| | <i>18C-TS1</i> | | | " | <i>1125</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 05 | | | | | | | | | | | | | | | |
| | <i>18C-TS2</i> | | | " | <i>1135</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 06 | | | | | | | | | | | | | | | |
| | <i>18C-SG</i> | | | " | <i>1545</i> | " | " | <i>6</i> | | | | | | | | X | X | X | X | X | X | 07 | | | | | | | | | | | | | | | |
| Turnaround Time (Business days) | | | Data Deliverable Information | | | Comments / Special Instructions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | | Approved By (Accutest PM): / Date: | | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | * All analyses per COGCA Table 910-1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Emergency & Rush T/A data available VIA Lablink | | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: | Date Time: | | Received By: | Date Time: | | Relinquished By: | Date Time: | | Received By: | Date Time: | | Relinquished By: | Date Time: | | Received By: | Custody Seal # | Intact | Not intact | Preserved when applicable | On Ice | Cooler Temp. | | | | | | | | | | | | | | | | |
| 1 | <i>R. March</i> | | <i>9/10/10 09:15</i> | <i>SOK</i> | | <i>9:45</i> | | | | | | | | | | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <i>4.0</i> | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

4.1
4

Job Change Order: D17265_9/10/2010

Requested 9/10/2010 **Received Date:** 9/10/2010
Account Name: Marathon Oil **Due Date:** 9/15/2010
Project Roan Pit Closure **Deliverable:** COMMBN
CSR: RR **TAT (Days):** 2

Change: TAT CHANGED to 2 days, due 09/14/2010

Sample #:
D17265-7

18C-SG

Sample #:
D17265-1, 2, 3, 4, 5, 6

Change: TAT remains the same with a 3 day TAT.

Above Changes Per: Client

Date: 9/10/2010

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

Page 1 of 1



GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V565-MB1 | 5V10244.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|------------|-----------------------|-------------|
| 2037-26-5 | Toluene-D8 | 87% 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 87% 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% 70-130% |

5.1.1
5

Blank Spike Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V565-BS1 | 5V10245.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 52.9 | 106 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 56.9 | 114 | 70-130 |
| 108-88-3 | Toluene | 50 | 54.2 | 108 | 70-130 |
| | m,p-Xylene | 50 | 52.7 | 105 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 51.1 | 102 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|------|---------|
| 2037-26-5 | Toluene-D8 | 90% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 102% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17265-7MS | 5V10247.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| D17265-7MSD | 5V10248.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| D17265-7 | 5V10246.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | D17265-7 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 2940 | 3150 | 107 | 3330 | 113 | 6 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 2940 | 3380 | 115 | 3530 | 120 | 4 | 56-139/30 |
| 108-88-3 | Toluene | ND | 2940 | 3190 | 109 | 3320 | 113 | 4 | 57-144/30 |
| | m,p-Xylene | ND | 2940 | 3250 | 111 | 3380 | 115 | 4 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 2940 | 3120 | 106 | 3220 | 110 | 3 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17265-7 | Limits |
|------------|-----------------------|------|------|----------|---------|
| 2037-26-5 | Toluene-D8 | 89% | 89% | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 105% | 107% | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | 86% | 91% | 70-130% |

5.3.1
5



GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-MB | 3G01953.D | 1 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 63% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 73% | 17-174% |

Blank Spike Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-BS | 3G01954.D | 1 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 52.4 | 63 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 50.8 | 61 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 55.5 | 67 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 52.6 | 63 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 50.1 | 60 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 50.1 | 60 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 50.0 | 60 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 52.0 | 62 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 53.3 | 64 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 50.0 | 60 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 55.4 | 66 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 51.3 | 62 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 48.9 | 59 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 52.3 | 63 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 50.3 | 60 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 52.0 | 62 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 53.8 | 65 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 50.6 | 61 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 63% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 59% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 63% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2492-MS | 3G01957.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| OP2492-MSD | 3G01958.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| D17264-2 | 3G01956.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | D17264-2 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|--------|-------------------|
| 83-32-9 | Acenaphthene | ND | | 83.3 | 81.8 | 98 | 80.4 | 97 | 2 | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 83.3 | 72.1 | 87 | 75.2 | 90 | 4 | 23-156/30 |
| 120-12-7 | Anthracene | ND | | 83.3 | 78.1 | 94 | 80.2 | 96 | 3 | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | 95.3 | | 83.3 | 186 | 109 | 189 | 113 | 2 | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | 49.9 | J | 83.3 | 128 | 94 | 127 | 93 | 1 | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | 214 | | 83.3 | 325 | 133 | 331 | 140 | 2 | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | 62.3 | J | 83.3 | 136 | 88 | 130 | 81 | 5 | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | 62.9 | J | 83.3 | 141 | 94 | 129 | 79 | 9 | 17-161/30 |
| 218-01-9 | Chrysene | 164 | | 83.3 | 256 | 110 | 254 | 108 | 1 | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | | 83.3 | ND | 0* a | 104 | 125 | 200* b | 21-154/30 |
| 206-44-0 | Fluoranthene | 136 | | 83.3 | 241 | 126 | 237 | 121 | 2 | 16-140/30 |
| 86-73-7 | Fluorene | ND | | 83.3 | 76.3 | 92 | 78.3 | 94 | 3 | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | | 83.3 | 135 | 162* a | 133 | 160* b | 1 | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | ND | | 83.3 | 87.5 | 105 | 88.9 | 107 | 2 | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | ND | | 83.3 | 110 | 132 | 110 | 132 | 0 | 10-181/30 |
| 91-20-3 | Naphthalene | ND | | 83.3 | 80.7 | 97 | 84.4 | 101 | 4 | 10-176/30 |
| 85-01-8 | Phenanthrene | ND | | 83.3 | 111 | 133 | 108 | 130 | 3 | 22-152/30 |
| 129-00-0 | Pyrene | 75.6 | | 83.3 | 165 | 107 | 174 | 118 | 5 | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17264-2 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 68% | 71% | 71% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | 77% | 77% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 90% | 92% | 80% | 17-174% |

(a) Outside control limits due to matrix interference. Refer to Blank Spike.

(b) High RPD due to possible sample nonhomogeneity.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB387-MB | GB7115.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 89% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB387-BS | GB7116.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 94.9 | 86 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 109% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17265-1MS | GB7118.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| D17265-1MSD | GB7119.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| D17265-1 | GB7117.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | D17265-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | 127 | 116 | 91 | 121 | 95 | 4 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17265-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 113% | 106% | 93% | 60-140% |

7.3.1
7



GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-MB | FE4138.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 105% 63-130% |

Blank Spike Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-BS | FE4139.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 727 | 109 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 107% | 63-130% |

8.2.1
8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17265
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2489-MS | FE4140.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| OP2489-MSD | FE4141.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| D17244-1 | FE4142.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

| CAS No. | Compound | D17244-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | ND | 774 | 816 | 105 | 876 | 113 | 7 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17244-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 109% | 116% | 108% | 63-130% |

8.3.1
8



Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/12/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.070 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.050 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.10 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 1.0 | .16 | .38 | 0.53 | <1.0 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.20 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.0 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | -0.20 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.60 | <3.0 |

Associated samples MP2852: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2852
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/12/10

| Metal | D17265-1 Original MS | | Spike/lot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|-----------------------------|----------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | anr | | | | |
| Barium | 224 | 354 | 161 | 80.6 | 75-125 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 1.2 | 31.1 | 40.3 | 74.2N(a) | 75-125 |
| Calcium | | | | | |
| Chromium | 20.3 | 51.6 | 40.3 | 77.6 | 75-125 |
| Cobalt | | | | | |
| Copper | 19.0 | 53.2 | 40.3 | 84.8 | 75-125 |
| Iron | | | | | |
| Lead | 9.5 | 68.6 | 80.6 | 73.3N(a) | 75-125 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 17.5 | 45.9 | 40.3 | 70.4N(a) | 75-125 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 2.6 | 60.7 | 80.6 | 72.0N(a) | 75-125 |
| Silicon | | | | | |
| Silver | 0.0 | 11.7 | 16.1 | 72.5N(a) | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 56.3 | 81.8 | 40.3 | 63.2N(a) | 75-125 |

Associated samples MP2852: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2852
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/12/10

| Metal | D17265-1 Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|----------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | anr | | | | | |
| Barium | 224 | 321 | 159 | 61.1N(a) | 9.8 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 1.2 | 31.5 | 39.7 | 76.4 | 1.3 | 20 |
| Calcium | | | | | | |
| Chromium | 20.3 | 51.1 | 39.7 | 77.6 | 1.0 | 20 |
| Cobalt | | | | | | |
| Copper | 19.0 | 52.7 | 39.7 | 84.9 | 0.9 | 20 |
| Iron | | | | | | |
| Lead | 9.5 | 71.0 | 79.4 | 77.5 | 3.4 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 17.5 | 47.7 | 39.7 | 76.1 | 3.8 | 20 |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.6 | 62.0 | 79.4 | 74.8N(b) | 2.1 | 20 |
| Silicon | | | | | | |
| Silver | 0.0 | 11.9 | 15.9 | 75.0 | 1.7 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 56.3 | 85.1 | 39.7 | 72.6N(b) | 4.0 | 20 |

Associated samples MP2852: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- (b) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2852
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/12/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 175 | 200 | 87.5 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 43.1 | 50 | 86.2 | 80-120 |
| Calcium | | | | |
| Chromium | 45.7 | 50 | 91.4 | 80-120 |
| Cobalt | | | | |
| Copper | 46.0 | 50 | 92.0 | 80-120 |
| Iron | | | | |
| Lead | 87.6 | 100 | 87.6 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 43.3 | 50 | 86.6 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 85.0 | 100 | 85.0 | 80-120 |
| Silicon | | | | |
| Silver | 17.0 | 20 | 85.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 44.1 | 50 | 88.2 | 80-120 |

Associated samples MP2852: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2852
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 09/12/10

| Metal | D17265-1 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 2760 | 3430 | 24.2*(a) | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 14.2 | 16.5 | 16.2*(a) | 0-10 |
| Calcium | | | | |
| Chromium | 249 | 305 | 22.1*(a) | 0-10 |
| Cobalt | | | | |
| Copper | 234 | 262 | 11.7*(a) | 0-10 |
| Iron | | | | |
| Lead | 116 | 150 | 29.0*(a) | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 216 | 273 | 26.6*(a) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 32.5 | 34.0 | 4.6 | 0-10 |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 692 | 905 | 30.8*(a) | 0-10 |

Associated samples MP2852: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2852
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2853
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 09/12/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|------|-----------|-------|
| Aluminum | 25 | .14 | .89 | | |
| Antimony | 0.20 | .001 | .045 | | |
| Arsenic | 0.40 | .049 | .26 | 0.26 | <0.40 |
| Barium | 1.0 | .0035 | .17 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 2 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 6.1 | | |
| Chromium | 1.0 | .021 | .23 | | |
| Cobalt | 0.10 | .0033 | .088 | | |
| Copper | 1.0 | .011 | .14 | | |
| Iron | 20 | .81 | 6.1 | | |
| Lead | 0.25 | .0012 | .18 | | |
| Magnesium | 50 | .067 | 1.3 | | |
| Manganese | 0.50 | .007 | .089 | | |
| Molybdenum | 0.50 | .0044 | .2 | | |
| Nickel | 1.0 | .0029 | .074 | | |
| Phosphorus | 30 | 1.8 | 5.6 | | |
| Potassium | 100 | 2 | 9.1 | | |
| Selenium | 0.20 | .075 | .14 | | |
| Silver | 0.050 | .0008 | .029 | | |
| Sodium | 250 | .8 | 1.8 | | |
| Strontium | 10 | .004 | .047 | | |
| Thallium | 0.10 | .015 | .071 | | |
| Tin | 5.0 | .006 | .17 | | |
| Titanium | 1.0 | .035 | .071 | | |
| Uranium | 0.25 | .00038 | .12 | | |
| Vanadium | 2.0 | .052 | .99 | | |
| Zinc | 5.0 | .039 | .53 | | |

Associated samples MP2853: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2853
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/12/10

| Metal | D17265-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|-----|----------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 16.3 | 107 | 80.6 | 112.5 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP2853: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2853
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/12/10

| Metal | D17265-1 Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 16.3 | 96.6 | 79.4 | 101.2 | 10.2 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP2853: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.2.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2853
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/12/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 91.3 | 100 | 91.3 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2853: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2853
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 09/12/10

| Metal | D17265-1 | | | QC |
|------------|----------|----------|------|--------|
| | Original | SDL 5:25 | %DIF | Limits |
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 201 | 204 | 1.4 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2853: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2854
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 09/12/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 66.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 54.5 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | 101 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP2854: D17265-7A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

9.3.1
9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2854
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2854
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/12/10

| Metal | D17132-8A Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 32200 | 162000 | 125000 | 103.8 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 4470 | 134000 | 125000 | 103.6 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 704000 | 839000 | 125000 | 108.0 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP2854: D17265-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2854
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2854
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/12/10

| Metal | D17132-8A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 32200 | 160000 | 125000 | 102.2 | 1.2 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 4470 | 134000 | 125000 | 103.6 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 704000 | 838000 | 125000 | 107.2 | 0.1 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP2854: D17265-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2854
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2854
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/12/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 134000 | 125000 | 107.2 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 129000 | 125000 | 103.2 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 138000 | 125000 | 110.4 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2854: D17265-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.3.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2854
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2858
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 09/13/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 85.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 20.5 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | 914 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP2858: D17265-1A, D17265-2A, D17265-3A, D17265-4A, D17265-5A, D17265-6A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2858
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2858
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/13/10

| Metal | D17265-5A Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|--------------------------|--------|----------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 24600 | 153000 | 125000 | 102.7 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 4360 | 130000 | 125000 | 100.5 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 8030 | 138000 | 125000 | 104.0 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP2858: D17265-1A, D17265-2A, D17265-3A, D17265-4A, D17265-5A, D17265-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2858
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2858
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/13/10

| Metal | D17265-5A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 24600 | 150000 | 125000 | 100.3 | 2.0 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 4360 | 128000 | 125000 | 98.9 | 1.6 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 8030 | 137000 | 125000 | 103.2 | 0.7 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP2858: D17265-1A, D17265-2A, D17265-3A, D17265-4A, D17265-5A, D17265-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2858
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2858
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/13/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 129000 | 125000 | 103.2 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 124000 | 125000 | 99.2 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 130000 | 125000 | 104.0 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP2858: D17265-1A, D17265-2A, D17265-3A, D17265-4A, D17265-5A, D17265-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2858
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2869
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/14/10

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|-------|---------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .0014 | -0.0055 | <0.10 |

Associated samples MP2869: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2869
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/14/10

| Metal | D17053-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.0 0.33 0.444 74.3N(a) 85-115

Associated samples MP2869: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17265
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP2869
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/14/10

| Metal | D17053-1 Original | MSD | Spike/lot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|----------------------|------|---------------------|----------|------------|-------------|
| Mercury | 0.0 | 0.35 | 0.453 | 77.3N(a) | 5.9 | 20 |

Associated samples MP2869: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP2869
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/14/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.33 | 0.4 | 82.5 | 80-120 |

Associated samples MP2869: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested



General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17265
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|----|-----------|----------|--------------|------------|------------|-------------|
| Specific Conductivity | GP2767/GN6340 | | | umhos/cm | 9984 | 9990 | 100.1 | 90-110% |
| pH | GN6322 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |
| pH | GN6322 | | | su | 8.00 | 7.99 | 99.9 | 99.3-100.7% |

Associated Samples:

Batch GN6322: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Batch GP2767: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

(*) Outside of QC limits

10.1
10



Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody



MIN OF CUST

CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| | |
|-------------------|--------|
| Accutest Job #: | D17265 |
| Accutest Quote #: | |
| AMS P.O. #: | |
| Project No.: | |

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | |
|--|--------------------|---------------------|--|--------------------|---------------------|--------------|------|-------|------|------------------------|-----|----------|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | |
| | | Collection | | | | Preservation | | | | | | | | |
| Field ID / Point of Collection | Date | Time | Matrix | # of bottles | PCL | NaOH | PH03 | H2SO4 | None | XCR | EPA | Comments | | |
| D17265 -1 | 9/9/10 | 10:45 AM | Soil | 1 | | | | | | X | X | | | |
| -2 | | 10:55 AM | Soil | 1 | | | | | | X | X | | | |
| -3 | | 11:05 AM | Soil | 1 | | | | | | X | X | | | |
| -4 | | 11:15 AM | Soil | 1 | | | | | | X | X | | | |
| -5 | | 11:25 AM | Soil | 1 | | | | | | X | X | | | |
| -6 | | 11:35 AM | Soil | 1 | | | | | | X | X | | | |
| -7 | | 3:45 PM | Soil | 1 | | | | | | X | X | | | |

| | | | | | | | |
|---|--|------------------------------|--|---|--|--|--|
| Turnaround Information | | Data Deliverable Information | | | | Comments / Remarks | |
| <input checked="" type="checkbox"/> 3-5 Business Day Rush <input type="checkbox"/> Other (Days) 2 day on RUSH! | | Approved By: | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | | | | Please use Colorado regulations and RLs. | |

| | | | | | | | |
|--|---------------|--------------|---------------|-------------------------------------|---|--|--|
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | For Subcontract Laboratory Use Only | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | |
| 1 | 9/9/10 10:50 | 1 | 9/9/10 10:55 | | Preserved Where applicable: <input type="checkbox"/> | | |
| 2 | 9/10/10 10:55 | 2 | 9/10/10 10:58 | | Temperature °C 0.1°C On Ice <input checked="" type="checkbox"/> | | |
| 3 | | 3 | | | | | |

D17265: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D17265

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 9/11/2010 10:55:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XCRA/EH

Airbill #'s: N/A

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

| <u>Cooler Temperature</u> | <u>Y</u> | <u>or</u> | <u>N</u> |
|------------------------------|-------------------------------------|-----------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> |
| 2. Cooler temp verification: | | | Infrared gun |
| 3. Cooler media: | | | Ice (bag) |

| <u>Quality Control Preservation</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|-------------------------------------|-------------------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | | <input type="checkbox"/> | |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

| <u>Sample Integrity - Instructions</u> | <u>Y</u> | <u>or</u> | <u>N</u> | <u>N/A</u> |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

111
11



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17265
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | 0.50 | 0.0 | mg/kg | 12 | 11.7 | 97.5 | 80-120% |
| Chromium, Hexavalent | GP12015/GN32820 | | | mg/kg | 1140 | 1010 | 88.6 | 80-120% |

Associated Samples:

Batch GP12015: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17265
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | Units | Spike Amount | BSD Result | RPD | QC Limit |
|----------------------|-----------------|-------|--------------|------------|-----|----------|
| Chromium, Hexavalent | GP12015/GN32820 | mg/kg | 12 | 11.7 | 0.0 | |

Associated Samples:

Batch GP12015: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17265
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32822 | D17166-1 | mv | 313 | 313 | 0.0 | 0-20% |

Associated Samples:

Batch GN32822: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

Batch GP12015: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17265
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 11.8 | 9.7 | 82.6 | 75-125% |
| Chromium, Hexavalent | GP12015/GN32820 | D17264-2 | mg/kg | 0.0 | 955 | 924 | 96.8 | 75-125% |

Associated Samples:

Batch GP12015: D17265-1, D17265-2, D17265-3, D17265-4, D17265-5, D17265-6, D17265-7

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.4
12

Report of Analysis

| | | | |
|--------------------------|------------------|------------------------|-------------------|
| Client Sample ID: | 18C-SG | Date Sampled: | 09/09/10 |
| Lab Sample ID: | D17265-7 | Date Received: | 09/10/10 |
| Matrix: | SO - Soil | Percent Solids: | 82.6 ^a |
| Method: | SW846 8260B | | |
| Project: | Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10246.D | 1 | 09/12/10 | DC | n/a | n/a | V5V565 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.059 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.059 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 18C-SG | Date Sampled: | 09/09/10 |
| Lab Sample ID: | D17265-7 | Date Received: | 09/10/10 |
| Matrix: | SO - Soil | Percent Solids: | 82.6 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G01959.D | 10 | 09/13/10 | TMB | 09/10/10 | OP2492 | E3G55 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.067 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.069 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.067 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.067 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.067 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0539 | 0.067 | 0.048 | mg/kg | J |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.067 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.067 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.0526 | 0.067 | 0.033 | mg/kg | J |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.067 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0744 | 0.067 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.067 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.067 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.067 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.074 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.067 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.067 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 72% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 74% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-SG | |
| Lab Sample ID: D17265-7 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846 8015B | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7125.D | 1 | 09/10/10 | JL | n/a | n/a | GGB387 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|------------------|--------|----|-----|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |

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

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 18C-SG | |
| Lab Sample ID: D17265-7 | Date Sampled: 09/09/10 |
| Matrix: SO - Soil | Date Received: 09/10/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4143.D | 1 | 09/11/10 | JB | 09/10/10 | OP2489 | GFE231 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 170 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 118% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 18C-SG | | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7 | | Date Received: 09/10/10 |
| Matrix: SO - Soil | | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 36.1 | 0.31 | mg/kg | 5 | 09/12/10 | 09/13/10 GJ | SW846 6020 ¹ | SW846 3050B ⁴ |
| Barium | 425 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Cadmium | < 0.78 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Chromium | 12.8 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Copper | 25.4 | 0.78 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Lead | 14.0 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Nickel | 14.0 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Selenium | < 3.9 | 3.9 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Silver | < 2.3 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |
| Zinc | 53.0 | 2.3 | mg/kg | 1 | 09/12/10 | 09/12/10 JM | SW846 6010B ² | SW846 3050B ³ |

(1) Instrument QC Batch: MA970

(2) Instrument QC Batch: MA971

(3) Prep QC Batch: MP2852

(4) Prep QC Batch: MP2853

(a) All results reported on wet weight basis.

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 18C-SG | Date Sampled: 09/09/10 |
| Lab Sample ID: D17265-7 | Date Received: 09/10/10 |
| Matrix: SO - Soil | Percent Solids: 82.6 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------|--------|-----|----------|----|----------------|----|----------------------|
| Solids, Percent ^a | 82.6 | | % | 1 | 09/12/10 | CJ | SM19 2540B M |
| Specific Conductivity | 1160 | 1.0 | umhos/cm | 1 | 09/13/10 | JD | DEPT. OF AG, BOOK N9 |
| pH | 8.48 | | su | 1 | 09/10/10 12:25 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D17734

Sampling Date: 09/27/10

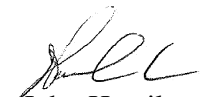
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **147**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|--|-----------|
| Section 1: Sample Summary | 4 |
| Section 2: Case Narrative/Conformance Summary | 6 |
| Section 3: Sample Results | 10 |
| 3.1: D17734-1: 31A F1 | 11 |
| 3.2: D17734-1A: 31A F1 | 17 |
| 3.3: D17734-2: 31A F2 | 19 |
| 3.4: D17734-2A: 31A F2 | 25 |
| 3.5: D17734-3: 31A F3 | 27 |
| 3.6: D17734-3A: 31A F3 | 33 |
| 3.7: D17734-4: 31A F4 | 35 |
| 3.8: D17734-4A: 31A F4 | 41 |
| 3.9: D17734-5: 31A TS1 | 43 |
| 3.10: D17734-5A: 31A TS1 | 49 |
| 3.11: D17734-6: 31A TS2 | 51 |
| 3.12: D17734-6A: 31A TS2 | 57 |
| 3.13: D17734-7: 31A F3 DUP | 59 |
| 3.14: D17734-7A: 31A F3 DUP | 65 |
| Section 4: Misc. Forms | 67 |
| 4.1: Chain of Custody | 68 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 70 |
| 5.1: Method Blank Summary | 71 |
| 5.2: Blank Spike Summary | 72 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 73 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 74 |
| 6.1: Method Blank Summary | 75 |
| 6.2: Blank Spike Summary | 76 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 77 |
| Section 7: GC Volatiles - QC Data Summaries | 78 |
| 7.1: Method Blank Summary | 79 |
| 7.2: Blank Spike Summary | 80 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 81 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 82 |
| 8.1: Method Blank Summary | 83 |
| 8.2: Blank Spike Summary | 85 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 87 |
| Section 9: Metals Analysis - QC Data Summaries | 89 |
| 9.1: Prep QC MP3008: Hg | 90 |
| 9.2: Prep QC MP3023: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 94 |
| 9.3: Prep QC MP3024: As | 104 |
| 9.4: Prep QC MP3032: Ca,Mg,Na,Sodium Adsorption Ratio | 109 |
| 9.5: Prep QC MP3055: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 117 |
| 9.6: Prep QC MP3056: As | 127 |

Table of Contents

-2-

| | |
|---|------------|
| 9.7: Prep QC MP3061: Ca,Mg,Na,Sodium Adsorption Ratio | 132 |
| Section 10: General Chemistry - QC Data Summaries | 140 |
| 10.1: Method Blank and Spike Results Summary | 141 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 142 |
| 11.1: Chain of Custody | 143 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 144 |
| 12.1: Method Blank and Spike Results Summary | 145 |
| 12.2: Duplicate Results Summary | 146 |
| 12.3: Matrix Spike Results Summary | 147 |

1

2

3

4

5

6

7

8

9

10

11

12



Sample Summary

Marathon Oil

Job No: D17734

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17734-1 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F1 |
| D17734-1A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F1 |
| D17734-2 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F2 |
| D17734-2A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F2 |
| D17734-3 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F3 |
| D17734-3A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F3 |
| D17734-4 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F4 |
| D17734-4A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F4 |
| D17734-5 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A TS1 |
| D17734-5A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A TS1 |
| D17734-6 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A TS2 |
| D17734-6A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A TS2 |
| D17734-7 | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F3 DUP |

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



Sample Summary (continued)

Marathon Oil

Job No: D17734

Roan Pit Closure

| Sample Number | Collected | | Matrix | | | Client Sample ID |
|---------------|-----------|----------|----------|------|------|------------------|
| | Date | Time By | Received | Code | Type | |
| D17734-7A | 09/27/10 | 00:00 BC | 09/28/10 | SO | Soil | 31A F3 DUP |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17734

Site: Roan Pit Closure

Report Dat 10/7/2010 10:57:15 AM

On 09/28/2010, seven (7) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.1°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17734 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V3V403 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D17932-3MS and D17932-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2589 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D17737-1MS and D17737-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recoveries of Benzo(b)fluoranthene and Chrysene are outside control limits. The spike amounts are low relative to the sample amounts. Refer to the lab control or spike blank for recovery information.
- The RPDs for the MS and MSD recoveries of Benzo(b)fluoranthene and Dibenzo(a,h)anthracene are outside control limits for sample OP2589-MSD. The high RPDs are due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB409 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17733-1MS and D17733-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2584 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17735-1MS and D17735-1MSD were used as the QC samples indicated.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2590 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17737-2MS and D17737-2MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP3032 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-1AMS and D17734-1AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP3061 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17735-3AMS and D17735-3AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3023 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-1MS, D17734-1MSD, and D17734-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPDs for Barium, Cadmium, Chromium, Lead, Nickel, Selenium, Silver, and Zinc are outside control limits for sample MP3023-SD1. The percent differences are acceptable for Cadmium, Selenium, and Silver due to low initial sample concentration (< 50 times IDL).
- MP3023-SD1 for Barium, Chromium, Lead, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3055 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-7MS, D17734-7MSD, and D17734-7SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery of Barium is outside control limits. Probable cause due to matrix interference.
- The serial dilution RPDs for Cadmium, Chromium, Lead, Nickel, Selenium, Silver, and Zinc are outside control limits for sample MP3055-SD1. The percent differences are acceptable for Cadmium, Selenium, and Silver due to low initial sample concentration (< 50 times IDL).
- MP3055-SD1 for Chromium, Lead, Nickel, and Zinc : Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3024 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-1MS, D17734-1MSD, and D17734-1SDL were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3056 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-7MS, D17734-7MSD, and D17734-7SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP3056-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3008 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17734-1MSD and D17734-1MS were used as the QC samples for the Mercury analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Mercury are outside control limits. The spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GN32947 |
|------------------|----------------------------|

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, and D17734-7.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3032 |
|------------------|-------------------------|

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GN6563 |
|------------------|-------------------------|

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R4569 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: $(\text{Chromium}) - (\text{Hexavalent Chromium})$

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12078 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17734

Site: MOILCOGJ: Roan Pit Closure

Report Date 10/1/2010 10:39:45 AM

7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/27/2010 and were received at Accutest on 09/28/2010 properly preserved, at 1.8 Deg. C and intact. These Samples received an Accutest job number of D17734. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN32947

- Sample(s) D17737-6DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP12078

- All samples were distilled and analyzed within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17735-4DUP, D17735-4MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17734).

Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07509.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 86% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 84% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 31A F1 | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17734-1 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 84.4 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02043.D | 2 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.067 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.0148 | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.0094 | 0.013 | 0.0084 | mg/kg | J |
| 205-99-2 | Benzo(b)fluoranthene | 0.0435 | 0.013 | 0.0097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0115 | 0.013 | 0.0083 | mg/kg | J |
| 207-08-9 | Benzo(k)fluoranthene | 0.0139 | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | 0.0254 | 0.013 | 0.0067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0099 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0196 | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0144 | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.067 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.067 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | 0.0104 | 0.013 | 0.0090 | mg/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 57% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 66% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 79% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7513.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 82% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4451.D | 1 | 09/30/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 116% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 4.4 | 0.39 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 253 | 0.97 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 30.0 | 0.97 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 15.0 | 0.49 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 11.5 | 4.9 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 18.5 | 2.9 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 44.0 | 2.9 | mg/kg | 1 | 09/29/10 | 09/30/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1015
- (3) Instrument QC Batch: MA1017
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3023
- (6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.82 | 0.50 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 29.2 | 1.5 | mg/kg | 1 | 09/30/10 23:32 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 372 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84.4 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 333 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.22 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 42.2 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 5.54 | 1.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 27.7 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1015

(2) Prep QC Batch: MP3032

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-1A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 1.06 | | ratio | 1 | 09/30/10 18:41 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 31A F2 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 83.2 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07510.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 85% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 31A F2 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 83.2 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02044.D | 2 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.066 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.013 | 0.0084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0217 | 0.013 | 0.0096 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.013 | 0.0083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | 0.0129 | 0.013 | 0.0066 | mg/kg | J |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0098 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.066 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.066 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.013 | 0.0090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 57% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 73% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7514.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 93% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 31A F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4452.D | 1 | 09/30/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 106% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 4.6 | 0.41 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 264 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 28.1 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 15.0 | 0.52 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 11.2 | 5.2 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 17.4 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 44.7 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

(1) Instrument QC Batch: MA1009

(2) Instrument QC Batch: MA1015

(3) Instrument QC Batch: MA1017

(4) Prep QC Batch: MP3008

(5) Prep QC Batch: MP3023

(6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F2 | |
| Lab Sample ID: D17734-2 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | 0.80 | 0.49 | mg/kg | 1 | 09/30/10 18:50 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 27.3 | 1.5 | mg/kg | 1 | 10/01/10 01:46 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 351 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 83.2 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 201 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.27 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 22.1 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 2.97 | 1.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 16.8 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1015

(2) Prep QC Batch: MP3032

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-2A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 83.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.890 | | ratio | 1 | 09/30/10 19:50 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | |
| Lab Sample ID: D17734-3 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07511.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.053 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.053 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.021 | mg/kg | |
| | m,p-Xylene | ND | 0.21 | 0.037 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.037 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 84% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 31A F3 | | |
| Lab Sample ID: D17734-3 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02068.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 54% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 80% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 94% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 93.8 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7515.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 78% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 31A F3 | |
| Lab Sample ID: D17734-3 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4453.D | 1 | 09/30/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 104% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.2 | 0.42 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 302 | 1.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 35.5 | 1.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 10.6 | 0.53 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 11.9 | 5.3 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 13.7 | 3.2 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 5.3 | 5.3 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 41.8 | 3.2 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1015
- (3) Instrument QC Batch: MA1017
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3023
- (6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | |
| Lab Sample ID: D17734-3 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 35.0 | 1.6 | mg/kg | 1 | 10/01/10 01:52 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 353 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 93.8 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 1040 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 7.13 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-3A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 145 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 25.7 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 16.9 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-3A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 93.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.340 | | ratio | 1 | 10/04/10 17:29 | JM | LADNR29B |

(a) All results reported on wet weight basis.
 (b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07512.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.054 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.054 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 95% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 84% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 31A F4 | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17734-4 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 91.4 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02069.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.183 | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.152 | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.462 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.174 | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.226 | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | 0.262 | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.126 | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.109 | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.176 | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.0562 | 0.17 | 0.051 | mg/kg | J |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.0558 | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | 0.129 | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 40% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 59% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 83% | | 17-174% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7517.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

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

(a) All results reported on wet weight basis.

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

Report of Analysis

37
3

| | |
|--|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD4454.D | 1 | 09/30/10 | CP | 09/29/10 | OP2584 | GFD190 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 44.0 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 125% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.3 | 0.40 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 325 | 0.99 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 0.99 | 0.99 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 47.7 | 0.99 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 11.1 | 0.50 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 9.7 | 5.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 22.9 | 3.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 37.9 | 3.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1015
- (3) Instrument QC Batch: MA1017
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3023
- (6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | |
| Lab Sample ID: D17734-4 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 91.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 47.7 | 1.5 | mg/kg | 1 | 10/01/10 02:10 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 334 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 91.4 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 296 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 9.31 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 36.0 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 5.13 | 1.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 24.2 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1015

(2) Prep QC Batch: MP3032

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.999 | | ratio | 1 | 09/30/10 19:56 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | |
| Lab Sample ID: D17734-5 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07513.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 95% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 31A TS1 | |
| Lab Sample ID: D17734-5 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02070.D | 2 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.066 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.013 | 0.0084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.013 | 0.0096 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.013 | 0.0083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.013 | 0.0066 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0098 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.066 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.066 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.013 | 0.0090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 62% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 67% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 85% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.9
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7518.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

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

(a) All results reported on wet weight basis.

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4424.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 110% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

39
3

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.3 | 0.38 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 261 | 0.96 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 33.2 | 0.96 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 11.2 | 0.48 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 11.9 | 4.8 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.4 | 2.9 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 45.7 | 2.9 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1015
- (3) Instrument QC Batch: MA1017
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3023
- (6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 33.2 | 1.5 | mg/kg | 1 | 10/01/10 02:16 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 346 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.5 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 302 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 7.41 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 43.6 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 8.66 | 1.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 11.0 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1015

(2) Prep QC Batch: MP3032

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-5A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.398 | | ratio | 1 | 09/30/10 20:02 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07514.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 88% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | 31A TS2 | Date Sampled: | 09/27/10 |
| Lab Sample ID: | D17734-6 | Date Received: | 09/28/10 |
| Matrix: | SO - Soil | Percent Solids: | 90.2 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02071.D | 2 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|--------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.013 | 0.012 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.067 | 0.014 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.013 | 0.0086 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.013 | 0.013 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.013 | 0.0084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.013 | 0.0097 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.013 | 0.0083 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.013 | 0.0084 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.013 | 0.0067 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.013 | 0.0099 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.013 | 0.0082 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.013 | 0.013 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.013 | 0.0087 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.013 | 0.012 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.067 | 0.020 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.067 | 0.015 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.013 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.013 | 0.0090 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 66% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 72% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 83% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7519.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 81% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4425.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 103% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 2.9 | 0.41 | mg/kg | 5 | 09/29/10 | 10/02/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 255 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Chromium | 33.0 | 1.0 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Copper | 11.0 | 0.51 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Lead | 11.5 | 5.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 15.7 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |
| Zinc | 44.2 | 3.1 | mg/kg | 1 | 09/29/10 | 10/01/10 JM | SW846 6010B ² | EPA 200.8 ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1015
- (3) Instrument QC Batch: MA1017
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3023
- (6) Prep QC Batch: MP3024

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 33.0 | 1.5 | mg/kg | 1 | 10/01/10 02:22 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 362 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.2 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 313 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 7.09 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 41.4 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 7.99 | 1.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 12.1 | 2.0 | mg/l | 1 | 09/30/10 | 09/30/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1015

(2) Prep QC Batch: MP3032

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 31A TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.451 | | ratio | 1 | 09/30/10 20:08 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 31A F3 DUP | |
| Lab Sample ID: D17734-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3V07515.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 87% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 31A F3 DUP | |
| Lab Sample ID: D17734-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02072.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.022 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.030 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.027 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.023 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 59% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 66% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 75% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 31A F3 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.7 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7520.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 79% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 31A F3 DUP | |
| Lab Sample ID: D17734-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4426.D | 1 | 10/01/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 107% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 31A F3 DUP**Lab Sample ID:** D17734-7**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 09/27/10**Date Received:** 09/28/10**Percent Solids:** 90.7 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.2 | 0.40 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 283 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 32.9 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 11.5 | 0.50 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10.3 | 5.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 14.1 | 3.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 38.5 | 3.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1009

(2) Instrument QC Batch: MA1018

(3) Instrument QC Batch: MA1023

(4) Prep QC Batch: MP3008

(5) Prep QC Batch: MP3055

(6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 31A F3 DUP | |
| Lab Sample ID: D17734-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 19:00 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 32.9 | 1.5 | mg/kg | 1 | 10/04/10 14:10 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 350 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.7 | | % | 1 | 09/28/10 | CJ | SM19 2540B M |
| Specific Conductivity | 813 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 6.83 | | su | 1 | 09/28/10 10:15 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 31A F3 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 108 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 19.6 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 8.90 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 31A F3 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17734-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.7 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.207 | | ratio | 1 | 10/04/10 17:35 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

| Client / Reporting Information | | | Project Information | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | Matrix Codes | | | | | | | |
|---|--------------------------------|--|-----------------------------------|------------|--|--|---|-----------------------------|---|--|-----|------------------|------------|----------|-----|--|---|--------------|---|---|---|----|----|
| Company Name: MAKATHON | | | Project Name: | | | <p style="text-align: center;"> TPH - GRD TPH - DRG BTEX PAHs Metals SAR, EC, PH </p> | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | | | | | | | |
| Street Address: | | | Street: | | | | | | | | | | | | | | | | | | | | |
| City State Zip: | | | City State: | | | | | | | | | | | | | | | | | | | | |
| Project Contact: | | | Project #: | | | | | | | | | | | | | | | | | | | | |
| Phone # Fax #: | | | Client Purchase Order #: | | | | | | | | | | | | | | | | | | | | |
| Sampler(s) Name(s): | | | Project Manager: | | | | | | | | | | | | | | | | | | | | |
| Account Sample # | Field ID / Point of Collection | | MECH/DI Vial # | Collection | | Matrix | # of bottles | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | | | | | |
| | 31A P1 | | | 9/27 | | | 6 | HCl | NO3 | NO2 | HN3 | H2SO4 | NONE | DI Water | MED | ENDORE | X | X | X | X | X | X | 01 |
| | 31A P2 | | | | | | 6 | | | | | | | | | | | | | | | 02 | |
| | 31A F3 | | | | | | 6 | | | | | | | | | | | | | | | 03 | |
| | 31A F4 | | | | | | 6 | | | | | | | | | | | | | | | 04 | |
| | 31A TS1 | | | | | | 6 | | | | | | | | | | | | | | | 05 | |
| | 31A TS2 | | | | | | 6 | | | | | | | | | | | | | | | 06 | |
| | | | | | | | 6 | | | | | | | | | | | | | | | 07 | |
| Turnaround Time (Business days) | | | Approved By (Accutest PM) / Date: | | | Data Deliverable Information | | | Comments / Special Instructions | | | | | | | | | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6-9 Day RUSH <input checked="" type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | | | | | <input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | | | | | | | | | | | | |
| Emergency & Rush TIA data available VIA Lablink | | | | | | | | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | | | | | | |
| Relinquished by Sampler: | Date Time: | | Received By: | Date Time: | | Relinquished By: | Date Time: | | Received By: | Date Time: | | Relinquished By: | Date Time: | | | | | | | | | | |
| 1 | 8/20 | | Sally | 8:30 | | 2 | | | 2 | | | 3 | | | | | | | | | | | |
| 3 | | | 3 | | | 4 | | | 4 | | | 5 | | | | | | | | | | | |
| 5 | | | 5 | | | Custody Seal # | <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact | | | <input checked="" type="checkbox"/> Preserved where applicable <input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp: 4.1 | | | | | | | | | | | | | |

4.1 4

Job Change Order: D17734_10/4/2010

Requested 10/4/2010 **Received Date:** 9/28/2010
Account Name: Marathon Oil **Due Date:** 10/12/2010
Project Roan Pit Closure **Deliverable:** COMMBN
CSR: RR **TAT (Days):** 14
Sample #: D17734-ALL
Change: Per the client, this job should be on a standard TAT, not a 3 day rush. Thanks.

Above Changes Per: Client **Date:** 10/4/2010

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| V3V403-MB | 3V07503.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 89% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 83% | 70-130% |

Blank Spike Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| V3V403-BS | 3V07504.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 52.0 | 104 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 55.1 | 110 | 70-130 |
| 108-88-3 | Toluene | 50 | 52.5 | 105 | 70-130 |
| | m,p-Xylene | 50 | 49.8 | 100 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 49.2 | 98 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 88% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 91% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 86% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17932-3MS | 3V07506.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| D17932-3MSD | 3V07507.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |
| D17932-3 | 3V07505.D | 1 | 10/05/10 | DC | n/a | n/a | V3V403 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | D17932-3 ug/kg | Spike Q ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---------------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | 3940 | 4180 | 106 | 4170 | 106 | 0 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | 3940 | 4420 | 112 | 4460 | 113 | 1 | 56-139/30 |
| 108-88-3 | Toluene | ND | 3940 | 4200 | 107 | 4210 | 107 | 0 | 57-144/30 |
| | m,p-Xylene | ND | 3940 | 4010 | 102 | 4080 | 104 | 2 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | 3940 | 3970 | 101 | 4040 | 103 | 2 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17932-3 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 85% | 85% | 87% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 95% | 93% | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 82% | 87% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-MB | 3G02041.D | 1 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 62% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 71% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 78% | 17-174% |

Blank Spike Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-BS | 3G02042.D | 1 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 61.7 | 74 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 64.7 | 78 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 69.0 | 83 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.2 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 71.4 | 86 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 80.3 | 96 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 63.1 | 76 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 63.2 | 76 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 67.2 | 81 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 65.5 | 79 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 64.6 | 78 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 63.9 | 77 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 71.0 | 85 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 59.1 | 71 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 58.1 | 70 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 57.0 | 68 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 63.9 | 77 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 74.9 | 90 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 60% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 66% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 75% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-MS | 3G02074.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| OP2589-MSD | 3G02075.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| D17737-1 | 3G02073.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | D17737-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| 83-32-9 | Acenaphthene | ND | 83.3 | 54.6 | 66 | 60.9 | 73 | 11 | 20-151/30 | |
| 208-96-8 | Acenaphthylene | ND | 83.3 | 53.9 | 65 | 58.3 | 70 | 8 | 23-156/30 | |
| 120-12-7 | Anthracene | ND | 83.3 | 56.5 | 68 | 63.5 | 76 | 12 | 25-149/30 | |
| 56-55-3 | Benzo(a)anthracene | 171 | 83.3 | 192 | 25 | 237 | 79 | 21 | 22-157/30 | |
| 50-32-8 | Benzo(a)pyrene | 118 | 83.3 | 151 | 40 | 190 | 87 | 23 | 23-153/30 | |
| 205-99-2 | Benzo(b)fluoranthene | 437 | 83.3 | 358 | -95* a | 536 | 119 | 40* b | 22-161/30 | |
| 191-24-2 | Benzo(g,h,i)perylene | 140 | 83.3 | 172 | 38 | 208 | 82 | 19 | 20-158/30 | |
| 207-08-9 | Benzo(k)fluoranthene | 116 | 83.3 | 152 | 43 | 197 | 97 | 26 | 17-161/30 | |
| 218-01-9 | Chrysene | 260 | 83.3 | 257 | -4* a | 311 | 61 | 19 | 16-159/30 | |
| 53-70-3 | Dibenzo(a,h)anthracene | 77.9 | 83.3 | 118 | 48 | 164 | 104 | 33* b | 21-154/30 | |
| 206-44-0 | Fluoranthene | 163 | 83.3 | 180 | 20 | 214 | 61 | 17 | 16-140/30 | |
| 86-73-7 | Fluorene | ND | 83.3 | 56.8 | 68 | 61.7 | 74 | 8 | 15-153/30 | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 140 | 83.3 | 183 | 52 | 238 | 118 | 26 | 21-159/30 | |
| 90-12-0 | 1-Methylnaphthalene | ND | 83.3 | 61.9 | 74 | 67.8 | 82 | 9 | 10-148/30 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 83.3 | 66.7 | 80 | 72.9 | 88 | 9 | 10-181/30 | |
| 91-20-3 | Naphthalene | ND | 83.3 | 58.4 | 70 | 65.0 | 78 | 11 | 10-176/30 | |
| 85-01-8 | Phenanthrene | 37.7 | 83.3 | 82.2 | 53 | 93.6 | 67 | 13 | 22-152/30 | |
| 129-00-0 | Pyrene | 119 | 83.3 | 156 | 44 | 207 | 106 | 28 | 10-200/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D17737-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 52% | 58% | 58% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 58% | 63% | 64% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | 80% | 78% | 17-174% |

(a) Outside control limits due to high level in sample relative to spike amount.
 (b) High RPD due to possible sample nonhomogeneity.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-MB | GB7502.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB409-BS | GB7503.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 98.6 | 90 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|-----|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 90% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17733-1MS | GB7505.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1MSD | GB7506.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |
| D17733-1 | GB7504.D | 1 | 09/28/10 | BR | n/a | n/a | GGB409 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

| CAS No. | Compound | D17733-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 16.9 | 120 | 121 | 86 | 135 | 98 | 11 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-1 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 93% | 91% | 100% | 60-140% |

7.3.1

7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MB | FD4426.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-1, D17734-2, D17734-3, D17734-4

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 116% 63-130% |

Method Blank Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-MB | FE4410.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl | 99% 63-130% |

8.12
8

Blank Spike Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-BS | FD4427.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-1, D17734-2, D17734-3, D17734-4

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 673 | 101 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 110% | 63-130% |

8.2.1
8

Blank Spike Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-BS | FE4411.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-5, D17734-6, D17734-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 694 | 104 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 114% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2584-MS | FD4428.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| OP2584-MSD | FD4429.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |
| D17735-1 | FD4430.D | 1 | 09/29/10 | CP | 09/29/10 | OP2584 | GFD190 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-1, D17734-2, D17734-3, D17734-4

| CAS No. | Compound | D17735-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | ND | 666 | 636 | 95 | 644 | 97 | 1 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17735-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 119% | 108% | 108% | 63-130% |

8.3.1
8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17734
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-MS | FE4412.D | 10 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| OP2590-MSD | FE4413.D | 10 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| D17737-2 | FE4414.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17734-5, D17734-6, D17734-7

| CAS No. | Compound | D17737-2 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 59.3 | 666 | 664 | 91 | 610 | 83 | 8 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17737-2 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 110% | 106% | 115% | 63-130% |

8.3.2
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | -0.0030 | <0.10 |

Associated samples MP3008: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.016 0.33 0.392 80.1N(a) 85-115

Associated samples MP3008: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original | MSD | Spike lot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|----------------------|------|------------------------|----------|------------|-------------|
| Mercury | 0.016 | 0.33 | 0.4 | 78.5N(a) | 0.0 | 20 |

Associated samples MP3008: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.37 | 0.4 | 92.5 | 80-120 |

Associated samples MP3008: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 09/29/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.080 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.060 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.050 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | -0.010 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.020 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | -0.040 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | -0.12 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.10 | <3.0 |

Associated samples MP3023: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.2.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3023
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17734-1 Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|-------------------------|------|---------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | anr | | | | |
| Barium | 253 | 425 | 204 | 84.3 | 75-125 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.31 | 42.1 | 51 | 81.9 | 75-125 |
| Calcium | | | | | |
| Chromium | 30.0 | 75.3 | 51 | 88.8 | 75-125 |
| Cobalt | | | | | |
| Copper | 15.0 | 59.3 | 51 | 86.8 | 75-125 |
| Iron | | | | | |
| Lead | 11.5 | 98.4 | 102 | 85.2 | 75-125 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 18.5 | 60.8 | 51 | 82.9 | 75-125 |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | 1.7 | 80.9 | 102 | 77.6 | 75-125 |
| Silicon | | | | | |
| Silver | 0.097 | 15.6 | 20.4 | 76.0 | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 44.0 | 86.0 | 51 | 82.3 | 75-125 |

Associated samples MP3023: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3023
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17734-1 Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | anr | | | | | |
| Barium | 253 | 470 | 211 | 103.1 | 10.1 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 0.31 | 43.1 | 52.6 | 81.3 | 2.3 | 20 |
| Calcium | | | | | | |
| Chromium | 30.0 | 77.1 | 52.6 | 89.5 | 2.4 | 20 |
| Cobalt | | | | | | |
| Copper | 15.0 | 61.6 | 52.6 | 88.5 | 3.8 | 20 |
| Iron | | | | | | |
| Lead | 11.5 | 97.6 | 105 | 81.8 | 0.8 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 18.5 | 61.7 | 52.6 | 82.1 | 1.5 | 20 |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 1.7 | 83.9 | 105 | 78.1 | 3.6 | 20 |
| Silicon | | | | | | |
| Silver | 0.097 | 15.9 | 21.1 | 75.1 | 1.9 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 44.0 | 87.5 | 52.6 | 82.7 | 1.7 | 20 |

Associated samples MP3023: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3023
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 09/29/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 171 | 200 | 85.5 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 44.5 | 50 | 89.0 | 80-120 |
| Calcium | | | | |
| Chromium | 47.4 | 50 | 94.8 | 80-120 |
| Cobalt | | | | |
| Copper | 44.7 | 50 | 89.4 | 80-120 |
| Iron | | | | |
| Lead | 93.8 | 100 | 93.8 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 44.8 | 50 | 89.6 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 85.5 | 100 | 85.5 | 80-120 |
| Silicon | | | | |
| Silver | 16.5 | 20 | 82.5 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 44.8 | 50 | 89.6 | 80-120 |

Associated samples MP3023: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3023
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 09/29/10

| Metal | D17734-1 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 2600 | 2960 | 13.8*(a) | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 3.20 | 5.00 | 56.3 (b) | 0-10 |
| Calcium | | | | |
| Chromium | 309 | 357 | 15.3*(a) | 0-10 |
| Cobalt | | | | |
| Copper | 154 | 161 | 4.5 | 0-10 |
| Iron | | | | |
| Lead | 118 | 135 | 13.9*(a) | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 191 | 227 | 18.8*(a) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 17.0 | 14.0 | 17.6 (b) | 0-10 |
| Silicon | | | | |
| Silver | 1.00 | 5.00 | 400.0(b) | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 453 | 565 | 24.7*(a) | 0-10 |

Associated samples MP3023: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3023
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Serial dilution indicates possible matrix interference.
- (b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3024
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 09/29/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|------|-----------|-------|
| Aluminum | 25 | .14 | .89 | | |
| Antimony | 0.20 | .001 | .045 | | |
| Arsenic | 0.40 | .049 | .26 | 0.0054 | <0.40 |
| Barium | 1.0 | .0035 | .17 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 2 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 6.1 | | |
| Chromium | 1.0 | .021 | .23 | | |
| Cobalt | 0.10 | .0033 | .088 | | |
| Copper | 1.0 | .011 | .14 | | |
| Iron | 20 | .81 | 6.1 | | |
| Lead | 0.25 | .0012 | .18 | | |
| Magnesium | 50 | .067 | 1.3 | | |
| Manganese | 0.50 | .007 | .089 | | |
| Molybdenum | 0.50 | .0044 | .2 | | |
| Nickel | 1.0 | .0029 | .074 | | |
| Phosphorus | 30 | 1.8 | 5.6 | | |
| Potassium | 100 | 2 | 9.1 | | |
| Selenium | 0.20 | .075 | .14 | | |
| Silver | 0.050 | .0008 | .029 | | |
| Sodium | 250 | .8 | 1.8 | | |
| Strontium | 10 | .004 | .047 | | |
| Thallium | 0.10 | .015 | .071 | | |
| Tin | 5.0 | .006 | .17 | | |
| Titanium | 1.0 | .035 | .071 | | |
| Uranium | 0.25 | .00038 | .12 | | |
| Vanadium | 2.0 | .052 | .99 | | |
| Zinc | 5.0 | .039 | .53 | | |

Associated samples MP3024: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3024
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17734-1 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 4.4 | 99.0 | 104 | 88.9 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3024: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3024
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | D17734-1 Original MSD | | SpikeLot MPICPAL % Rec | MSD RPD | QC Limit | |
|------------|--------------------------|-----|---------------------------|------------|-------------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 4.4 | 102 | 111 | 83.3 | 3.0 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3024: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.3.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3024
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 09/29/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 96.8 | 100 | 96.8 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3024: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3024
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 09/29/10

| Metal | D17734-1 | | | QC |
|------------|----------|----------|------|--------|
| | Original | SDL 5:25 | %DIF | Limits |
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 45.1 | 41.3 | 8.3 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3024: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3032
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 09/30/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 59.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 70.0 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | 136 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3032: D17734-1A, D17734-2A, D17734-4A, D17734-5A, D17734-6A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3032
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3032
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/30/10

| Metal | D17734-1A Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 42200 | 178000 | 125000 | 108.6 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 5540 | 135000 | 125000 | 103.6 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 27700 | 158000 | 125000 | 104.2 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3032: D17734-1A, D17734-2A, D17734-4A, D17734-5A, D17734-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3032
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3032
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/30/10

| Metal | D17734-1A Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|---------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 42200 | 173000 | 125000 | 104.6 | 2.8 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 5540 | 133000 | 125000 | 102.0 | 1.5 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 27700 | 155000 | 125000 | 101.8 | 1.9 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3032: D17734-1A, D17734-2A, D17734-4A, D17734-5A, D17734-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3032
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3032
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 09/30/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 138000 | 125000 | 110.4 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 133000 | 125000 | 106.4 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 133000 | 125000 | 106.4 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3032: D17734-1A, D17734-2A, D17734-4A, D17734-5A, D17734-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3032
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 20 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.11 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.12 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.48 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.16 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.010 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.14 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.30 | <3.0 |

Associated samples MP3055: D17734-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.5.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | anr | | | | |
| Antimony | anr | | | | |
| Arsenic | anr | | | | |
| Barium | 283 | 440 | 198 | 79.3 | 75-125 |
| Beryllium | anr | | | | |
| Boron | anr | | | | |
| Cadmium | 0.24 | 40.7 | 49.5 | 81.7 | 75-125 |
| Calcium | anr | | | | |
| Chromium | 32.9 | 75.0 | 49.5 | 85.0 | 75-125 |
| Cobalt | anr | | | | |
| Copper | 11.5 | 54.8 | 49.5 | 87.5 | 75-125 |
| Iron | anr | | | | |
| Lead | 10.3 | 94.2 | 99 | 84.7 | 75-125 |
| Lithium | anr | | | | |
| Magnesium | anr | | | | |
| Manganese | anr | | | | |
| Molybdenum | anr | | | | |
| Nickel | 14.1 | 55.2 | 49.5 | 83.0 | 75-125 |
| Phosphorus | anr | | | | |
| Potassium | anr | | | | |
| Selenium | 2.0 | 81.2 | 99 | 80.0 | 75-125 |
| Silicon | anr | | | | |
| Silver | 0.20 | 16.4 | 19.8 | 81.8 | 75-125 |
| Sodium | anr | | | | |
| Strontium | anr | | | | |
| Thallium | anr | | | | |
| Tin | anr | | | | |
| Titanium | anr | | | | |
| Uranium | anr | | | | |
| Vanadium | anr | | | | |
| Zinc | 38.5 | 80.0 | 49.5 | 83.8 | 75-125 |

Associated samples MP3055: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|---------------------------|----------|------------|-------------|
| Aluminum | anr | | | | | |
| Antimony | anr | | | | | |
| Arsenic | anr | | | | | |
| Barium | 283 | 420 | 192 | 71.2N(a) | 4.7 | 20 |
| Beryllium | anr | | | | | |
| Boron | | | | | | |
| Cadmium | 0.24 | 39.1 | 48.1 | 80.8 | 4.0 | 20 |
| Calcium | anr | | | | | |
| Chromium | 32.9 | 73.3 | 48.1 | 84.0 | 2.3 | 20 |
| Cobalt | anr | | | | | |
| Copper | 11.5 | 52.5 | 48.1 | 85.3 | 4.3 | 20 |
| Iron | anr | | | | | |
| Lead | 10.3 | 90.8 | 96.2 | 83.7 | 3.7 | 20 |
| Lithium | | | | | | |
| Magnesium | anr | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | | | | | | |
| Nickel | 14.1 | 53.1 | 48.1 | 81.1 | 3.9 | 20 |
| Phosphorus | | | | | | |
| Potassium | anr | | | | | |
| Selenium | 2.0 | 78.0 | 96.2 | 79.0 | 4.0 | 20 |
| Silicon | | | | | | |
| Silver | 0.20 | 15.9 | 19.2 | 81.6 | 3.1 | 20 |
| Sodium | anr | | | | | |
| Strontium | | | | | | |
| Thallium | anr | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | anr | | | | | |
| Zinc | 38.5 | 77.4 | 48.1 | 80.9 | 3.3 | 20 |

Associated samples MP3055: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 169 | 200 | 84.5 | 80-120 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 43.0 | 50 | 86.0 | 80-120 |
| Calcium | anr | | | |
| Chromium | 45.8 | 50 | 91.6 | 80-120 |
| Cobalt | anr | | | |
| Copper | 44.7 | 50 | 89.4 | 80-120 |
| Iron | anr | | | |
| Lead | 90.5 | 100 | 90.5 | 80-120 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 43.3 | 50 | 86.6 | 80-120 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 83.9 | 100 | 83.9 | 80-120 |
| Silicon | | | | |
| Silver | 17.4 | 20 | 87.0 | 80-120 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 43.4 | 50 | 86.8 | 80-120 |

Associated samples MP3055: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 2830 | 3110 | 9.9 | 0-10 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 2.40 | 2.00 | 16.7 (a) | 0-10 |
| Calcium | anr | | | |
| Chromium | 329 | 372 | 13.0*(b) | 0-10 |
| Cobalt | anr | | | |
| Copper | 115 | 116 | 1.0 | 0-10 |
| Iron | anr | | | |
| Lead | 103 | 116 | 11.9*(b) | 0-10 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 141 | 164 | 16.2*(b) | 0-10 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 19.8 | 30.0 | 51.5 (a) | 0-10 |
| Silicon | | | | |
| Silver | 2.00 | 0.00 | 100.0(a) | 0-10 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 385 | 460 | 19.5*(b) | 0-10 |

Associated samples MP3055: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3056
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.12 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3056: D17734-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.6.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 3.2 | 83.2 | 99 | 80.8 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3056: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.6.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|----------------------------|------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 3.2 | 84.9 | 96.2 | 85.0 | 2.0 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3056: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.6.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 103 | 100 | 103.0 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3056: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.6.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 | | QC |
|-------|----------|---------------|--------|
| | Original | SDL 5:25 %DIF | Limits |

| | | | |
|------------|------|------|---------------|
| Aluminum | | | |
| Antimony | | | |
| Arsenic | 32.1 | 37.8 | 17.9*(a) 0-10 |
| Barium | | | |
| Beryllium | | | |
| Boron | | | |
| Cadmium | | | |
| Calcium | | | |
| Chromium | | | |
| Cobalt | | | |
| Copper | | | |
| Iron | | | |
| Lead | | | |
| Magnesium | | | |
| Manganese | | | |
| Molybdenum | | | |
| Nickel | | | |
| Phosphorus | | | |
| Potassium | | | |
| Selenium | | | |
| Silver | | | |
| Sodium | | | |
| Strontium | | | |
| Thallium | | | |
| Tin | | | |
| Titanium | | | |
| Uranium | | | |
| Vanadium | | | |
| Zinc | | | |

Associated samples MP3056: D17734-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

9.6.4
9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 274 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 109 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -740 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3061: D17734-3A, D17734-7A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 29300 | 170000 | 125000 | 112.6 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3061: D17734-3A, D17734-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.7.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 29300 | 169000 | 125000 | 111.8 | 0.6 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 0.0 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3061: D17734-3A, D17734-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.7.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 141000 | 125000 | 112.8 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 133000 | 125000 | 106.4 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 132000 | 125000 | 105.6 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3061: D17734-3A, D17734-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.7.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17734
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|----|--------------|----------|-----------------|---------------|---------------|--------------|
| Specific Conductivity | GP2898/GN6657 | | | umhos/cm | 9984 | 10200 | 102.6 | 90-110% |
| pH | GN6570 | | | su | 8.00 | 8.02 | 100.3 | 99.3-100.7% |

Associated Samples:

Batch GN6570: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Batch GP2898: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





ACCUTEST

CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| | |
|-------------------|--------|
| Accutest Job #: | D17734 |
| Accutest Quote #: | |
| AMS P.O. #: | |
| Project No.: | |

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | Comments |
|---|--------------------|---------------------|---|--------------------|--|------|------|-------|------|---|------|--|--|----------|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | Matrix | XGRA | JH | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | Phone: (508) 481-6200 | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | |
| Field ID / Point of Collection | Collection | | Matrix | # of bottles | Preservation | | | | | | XGRA | JH | | |
| | Date | Time | | | PCOL | NaOH | HNO3 | H2SO4 | None | | | | | |
| D17734 -1 | 9/27/10 | | Soil | 1 | | | | | | | X | X | | |
| -2 | | | Soil | 1 | | | | | | | X | X | | |
| -3 | | | Soil | 1 | | | | | | | X | X | | |
| -4 | | | Soil | 1 | | | | | | | X | X | | |
| -5 | | | Soil | 1 | | | | | | | X | X | | |
| -6 | | | Soil | 1 | | | | | | | X | X | | |
| -7 | | | Soil | 1 | | | | | | | X | X | | |
| - | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | | |
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____ | | | | | | | Please use Colorado regulations and RLs. <i>10E</i> | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | For Subcontract Laboratory Use Only | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: | | | | | | | | | |
| 1 | 9/28/10 1500 | 1 FedEx | 1 | 1 | Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: | | | | | | | | | |
| 2 FedEx | 9/29/10 1300 | 2 [Signature] | 2 | 2 | Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | |
| Relinquished by: | Date & Time: | Received By: | Date & Time: | Seal #: | Headspace: | | | | | | | | | |
| 3 | | 3 | 3 | 3 | Temperature °C: <i>1.5</i> On Ice <input checked="" type="checkbox"/> | | | | | | | | | |

11.1 11

D17734: Chain of Custody
Page 1 of 1
Accutest Labs of New England, Inc.

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17734
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | 0.50 | 0.0 | mg/kg | 12 | 11.9 | 99.2 | 80-120% |
| Chromium, Hexavalent | GP12078/GN32952 | | | mg/kg | 650 | 660 | 101.5 | 80-120% |

Associated Samples:

Batch GP12078: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

(*) Outside of QC limits

12.1
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17734
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32947 | D17737-6 | mv | 349 | 338 | 3.2 | 0-20% |

Associated Samples:

Batch GN32947: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

Batch GP12078: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

(*) Outside of QC limits

12.2
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17734
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 12 | 9.2 | 76.7 | 75-125% |
| Chromium, Hexavalent | GP12078/GN32952 | D17735-4 | mg/kg | 0.0 | 723 | 623 | 86.2 | 75-125% |

Associated Samples:

Batch GP12078: D17734-1, D17734-2, D17734-3, D17734-4, D17734-5, D17734-6, D17734-7

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D20215

Sampling Date: 01/05/11

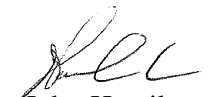
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
tcpersaud@marathonoil.com; randy_march@golder.com;
Benjamin_Yanda@golder.com; swales@marathonoil.com
ATTN: R March

Total number of pages in report: **116**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|---|------------|
| Section 1: Sample Summary | 4 |
| Section 2: Case Narrative/Conformance Summary | 5 |
| Section 3: Sample Results | 9 |
| 3.1: D20215-1: SG1-31A | 10 |
| 3.2: D20215-1A: SG1-31A | 16 |
| 3.3: D20215-2: SG1-31A DUP | 18 |
| 3.4: D20215-2A: SG1-31A DUP | 24 |
| 3.5: D20215-3: AM1-31A | 26 |
| 3.6: D20215-4: AM2-31A | 32 |
| 3.7: D20215-5: AM3-31A | 38 |
| 3.8: D20215-6: AM3-31A DUP | 44 |
| 3.9: D20215-7: AM4-31A | 50 |
| 3.10: D20215-8: AM5-31A | 56 |
| Section 4: Misc. Forms | 62 |
| 4.1: Chain of Custody | 63 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 64 |
| 5.1: Method Blank Summary | 65 |
| 5.2: Blank Spike Summary | 66 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 67 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 68 |
| 6.1: Method Blank Summary | 69 |
| 6.2: Blank Spike Summary | 70 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 71 |
| Section 7: GC Volatiles - QC Data Summaries | 72 |
| 7.1: Method Blank Summary | 73 |
| 7.2: Blank Spike Summary | 74 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 75 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 76 |
| 8.1: Method Blank Summary | 77 |
| 8.2: Blank Spike Summary | 78 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 79 |
| Section 9: Metals Analysis - QC Data Summaries | 80 |
| 9.1: Prep QC MP3753: Hg | 81 |
| 9.2: Prep QC MP3757: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 85 |
| 9.3: Prep QC MP3758: As | 95 |
| 9.4: Prep QC MP3768: Ca,Mg,Na,Sodium Adsorption Ratio | 100 |
| Section 10: General Chemistry - QC Data Summaries | 108 |
| 10.1: Method Blank and Spike Results Summary | 109 |
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 110 |
| 11.1: Chain of Custody | 111 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 113 |
| 12.1: Method Blank and Spike Results Summary | 114 |

Table of Contents

Sections:

1

2

3

4

5

6

7

8

9

10

11

12

-2-

| | |
|---|-----|
| 12.2: Duplicate Results Summary | 115 |
| 12.3: Matrix Spike Results Summary | 116 |



Sample Summary

Marathon Oil

Job No: D20215

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D20215-1 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | SG1-31A |
| D20215-1A | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | SG1-31A |
| D20215-2 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | SG1-31A DUP |
| D20215-2A | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | SG1-31A DUP |
| D20215-3 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM1-31A |
| D20215-4 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM2-31A |
| D20215-5 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM3-31A |
| D20215-6 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM3-31A DUP |
| D20215-7 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM4-31A |
| D20215-8 | 01/05/11 | 12:30 BY | 01/06/11 | SO | Soil | AM5-31A |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D20215

Site: Roan Pit Closure

Report Dat 1/13/2011 9:10:21 AM

On 01/06/2011, eight (8) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 5.1°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D20215 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V719 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D20215-1MS and D20215-1MSD were used as the QC samples indicated.
- The method blank for this batch meets method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2993 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D20215-1MS and D20215-1MSD were used as the QC samples indicated.
- The matrix spike duplicate (MSD) recovery of Dibenzo(a,h)anthracene is outside control limits. Probable cause due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of a number of analytes are outside control limits. The spike amounts are low relative to the sample amounts. Refer to the lab control or spike blank for recovery information.
- The RPDs for the MS and MSD recoveries of a number of analytes are outside control limits for sample OP2993-MSD. The high RPDs are due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB478 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Samples D20215-1MS and D20215-1MSD were used as the QC samples indicated.
- The method blank for this batch meets method specific criteria.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2992 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D20174-1MS and D20174-1MSD were used as the QC samples indicated.
- The method blank for this batch meets method specific criteria.

Metals By Method SW846 6010B

Matrix AQ **Batch ID:** MP3768

- All samples were digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D20215-2AMS and D20215-2AMSD were used as the QC samples for the metals analysis.

Matrix SO **Batch ID:** MP3757

- All samples were digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D20215-3MS, D20215-3MSD, and D20215-3SDL were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate (MS) recoveries of Barium, Selenium, and Zinc are outside control limits. Probable cause due to matrix interference. Refer to the lab control or spike blank for recovery information.
- The serial dilution RPDs for Cadmium, Copper, Nickel, Selenium, and Zinc are outside control limits for sample MP3757-SD1. The percent difference is acceptable for Cadmium due to low initial sample concentration (< 50 times IDL).
- MP3757-S1 for Copper, Nickel, Selenium, and Zinc: Spike recovery indicates possible matrix interference.

Metals By Method SW846 6020

Matrix SO **Batch ID:** MP3758

- All samples were digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D20215-3MS, D20215-3MSD, and D20215-3SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

Matrix SO **Batch ID:** MP3753

- All samples were digested and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.
- Samples D20215-1MS and D20215-1MSD were used as the QC samples for the Mercury analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix SO **Batch ID:** M:GN33893

- The data for ASTM D1498-76M meets quality control requirements.
- Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method DEPT.OF AG, BOOK N9

Matrix SO **Batch ID:** GP3557

- All samples were prepared and analyzed within the recommended method holding time.
- The method blank for this batch meets method specific criteria.

Wet Chemistry By Method LADNR29B

Matrix SO **Batch ID:** MP3768

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO **Batch ID:** GN7782

- The data for SM19 2540B M meets quality control requirements.
- Percent Solids: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

| | |
|------------------|------------------------|
| Matrix SO | Batch ID: R5910 |
|------------------|------------------------|

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium: Calculated as: (Chromium) - (Hexavalent Chromium)

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|----------------------------|
| Matrix SO | Batch ID: M:GP12501 |
|------------------|----------------------------|

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D20215

Site: MOILCOGJ: Roan Pit Closure

Report Date 1/10/2011 5:41:23 PM

8 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 01/05/2011 and were received at Accutest on 01/06/2011 properly preserved, at 1.7 Deg. C and intact. These Samples received an Accutest job number of D20215. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM D1498-76M

Matrix: SO

Batch ID: GN33893

- Sample(s) D20215-3DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix: SO

Batch ID: GP12501

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D20215-1DUP, D20215-1MS were used as the QC samples for Chromium, Hexavalent.
- Matrix Spike Recovery(s) for Chromium, Hexavalent are outside control limits. Soluble spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to spike blank.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D20215).

Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12490.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.01 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0491 | 0.062 | 0.018 | mg/kg | J |
| 108-88-3 | Toluene | 0.0976 | 0.12 | 0.062 | mg/kg | J |
| 100-41-4 | Ethylbenzene | 0.0251 | 0.12 | 0.025 | mg/kg | J |
| | m,p-Xylene | 0.120 | 0.25 | 0.043 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 100% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 103% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: SG1-31A | |
| Lab Sample ID: D20215-1 | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | Date Received: 01/06/11 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 76.5 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02622.D | 10 | 01/12/11 | TMB | 01/06/11 | OP2993 | E3G88 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.0849 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.627 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.354 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.910 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.335 | 0.066 | 0.041 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.441 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.859 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0810 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 1.00 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.0699 | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.368 | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.121 | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.233 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.126 | 0.33 | 0.073 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.638 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.410 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 52% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 61% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 59% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8927.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 12.7 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 92% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5262.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 269 | 13 | 8.7 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 116% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: SG1-31A

Lab Sample ID: D20215-1

Matrix: SO - Soil

Project: Roan Pit Closure

Date Sampled: 01/05/11

Date Received: 01/06/11

Percent Solids: 76.5^a

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.4 | 0.40 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 792 | 0.99 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.99 | 0.99 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 24.2 | 0.99 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 17.7 | 0.50 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 8.2 | 5.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.088 | 0.088 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 14.9 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.0 | 5.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.3 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1234

(2) Instrument QC Batch: MA1235

(3) Instrument QC Batch: MA1238

(4) Prep QC Batch: MP3753

(5) Prep QC Batch: MP3757

(6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.39 | 0.39 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 24.2 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 319 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 76.5 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| Specific Conductivity | 768 | 1.0 | umhos/cm | 1 | 01/10/11 | JK | DEPT.OF AG, BOOK N9 |
| pH | 9.41 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1A | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|-------------------|-------------|--------------------------|------------------------|
| Calcium | 36.2 | 2.0 | mg/l | 1 | 01/07/11 01/10/11 | JM | SW846 6010B ² | EPA 200.7 ³ |
| Magnesium | 4.17 | 1.0 | mg/l | 1 | 01/07/11 01/07/11 | JM | SW846 6010B ¹ | EPA 200.7 ³ |
| Sodium | 124 | 2.0 | mg/l | 1 | 01/07/11 01/07/11 | JM | SW846 6010B ¹ | EPA 200.7 ³ |

(1) Instrument QC Batch: MA1237

(2) Instrument QC Batch: MA1241

(3) Prep QC Batch: MP3768

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: SG1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-1A | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 5.20 | | ratio | 1 | 01/10/11 16:33 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12493.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.02 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0646 | 0.062 | 0.019 | mg/kg | |
| 108-88-3 | Toluene | 0.127 | 0.12 | 0.062 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.0461 | 0.12 | 0.025 | mg/kg | J |
| | m,p-Xylene | 0.201 | 0.25 | 0.044 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.044 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 101% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 104% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: SG1-31A DUP | | |
| Lab Sample ID: D20215-2 | | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | | Date Received: 01/06/11 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 75.0 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02576.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.151 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.966 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.552 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1.23 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.481 | 0.066 | 0.041 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.398 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.912 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.375 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 1.15 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.100 | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.895 | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.105 | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.218 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.102 | 0.33 | 0.073 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.628 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.546 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 65% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 47% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 59% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8930.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 14.6 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 96% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5263.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 433 | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 116% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: SG1-31A DUP**Lab Sample ID:** D20215-2**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 01/05/11**Date Received:** 01/06/11**Percent Solids:** 75.0 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.3 | 0.41 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 796 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 22.6 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 18.6 | 0.52 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 8.1 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.091 | 0.091 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.0 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.2 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1234

(2) Instrument QC Batch: MA1235

(3) Instrument QC Batch: MA1238

(4) Prep QC Batch: MP3753

(5) Prep QC Batch: MP3757

(6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.40 | 0.40 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 22.6 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 311 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 75 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| Specific Conductivity | 600 | 1.0 | umhos/cm | 1 | 01/10/11 | JK | DEPT.OF AG, BOOK N9 |
| pH | 9.45 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2A | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 40.4 | 2.0 | mg/l | 1 | 01/07/11 | 01/07/11 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 5.09 | 1.0 | mg/l | 1 | 01/07/11 | 01/07/11 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 85.9 | 2.0 | mg/l | 1 | 01/07/11 | 01/07/11 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1237

(2) Prep QC Batch: MP3768

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: SG1-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-2A | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 75.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 3.38 | | ratio | 1 | 01/07/11 17:21 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: AM1-31A | | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-3 | | Date Received: 01/06/11 |
| Matrix: SO - Soil | | Percent Solids: 78.1 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12494.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.061 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.061 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | ND | 0.24 | 0.043 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 105% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 112% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | AM1-31A | Date Sampled: | 01/05/11 |
| Lab Sample ID: | D20215-3 | Date Received: | 01/06/11 |
| Matrix: | SO - Soil | Percent Solids: | 78.1 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02577.D | 5 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.0341 | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0415 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0264 | 0.033 | 0.021 | mg/kg | J |
| 207-08-9 | Benzo(k)fluoranthene | 0.0224 | 0.033 | 0.021 | mg/kg | J |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0347 | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0307 | 0.033 | 0.020 | mg/kg | J |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0226 | 0.033 | 0.022 | mg/kg | J |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 52% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 35% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 40% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

| | | |
|----------------------------------|--|--|
| Client Sample ID: AM1-31A | | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-3 | | Date Received: 01/06/11 |
| Matrix: SO - Soil | | Percent Solids: 78.1 ^a |
| Method: SW846 8015B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8931.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.5
3

| | |
|--|--|
| Client Sample ID: AM1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-3 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.1 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5264.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 102% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-3 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.1 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 4.0 | 0.38 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 281 | 0.96 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 42.0 | 0.96 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 11.8 | 0.48 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 8.6 | 4.8 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 19.5 | 2.9 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.3 | 2.9 | mg/kg | 1 | 01/06/11 | 01/06/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1234
- (2) Instrument QC Batch: MA1235
- (3) Instrument QC Batch: MA1238
- (4) Prep QC Batch: MP3753
- (5) Prep QC Batch: MP3757
- (6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM1-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-3 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.1 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.39 | 0.39 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 41.8 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 329 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 78.1 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.07 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM2-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-4 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 79.7 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12495.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0420 | 0.060 | 0.018 | mg/kg | J |
| 108-88-3 | Toluene | 0.0790 | 0.12 | 0.060 | mg/kg | J |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.024 | mg/kg | |
| | m,p-Xylene | 0.0868 | 0.24 | 0.042 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 103% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 107% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | | 70-130% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: AM2-31A | |
| Lab Sample ID: D20215-4 | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | Date Received: 01/06/11 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 79.7 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02578.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.115 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.756 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.403 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1.08 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.322 | 0.066 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.338 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.672 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.141 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.986 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.0798 | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.608 | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.459 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.411 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 53% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 39% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 44% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM2-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-4 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 79.7 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8932.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 13.1 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.6
3

| | |
|--|--|
| Client Sample ID: AM2-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-4 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 79.7 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5265.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 130 | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 103% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM2-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-4 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 79.7 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.6 | 0.40 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 789 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 35.2 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 15.7 | 0.51 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 8.8 | 5.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.086 | 0.086 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 18.1 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.1 | 5.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.0 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.4 | 3.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1234
- (2) Instrument QC Batch: MA1235
- (3) Instrument QC Batch: MA1238
- (4) Prep QC Batch: MP3753
- (5) Prep QC Batch: MP3757
- (6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM2-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-4 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 79.7 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.40 | 0.40 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 34.9 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 314 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 79.7 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.16 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: AM3-31A | | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-5 | | Date Received: 01/06/11 |
| Matrix: SO - Soil | | Percent Solids: 78.2 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12496.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.06 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0236 | 0.060 | 0.018 | mg/kg | J |
| 108-88-3 | Toluene | ND | 0.12 | 0.060 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.0349 | 0.12 | 0.024 | mg/kg | J |
| | m,p-Xylene | 0.0856 | 0.24 | 0.042 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 103% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 109% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 96% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: AM3-31A | | |
| Lab Sample ID: D20215-5 | | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | | Date Received: 01/06/11 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 78.2 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02579.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.144 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 1.00 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.509 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1.15 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.417 | 0.066 | 0.041 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.413 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.932 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.307 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 1.27 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.0982 | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.752 | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.0748 | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.145 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.0740 | 0.33 | 0.073 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.667 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.515 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 64% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 47% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 52% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: AM3-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-5 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.2 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8933.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.1 g | 5.0 ml | 100 ul |
| Run #2 | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

37
3

| | |
|--|--|
| Client Sample ID: AM3-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-5 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.2 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5266.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 197 | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 114% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM3-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-5 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.2 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 4.3 | 0.42 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 579 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 39.6 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 12.6 | 0.52 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 8.2 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.089 | 0.089 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 20.8 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 30.6 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1234
- (2) Instrument QC Batch: MA1235
- (3) Instrument QC Batch: MA1238
- (4) Prep QC Batch: MP3753
- (5) Prep QC Batch: MP3757
- (6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM3-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-5 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.2 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.40 | 0.40 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 39.2 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 302 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 78.2 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.24 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | | |
|--------------------------------------|--|--|
| Client Sample ID: AM3-31A DUP | | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-6 | | Date Received: 01/06/11 |
| Matrix: SO - Soil | | Percent Solids: 78.4 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12497.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.04 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | 0.0294 | 0.060 | 0.018 | mg/kg | J |
| 108-88-3 | Toluene | 0.0751 | 0.12 | 0.060 | mg/kg | J |
| 100-41-4 | Ethylbenzene | 0.0421 | 0.12 | 0.024 | mg/kg | J |
| | m,p-Xylene | 0.107 | 0.24 | 0.042 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 102% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 106% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | | |
|--------------------------|--------------------------------|------------------------|-------------------|
| Client Sample ID: | AM3-31A DUP | Date Sampled: | 01/05/11 |
| Lab Sample ID: | D20215-6 | Date Received: | 01/06/11 |
| Matrix: | SO - Soil | Percent Solids: | 78.4 ^a |
| Method: | SW846 8270C BY SIM SW846 3540C | | |
| Project: | Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02580.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.118 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.771 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.398 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.911 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.328 | 0.066 | 0.041 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.324 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.704 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.141 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.895 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | 0.0796 | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.618 | 0.066 | 0.043 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | 0.0939 | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | 0.139 | 0.33 | 0.10 | mg/kg | J |
| 91-20-3 | Naphthalene | 0.0734 | 0.33 | 0.073 | mg/kg | J |
| 85-01-8 | Phenanthrene | 0.486 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.385 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 61% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 41% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 43% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.8
3

| | |
|--------------------------------------|--|
| Client Sample ID: AM3-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-6 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8934.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 13.1 | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 98% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis



| | |
|--|--|
| Client Sample ID: AM3-31A DUP | |
| Lab Sample ID: D20215-6 | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | Date Received: 01/06/11 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 78.4 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5267.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 125 | 13 | 8.7 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 121% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

Client Sample ID: AM3-31A DUP**Lab Sample ID:** D20215-6**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 01/05/11**Date Received:** 01/06/11**Percent Solids:** 78.4 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.7 | 0.38 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 618 | 0.95 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.95 | 0.95 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 33.6 | 0.95 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 14.6 | 0.48 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 7.9 | 4.8 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.3 | 2.9 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 30.4 | 2.9 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1234

(2) Instrument QC Batch: MA1235

(3) Instrument QC Batch: MA1238

(4) Prep QC Batch: MP3753

(5) Prep QC Batch: MP3757

(6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|--------------------------------------|--|
| Client Sample ID: AM3-31A DUP | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-6 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 78.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.43 | 0.40 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 33.2 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 317 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 78.4 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.33 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM4-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-7 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.0 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12498.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.02 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.062 | 0.019 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.062 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.025 | mg/kg | |
| | m,p-Xylene | 0.103 | 0.25 | 0.043 | mg/kg | J |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 107% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 112% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | | 70-130% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: AM4-31A | |
| Lab Sample ID: D20215-7 | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | Date Received: 01/06/11 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 76.0 ^a |
| Project: Roan Pit Closure | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02581.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.066 | 0.062 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.33 | 0.068 | mg/kg | |
| 120-12-7 | Anthracene | 0.0743 | 0.066 | 0.043 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.242 | 0.066 | 0.065 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.174 | 0.066 | 0.042 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.358 | 0.066 | 0.048 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.136 | 0.066 | 0.042 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.148 | 0.066 | 0.042 | mg/kg | |
| 218-01-9 | Chrysene | 0.198 | 0.066 | 0.033 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0896 | 0.066 | 0.049 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.276 | 0.066 | 0.041 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.066 | 0.065 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.239 | 0.066 | 0.044 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.066 | 0.059 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.33 | 0.10 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.33 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.146 | 0.066 | 0.053 | mg/kg | |
| 129-00-0 | Pyrene | 0.142 | 0.066 | 0.045 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 59% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 44% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 48% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

| | |
|----------------------------------|--|
| Client Sample ID: AM4-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-7 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.0 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8935.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: AM4-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-7 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5268.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 78.9 | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 112% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

Client Sample ID: AM4-31A

Lab Sample ID: D20215-7

Matrix: SO - Soil

Date Sampled: 01/05/11

Date Received: 01/06/11

Percent Solids: 76.0 ^a

Project: Roan Pit Closure

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.5 | 0.41 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 282 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 36.4 | 1.0 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 11.3 | 0.52 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 7.8 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.098 | 0.098 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 18.8 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.1 | 3.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1234

(2) Instrument QC Batch: MA1235

(3) Instrument QC Batch: MA1238

(4) Prep QC Batch: MP3753

(5) Prep QC Batch: MP3757

(6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM4-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-7 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 76.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.45 | 0.39 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 36.0 | 1.4 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 344 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 76 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.21 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM5-31A | |
| Lab Sample ID: D20215-8 | Date Sampled: 01/05/11 |
| Matrix: SO - Soil | Date Received: 01/06/11 |
| Method: SW846 8260B | Percent Solids: 77.5 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V12499.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.061 | 0.018 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.061 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.025 | mg/kg | |
| | m,p-Xylene | ND | 0.25 | 0.043 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.043 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 106% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 109% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: AM5-31A | | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-8 | | Date Received: 01/06/11 |
| Matrix: SO - Soil | | Percent Solids: 77.5 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02582.D | 5 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.0333 | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.0373 | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0543 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0291 | 0.033 | 0.021 | mg/kg | J |
| 207-08-9 | Benzo(k)fluoranthene | 0.0269 | 0.033 | 0.021 | mg/kg | J |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0363 | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0352 | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0281 | 0.033 | 0.022 | mg/kg | J |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | 0.0232 | 0.033 | 0.022 | mg/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 42% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 33% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 40% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM5-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-8 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 77.5 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB8936.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.1 g | 5.0 ml | 100 ul |
| Run #2 | | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 96% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: AM5-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-8 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 77.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD5269.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | 8.6 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 113% | | 63-130% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM5-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-8 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 77.5 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 3.4 | 0.42 | mg/kg | 5 | 01/06/11 | 01/07/11 JM | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 275 | 1.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 35.7 | 1.1 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 14.8 | 0.53 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 10 | 5.3 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 01/06/11 | 01/06/11 JB | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 22.5 | 3.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.3 | 5.3 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 31.3 | 3.2 | mg/kg | 1 | 01/06/11 | 01/07/11 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1234
- (2) Instrument QC Batch: MA1235
- (3) Instrument QC Batch: MA1238
- (4) Prep QC Batch: MP3753
- (5) Prep QC Batch: MP3757
- (6) Prep QC Batch: MP3758

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: AM5-31A | Date Sampled: 01/05/11 |
| Lab Sample ID: D20215-8 | Date Received: 01/06/11 |
| Matrix: SO - Soil | Percent Solids: 77.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.39 | 0.39 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 35.4 | 1.5 | mg/kg | 1 | 01/10/11 16:33 | AMA | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 333 | | mv | 1 | 01/07/11 | AMA | ASTM D1498-76M |
| Solids, Percent ^a | 77.5 | | % | 1 | 01/06/11 | CJ | SM19 2540B M |
| pH | 9.17 | | su | 1 | 01/06/11 11:05 | JD | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, Colorado 80033
TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
www.accutest.com

FED-EX Tracking #
Boille Order Control #
Accutest Quote #
Accutest Job # **D20215**

| Client / Reporting Information | | Project Information | | | | Requested Analysis (see TEST CODE sheet) | | | | | | | | | | | | Matrix Codes | |
|--|--|---|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Company Name Golden Assoc. | | Project Name MARATHON Roan Pit Closure | | | | V805GR0 B8015DR0 B8270SUMPAH V8240RSTX ASMS YXCPA Table 910 metals * SAR SCON PH | | | | | | | | | | | | DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIO - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank | |
| Street Address 44 Union Blvd Surf300 | | Street | | | | | | | | | | | | | | | | | |
| City State Zip Lake wood CO 80403 | | Billing Information (if different from Report to) | | | | | | | | | | | | | | | | | |
| Project Contact Randy March | | Street Address | | | | | | | | | | | | | | | | | |
| Phone # 303.980.0540 | | Client Purchase Order # | | | | | | | | | | | | | | | | | |
| Samples(s) Name(s) BEN YANDA | | Project Manager | | | | | | | | | | | | | | | | | |

| Account Sample # | Field ID / Point of Collection | MEQ(HD) Vial # | Collection | | | Matrix | # of bottles | Number of preserved Bottles | | | | | | | | | | LAB USE ONLY | | | | | | | | |
|------------------|--------------------------------|----------------|-------------|--------------|------------|-----------|--------------|-----------------------------|-------------------|------------------|--------------------------------|------------------|----------|------|--------|--|--|--------------|--|--|--|--|--|--|--|--|
| | | | Date | Time | Sampled by | | | HCl | NiCl ₂ | HNO ₃ | H ₂ SO ₄ | HNO ₂ | DI Water | MEDH | ENCODE | | | | | | | | | | | |
| | S61-31A | | 01/5 | 12:30 | BI | 30 | 6 | | | | | | | | | | | | | | | | | | | |
| | S61-31A DUP | | 1/5 | | | | 6 | | | | | | | | | | | | | | | | | | | |
| | AM2-31A | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | AM2-31A | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | AM3-31A | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | AM3-31A DUP | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | AM4-31A | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |
| | AM5-31A | | 1/5 | | | | 5 | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|--|------------------------------------|--|---|--|--|--|---|--|--|--|--|--|--|--|
| Turnaround Time (Business days) | | Approved By (Accutest PM): / Date: | | Data Deliverable Information | | | | Comments / Special Instructions | | | | | | | |
| <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input type="checkbox"/> 3 - 5 Day RUSH <input checked="" type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY | | | | <input type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable | | | | <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other | | | | * Ba, Cd, Cr, Cr3, Cu, Pb, Hg, Ni, Se, Ag, Zn | | | |

| | | | | | | | | | | | | | | | | | |
|---|--|-------------------------------|--|---------------------------------------|--|------------|--|--|--|---|--|---|--|-------------------------|--|--------------------------|--|
| Emergency & Rush T/A data available VIA Lablink | | | | | | | | Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | |
| Relinquished by Sampler: 1 Ben Yanda | | Date Time: 01/6 815 | | Received By: Amanda Russell | | Date Time: | | Relinquished By: 2 | | Date Time: | | Received By: 2 | | Date Time: | | Received By: 2 | |
| Relinquished by Sampler: 3 | | Date Time: | | Received By: 3 | | Date Time: | | Relinquished By: 4 | | Date Time: | | Received By: 4 | | Date Time: | | Received By: | |
| Relinquished by: 5 | | Date Time: | | Received By: 5 | | Date Time: | | Custody Seal # <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not intact | | Preserved where applicable <input checked="" type="checkbox"/> | | On Ice <input checked="" type="checkbox"/> | | Cooler Temp. 5.8 | | | |

4.1
4

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V719-MB1 | 5V12488.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 103% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103% | 70-130% |

Blank Spike Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V719-BS1 | 5V12489.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 54.7 | 109 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 57.7 | 115 | 70-130 |
| 108-88-3 | Toluene | 50 | 54.5 | 109 | 70-130 |
| | m,p-Xylene | 50 | 52.7 | 105 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 51.9 | 104 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|------|---------|
| 2037-26-5 | Toluene-D8 | 103% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 107% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D20215-1MS | 5V12491.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| D20215-1MSD | 5V12492.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |
| D20215-1 | 5V12490.D | 1 | 01/06/11 | DC | n/a | n/a | V5V719 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | D20215-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | 49.1 | J | 3080 | 3580 | 115 | 3640 | 116 | 2 | 55-140/30 |
| 100-41-4 | Ethylbenzene | 25.1 | J | 3080 | 3700 | 119 | 3780 | 122 | 2 | 56-139/30 |
| 108-88-3 | Toluene | 97.6 | J | 3080 | 3410 | 107 | 3500 | 110 | 3 | 57-144/30 |
| | m,p-Xylene | 120 | J | 3080 | 3540 | 111 | 3660 | 115 | 3 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | | 3080 | 3370 | 109 | 3470 | 113 | 3 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D20215-1 | Limits |
|------------|-----------------------|------|------|----------|---------|
| 2037-26-5 | Toluene-D8 | 100% | 104% | 100% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 119% | 122% | 103% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 102% | 103% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2993-MB | 3G02571.D | 1 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 47% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 39% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 55% | 17-174% |

Blank Spike Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2993-BS | 3G02572.D | 1 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 57.3 | 69 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 55.7 | 67 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 51.0 | 61 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 56.6 | 68 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 48.9 | 59 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 52.4 | 63 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 49.1 | 59 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 54.8 | 66 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 53.2 | 64 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 46.6 | 56 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 51.2 | 61 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 51.9 | 62 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 39.8 | 48 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 51.0 | 61 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 49.2 | 59 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 49.1 | 59 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 51.9 | 62 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 51.3 | 62 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 57% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 48% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 59% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2993-MS | 3G02574.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| OP2993-MSD | 3G02575.D | 10 | 01/07/11 | TMB | 01/06/11 | OP2993 | E3G85 |
| D20215-1 | 3G02622.D | 10 | 01/12/11 | TMB | 01/06/11 | OP2993 | E3G88 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | D20215-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-------|-------------------|
| 83-32-9 | Acenaphthene | ND | | 83.3 | 119 | 143 | 91.0 | 109 | 27 | 20-151/30 |
| 208-96-8 | Acenaphthylene | ND | | 83.3 | 115 | 138 | 103 | 124 | 11 | 23-156/30 |
| 120-12-7 | Anthracene | 84.9 | | 83.3 | 206 | 125 | 148 | 55 | 33* a | 25-149/30 |
| 56-55-3 | Benzo(a)anthracene | 627 | | 83.3 | 1090 | 537* b | 649 | 7* b | 51* a | 22-157/30 |
| 50-32-8 | Benzo(a)pyrene | 354 | | 83.3 | 683 | 375* b | 410 | 47 | 50* a | 23-153/30 |
| 205-99-2 | Benzo(b)fluoranthene | 910 | | 83.3 | 1830 | 1299* b | 768 | 24 | 82* a | 22-161/30 |
| 191-24-2 | Benzo(g,h,i)perylene | 335 | | 83.3 | 553 | 294* b | 333 | 30 | 50* a | 20-158/30 |
| 207-08-9 | Benzo(k)fluoranthene | 441 | | 83.3 | 579 | 345* b | 349 | 69 | 50* a | 17-161/30 |
| 218-01-9 | Chrysene | 859 | | 83.3 | 1030 | 498* b | 587 | -34* b | 55* a | 16-159/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | 81.0 | | 83.3 | 186 | 76 | 133 | 12* c | 33* a | 21-154/30 |
| 206-44-0 | Fluoranthene | 1000 | | 83.3 | 1390 | 744* b | 783 | 16 | 56* a | 16-140/30 |
| 86-73-7 | Fluorene | 69.9 | | 83.3 | 172 | 112 | 125 | 55 | 32* a | 15-153/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 368 | | 83.3 | 1040 | 608* b | 662 | 154 | 44* a | 21-159/30 |
| 90-12-0 | 1-Methylnaphthalene | 121 | | 83.3 | 164 | 95 | 121 | 43 | 30 | 10-148/30 |
| 91-57-6 | 2-Methylnaphthalene | 233 | J | 83.3 | 281 | 140 | 214 | 60 | 27 | 10-181/30 |
| 91-20-3 | Naphthalene | 126 | J | 83.3 | 162 | 73 | 126 | 30 | 25 | 10-176/30 |
| 85-01-8 | Phenanthrene | 638 | | 83.3 | 757 | 365* b | 457 | 5* b | 49* a | 22-152/30 |
| 129-00-0 | Pyrene | 410 | | 83.3 | 625 | 300* b | 360 | -18* b | 54* a | 10-200/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D20215-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 60% | 56% | 52% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 49% | 42% | 61% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 57% | 47% | 59% | 17-174% |

- (a) High RPD due to possible sample nonhomogeneity.
- (b) Outside control limits due to high level in sample relative to spike amount.
- (c) Outside control limits due to matrix interference. Refer to Blank Spike.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB478-MB | GB8925.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|--------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 107% 60-140% |

Blank Spike Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB478-BS | GB8926.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |

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

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 93.6 | 85 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 108% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D20215-1MS | GB8928.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| D20215-1MSD | GB8929.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |
| D20215-1 | GB8927.D | 1 | 01/07/11 | BR | n/a | n/a | GGB478 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | D20215-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | 12.7 | 136 | 127 | 84 | 123 | 81 | 3 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D20215-1 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 99% | 96% | 92% | 60-140% |

7.3.1

7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2992-MB | FD5255.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |

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

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|-------------------|--------|----|-----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | 8.7 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 106% 63-130% |

Blank Spike Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2992-BS | FD5256.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 581 | 87 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl | 99% | 63-130% |

8.2.1

8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D20215
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2992-MS | FD5260.D | 2 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| OP2992-MSD | FD5259.D | 2 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |
| D20174-1 | FD5257.D | 1 | 01/06/11 | JB | 01/06/11 | OP2992 | GFD233 |

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

D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

| CAS No. | Compound | D20174-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 1180 | 748 | 1850 | 90 | 2110 | 124 | 13 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D20174-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 104% | 111% | 102% | 63-130% |

8.3.1
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3753
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 01/06/11

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | -0.0057 | <0.10 |

Associated samples MP3753: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3753
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-1 Original MS | Spike HGWSR1 | lot % Rec | QC Limits |
|-------|-------------------------|-----------------|--------------|--------------|
|-------|-------------------------|-----------------|--------------|--------------|

Mercury 0.0037 0.39 0.385 100.4 85-115

Associated samples MP3753: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3753
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-1 Original MSD | SpikeLot HGWSR1 | % Rec | MSD RPD | QC Limit |
|-------|--------------------------|--------------------|-------|------------|-------------|
|-------|--------------------------|--------------------|-------|------------|-------------|

| | | | | | | |
|---------|--------|------|-------|------|------|----|
| Mercury | 0.0037 | 0.34 | 0.339 | 99.2 | 13.7 | 20 |
|---------|--------|------|-------|------|------|----|

Associated samples MP3753: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3753
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 01/06/11

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.40 | 0.4 | 100.0 | 80-120 |

Associated samples MP3753: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 01/06/11

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 10 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.45 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.080 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | -0.070 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.25 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.070 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | -0.13 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | -0.10 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.40 | <3.0 |

Associated samples MP3757: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

9.2.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3757
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-3 Original MS | | SpikeLot MPICPALL % Rec | QC Limits |
|------------|-------------------------|------|----------------------------|-----------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 281 | 419 | 206 | 66.9N(a) 75-125 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 0.15 | 42.8 | 51.5 | 82.7 75-125 |
| Calcium | | | | |
| Chromium | 42.0 | 88.0 | 51.5 | 89.2 75-125 |
| Cobalt | | | | |
| Copper | 11.8 | 62.5 | 51.5 | 98.4 75-125 |
| Iron | | | | |
| Lead | 8.6 | 93.9 | 103 | 82.7 75-125 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 19.5 | 61.5 | 51.5 | 81.5 75-125 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 2.3 | 78.6 | 103 | 74.0N(b) 75-125 |
| Silicon | | | | |
| Silver | 0.0 | 15.7 | 20.6 | 76.1 75-125 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 31.3 | 69.0 | 51.5 | 73.1N(b) 75-125 |

Associated samples MP3757: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- (b) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3757
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-3 Original MSD | | SpikeLot MPICPALL % Rec | MSD RPD | QC Limit | |
|------------|--------------------------|------|----------------------------|------------|-------------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | anr | | | | | |
| Barium | 281 | 404 | 208 | 59.0N(a) | 3.6 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 0.15 | 43.0 | 52.1 | 82.3 | 0.5 | 20 |
| Calcium | | | | | | |
| Chromium | 42.0 | 85.6 | 52.1 | 83.7 | 2.8 | 20 |
| Cobalt | | | | | | |
| Copper | 11.8 | 62.6 | 52.1 | 97.5 | 0.2 | 20 |
| Iron | | | | | | |
| Lead | 8.6 | 94.1 | 104 | 82.1 | 0.2 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 19.5 | 62.2 | 52.1 | 82.0 | 1.1 | 20 |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | 2.3 | 79.4 | 104 | 74.0N(b) | 1.0 | 20 |
| Silicon | | | | | | |
| Silver | 0.0 | 15.7 | 20.8 | 75.4 | 0.0 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 31.3 | 69.1 | 52.1 | 72.6N(b) | 0.1 | 20 |

Associated samples MP3757: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- (b) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3757
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 01/06/11

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 186 | 200 | 93.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 45.9 | 50 | 91.8 | 80-120 |
| Calcium | | | | |
| Chromium | 49.6 | 50 | 99.2 | 80-120 |
| Cobalt | | | | |
| Copper | 51.8 | 50 | 103.6 | 80-120 |
| Iron | | | | |
| Lead | 94.5 | 100 | 94.5 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 47.5 | 50 | 95.0 | 80-120 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 83.6 | 100 | 83.6 | 80-120 |
| Silicon | | | | |
| Silver | 18.2 | 20 | 91.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 42.9 | 50 | 85.8 | 80-120 |

Associated samples MP3757: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3757
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 01/06/11

| Metal | D20215-3 Original SDL 1:5 | | %DIF | QC Limits |
|------------|------------------------------|------|----------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 2930 | 3030 | 3.5 | 0-10 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 1.60 | 0.00 | 100.0(a) | 0-10 |
| Calcium | | | | |
| Chromium | 437 | 479 | 9.7 | 0-10 |
| Cobalt | | | | |
| Copper | 123 | 109 | 11.9*(b) | 0-10 |
| Iron | | | | |
| Lead | 89.1 | 97.0 | 8.9 | 0-10 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 203 | 230 | 13.5*(b) | 0-10 |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | 23.9 | 28.5 | 19.2 (a) | 0-10 |
| Silicon | | | | |
| Silver | 0.00 | 0.00 | NC | 0-10 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 325 | 390 | 20.0*(b) | 0-10 |

Associated samples MP3757: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3757
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3758
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 01/06/11

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.11 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3758: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3758
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-3 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|-----|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 4.0 | 100 | 103 | 93.1 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3758: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3758
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 01/06/11

| Metal | D20215-3 Original MSD | | SpikeLot MPICPALL % Rec | MSD RPD | QC Limit | |
|------------|--------------------------|-----|----------------------------|------------|-------------|----|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 4.0 | 104 | 104 | 96.0 | 3.9 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3758: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3758
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 01/06/11

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 102 | 100 | 102.0 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3758: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3758
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 01/06/11

| Metal | D20215-3 Original SDL 5:25 %DIF | | | QC Limits |
|------------|------------------------------------|------|-----|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 42.6 | 42.8 | 2.4 | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3758: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.3.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3768
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 01/07/11

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 109 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | -3.0 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -620 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3768: D20215-1A, D20215-2A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3768
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3768
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 01/07/11

| Metal | D20215-2A Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|--------------------------|--------|----------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 40400 | 160000 | 125000 | 95.7 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 5090 | 149000 | 125000 | 115.1 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 85900 | 210000 | 125000 | 99.3 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3768: D20215-1A, D20215-2A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3768
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3768
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 01/07/11

| Metal | D20215-2A Original MSD | | SpikeLot MPICPAL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|---------------------------|------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 40400 | 158000 | 125000 | 94.1 | 1.3 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 5090 | 129000 | 125000 | 99.1 | 14.4 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 85900 | 184000 | 125000 | 78.5 | 13.2 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3768: D20215-1A, D20215-2A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3768
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3768
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 01/07/11

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 127000 | 125000 | 101.6 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 125000 | 125000 | 100.0 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 125000 | 125000 | 100.0 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3768: D20215-1A, D20215-2A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.4.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3768
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D20215
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|-----|-----------|----------|--------------|------------|------------|-------------|
| Specific Conductivity | GP3557/GN7819 | 1.0 | <1.0 | umhos/cm | 9985 | 9820 | 98.3 | 90-110% |
| pH | GN7785 | | | su | 8.00 | 8.00 | 100.0 | 99.3-100.7% |

Associated Samples:

Batch GN7785: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Batch GP3557: D20215-1, D20215-2

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| | |
|-------------------|--------|
| Accutest Job #: | D20215 |
| Accutest Quote #: | |
| AMS P.O. #: | |
| Project No.: | |

| Client Information | | | Subcontract Laboratory Information | | | | | | | Analytical Information | | | | | |
|--|------------------------------------|---------------------------------------|---|---|--|------|------|-------|------|--|--------|--|--|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG C | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | | |
| Field ID / Point of Collection | Collection | | Matrix | # of bottles | Preservation | | | | | XCR | H E | Comments | | | |
| | Date | Time | | | HCL | NaOH | HNO3 | H2SO4 | None | | | | | | |
| D20215 -1 | 1/5/11 | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -2 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -3 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -4 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -5 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -6 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -7 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| -8 | | 12:30 PM | Soil | 1 | | | | | | X | X | | | | |
| - | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | Comments / Remarks | | | | | |
| <input checked="" type="checkbox"/> 1 - 2 Business Day Rush <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ <input type="checkbox"/> Commercial "A" <input type="checkbox"/> PDF <input type="checkbox"/> Commercial "B" <input type="checkbox"/> Compact Disk Deliverable <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Electronic Delivery: _____ <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> State Forms <input type="checkbox"/> Full Tier 1 <input type="checkbox"/> Other (Specify) _____ | | | | | | | Please use Colorado regulations and RLs. 11C | | | | | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | For Subcontract Laboratory Use Only | | | |
| Relinquished by: 1 <i>JDL</i> | Date & Time: 1/6/11 | Received By: 1 <i>FedEx</i> | Date & Time: 1 | Seal #: | Headspace: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | | | | | | |
| Relinquished by: 2 <i>FedEx</i> | Date & Time: 1/7/11 9:15 | Received By: 2 <i>AmBry</i> | Date & Time: 2 | Preserved where applicable: <input type="checkbox"/> | | | | | | | | | | | |
| Relinquished by: 3 | Date & Time: | Received By: 3 | Date & Time: 3 | Temperature °C 1.7° | On Ice <input checked="" type="checkbox"/> | | | | | | | | | | |

D20215: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.

111
 11

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D20215

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 1/7/2011

Delivery Method:

Client Service Action Required at Login: No

Project: N/A

No. Coolers: 1

Airbill #'s: N/A

| <u>Cooler Security</u> | <u>Y or N</u> | | <u>Y or N</u> | <u>Y or N</u> | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. SmpI Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

| <u>Cooler Temperature</u> | <u>Y or N</u> | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

| <u>Quality Control Preservatio</u> | <u>Y or N</u> | | <u>N/A</u> |
|------------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

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

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

Comments

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
 GENERAL CHEMISTRY

Login Number: D20215
 Account: ALMS - Accutest Mountain States
 Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12501/GN33903 | 0.40 | 0.0 | mg/kg | 12 | 11.9 | 99.2 | 80-120% |
| Chromium, Hexavalent | GP12501/GN33903 | | | mg/kg | 1190 | 1300 | 109.2 | 80-120% |

Associated Samples:

Batch GP12501: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

(*) Outside of QC limits

12.1

12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D20215
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12501/GN33903 | D20215-1 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN33893 | D20215-3 | mv | 329 | 339 | 3.0 | 0-20% |

Associated Samples:

Batch GN33893: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

Batch GP12501: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

(*) Outside of QC limits

12.2
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D20215
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|---------|-----------|
| Chromium, Hexavalent | GP12501/GN33903 | D20215-1 | mg/kg | 0.0 | 11.9 | 5.5 | 46.2(a) | 75-125% |
| Chromium, Hexavalent | GP12501/GN33903 | D20215-1 | mg/kg | 0.0 | 786 | 807 | 102.7 | 75-125% |

Associated Samples:

Batch GP12501: D20215-1, D20215-2, D20215-3, D20215-4, D20215-5, D20215-6, D20215-7, D20215-8

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Soluble spike recovery indicates possible matrix interference and/or sample nonhomogeneity. Refer to spike blank.

12.3
12

Technical Report for

Marathon Oil

Roan Pit Closure

Accutest Job Number: D17737

Sampling Date: 09/27/10

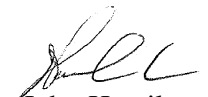
Report to:

Marathon Oil
44 Union Blvd, Ste 300
Lakewood, CO 80228
feehlman@marathonoil.com; tcpersaud@marathonoil.com;
randy_march@golder.com; Benjamin_Yanda@golder.com
ATTN: R March

Total number of pages in report: **131**



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



John Hamilton
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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

Table of Contents

-1-

| | |
|--|------------|
| Section 1: Sample Summary | 4 |
| Section 2: Case Narrative/Conformance Summary | 5 |
| Section 3: Sample Results | 9 |
| 3.1: D17737-1: 33C-F1 | 10 |
| 3.2: D17737-2: 33C-F2 | 16 |
| 3.3: D17737-3: 33C-F3 | 22 |
| 3.4: D17737-3A: 33C-F3 | 28 |
| 3.5: D17737-4: 33C-F4 | 30 |
| 3.6: D17737-4A: 33C-F4 | 36 |
| 3.7: D17737-5: 33C-TS1 | 38 |
| 3.8: D17737-5A: 33C-TS1 | 44 |
| 3.9: D17737-6: 33C-TS2 | 46 |
| 3.10: D17737-6A: 33C-TS2 | 52 |
| 3.11: D17737-7: 33C-F4 DUP | 54 |
| 3.12: D17737-7A: 33C-F4 DUP | 60 |
| Section 4: Misc. Forms | 62 |
| 4.1: Chain of Custody | 63 |
| Section 5: GC/MS Volatiles - QC Data Summaries | 65 |
| 5.1: Method Blank Summary | 66 |
| 5.2: Blank Spike Summary | 67 |
| 5.3: Matrix Spike/Matrix Spike Duplicate Summary | 68 |
| Section 6: GC/MS Semi-volatiles - QC Data Summaries | 69 |
| 6.1: Method Blank Summary | 70 |
| 6.2: Blank Spike Summary | 71 |
| 6.3: Matrix Spike/Matrix Spike Duplicate Summary | 72 |
| Section 7: GC Volatiles - QC Data Summaries | 73 |
| 7.1: Method Blank Summary | 74 |
| 7.2: Blank Spike Summary | 75 |
| 7.3: Matrix Spike/Matrix Spike Duplicate Summary | 76 |
| Section 8: GC Semi-volatiles - QC Data Summaries | 77 |
| 8.1: Method Blank Summary | 78 |
| 8.2: Blank Spike Summary | 80 |
| 8.3: Matrix Spike/Matrix Spike Duplicate Summary | 82 |
| Section 9: Metals Analysis - QC Data Summaries | 84 |
| 9.1: Prep QC MP3007: Hg | 85 |
| 9.2: Prep QC MP3008: Hg | 89 |
| 9.3: Prep QC MP3055: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn | 93 |
| 9.4: Prep QC MP3056: As | 103 |
| 9.5: Prep QC MP3061: Ca,Mg,Na,Sodium Adsorption Ratio | 108 |
| 9.6: Prep QC MP3094: Ca,Mg,Na,Sodium Adsorption Ratio | 116 |
| Section 10: General Chemistry - QC Data Summaries | 124 |
| 10.1: Method Blank and Spike Results Summary | 125 |

Table of Contents

-2-

| | |
|---|------------|
| Section 11: Misc. Forms (Accutest Labs of New England, Inc.) | 126 |
| 11.1: Chain of Custody | 127 |
| Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) | 128 |
| 12.1: Method Blank and Spike Results Summary | 129 |
| 12.2: Duplicate Results Summary | 130 |
| 12.3: Matrix Spike Results Summary | 131 |

1

2

3

4

5

6

7

8

9

10

11

12



Sample Summary

Marathon Oil

Job No: D17737

Roan Pit Closure

| Sample Number | Collected | | Received | Matrix | | Client Sample ID |
|---------------|-----------|----------|----------|--------|------|------------------|
| | Date | Time By | | Code | Type | |
| D17737-1 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F1 |
| D17737-2 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F2 |
| D17737-3 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F3 |
| D17737-3A | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F3 |
| D17737-4 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F4 |
| D17737-4A | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F4 |
| D17737-5 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-TS1 |
| D17737-5A | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-TS1 |
| D17737-6 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-TS2 |
| D17737-6A | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-TS2 |
| D17737-7 | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F4 DUP |
| D17737-7A | 09/27/10 | 09:00 BY | 09/28/10 | SO | Soil | 33C-F4 DUP |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Marathon Oil

Job No D17737

Site: Roan Pit Closure

Report Dat 10/8/2010 10:37:44 AM

On 09/28/2010, 7 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D17737 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

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

Volatiles by GCMS By Method SW846 8260B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: V5V582 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Sample(s) D17733-1MS, D17733-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2589 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D17737-1MS, D17737-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike recoveries for Chrysene and Benzo(b)fluoranthene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- The RPDs for the MS and MSD recoveries of Benzo(b)fluoranthene, Dibenzo(a,h)anthracene are outside control limits for sample OP2589-MSD. High RPD due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: GGB410 |
|------------------|-------------------------|

- All samples were analyzed within the recommended method holding time.
- Sample(s) D17735-7MS, D17735-7MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2590 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17737-2MS, D17737-2MSD were used as the QC samples indicated.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: OP2608 |
|------------------|-------------------------|

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17915-1MS and D17915-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP3061 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17735-3AMS, D17735-3AMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix AQ | Batch ID: MP3094 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17932-3CMS, D17932-3CMSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3055 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17734-7MS, D17734-7MSD, D17734-7SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery of Barium is outside control limits. Probable cause due to matrix interference.
- The serial dilution RPDs for Cadmium, Selenium, Silver, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP3055-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3056 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17734-7MS, D17734-7MSD, D17734-7SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP3056-SD1. Probable cause due to sample homogeneity.

Metals By Method SW846 7471A

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3007 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17557-1MS, D17557-1MSD were used as the QC samples for the metals analysis.

| | |
|------------------|-------------------------|
| Matrix SO | Batch ID: MP3008 |
|------------------|-------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17734-1MSD, D17734-1MS were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate recoveries for Mercury are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO **Batch ID:** M:GN32947

- The data for ASTM E1498-76M meets quality control requirements.
- The following sample was run outside of holding time for method ASTM E1498-76M: D17737-6.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix SO **Batch ID:** M:GN32958

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D17737-1 through D17737-5, and D17737-7.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO **Batch ID:** MP3061

- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO **Batch ID:** GN6567

- The data for SM19 2540B M meets quality control requirements.
- Solids, Percent: All results reported on wet weight basis.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO **Batch ID:** R4619

- The data for SW846 3060/7196A M meets quality control requirements.
- Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO **Batch ID:** M:GP12082

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D17737

Site: MOILCOGJ: Roan Pit Closure

Report Date 10/1/2010 10:41:48 AM

7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 09/27/2010 and were received at Accutest on 09/28/2010 properly preserved, at 1.8 Deg. C and intact. These Samples received an Accutest job number of D17737. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN32947 |
|------------------|--------------------------|

- Sample(s) D17737-6DUP were used as the QC samples for Redox Potential Vs H2.

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GN32958 |
|------------------|--------------------------|

- Sample(s) D17735-5DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

| | |
|------------------|--------------------------|
| Matrix SO | Batch ID: GP12082 |
|------------------|--------------------------|

- All samples were distilled and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D17733-6DUP, D17733-6MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D17737).



Sample Results

Report of Analysis

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 88.9 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10627.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.056 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.056 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 71% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 75% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 33C-F1 | |
| Lab Sample ID: D17737-1 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 88.9 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02073.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.171 | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.118 | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.437 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.140 | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.116 | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | 0.260 | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.0779 | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.163 | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.140 | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.0377 | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | 0.119 | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 58% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 64% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 78% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 88.9 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7533.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | 11.3 | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 79% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

3.1
3

| | |
|--|--|
| Client Sample ID: 33C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 88.9 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4487.D | 1 | 10/04/10 | JB | 09/30/10 | OP2590 | GFE241 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 43.8 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 116% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 88.9 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 6.5 | 0.38 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 1540 | 0.95 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.95 | 0.95 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 25.9 | 0.95 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 22.0 | 0.48 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 13.7 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.085 | 0.085 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 19.5 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 54.6 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-1 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 88.9 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 25.9 | 1.5 | mg/kg | 1 | 10/04/10 15:34 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 347 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 88.9 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| pH | 8.90 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

32
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10628.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 80% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 81% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 33C-F2 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 91.0 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02076.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.022 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.291 | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.186 | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.712 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.219 | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.321 | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | 0.416 | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | 0.151 | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.207 | 0.033 | 0.021 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.239 | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.030 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.0619 | 0.033 | 0.027 | mg/kg | |
| 129-00-0 | Pyrene | 0.212 | 0.033 | 0.023 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 54% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 61% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 85% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

32
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7534.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 88% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

32
3

| | |
|--|--|
| Client Sample ID: 33C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4414.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| Run # | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 59.3 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 115% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 9.2 | 0.39 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 1610 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 24.5 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 20.6 | 0.49 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 13.5 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.093 | 0.093 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 19.1 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 54.2 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1009

(2) Instrument QC Batch: MA1018

(3) Instrument QC Batch: MA1023

(4) Prep QC Batch: MP3008

(5) Prep QC Batch: MP3055

(6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-2 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 91.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|-------|----|----------------|-----|--------------------|
| Chromium, Hexavalent ^b | 0.56 | 0.49 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.9 | 1.5 | mg/kg | 1 | 10/04/10 15:39 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 339 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 91 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| pH | 9.05 | | su | 1 | 09/28/10 10:50 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10629.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.016 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.038 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 79% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 80% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 33C-F3 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 90.8 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02077.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0462 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | 0.0288 | 0.033 | 0.017 | mg/kg | J |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0220 | 0.033 | 0.020 | mg/kg | J |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 58% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 64% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 77% | | 17-174% |

(a) All results reported on wet weight basis.

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7535.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 77% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4416.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 29.6 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 99% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 10.3 | 0.39 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 452 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.97 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 24.8 | 0.97 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 21.5 | 0.49 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 17.7 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.10 | 0.10 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 18.8 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.9 | 4.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 56.8 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 33C-F3 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 90.8 ^a |
| Project: Roan Pit Closure | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.48 | 0.48 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 24.8 | 1.5 | mg/kg | 1 | 10/04/10 15:45 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 351 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 90.8 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| Specific Conductivity | 398 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 8.81 | | su | 1 | 09/28/10 12:40 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 42.5 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 8.30 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 25.4 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F3 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-3A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 90.8 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.932 | | ratio | 1 | 10/04/10 18:16 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Method: SW846 8260B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10630.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.055 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.055 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| | m,p-Xylene | ND | 0.22 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 71% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 74% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 33C-F4 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 89.4 ^a |
| Method: SW846 8270C BY SIM SW846 3540C | | |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02078.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.022 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.0358 | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.0225 | 0.033 | 0.021 | mg/kg | J |
| 205-99-2 | Benzo(b)fluoranthene | 0.137 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0347 | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | 0.0421 | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | 0.0730 | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0508 | 0.033 | 0.021 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0387 | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.030 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.027 | mg/kg | |
| 129-00-0 | Pyrene | 0.0338 | 0.033 | 0.023 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 53% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 59% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 69% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7536.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 86% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4417.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 53.2 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 102% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 6.6 | 0.41 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 446 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 23.8 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 21.0 | 0.52 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 14.1 | 5.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.2 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 48.4 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 23.4 | 1.5 | mg/kg | 1 | 10/04/10 15:50 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 253 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 89.4 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| Specific Conductivity | 678 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 8.71 | | su | 1 | 09/28/10 12:40 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 81.5 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 17.6 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 41.6 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-F4 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-4A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 89.4 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 1.09 | | ratio | 1 | 10/04/10 18:22 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 33C-TS1 | | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5 | | Date Received: 09/28/10 |
| Matrix: SO - Soil | | Percent Solids: 87.5 ^a |
| Method: SW846 8260B | | |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10631.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.056 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.056 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.039 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.039 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 79% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 80% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 33C-TS1 | | |
| Lab Sample ID: D17737-5 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 87.5 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02079.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 61% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 64% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 77% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

37
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 87.5 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7537.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 81% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 33C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 87.5 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4418.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.0 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 99% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 87.5 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.3 | 0.38 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 252 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 21.7 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 15.2 | 0.48 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 13.2 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.091 | 0.091 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 14.0 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 48.1 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 87.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.48 | 0.48 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 21.2 | 1.4 | mg/kg | 1 | 10/04/10 15:56 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 351 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 87.5 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| Specific Conductivity | 665 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 6.72 | | su | 1 | 09/28/10 12:40 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis



| | |
|---|---|
| Client Sample ID: 33C-TS1 Lab Sample ID: D17737-5A Matrix: SO - Soil Project: Roan Pit Closure | Date Sampled: 09/27/10 Date Received: 09/28/10 Percent Solids: 87.5 ^a |
|---|---|

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 88.0 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 17.7 | 1.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 11.4 | 2.0 | mg/l | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1018

(2) Prep QC Batch: MP3061

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS1 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-5A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 87.5 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.290 | | ratio | 1 | 10/04/10 18:29 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | | |
|----------------------------------|--|--|
| Client Sample ID: 33C-TS2 | | |
| Lab Sample ID: D17737-6 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8260B | | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10632.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.058 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.12 | 0.058 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.12 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.041 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.12 | 0.041 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 77% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 79% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|---|--|
| Client Sample ID: 33C-TS2 | |
| Lab Sample ID: D17737-6 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02080.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 0.033 | 0.021 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.033 | 0.021 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | ND | 0.033 | 0.020 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.033 | 0.022 | mg/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 65% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 82% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846 8015B | |
| Project: Roan Pit Closure | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7538.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 12 | 12 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 83% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

Report of Analysis

3.9
3

| | |
|--|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Method: SW846-8015B SW846 3550B | |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4419.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 96% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.5 | 0.42 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 247 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 1.0 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 20.2 | 1.0 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 16.0 | 0.52 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 13.5 | 5.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.091 | 0.091 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 13.0 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 5.2 | 5.2 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 3.1 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 48.8 | 3.1 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

- (1) Instrument QC Batch: MA1009
- (2) Instrument QC Batch: MA1018
- (3) Instrument QC Batch: MA1023
- (4) Prep QC Batch: MP3008
- (5) Prep QC Batch: MP3055
- (6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

39
3

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.50 | 0.50 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.2 | 1.5 | mg/kg | 1 | 10/04/10 16:01 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 349 | | mv | 1 | 09/30/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 84 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| Specific Conductivity | 267 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 6.70 | | su | 1 | 09/28/10 12:40 | CJ | SW846 9045C |

- (a) All results reported on wet weight basis.
- (b) Analysis performed at Accutest Laboratories, Marlborough, MA.
- (c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 34.4 | 2.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 6.71 | 1.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 12.6 | 2.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1026

(2) Prep QC Batch: MP3094

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|----------------------------------|--|
| Client Sample ID: 33C-TS2 | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-6A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 84.0 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 0.514 | | ratio | 1 | 10/07/10 01:49 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 33C-F4 DUP | |
| Lab Sample ID: D17737-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846 8260B | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V10633.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.00 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.017 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.023 | mg/kg | |
| | m,p-Xylene | ND | 0.23 | 0.040 | mg/kg | |
| 95-47-6 | o-Xylene | ND | 0.11 | 0.040 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 79% | | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 80% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | | 70-130% |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | | |
|---|--|--|
| Client Sample ID: 33C-F4 DUP | | |
| Lab Sample ID: D17737-7 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8270C BY SIM SW846 3540C | | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | | |

| Run #1 | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|-----|-----------|------------|------------------|
| Run #1 | 3G02081.D | 5 | 10/02/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| Run #2 | | | | | | | |

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

BN PAH List

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-------|-------|-------|---|
| 83-32-9 | Acenaphthene | ND | 0.033 | 0.031 | mg/kg | |
| 208-96-8 | Acenaphthylene | ND | 0.17 | 0.034 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.033 | 0.021 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.033 | 0.033 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.033 | 0.021 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.0840 | 0.033 | 0.024 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0235 | 0.033 | 0.021 | mg/kg | J |
| 207-08-9 | Benzo(k)fluoranthene | 0.0269 | 0.033 | 0.021 | mg/kg | J |
| 218-01-9 | Chrysene | 0.0450 | 0.033 | 0.017 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.033 | 0.025 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0319 | 0.033 | 0.020 | mg/kg | J |
| 86-73-7 | Fluorene | ND | 0.033 | 0.033 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0289 | 0.033 | 0.022 | mg/kg | J |
| 90-12-0 | 1-Methylnaphthalene | ND | 0.033 | 0.029 | mg/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 0.17 | 0.051 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.17 | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | ND | 0.033 | 0.026 | mg/kg | |
| 129-00-0 | Pyrene | ND | 0.033 | 0.022 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 59% | | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 64% | | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 75% | | 17-174% |

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | | |
|-------------------------------------|--|--|
| Client Sample ID: 33C-F4 DUP | | |
| Lab Sample ID: D17737-7 | | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | | Date Received: 09/28/10 |
| Method: SW846 8015B | | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB7539.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| Run #2 | | | | | | | |

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

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|--------|---------|-------|---|
| | TPH-GRO (C6-C10) | ND | 11 | 11 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 71% | | 60-140% | | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

| | |
|--|--|
| Client Sample ID: 33C-F4 DUP | |
| Lab Sample ID: D17737-7 | Date Sampled: 09/27/10 |
| Matrix: SO - Soil | Date Received: 09/28/10 |
| Method: SW846-8015B SW846 3550B | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FE4526.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------------------|--------|--------|---------|---|
| | TPH-DRO (C10-C28) | 31.2 | 13 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | |
| 84-15-1 | o-Terphenyl | 95% | | 63-130% | |

(a) All results reported on wet weight basis.

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

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

Report of Analysis

Client Sample ID: 33C-F4 DUP**Lab Sample ID:** D17737-7**Matrix:** SO - Soil**Project:** Roan Pit Closure**Date Sampled:** 09/27/10**Date Received:** 09/28/10**Percent Solids:** 86.3 ^a**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 9.3 | 0.38 | mg/kg | 5 | 10/04/10 | 10/05/10 GJ | SW846 6020 ³ | SW846 3050B ⁶ |
| Barium | 377 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Cadmium | < 0.96 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Chromium | 21.1 | 0.96 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Copper | 18.1 | 0.48 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Lead | 12.6 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Mercury | < 0.096 | 0.096 | mg/kg | 1 | 09/28/10 | 09/28/10 JM | SW846 7471A ¹ | SW846 7471A ⁴ |
| Nickel | 16.4 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Selenium | < 4.8 | 4.8 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Silver | < 2.9 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |
| Zinc | 52.2 | 2.9 | mg/kg | 1 | 10/04/10 | 10/04/10 JM | SW846 6010B ² | SW846 3050B ⁵ |

(1) Instrument QC Batch: MA1009

(2) Instrument QC Batch: MA1018

(3) Instrument QC Batch: MA1023

(4) Prep QC Batch: MP3007

(5) Prep QC Batch: MP3055

(6) Prep QC Batch: MP3056

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 33C-F4 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-7 | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|------------------------------------|--------|------|----------|----|----------------|-----|---------------------|
| Chromium, Hexavalent ^b | < 0.49 | 0.49 | mg/kg | 1 | 09/30/10 20:20 | AMA | SW846 3060A/7196A |
| Chromium, Trivalent ^c | 20.7 | 1.5 | mg/kg | 1 | 10/04/10 16:07 | JM | SW846 3060/7196A M |
| Redox Potential Vs H2 ^b | 373 | | mv | 1 | 09/29/10 | AMA | ASTM E1498-76M |
| Solids, Percent ^a | 86.3 | | % | 1 | 09/28/10 | SWT | SM19 2540B M |
| Specific Conductivity | 503 | 1.0 | umhos/cm | 1 | 10/04/10 | CJ | DEPT.OF AG, BOOK N9 |
| pH | 8.85 | | su | 1 | 09/28/10 12:40 | CJ | SW846 9045C |

(a) All results reported on wet weight basis.

(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

(c) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 33C-F4 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|------------------------|
| Calcium | 62.7 | 2.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Magnesium | 14.3 | 1.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |
| Sodium | 36.9 | 2.0 | mg/l | 1 | 10/06/10 | 10/07/10 JM | SW846 6010B ¹ | EPA 200.7 ² |

(1) Instrument QC Batch: MA1026

(2) Prep QC Batch: MP3094

(a) All results reported on wet weight basis.

RL = Reporting Limit

Report of Analysis

| | |
|-------------------------------------|--|
| Client Sample ID: 33C-F4 DUP | Date Sampled: 09/27/10 |
| Lab Sample ID: D17737-7A | Date Received: 09/28/10 |
| Matrix: SO - Soil | Percent Solids: 86.3 ^a |
| Project: Roan Pit Closure | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|----------|
| Sodium Adsorption Ratio ^b | 1.09 | | ratio | 1 | 10/07/10 01:55 | JM | LADNR29B |

(a) All results reported on wet weight basis.

(b) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Job Change Order: D17737_10/4/2010

| | | | |
|----------------------|------------------|-----------------------|------------|
| Requested | 10/4/2010 | Received Date: | 9/28/2010 |
| Account Name: | Marathon Oil | Due Date: | 10/12/2010 |
| Project | Roan Pit Closure | Deliverable: | COMMBN |
| CSR: | RR | TAT (Days): | 14 |

Sample #: D17737-ALL
Change: Per client, this job should be on a 14 day TAT, not a 3 day rush. Thanks

Above Changes Per: Client **Date:** 10/4/2010

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service Representative.
Page 1 of 1

D17737: Chain of Custody
Page 2 of 2

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V582-MB1 | 5V10614.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|--------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 15 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 100 | 20 | ug/kg | |
| 108-88-3 | Toluene | ND | 100 | 50 | ug/kg | |
| | m,p-Xylene | ND | 200 | 35 | ug/kg | |
| 95-47-6 | o-Xylene | ND | 100 | 35 | ug/kg | |

| CAS No. | Surrogate Recoveries | Results | Limits |
|------------|-----------------------|---------|---------|
| 2037-26-5 | Toluene-D8 | 76% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 74% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | 70-130% |

Blank Spike Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V582-BS1 | 5V10617.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|--------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 50.0 | 100 | 68-130 |
| 100-41-4 | Ethylbenzene | 50 | 51.7 | 103 | 70-130 |
| 108-88-3 | Toluene | 50 | 50.5 | 101 | 70-130 |
| | m,p-Xylene | 50 | 47.0 | 94 | 53-130 |
| 95-47-6 | o-Xylene | 50 | 47.8 | 96 | 61-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|-----|---------|
| 2037-26-5 | Toluene-D8 | 76% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 86% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 93% | 70-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D17733-1MS | 5V10619.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| D17733-1MSD | 5V10620.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |
| D17733-1 | 5V10618.D | 1 | 09/28/10 | DC | n/a | n/a | V5V582 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | D17733-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|--------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | 45.3 | J | 2740 | 2940 | 106 | 3130 | 113 | 6 | 55-140/30 |
| 100-41-4 | Ethylbenzene | ND | | 2740 | 2850 | 104 | 3110 | 114 | 9 | 56-139/30 |
| 108-88-3 | Toluene | 80.2 | J | 2740 | 2900 | 103 | 3150 | 112 | 8 | 57-144/30 |
| | m,p-Xylene | 86.0 | J | 2740 | 2730 | 97 | 2930 | 104 | 7 | 47-130/30 |
| 95-47-6 | o-Xylene | ND | | 2740 | 2700 | 99 | 2890 | 106 | 7 | 51-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17733-1 | Limits |
|------------|-----------------------|-----|-----|----------|---------|
| 2037-26-5 | Toluene-D8 | 74% | 75% | 78% | 70-130% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | 91% | 81% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | 97% | 95% | 70-130% |

5.3.1
5

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-MB | 3G02041.D | 1 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|----------|------------------------|--------|-----|-----|-------|---|
| 83-32-9 | Acenaphthene | ND | 6.7 | 6.2 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 33 | 6.9 | ug/kg | |
| 120-12-7 | Anthracene | ND | 6.7 | 4.3 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 6.7 | 6.5 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 6.7 | 4.2 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 6.7 | 4.8 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 6.7 | 4.2 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 6.7 | 4.2 | ug/kg | |
| 218-01-9 | Chrysene | ND | 6.7 | 3.3 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 6.7 | 4.9 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 6.7 | 4.1 | ug/kg | |
| 86-73-7 | Fluorene | ND | 6.7 | 6.5 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 6.7 | 4.4 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 6.7 | 5.9 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 33 | 10 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 33 | 7.4 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 6.7 | 5.3 | ug/kg | |
| 129-00-0 | Pyrene | ND | 6.7 | 4.5 | ug/kg | |

| CAS No. | Surrogate Recoveries | Limits | |
|-----------|----------------------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 62% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 71% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 78% | 17-174% |

Blank Spike Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-BS | 3G02042.D | 1 | 09/30/10 | TMB | 09/29/10 | OP2589 | E3G57 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|-------------|-----------|-------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 61.7 | 74 | 40-136 |
| 208-96-8 | Acenaphthylene | 83.3 | 64.7 | 78 | 42-139 |
| 120-12-7 | Anthracene | 83.3 | 69.0 | 83 | 40-141 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 73.2 | 88 | 38-143 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 71.4 | 86 | 39-145 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 80.3 | 96 | 38-151 |
| 191-24-2 | Benzo(g,h,i)perylene | 83.3 | 63.1 | 76 | 35-136 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 63.2 | 76 | 38-147 |
| 218-01-9 | Chrysene | 83.3 | 67.2 | 81 | 39-137 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 65.5 | 79 | 35-139 |
| 206-44-0 | Fluoranthene | 83.3 | 64.6 | 78 | 34-132 |
| 86-73-7 | Fluorene | 83.3 | 63.9 | 77 | 41-136 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 71.0 | 85 | 31-144 |
| 90-12-0 | 1-Methylnaphthalene | 83.3 | 59.1 | 71 | 36-130 |
| 91-57-6 | 2-Methylnaphthalene | 83.3 | 58.1 | 70 | 40-131 |
| 91-20-3 | Naphthalene | 83.3 | 57.0 | 68 | 36-130 |
| 85-01-8 | Phenanthrene | 83.3 | 63.9 | 77 | 40-135 |
| 129-00-0 | Pyrene | 83.3 | 74.9 | 90 | 29-157 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 60% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 66% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 75% | 17-174% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP2589-MS | 3G02074.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| OP2589-MSD | 3G02075.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |
| D17737-1 | 3G02073.D | 5 | 10/01/10 | TMB | 09/29/10 | OP2589 | E3G58 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | D17737-1 ug/kg | Spike Q | ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|------------|-------|-------------|---------|--------------|----------|-----------|-------------------|
| 83-32-9 | Acenaphthene | ND | 83.3 | 54.6 | 66 | 60.9 | 73 | 11 | 20-151/30 | |
| 208-96-8 | Acenaphthylene | ND | 83.3 | 53.9 | 65 | 58.3 | 70 | 8 | 23-156/30 | |
| 120-12-7 | Anthracene | ND | 83.3 | 56.5 | 68 | 63.5 | 76 | 12 | 25-149/30 | |
| 56-55-3 | Benzo(a)anthracene | 171 | 83.3 | 192 | 25 | 237 | 79 | 21 | 22-157/30 | |
| 50-32-8 | Benzo(a)pyrene | 118 | 83.3 | 151 | 40 | 190 | 87 | 23 | 23-153/30 | |
| 205-99-2 | Benzo(b)fluoranthene | 437 | 83.3 | 358 | -95* a | 536 | 119 | 40* b | 22-161/30 | |
| 191-24-2 | Benzo(g,h,i)perylene | 140 | 83.3 | 172 | 38 | 208 | 82 | 19 | 20-158/30 | |
| 207-08-9 | Benzo(k)fluoranthene | 116 | 83.3 | 152 | 43 | 197 | 97 | 26 | 17-161/30 | |
| 218-01-9 | Chrysene | 260 | 83.3 | 257 | -4* a | 311 | 61 | 19 | 16-159/30 | |
| 53-70-3 | Dibenzo(a,h)anthracene | 77.9 | 83.3 | 118 | 48 | 164 | 104 | 33* b | 21-154/30 | |
| 206-44-0 | Fluoranthene | 163 | 83.3 | 180 | 20 | 214 | 61 | 17 | 16-140/30 | |
| 86-73-7 | Fluorene | ND | 83.3 | 56.8 | 68 | 61.7 | 74 | 8 | 15-153/30 | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 140 | 83.3 | 183 | 52 | 238 | 118 | 26 | 21-159/30 | |
| 90-12-0 | 1-Methylnaphthalene | ND | 83.3 | 61.9 | 74 | 67.8 | 82 | 9 | 10-148/30 | |
| 91-57-6 | 2-Methylnaphthalene | ND | 83.3 | 66.7 | 80 | 72.9 | 88 | 9 | 10-181/30 | |
| 91-20-3 | Naphthalene | ND | 83.3 | 58.4 | 70 | 65.0 | 78 | 11 | 10-176/30 | |
| 85-01-8 | Phenanthrene | 37.7 | 83.3 | 82.2 | 53 | 93.6 | 67 | 13 | 22-152/30 | |
| 129-00-0 | Pyrene | 119 | 83.3 | 156 | 44 | 207 | 106 | 28 | 10-200/30 | |

| CAS No. | Surrogate Recoveries | MS | MSD | D17737-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 52% | 58% | 58% | 10-193% |
| 321-60-8 | 2-Fluorobiphenyl | 58% | 63% | 64% | 20-138% |
| 1718-51-0 | Terphenyl-d14 | 66% | 80% | 78% | 17-174% |

(a) Outside control limits due to high level in sample relative to spike amount.
 (b) High RPD due to possible sample nonhomogeneity.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB410-MB | GB7528.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

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

| CAS No. | Surrogate Recoveries | Limits |
|----------|------------------------|-------------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% 60-140% |

7.1.1
7

Blank Spike Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| GGB410-BS | GB7529.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 103 | 94 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|-----|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 91% | 60-140% |

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|----|-----------|------------|------------------|
| D17735-7MS | GB7531.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| D17735-7MSD | GB7532.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |
| D17735-7 | GB7530.D | 1 | 09/29/10 | BR | n/a | n/a | GGB410 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

| CAS No. | Compound | D17735-7 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | 125 | 107 | 86 | 101 | 81 | 6 | 62-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17735-7 | Limits |
|----------|------------------------|-----|-----|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 88% | 88% | 81% | 60-140% |

7.3.1

7

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-MB | FE4410.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl | 99% 63-130% |

Method Blank Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2608-MB | FE4519.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-7

| CAS No. | Compound | Result | RL | Units | Q |
|---------|-------------------|--------|----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|--------------|
| 84-15-1 | o-Terphenyl | 105% 63-130% |

8.1.2
8

Blank Spike Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-BS | FE4411.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 694 | 104 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 114% | 63-130% |

Blank Spike Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|----------|----|----------|----|-----------|------------|------------------|
| OP2608-BS | FE4520.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-7

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 704 | 106 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 109% | 63-130% |

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2590-MS | FE4412.D | 10 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| OP2590-MSD | FE4413.D | 10 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |
| D17737-2 | FE4414.D | 1 | 09/30/10 | JB | 09/30/10 | OP2590 | GFE239 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

| CAS No. | Compound | D17737-2 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 59.3 | 666 | 664 | 91 | 610 | 83 | 8 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17737-2 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 110% | 106% | 115% | 63-130% |

8.3.1
8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D17737
Account: MOILCOGJ Marathon Oil
Project: Roan Pit Closure

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|----|-----------|------------|------------------|
| OP2608-MS | FE4521.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |
| OP2608-MSD | FE4522.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |
| D17915-1 | FE4523.D | 1 | 10/05/10 | JB | 10/05/10 | OP2608 | GFE243 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D17737-7

| CAS No. | Compound | D17915-1 mg/kg | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | ND | 673 | 695 | 103 | 680 | 101 | 2 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D17915-1 | Limits |
|---------|----------------------|------|------|----------|---------|
| 84-15-1 | o-Terphenyl | 106% | 103% | 102% | 63-130% |

8.3.2
8

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3007
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB raw | final |
|---------|------|-------|------|-----------|-------|
| Mercury | 0.10 | .0011 | .013 | -0.0032 | <0.10 |

Associated samples MP3007: D17737-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3007
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | D17557-1 Original MS | SpikeLot HGWSR1 | % Rec | QC Limits |
|-------|-------------------------|--------------------|-------|--------------|
|-------|-------------------------|--------------------|-------|--------------|

Mercury 0.0 0.38 0.378 100.5 85-115

Associated samples MP3007: D17737-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3007
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17557-1 Original MSD | Spikelot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|--------------------------|--------------------|-------|------------|-------------|
| Mercury | 0.0 | 0.39 | 0.385 | 101.2 | 2.6 20 |

Associated samples MP3007: D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3007
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.39 | 0.4 | 97.5 | 80-120 |

Associated samples MP3007: D17737-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|------|---------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .013 | -0.0030 | <0.10 |

Associated samples MP3008: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original MS | SpikeLot HGWSR1 | % Rec | QC Limits |
|-------|-------------------------|--------------------|-------|--------------|
|-------|-------------------------|--------------------|-------|--------------|

Mercury 0.016 0.33 0.392 80.1N(a) 85-115

Associated samples MP3008: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3008
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 09/28/10

| Metal | D17734-1 Original MSD | SpikeLot HGWSR1 | % Rec | MSD RPD | QC Limit |
|---------|--------------------------|--------------------|-------|--------------|-------------|
| Mercury | 0.016 | 0.33 | 0.4 | 78.5N(a) 0.0 | 20 |

Associated samples MP3008: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3008
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 09/28/10

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.37 | 0.4 | 92.5 | 80-120 |

Associated samples MP3008: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-------|------|-----------|-------|
| Aluminum | 20 | .7 | 2 | | |
| Antimony | 3.0 | .17 | .5 | | |
| Arsenic | 2.5 | .28 | .72 | | |
| Barium | 1.0 | .014 | .05 | 0.11 | <1.0 |
| Beryllium | 1.0 | .14 | .21 | | |
| Boron | 5.0 | .35 | .91 | | |
| Cadmium | 1.0 | .022 | .12 | 0.040 | <1.0 |
| Calcium | 40 | 1.7 | 2.7 | | |
| Chromium | 1.0 | .027 | .18 | 0.12 | <1.0 |
| Cobalt | 0.50 | .048 | .058 | | |
| Copper | 0.50 | .16 | .38 | 0.48 | <0.50 |
| Iron | 7.0 | .77 | .91 | | |
| Lead | 5.0 | .13 | .24 | 0.16 | <5.0 |
| Lithium | 0.20 | .076 | .09 | | |
| Magnesium | 20 | .58 | .93 | | |
| Manganese | 0.50 | .021 | .028 | | |
| Molybdenum | 1.0 | .041 | .16 | | |
| Nickel | 3.0 | .038 | .075 | 0.010 | <3.0 |
| Phosphorus | 10 | 1.5 | 3.5 | | |
| Potassium | 200 | 38 | 130 | | |
| Selenium | 5.0 | .28 | .54 | 0.14 | <5.0 |
| Silicon | 5.0 | 1.2 | .68 | | |
| Silver | 3.0 | .098 | .068 | 0.0 | <3.0 |
| Sodium | 40 | 23 | 6.3 | | |
| Strontium | 5.0 | .0091 | .02 | | |
| Thallium | 1.0 | .31 | .21 | | |
| Tin | 5.0 | 1.4 | .56 | | |
| Titanium | 1.0 | .0098 | .041 | | |
| Uranium | 5.0 | .22 | .53 | | |
| Vanadium | 1.0 | .027 | .034 | | |
| Zinc | 3.0 | .076 | .49 | 0.30 | <3.0 |

Associated samples MP3055: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | anr | | | | |
| Antimony | anr | | | | |
| Arsenic | anr | | | | |
| Barium | 283 | 440 | 198 | 79.3 | 75-125 |
| Beryllium | anr | | | | |
| Boron | anr | | | | |
| Cadmium | 0.24 | 40.7 | 49.5 | 81.7 | 75-125 |
| Calcium | anr | | | | |
| Chromium | 32.9 | 75.0 | 49.5 | 85.0 | 75-125 |
| Cobalt | anr | | | | |
| Copper | 11.5 | 54.8 | 49.5 | 87.5 | 75-125 |
| Iron | anr | | | | |
| Lead | 10.3 | 94.2 | 99 | 84.7 | 75-125 |
| Lithium | anr | | | | |
| Magnesium | anr | | | | |
| Manganese | anr | | | | |
| Molybdenum | anr | | | | |
| Nickel | 14.1 | 55.2 | 49.5 | 83.0 | 75-125 |
| Phosphorus | anr | | | | |
| Potassium | anr | | | | |
| Selenium | 2.0 | 81.2 | 99 | 80.0 | 75-125 |
| Silicon | anr | | | | |
| Silver | 0.20 | 16.4 | 19.8 | 81.8 | 75-125 |
| Sodium | anr | | | | |
| Strontium | anr | | | | |
| Thallium | anr | | | | |
| Tin | anr | | | | |
| Titanium | anr | | | | |
| Uranium | anr | | | | |
| Vanadium | anr | | | | |
| Zinc | 38.5 | 80.0 | 49.5 | 83.8 | 75-125 |

Associated samples MP3055: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original | MSD | SpikeLot MPICPAL | % Rec | MSD RPD | QC Limit |
|------------|----------------------|------|---------------------|----------|------------|-------------|
| Aluminum | anr | | | | | |
| Antimony | anr | | | | | |
| Arsenic | anr | | | | | |
| Barium | 283 | 420 | 192 | 71.2N(a) | 4.7 | 20 |
| Beryllium | anr | | | | | |
| Boron | | | | | | |
| Cadmium | 0.24 | 39.1 | 48.1 | 80.8 | 4.0 | 20 |
| Calcium | anr | | | | | |
| Chromium | 32.9 | 73.3 | 48.1 | 84.0 | 2.3 | 20 |
| Cobalt | anr | | | | | |
| Copper | 11.5 | 52.5 | 48.1 | 85.3 | 4.3 | 20 |
| Iron | anr | | | | | |
| Lead | 10.3 | 90.8 | 96.2 | 83.7 | 3.7 | 20 |
| Lithium | | | | | | |
| Magnesium | anr | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | | | | | | |
| Nickel | 14.1 | 53.1 | 48.1 | 81.1 | 3.9 | 20 |
| Phosphorus | | | | | | |
| Potassium | anr | | | | | |
| Selenium | 2.0 | 78.0 | 96.2 | 79.0 | 4.0 | 20 |
| Silicon | | | | | | |
| Silver | 0.20 | 15.9 | 19.2 | 81.6 | 3.1 | 20 |
| Sodium | anr | | | | | |
| Strontium | | | | | | |
| Thallium | anr | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | anr | | | | | |
| Zinc | 38.5 | 77.4 | 48.1 | 80.9 | 3.3 | 20 |

Associated samples MP3055: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 169 | 200 | 84.5 | 80-120 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 43.0 | 50 | 86.0 | 80-120 |
| Calcium | anr | | | |
| Chromium | 45.8 | 50 | 91.6 | 80-120 |
| Cobalt | anr | | | |
| Copper | 44.7 | 50 | 89.4 | 80-120 |
| Iron | anr | | | |
| Lead | 90.5 | 100 | 90.5 | 80-120 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 43.3 | 50 | 86.6 | 80-120 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 83.9 | 100 | 83.9 | 80-120 |
| Silicon | | | | |
| Silver | 17.4 | 20 | 87.0 | 80-120 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 43.4 | 50 | 86.8 | 80-120 |

Associated samples MP3055: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.3.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3055
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 Original | SDL 1:5 | %DIF | QC Limits |
|------------|----------------------|---------|----------|--------------|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | 2830 | 3110 | 9.9 | 0-10 |
| Beryllium | anr | | | |
| Boron | | | | |
| Cadmium | 2.40 | 2.00 | 16.7 (a) | 0-10 |
| Calcium | anr | | | |
| Chromium | 329 | 372 | 13.0*(b) | 0-10 |
| Cobalt | anr | | | |
| Copper | 115 | 116 | 1.0 | 0-10 |
| Iron | anr | | | |
| Lead | 103 | 116 | 11.9*(b) | 0-10 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | 141 | 164 | 16.2*(b) | 0-10 |
| Phosphorus | | | | |
| Potassium | anr | | | |
| Selenium | 19.8 | 30.0 | 51.5 (a) | 0-10 |
| Silicon | | | | |
| Silver | 2.00 | 0.00 | 100.0(a) | 0-10 |
| Sodium | anr | | | |
| Strontium | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | anr | | | |
| Zinc | 385 | 460 | 19.5*(b) | 0-10 |

Associated samples MP3055: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.3.4
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3055
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3056
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .14 | 1.2 | | |
| Antimony | 0.20 | .001 | .0095 | | |
| Arsenic | 0.40 | .049 | .22 | 0.12 | <0.40 |
| Barium | 1.0 | .0035 | .1 | | |
| Beryllium | 0.10 | .0075 | .014 | | |
| Boron | 20 | .97 | 1 | | |
| Cadmium | 0.050 | .023 | .048 | | |
| Calcium | 200 | 1.8 | 8.2 | | |
| Chromium | 1.0 | .021 | .24 | | |
| Cobalt | 0.10 | .0033 | .003 | | |
| Copper | 1.0 | .011 | .063 | | |
| Iron | 20 | .81 | 3.7 | | |
| Lead | 0.25 | .0012 | .015 | | |
| Magnesium | 50 | .067 | 2.6 | | |
| Manganese | 0.50 | .007 | .029 | | |
| Molybdenum | 0.50 | .0044 | .023 | | |
| Nickel | 1.0 | .0029 | .031 | | |
| Phosphorus | 30 | 1.8 | 3.5 | | |
| Potassium | 100 | 2 | 3.2 | | |
| Selenium | 0.20 | .075 | .19 | | |
| Silver | 0.050 | .0008 | .002 | | |
| Sodium | 250 | .8 | 4.4 | | |
| Strontium | 10 | .004 | .04 | | |
| Thallium | 0.10 | .015 | .02 | | |
| Tin | 5.0 | .006 | .028 | | |
| Titanium | 1.0 | .035 | .062 | | |
| Uranium | 0.25 | .00038 | .0009 | | |
| Vanadium | 2.0 | .052 | .29 | | |
| Zinc | 5.0 | .039 | .12 | | |

Associated samples MP3056: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.4.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MS | | SpikeLot MPICPALL % Rec | | QC Limits |
|------------|-------------------------|------|----------------------------|------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 3.2 | 83.2 | 99 | 80.8 | 60-119 |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | | | | | |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silver | | | | | |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3056: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.4.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | D17734-7 Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|--------------------------|------|----------------------------|------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 3.2 | 84.9 | 96.2 | 85.0 | 2.0 | 20 |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | | | | | | |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silver | | | | | | |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3056: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.4.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 103 | 100 | 103.0 | 80-120 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3056: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.4.3
 9

SERIAL DILUTION RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3056
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17734-7 | | QC | |
|-------|----------|----------|------|--------|
| | Original | SDL 5:25 | %DIF | Limits |

| | | | | |
|------------|------|------|----------|------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 32.1 | 37.8 | 17.9*(a) | 0-10 |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | | | | |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silver | | | | |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3056: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested
 (a) Serial dilution indicates possible matrix interference.

9.4.4
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/04/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 274 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 109 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | -740 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3061: D17737-3A, D17737-4A, D17737-5A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

9.5.1
9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 29300 | 170000 | 125000 | 112.6 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3061: D17737-3A, D17737-4A, D17737-5A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | D17735-3A Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 29300 | 169000 | 125000 | 111.8 | 0.6 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 6320 | 139000 | 125000 | 106.1 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 17900 | 150000 | 125000 | 105.7 | 0.0 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3061: D17737-3A, D17737-4A, D17737-5A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3061
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/04/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 141000 | 125000 | 112.8 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 133000 | 125000 | 106.4 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 132000 | 125000 | 105.6 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3061: D17737-3A, D17737-4A, D17737-5A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.5.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3061
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3094
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/06/10

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 500 | 35 | 250 | | |
| Antimony | 150 | 8.5 | 65 | | |
| Arsenic | 130 | 14 | 33 | | |
| Barium | 50 | .7 | 12 | | |
| Beryllium | 50 | 7 | 22 | | |
| Boron | 250 | 18 | 93 | | |
| Cadmium | 50 | 1.1 | 6 | | |
| Calcium | 2000 | 85 | 46 | 38.0 | <2000 |
| Chromium | 50 | 1.4 | 8 | | |
| Cobalt | 25 | 2.4 | 1.5 | | |
| Copper | 25 | 8 | 14 | | |
| Iron | 350 | 39 | 50 | | |
| Lead | 250 | 6.5 | 16 | | |
| Lithium | 10 | 3.8 | 8 | | |
| Magnesium | 1000 | 29 | 62 | 22.0 | <1000 |
| Manganese | 25 | 1.1 | 3.5 | | |
| Molybdenum | 50 | 2.1 | 6 | | |
| Nickel | 150 | 1.9 | 3 | | |
| Phosphorus | 500 | 75 | 270 | | |
| Potassium | 5000 | 1900 | 2700 | | |
| Selenium | 250 | 14 | 36 | | |
| Silicon | 250 | 60 | 100 | | |
| Silver | 150 | 4.9 | 1.5 | | |
| Sodium | 2000 | 1200 | 110 | 381 | <2000 |
| Strontium | 25 | .46 | 17 | | |
| Thallium | 50 | 16 | 11 | | |
| Tin | 250 | 70 | 22 | | |
| Titanium | 50 | .49 | 3.5 | | |
| Uranium | 250 | 11 | 20 | | |
| Vanadium | 50 | 1.4 | 1.5 | | |
| Zinc | 150 | 3.8 | 8.5 | | |

Associated samples MP3094: D17737-6A, D17737-7A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3094
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3094
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/06/10

| Metal | D17932-3C Original MS | | SpikeLot MPICPAL % Rec | | QC Limits |
|------------|--------------------------|--------|---------------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 48200 | 180000 | 125000 | 105.4 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 11100 | 139000 | 125000 | 102.3 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 18600 | 154000 | 125000 | 108.3 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP3094: D17737-6A, D17737-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.6.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3094
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3094
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/06/10

| Metal | D17932-3C Original MSD | | SpikeLot MPICPALL % Rec | | MSD RPD | QC Limit |
|------------|---------------------------|--------|----------------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 48200 | 180000 | 125000 | 105.4 | 0.0 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 11100 | 141000 | 125000 | 103.9 | 1.4 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 18600 | 156000 | 125000 | 109.9 | 1.3 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP3094: D17737-6A, D17737-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.6.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3094
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
 Account: MOILCOGJ - Marathon Oil
 Project: Roan Pit Closure

QC Batch ID: MP3094
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/06/10

| Metal | BSP Result | Spikelot MPICPALL | % Rec | QC Limits |
|------------|------------|-------------------|-------|-----------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 134000 | 125000 | 107.2 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 126000 | 125000 | 100.8 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 135000 | 125000 | 108.0 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP3094: D17737-6A, D17737-7A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.6.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

QC Batch ID: MP3094
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17737
Account: MOILCOGJ - Marathon Oil
Project: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|---------------|----|--------------|----------|-----------------|---------------|---------------|--------------|
| Specific Conductivity | GP2898/GN6657 | | | umhos/cm | 9984 | 10200 | 102.6 | 90-110% |
| pH | GN6571 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |
| pH | GN6572 | | | su | 8.00 | 7.98 | 99.8 | 99.3-100.7% |

Associated Samples:

Batch GN6571: D17737-1, D17737-2

Batch GN6572: D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

Batch GP2898: D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

(*) Outside of QC limits

10.1
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody





4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

| | |
|-------------------|--------|
| Accutest Job #: | D17737 |
| Accutest Quote #: | |
| AMS P.O. #: | |
| Project No.: | |

| Client Information | | | Subcontract Laboratory Information | | | | | | | | | | Analytical Information | | | | | | |
|---|--------------------|---------------------|--|--------------------|---------------------|--|------|-------|--------------|--|--|-----------------------------|------------------------|--|--|---|--|--|--|
| Name Accutest Mountain States (AMS) | | | Name Accutest - New England | | | | | | | | | | | | | | | | |
| Address 4036 Youngfield St. | | | Address 495 Technology Center West, BLDG O | | | | | | | | | | | | | | | | |
| City Wheat Ridge, | State CO | Zip 80033 | City Marlborough | State MA | Zip 01752 | | | | | | | | | | | | | | |
| Send Report to: Tiffany Pham | | | Contact: Sample Management | | | | | | | | | | | | | | | | |
| Any questions contact: Amanda Kissell | | | | | | | | | | | | | | | | | | | |
| Phone/Fax #: (303) 425-6021; (303) 425-6854 | | | Phone: (508) 481-6200 | | | | | | | | | | | | | | | | |
| Field ID / Point of Collection | Collection | | Matrix | # of bottles | Preservation | | | | | | XCR | eh | Comments | | | | | | |
| | Date | Time | | | LiCl | NaOH | HNO3 | H2SO4 | None | | | | | | | | | | |
| D17737 -1 | 9/27/10 | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -2 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -3 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -4 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -5 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -6 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| -7 | | 9:00 AM | Soil | 1 | | | | | | | X | X | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | | | | |
| Turnaround Information | | | Data Deliverable Information | | | | | | | | | | Comments / Remarks | | | | | | |
| <input checked="" type="checkbox"/> 10 Business Day Standard <input type="checkbox"/> Other _____ (Days) | | | Approved By: _____ | | | <input type="checkbox"/> Commercial "A" <input type="checkbox"/> Commercial "B" <input checked="" type="checkbox"/> Commercial "BN" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Tier 1 | | | | | <input type="checkbox"/> PDF <input type="checkbox"/> Compact Disk Deliverable <input type="checkbox"/> Electronic Delivery: <input type="checkbox"/> State Forms <input type="checkbox"/> Other (Specify) _____ | | | | | Please use Colorado regulations and RLs. <i>10E</i> | | | |
| 10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved. | | | | | | | | | | | | | | | | | | | |
| Sample Custody must be documented below each time samples change possession, including courier delivery. | | | | | | | | | | | | | | | | | | | |
| Relinquished by: | | | Date & Time: | | | Received By: | | | Date & Time: | | | Seal #: | | Headspace: | | | | | |
| 1 <i>[Signature]</i> | | | 9/28/10 1:50 | | | 1 <i>FedEx</i> | | | 1 | | | | | Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> | | | | | |
| Relinquished by: | | | Date & Time: | | | Received By: | | | Date & Time: | | | Preserved where applicable: | | | | | | | |
| 2 <i>FedEx</i> | | | 9/28/10 4:30 | | | 2 <i>[Signature]</i> | | | 2 | | | <input type="checkbox"/> | | | | | | | |
| Relinquished by: | | | Date & Time: | | | Received By: | | | Date & Time: | | | Temperature °C | | On Ice | | | | | |
| 3 | | | | | | 3 | | | 3 | | | 1.8 | | <input checked="" type="checkbox"/> | | | | | |

11.1 11

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17737
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|----------------------|-----------------|------|-----------|-------|--------------|------------|------------|-----------|
| Chromium, Hexavalent | GP12082/GN32961 | 0.50 | 0.0 | mg/kg | 12 | 11.2 | 93.3 | 80-120% |
| Chromium, Hexavalent | GP12082/GN32961 | | | mg/kg | 657 | 623 | 94.8 | 80-120% |

Associated Samples:

Batch GP12082: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

(*) Outside of QC limits

12.1

12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17737
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|-----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN32947 | D17737-6 | mv | 349 | 338 | 3.2 | 0-20% |
| Redox Potential Vs H2 | GN32958 | D17735-5 | mv | 371 | 363 | 2.2 | 0-20% |

Associated Samples:

Batch GN32947: D17737-6

Batch GN32958: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-7

Batch GP12082: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

(*) Outside of QC limits

12.2
12

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D17737
Account: ALMS - Accutest Mountain States
Project: MOILCOGJ: Roan Pit Closure

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|-----------------|-----------|-------|-----------------|--------------|-----------|-------|-----------|
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 11.9 | 10.6 | 89.1 | 75-125% |
| Chromium, Hexavalent | GP12082/GN32961 | D17733-6 | mg/kg | 0.0 | 1040 | 1090 | 104.8 | 75-125% |

Associated Samples:

Batch GP12082: D17737-1, D17737-2, D17737-3, D17737-4, D17737-5, D17737-6, D17737-7

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.3
12