

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-109010-1

Client Project/Site: Ford LTP Livonia MI - E203631

For:

ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
3/8/2019 4:55:45 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

| | |
|----------------------------------|----|
| Cover Page | 1 |
| Table of Contents | 2 |
| Definitions/Glossary | 3 |
| Case Narrative | 4 |
| Method Summary | 6 |
| Sample Summary | 7 |
| Detection Summary | 8 |
| Client Sample Results | 9 |
| Surrogate Summary | 11 |
| QC Sample Results | 12 |
| QC Association Summary | 15 |
| Lab Chronicle | 16 |
| Certification Summary | 17 |
| Chain of Custody | 18 |

Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Qualifiers

GC/MS VOA

| Qualifier | Qualifier Description |
|-----------|--|
| U | Indicates the analyte was analyzed for but not detected. |
| * | LCS or LCSD is outside acceptance limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|---|
| α | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Job ID: 240-109010-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-109010-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 3/7/2019 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-182S_030519 (240-109010-1) and DUP-05_030519 (240-109010-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/07/2019.

The continuing calibration verification (CCV) associated with batch 370674 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: MW-182S_030519 (240-109010-1) and DUP-05_030519 (240-109010-2).

The laboratory control sample (LCS) for 370674 recovered outside control limits for one or multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. MW-182S_030519 (240-109010-1), DUP-05_030519 (240-109010-2) and (LCS 240-370674/4)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-182S_030519 (240-109010-1) and DUP-05_030519 (240-109010-2) were analyzed for volatile organic compounds (GCMS

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Job ID: 240-109010-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 03/07/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

| Method | Method Description | Protocol | Laboratory |
|-----------|------------------------------------|----------|------------|
| 8260B | Volatile Organic Compounds (GC/MS) | SW846 | TAL CAN |
| 8260B SIM | Volatile Organic Compounds (GC/MS) | SW846 | TAL CAN |
| 5030B | Purge and Trap | SW846 | TAL CAN |

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|------------------|--------|----------------|----------------|
| 240-109010-1 | MW-182S_030519 | Water | 03/05/19 15:20 | 03/07/19 08:15 |
| 240-109010-2 | DUP-05_030519 | Water | 03/05/19 00:00 | 03/07/19 08:15 |

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: MW-182S_030519

Lab Sample ID: 240-109010-1

No Detections.

Client Sample ID: DUP-05_030519

Lab Sample ID: 240-109010-2

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: MW-182S_030519

Lab Sample ID: 240-109010-1

Date Collected: 03/05/19 15:20

Matrix: Water

Date Received: 03/07/19 08:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|------|------|---|----------|----------------|---------|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/07/19 13:27 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 | | | | | 03/07/19 13:27 | 1 |

Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 13:40 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/07/19 13:40 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/07/19 13:40 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 13:40 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/07/19 13:40 | 1 |
| Vinyl chloride | 1.0 | U * | 1.0 | 0.20 | ug/L | | | 03/07/19 13:40 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 110 | | 70 - 121 | | | | | 03/07/19 13:40 | 1 |
| 4-Bromofluorobenzene (Surr) | 96 | | 59 - 120 | | | | | 03/07/19 13:40 | 1 |
| Toluene-d8 (Surr) | 106 | | 70 - 123 | | | | | 03/07/19 13:40 | 1 |
| Dibromofluoromethane (Surr) | 96 | | 75 - 128 | | | | | 03/07/19 13:40 | 1 |

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: DUP-05_030519

Lab Sample ID: 240-109010-2

Date Collected: 03/05/19 00:00

Matrix: Water

Date Received: 03/07/19 08:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/07/19 13:52 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 | | | | | 03/07/19 13:52 | 1 |

Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 14:02 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/07/19 14:02 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/07/19 14:02 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 14:02 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/07/19 14:02 | 1 |
| Vinyl chloride | 1.0 | U * | 1.0 | 0.20 | ug/L | | | 03/07/19 14:02 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 117 | | 70 - 121 | | | | | 03/07/19 14:02 | 1 |
| 4-Bromofluorobenzene (Surr) | 95 | | 59 - 120 | | | | | 03/07/19 14:02 | 1 |
| Toluene-d8 (Surr) | 111 | | 70 - 123 | | | | | 03/07/19 14:02 | 1 |
| Dibromofluoromethane (Surr) | 107 | | 75 - 128 | | | | | 03/07/19 14:02 | 1 |

Surrogate Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID | Client Sample ID | Percent Surrogate Recovery (Acceptance Limits) | | | |
|--------------------|------------------------|--|-----------------|-----------------|------------------|
| | | DCA (70-121) | BFB (59-120) | TOL (70-123) | DBFM (75-128) |
| 240-108787-B-3 MS | Matrix Spike | 101 | 103 | 112 | 87 |
| 240-108787-B-3 MSD | Matrix Spike Duplicate | 90 | 91 | 101 | 80 |
| 240-109010-1 | MW-182S_030519 | 110 | 96 | 106 | 96 |
| 240-109010-2 | DUP-05_030519 | 117 | 95 | 111 | 107 |
| LCS 240-370674/4 | Lab Control Sample | 109 | 109 | 116 | 101 |
| MB 240-370674/6 | Method Blank | 115 | 97 | 112 | 104 |

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
 BFB = 4-Bromofluorobenzene (Surr)
 TOL = Toluene-d8 (Surr)
 DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID | Client Sample ID | Percent Surrogate Recovery (Acceptance Limits) |
|--------------------|------------------------|--|
| | | DCA (63-125) |
| 240-108818-F-8 MS | Matrix Spike | 82 |
| 240-108818-F-8 MSD | Matrix Spike Duplicate | 84 |
| 240-109010-1 | MW-182S_030519 | 82 |
| 240-109010-2 | DUP-05_030519 | 82 |
| LCS 240-370673/4 | Lab Control Sample | 82 |
| MB 240-370673/5 | Method Blank | 84 |

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID | Client Sample ID | Percent Surrogate Recovery (Acceptance Limits) |
|------------------|--------------------|--|
| | | DCA (10-150) |
| MRL 240-370673/6 | Lab Control Sample | 84 |

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-370674/6
Matrix: Water
Analysis Batch: 370674

Client Sample ID: Method Blank
Prep Type: Total/NA

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------|-----------|--------------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 12:55 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/07/19 12:55 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/07/19 12:55 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 12:55 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/07/19 12:55 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 03/07/19 12:55 | 1 |

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|--------------|--------------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 115 | | 70 - 121 | | 03/07/19 12:55 | 1 |
| 4-Bromofluorobenzene (Surr) | 97 | | 59 - 120 | | 03/07/19 12:55 | 1 |
| Toluene-d8 (Surr) | 112 | | 70 - 123 | | 03/07/19 12:55 | 1 |
| Dibromofluoromethane (Surr) | 104 | | 75 - 128 | | 03/07/19 12:55 | 1 |

Lab Sample ID: LCS 240-370674/4
Matrix: Water
Analysis Batch: 370674

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|--------------------------|-------------|------------|---------------|------|---|------|--------------|
| 1,1-Dichloroethene | 10.0 | 11.2 | | ug/L | | 112 | 65 - 139 |
| cis-1,2-Dichloroethene | 10.0 | 10.3 | | ug/L | | 103 | 76 - 128 |
| Tetrachloroethene | 10.0 | 8.10 | | ug/L | | 81 | 74 - 130 |
| trans-1,2-Dichloroethene | 10.0 | 10.5 | | ug/L | | 105 | 78 - 133 |
| Trichloroethene | 10.0 | 8.07 | | ug/L | | 81 | 76 - 125 |
| Vinyl chloride | 10.0 | 14.6 * | | ug/L | | 146 | 58 - 143 |

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|------------------------------|---------------|---------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 109 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 109 | | 59 - 120 |
| Toluene-d8 (Surr) | 116 | | 70 - 123 |
| Dibromofluoromethane (Surr) | 101 | | 75 - 128 |

Lab Sample ID: 240-108787-B-3 MS
Matrix: Water
Analysis Batch: 370674

Client Sample ID: Matrix Spike
Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|--------------------------|---------------|------------------|-------------|-----------|--------------|------|---|------|--------------|
| 1,1-Dichloroethene | 5.0 | U | 50.0 | 45.0 | | ug/L | | 90 | 53 - 140 |
| cis-1,2-Dichloroethene | 5.0 | U | 50.0 | 47.3 | | ug/L | | 95 | 64 - 130 |
| Tetrachloroethene | 5.0 | U | 50.0 | 35.3 | | ug/L | | 71 | 51 - 136 |
| trans-1,2-Dichloroethene | 5.0 | U | 50.0 | 45.3 | | ug/L | | 91 | 68 - 133 |
| Trichloroethene | 0.76 | J | 50.0 | 37.5 | | ug/L | | 73 | 55 - 131 |
| Vinyl chloride | 5.0 | U * | 50.0 | 64.9 | | ug/L | | 130 | 43 - 154 |

| Surrogate | MS %Recovery | MS Qualifier | Limits |
|------------------------------|--------------|--------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 101 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 103 | | 59 - 120 |
| Toluene-d8 (Surr) | 112 | | 70 - 123 |

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-108787-B-3 MS
Matrix: Water
Analysis Batch: 370674

Client Sample ID: Matrix Spike
Prep Type: Total/NA

| Surrogate | MS MS | | Limits |
|-----------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| Dibromofluoromethane (Surr) | 87 | | 75 - 128 |

Lab Sample ID: 240-108787-B-3 MSD
Matrix: Water
Analysis Batch: 370674

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD MSD | | Unit | D | %Rec | %Rec. Limits | | RPD | RPD Limit |
|--------------------------|---------------|------------------|-------------|---------|-----------|------|---|------|--------------|-----|-----|-----------|
| | | | | Result | Qualifier | | | | Limit | RPD | | |
| 1,1-Dichloroethene | 5.0 | U | 50.0 | 48.7 | | ug/L | | 97 | 53 - 140 | 8 | 35 | |
| cis-1,2-Dichloroethene | 5.0 | U | 50.0 | 45.7 | | ug/L | | 91 | 64 - 130 | 3 | 21 | |
| Tetrachloroethene | 5.0 | U | 50.0 | 39.8 | | ug/L | | 80 | 51 - 136 | 12 | 23 | |
| trans-1,2-Dichloroethene | 5.0 | U | 50.0 | 48.8 | | ug/L | | 98 | 68 - 133 | 7 | 24 | |
| Trichloroethene | 0.76 | J | 50.0 | 40.2 | | ug/L | | 79 | 55 - 131 | 7 | 23 | |
| Vinyl chloride | 5.0 | U * | 50.0 | 63.0 | | ug/L | | 126 | 43 - 154 | 3 | 29 | |

| Surrogate | MSD MSD | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 90 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 91 | | 59 - 120 |
| Toluene-d8 (Surr) | 101 | | 70 - 123 |
| Dibromofluoromethane (Surr) | 80 | | 75 - 128 |

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-370673/5
Matrix: Water
Analysis Batch: 370673

Client Sample ID: Method Blank
Prep Type: Total/NA

| Analyte | MB MB | | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|-------------|--------|-----------|-----|------|------|---|----------------|----------|---------|
| | Result | Qualifier | | | | | | | |
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | 03/07/19 11:22 | 1 | |

| Surrogate | MB MB | | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------------|----------|---------|
| | %Recovery | Qualifier | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 84 | | 63 - 125 | 03/07/19 11:22 | 1 | |

Lab Sample ID: LCS 240-370673/4
Matrix: Water
Analysis Batch: 370673

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

| Analyte | Spike Added | LCS LCS | | Unit | D | %Rec | %Rec. Limits | |
|-------------|-------------|---------|-----------|------|---|------|--------------|-----|
| | | Result | Qualifier | | | | Limit | RPD |
| 1,4-Dioxane | 10.0 | 11.8 | | ug/L | | 118 | 59 - 131 | |

| Surrogate | LCS LCS | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 |

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MRL 240-370673/6

Matrix: Water

Analysis Batch: 370673

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|------------------------------|------------------|----------------------|---------------|-------|---|------|--------------|
| 1,4-Dioxane | 0.00100 | 0.00116 | J | ng/uL | | 116 | 10 - 150 |
| Surrogate | %Recovery | MRL Qualifier | Limits | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 84 | | 10 - 150 | | | | |

Lab Sample ID: 240-108818-F-8 MS

Matrix: Water

Analysis Batch: 370673

Client Sample ID: Matrix Spike

Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|------------------------------|------------------|---------------------|---------------|-----------|--------------|------|---|------|--------------|
| 1,4-Dioxane | 2.0 | U | 10.0 | 11.9 | | ug/L | | 119 | 52 - 129 |
| Surrogate | %Recovery | MS Qualifier | Limits | | | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 | | | | | | |

Lab Sample ID: 240-108818-F-8 MSD

Matrix: Water

Analysis Batch: 370673

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|------------------------------|------------------|----------------------|---------------|------------|---------------|------|---|------|--------------|-----|-----------|
| 1,4-Dioxane | 2.0 | U | 10.0 | 11.7 | | ug/L | | 117 | 52 - 129 | 1 | 13 |
| Surrogate | %Recovery | MSD Qualifier | Limits | | | | | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 84 | | 63 - 125 | | | | | | | | |

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

GC/MS VOA

Analysis Batch: 370673

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|------------------------|-----------|--------|-----------|------------|
| 240-109010-1 | MW-182S_030519 | Total/NA | Water | 8260B SIM | |
| 240-109010-2 | DUP-05_030519 | Total/NA | Water | 8260B SIM | |
| MB 240-370673/5 | Method Blank | Total/NA | Water | 8260B SIM | |
| LCS 240-370673/4 | Lab Control Sample | Total/NA | Water | 8260B SIM | |
| MRL 240-370673/6 | Lab Control Sample | Total/NA | Water | 8260B SIM | |
| 240-108818-F-8 MS | Matrix Spike | Total/NA | Water | 8260B SIM | |
| 240-108818-F-8 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B SIM | |

Analysis Batch: 370674

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|------------------------|-----------|--------|--------|------------|
| 240-109010-1 | MW-182S_030519 | Total/NA | Water | 8260B | |
| 240-109010-2 | DUP-05_030519 | Total/NA | Water | 8260B | |
| MB 240-370674/6 | Method Blank | Total/NA | Water | 8260B | |
| LCS 240-370674/4 | Lab Control Sample | Total/NA | Water | 8260B | |
| 240-108787-B-3 MS | Matrix Spike | Total/NA | Water | 8260B | |
| 240-108787-B-3 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B | |

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: MW-182S_030519

Date Collected: 03/05/19 15:20

Date Received: 03/07/19 08:15

Lab Sample ID: 240-109010-1

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 370674 | 03/07/19 13:40 | LEE | TAL CAN |
| Total/NA | Analysis | 8260B SIM | | 1 | 370673 | 03/07/19 13:27 | SAM | TAL CAN |

Client Sample ID: DUP-05_030519

Date Collected: 03/05/19 00:00

Date Received: 03/07/19 08:15

Lab Sample ID: 240-109010-2

Matrix: Water

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 370674 | 03/07/19 14:02 | LEE | TAL CAN |
| Total/NA | Analysis | 8260B SIM | | 1 | 370673 | 03/07/19 13:52 | SAM | TAL CAN |

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|-----------------------|---------------|------------|-----------------------|-----------------|
| California | State Program | 9 | 2927 | 02-23-20 |
| Connecticut | State Program | 1 | PH-0590 | 12-31-19 |
| Florida | NELAP | 4 | E87225 | 06-30-19 |
| Illinois | NELAP | 5 | 200004 | 07-31-19 |
| Kansas | NELAP | 7 | E-10336 | 04-30-19 * |
| Kentucky (UST) | State Program | 4 | 58 | 02-23-20 |
| Kentucky (WW) | State Program | 4 | 98016 | 12-31-19 |
| Minnesota | NELAP | 5 | 039-999-348 | 12-31-19 * |
| Minnesota (Petrofund) | State Program | 1 | 3506 | 07-31-19 |
| Nevada | State Program | 9 | OH00048 | 07-31-19 |
| New Jersey | NELAP | 2 | OH001 | 06-30-19 |
| New York | NELAP | 2 | 10975 | 03-31-19 * |
| Ohio VAP | State Program | 5 | CL0024 | 09-06-19 |
| Oregon | NELAP | 10 | 4062 | 02-23-20 |
| Pennsylvania | NELAP | 3 | 68-00340 | 08-31-19 * |
| Texas | NELAP | 6 | T104704517-18-10 | 08-31-19 |
| USDA | Federal | | P330-16-00404 | 12-28-19 |
| Virginia | NELAP | 3 | 460175 | 09-14-19 |
| Washington | State Program | 10 | C971 | 01-12-20 * |
| West Virginia DEP | State Program | 3 | 210 | 12-31-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.


TestAmerica Michigan
10448 Citations Drive
Suite 200
Brighton, MI 48116
Phone: 810.229.3763 Fax: 412.963.2470

MICHIGAN Chain of Custody Record · 221583
190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (07/13)

2.6 / C2.4

Regulatory Program: DW NPDES RCRA Other:

| | | | | | | | |
|--|--|---|--|---|--------------------------------|---|--|
| Client Contact Company Name: <u>Accadis U.S. Inc.</u> Address: <u>28550 Cabot Drive Suite 500</u> City/State/Zip: <u>Novi, MI, 48377</u> Phone: Fax: Project Name: <u>FORU LTP Livonia MI - E203631</u> Site: P.O.# | | Project Manager: <u>Angela DeGrandis</u> Tel/Fax: Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 24 HR <input checked="" type="checkbox"/> 1 day | | Site Contact: <u>Angela DeGrandis</u> Date: <u>3/15/19</u> Carrier: <u>Accadis-US.com</u> Lab Contact: <u>82608 SIM-Local Meeting</u> Perform MS / MSD (Y / N) Filtered Sample (Y / N) | | COC No.: <u>1</u> of <u>1</u> COCs Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.: | |
| Sample Identification <u>MM-1025-030519</u> <u>DUP-05-030519</u> | | Sample Date <u>3/5/19</u> <u>3/5/19</u> | Sample Time <u>1520</u> <u>---</u> | Sample Type (C=Comp, G=Grab) <u>6</u> <u>6</u> | Matrix <u>W</u> <u>W</u> | # of Cont. <u>6</u> <u>6</u> | Sample Specific Notes: <u>82608 SIM = 1,4-dioxane</u> <u>82608 = 1,1-DCE, CS-1,2-DCE</u> <u>KANS-1,2-DCE</u> <u>PCE, TCE, VC</u> |
|  | | | | | | | |
| Preservation Used: 1= Ice (2) HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification: <u>2</u> Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. | | | | | | | |
| Special Instructions/QC Requirements & Comments: <u>Submit all results through Cadena at jim.tomalia@cadenal.com # E203631</u> <u>Level VI Reporting</u> | | | | | | | |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No | | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | | Return to Client: <input type="checkbox"/> <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months | | Therm ID No.: _____ | |
| Relinquished by: <u>Christina Weaver / Christine Wen</u> | | Date/Time: <u>3/5/19 / 17:10</u> | | Company: <u>Accadis</u> | | Date/Time: <u>3/5/19 / 17:10</u> | |
| Relinquished by: <u>Caroline O'Neil</u> | | Date/Time: <u>3/6/19 07:20</u> | | Company: <u>TR</u> | | Date/Time: <u>3/6/19 07:20</u> | |
| Relinquished by: <u>Jeni Heel</u> | | Date/Time: <u>3-6-19 1039</u> | | Company: <u>TR</u> | | Date/Time: <u>3/2/19 815</u> | |



TestAmerica Canton Sample Receipt Form/Narrative

Login # : 109010

Canton Facility

Client Arcadis

Site Name _____

Cooler unpacked by: [Signature]

Cooler Received on 3/2/19

Opened on 3/2/19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____

Storage Location _____

TestAmerica Cooler # 216 Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF -0.2 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.4 °C
 IR GUN #36 (CF +0.7 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC861525
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
 Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: JR

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____
 VOA Sample Preservation - Date/Time VOAs Frozen: _____



March 08, 2019

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: TestAmerica - North Canton
Laboratory submittal: 109010-1
Sample date: 2019-03-05
Report received by CADENA: 2019-03-08
Initial Data Verification completed by CADENA: 2019-03-08

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 370674 LCS recovery was outlying biased high for the following analyte: VINYL CHLORIDE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

2 Water sample(s) were analyzed for GCMS VOC parameter(s).

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

| Valid Qualifiers | Description |
|------------------|--|
| < | Less than the reported concentration. |
| > | Greater than the reported concentration. |
| B | The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration. |
| E | The analyte / Compound reported exceeds the calibration range and is considered estimated. |
| EMPC | Estimated Minimum Potential Contamination - Dioxin/Furan analyses only. |
| J | Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies. |
| J- | The result is an estimated quantity, but the result may be biased low. |
| JB | NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED |
| JH | The sample result is considered estimated and is potentially biased high. |
| JL | The sample result is considered estimated and is potentially biased low. |
| JUB | NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED |
| NJ | Tentatively identified compound with approximated concentration. |
| R | Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.) |
| TNTC | Too Numerous to Count - Asbestos and Microbiological Results. |
| U | Indicates that the analyte / compound was analyzed for, but not detected. |
| UB | The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL. |
| UJ | The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample. |

SAMPLING AND ANALYSIS SUMMARY

CADENA Project ID: E203631

Laboratory: TestAmerica-North Canton

Laboratory Submittal: 109010-1

| Lab Sample ID | Sample ID | Collection Date (mm/yy/dd) | Collection Time (hh:mm:ss) | Volatile Organics by GCMS | 8260B with Single Ion Monitoring | Comment |
|---------------|----------------|-------------------------------|-------------------------------|------------------------------|-------------------------------------|---------|
| 2401090101 | MW-182S_030519 | 3/5/2019 | 3:20:00 | X | X | |
| 2401090102 | DUP-05_030519 | 3/5/2019 | 12:00:00 | X | X | |

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 109010-1

| | | |
|-----------------------|----------------|---------------|
| Sample Name: | MW-182S_030519 | DUP-05_030519 |
| Lab Sample ID: | 2401090101 | 2401090102 |
| Sample Date: | 3/5/2019 | 3/5/2019 |

| Analyte | Cas No. | Report | | Units | Valid | | Report | | Valid | |
|--------------------------|----------|--------|-------|-------|-----------|--------|--------|-----------|-------|--|
| | | Result | Limit | | Qualifier | Result | Limit | Qualifier | | |
| GC/MS VOC | | | | | | | | | | |
| <u>OSW-8260B</u> | | | | | | | | | | |
| 1,1-Dichloroethene | 75-35-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| cis-1,2-Dichloroethene | 156-59-2 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Tetrachloroethene | 127-18-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| trans-1,2-Dichloroethene | 156-60-5 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Trichloroethene | 79-01-6 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Vinyl chloride | 75-01-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| <u>OSW-8260BBSim</u> | | | | | | | | | | |
| 1,4-Dioxane | 123-91-1 | ND | 2.0 | ug/l | --- | ND | 2.0 | ug/l | --- | |

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG #240-109010-1

CADENA Verification Report: 2019-03-08

Analyses Performed By:

TestAmerica
Canton, Ohio

Report #32021R

Review Level: Tier II/Plus

Project: MI001454.0003.00002



DATA REVIEW

SUMMARY

This data quality assessment/verification summarizes the confirmation of detected compounds (if applicable), review of the verification/Tier II validation review performed by CADENA Inc. and review of level II laboratory data package completeness for Sample Delivery Group (SDG) # 240-109010-1 for samples collected in association with the Ford – Livonia, Michigan site. Only detected compound confirmations and omitted deviations from the CADENA verification/Tier II report are documented in this report. The Tier II/Plus validation is performed in the instance when a sample location has a detection at a concentration of 5 ppb or less. The detection and the concentration are reviewed and verified based on the instrument calibration and laboratory raw data. Only analytical data associated with constituents of concern were reviewed for this verification. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

| SDG | Sample ID | Lab ID | Matrix | Sample Collection Date | Parent Sample | Analysis | | |
|--------------|----------------|--------------|--------|------------------------|---------------|----------|-----------|------|
| | | | | | | VOC | VOC (SIM) | MISC |
| 240-109010-1 | MW-182S_030519 | 240-109010-1 | Water | 3/5/2019 | | X | X | |
| | DUP-05_030519 | 240-109010-2 | Water | 3/5/2019 | | X | | |

Notes:

VOC = volatile organic compound

SIM = selective ion monitoring

MISC = miscellaneous

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

| Items Reviewed | Reported | | Performance Acceptable | | Not Required |
|--|----------|-----|------------------------|-----|--------------|
| | No | Yes | No | Yes | |
| 1. Sample receipt condition | | X | | X | |
| 2. Requested analyses and sample results | | X | | X | |
| 3. Master tracking list | | X | | X | |
| 4. Methods of analysis | | X | | X | |
| 5. Reporting limits | | X | | X | |
| 6. Sample collection date | | X | | X | |
| 7. Laboratory sample received date | | X | | X | |
| 8. Sample preservation verification (as applicable) | | X | | X | |
| 9. Sample preparation/extraction/analysis dates | | X | | X | |
| 10. Fully executed Chain-of-Custody (COC) form | | X | | X | |
| 11. Narrative summary of Quality Assurance or sample problems provided | | X | | X | |
| 12. Data Package Completeness and Compliance | | X | | X | |

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

1.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

1.2 Continuing Calibration

All target compounds associated with the continuing calibration verification (CCV) standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

Calibration criteria are only reviewed when detections were present in samples. No compounds were detected in the samples within this SDG; therefore, calibration criteria was not evaluated.

2. Compound Identification

Compounds are identified on the GC/MS by using the analyte's relative retention time, ion spectra, and concentration.

No compounds were detected in the samples within this SDG.

3. System Performance and Overall Assessment

Sample DUP-05_030519 is a field duplicate of parent sample MW-182S_030519, which is reported in SDG 240-109010-1. No compounds were detected in either sample, therefore a field duplicate evaluation was not required.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in the CADENA Inc. review and this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

| VOCs: 8260B/8260B-SIM | Reported | | Performance Acceptable | | Not Required |
|---|----------|-----|------------------------|-----|--------------|
| | No | Yes | No | Yes | |
| GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) | | | | | |
| Tier II+ Validation | | | | | |
| Compound identification and quantitation | | | | | |
| A. Reconstructed ion chromatograms | X | | | | X |
| B. Quantitation Reports | X | | | | X |
| C. RT of sample compounds within the established RT windows | X | | | | X |

Notes:

RT retention time

VERIFICATION/VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: March 11, 2019

PEER REVIEW: Dennis Capria

DATE: March 11, 2019



**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**




TestAmerica Michigan
 10448 Citations Drive
 Suite 200
 Brighton, MI 48116
 Phone: 810.229.3763 Fax: 412.963.2470

MICHIGAN Chain of Custody Record · 221583
 190

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 TestAmerica Laboratories, Inc.
 TAL-8210 (07/13)

2.6 / C2.4

Regulatory Program: DW NPDES RCRA Other:

| | | | | | | | |
|---|--|---|--|--|--|--|--|
| Client Contact Company Name: <u>Accadis U.S. Inc.</u> Address: <u>28550 Cabot Drive Suite 500</u> City/State/Zip: <u>Novi, MI, 48377</u> Phone: Fax: Project Name: <u>FORD LTP Livonia MI - E203631</u> Site: P.O.# | | Project Manager: <u>Angela DeGrandis</u> Tel/Fax: Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 24 HR <input checked="" type="checkbox"/> 1 day | | Site Contact: <u>Angela DeGrandis</u> Carrier: <u>Accadis-US.com</u> Lab Contact: Perform MS / MSD (Y / N) Filtered Sample (Y / N) | | COC No.: _____ of _____ COCs Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.: | |
| Sample Identification <u>MM-1025-030519</u> <u>DUP-05-030519</u> | | Sample Type (C=Comp, G=Grab) <u>6</u> <u>6</u> | | Matrix <u>W</u> <u>W</u> | | # of Cont. <u>6</u> <u>6</u> | |
| Sample Date <u>3/5/19</u> <u>3/5/19</u> | | Sample Time <u>1520</u> <u>---</u> | | Sample Specific Notes: <u>82608 SIM = 1,4-dioxane</u> <u>82608 = 1,1-DCE, CS-1,2-DCE</u> <u>KANS-1,2-DCE</u> <u>PCE, TCE, VC</u> | | Sample Specific Notes: <u>82608 SIM = 1,4-dioxane</u> <u>82608 = 1,1-DCE, CS-1,2-DCE</u> <u>KANS-1,2-DCE</u> <u>PCE, TCE, VC</u> | |
|  240-109010 Chain of Custody | | | | | | | |
| Preservation Used: 1= Ice (2) HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification: _____ Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. | | | | | | | |
| Special Instructions/QC Requirements & Comments: <u>Submit all results through Cadena at jim.tomalia @ cadena.com # E203631</u> <u>Level VI Reporting</u> | | | | | | | |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No | | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | | Return to Client: <input type="checkbox"/> <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months | | Therm ID No.: _____ | |
| Relinquished by: <u>Christina Weaver / Christine Wen</u> | | Date/Time: <u>3/5/19 / 17:10</u> | | Company: <u>Accadis</u> | | Date/Time: <u>3/5/19 / 17:10</u> | |
| Relinquished by: <u>Caroline O'Neil</u> | | Date/Time: <u>3/6/19 07:20</u> | | Company: <u>TR</u> | | Date/Time: <u>3/6/19 07:20</u> | |
| Relinquished by: <u>Jeni Heel</u> | | Date/Time: <u>3-6-19 1039</u> | | Company: <u>TR</u> | | Date/Time: <u>3/2/19 815</u> | |



Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: MW-182S_030519

Lab Sample ID: 240-109010-1

Date Collected: 03/05/19 15:20

Matrix: Water

Date Received: 03/07/19 08:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|------|------|---|----------|----------------|---------|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/07/19 13:27 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 | | | | | 03/07/19 13:27 | 1 |

Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|------------|----------|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 13:40 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/07/19 13:40 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/07/19 13:40 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 13:40 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/07/19 13:40 | 1 |
| Vinyl chloride | 1.0 | U <i>†</i> | 1.0 | 0.20 | ug/L | | | 03/07/19 13:40 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 110 | | 70 - 121 | | | | | 03/07/19 13:40 | 1 |
| 4-Bromofluorobenzene (Surr) | 96 | | 59 - 120 | | | | | 03/07/19 13:40 | 1 |
| Toluene-d8 (Surr) | 106 | | 70 - 123 | | | | | 03/07/19 13:40 | 1 |
| Dibromofluoromethane (Surr) | 96 | | 75 - 128 | | | | | 03/07/19 13:40 | 1 |

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

TestAmerica Job ID: 240-109010-1

Client Sample ID: DUP-05_030519

Lab Sample ID: 240-109010-2

Date Collected: 03/05/19 00:00

Matrix: Water

Date Received: 03/07/19 08:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/07/19 13:52 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 82 | | 63 - 125 | | | | | 03/07/19 13:52 | 1 |

Method: 8260B - Volatile Organic Compounds (GC/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 14:02 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/07/19 14:02 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/07/19 14:02 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/07/19 14:02 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/07/19 14:02 | 1 |
| Vinyl chloride | 1.0 | U ↓ | 1.0 | 0.20 | ug/L | | | 03/07/19 14:02 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 117 | | 70 - 121 | | | | | 03/07/19 14:02 | 1 |
| 4-Bromofluorobenzene (Surr) | 95 | | 59 - 120 | | | | | 03/07/19 14:02 | 1 |
| Toluene-d8 (Surr) | 111 | | 70 - 123 | | | | | 03/07/19 14:02 | 1 |
| Dibromofluoromethane (Surr) | 107 | | 75 - 128 | | | | | 03/07/19 14:02 | 1 |