

## ANALYTICAL REPORT

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Laboratory Job ID: 460-196764-1  
Client Project/Site: Ford LTP Off-Site

For:  
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Authorized for release by:  
11/27/2019 11:36:23 AM

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*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.*



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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Qualifiers

### GC/MS VOA

| Qualifier | Qualifier Description                                    |
|-----------|--|
| U         | Indicates the analyte was analyzed for but not detected. |

## Glossary

| Abbreviation   | These commonly used abbreviations may or may not be present in this report.                                 |
|----------------|---|
| ▫              | 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 Off-Site

Job ID: 460-196764-1

**Job ID: 460-196764-1**

**Laboratory: Eurofins TestAmerica, Edison**

## Narrative

### CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: Ford LTP Off-Site**

**Report Number: 460-196764-1**

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.

Eurofins TestAmerica, Edison attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins 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 Eurofins TestAmerica and its client.

#### **RECEIPT**

The samples were received on 11/13/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

#### **VOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples TRIP BLANK (460-196764-1) and MW-186S\_111119 (460-196764-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/23/2019.

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

#### **VOLATILE ORGANIC COMPOUNDS (GC/MS)**

Samples MW-186S\_111119 (460-196764-2) were analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/20/2019.

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

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-196764-1**

No Detections.

**Client Sample ID: MW-186S\_111119**

**Lab Sample ID: 460-196764-2**

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-196764-1**

Date Collected: 11/11/19 00:00

Matrix: Water

Date Received: 11/13/19 10:00

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte                  | Result | Qualifier | RL  | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene       | 1.0    | U         | 1.0 | 0.26 | ug/L | - |          | 11/23/19 19:21 | 1       |
| cis-1,2-Dichloroethene   | 1.0    | U         | 1.0 | 0.22 | ug/L | - |          | 11/23/19 19:21 | 1       |
| Tetrachloroethene        | 1.0    | U         | 1.0 | 0.25 | ug/L | - |          | 11/23/19 19:21 | 1       |
| trans-1,2-Dichloroethene | 1.0    | U         | 1.0 | 0.24 | ug/L | - |          | 11/23/19 19:21 | 1       |
| Trichloroethene          | 1.0    | U         | 1.0 | 0.31 | ug/L | - |          | 11/23/19 19:21 | 1       |
| Vinyl chloride           | 1.0    | U         | 1.0 | 0.17 | ug/L | - |          | 11/23/19 19:21 | 1       |

| Surrogate                    | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 95        |           | 74 - 132 |          | 11/23/19 19:21 | 1       |
| Toluene-d8 (Surr)            | 99        |           | 80 - 120 |          | 11/23/19 19:21 | 1       |
| Dibromofluoromethane (Surr)  | 100       |           | 72 - 131 |          | 11/23/19 19:21 | 1       |
| 4-Bromofluorobenzene         | 97        |           | 77 - 124 |          | 11/23/19 19:21 | 1       |

**Client Sample ID: MW-186S\_111119**

**Lab Sample ID: 460-196764-2**

Date Collected: 11/11/19 14:17

Matrix: Water

Date Received: 11/13/19 10:00

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

| Analyte     | Result | Qualifier | RL   | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|-------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| 1,4-Dioxane | 0.40   | U         | 0.40 | 0.33 | ug/L | - |          | 11/20/19 21:04 | 1       |

| Surrogate            | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|----------------------|-----------|-----------|----------|----------|----------------|---------|
| 4-Bromofluorobenzene | 78        |           | 72 - 133 |          | 11/20/19 21:04 | 1       |

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte                  | Result | Qualifier | RL  | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene       | 1.0    | U         | 1.0 | 0.26 | ug/L | - |          | 11/23/19 02:42 | 1       |
| cis-1,2-Dichloroethene   | 1.0    | U         | 1.0 | 0.22 | ug/L | - |          | 11/23/19 02:42 | 1       |
| Tetrachloroethene        | 1.0    | U         | 1.0 | 0.25 | ug/L | - |          | 11/23/19 02:42 | 1       |
| trans-1,2-Dichloroethene | 1.0    | U         | 1.0 | 0.24 | ug/L | - |          | 11/23/19 02:42 | 1       |
| Trichloroethene          | 1.0    | U         | 1.0 | 0.31 | ug/L | - |          | 11/23/19 02:42 | 1       |
| Vinyl chloride           | 1.0    | U         | 1.0 | 0.17 | ug/L | - |          | 11/23/19 02:42 | 1       |

| Surrogate                    | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 97        |           | 74 - 132 |          | 11/23/19 02:42 | 1       |
| Toluene-d8 (Surr)            | 99        |           | 80 - 120 |          | 11/23/19 02:42 | 1       |
| Dibromofluoromethane (Surr)  | 101       |           | 72 - 131 |          | 11/23/19 02:42 | 1       |
| 4-Bromofluorobenzene         | 96        |           | 77 - 124 |          | 11/23/19 02:42 | 1       |

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

| Lab Sample ID     | Client Sample ID       | DCA<br>(74-132) | TOL<br>(80-120) | DBFM<br>(72-131) | BFB<br>(77-124) |
|-------------------|------------------------|-----------------|-----------------|------------------|-----------------|
| 460-196764-1      | TRIP BLANK             | 95              | 99              | 100              | 97              |
| 460-196764-2      | MW-186S_111119         | 97              | 99              | 101              | 96              |
| LCS 460-657584/3  | Lab Control Sample     | 98              | 103             | 104              | 101             |
| LCS 460-657766/4  | Lab Control Sample     | 95              | 101             | 101              | 101             |
| LCSD 460-657584/4 | Lab Control Sample Dup | 101             | 106             | 105              | 102             |
| LCSD 460-657766/5 | Lab Control Sample Dup | 96              | 102             | 103              | 100             |
| MB 460-657584/9   | Method Blank           | 100             | 103             | 104              | 99              |
| MB 460-657766/9   | Method Blank           | 92              | 99              | 100              | 98              |

#### Surrogate Legend

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

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene

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

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

| Lab Sample ID     | Client Sample ID       | BFB<br>(72-133) |
|-------------------|------------------------|-----------------|
| 460-196764-2      | MW-186S_111119         | 78              |
| LCS 460-656856/3  | Lab Control Sample     | 84              |
| LCSD 460-656856/4 | Lab Control Sample Dup | 82              |
| MB 460-656856/8   | Method Blank           | 86              |

#### Surrogate Legend

BFB = 4-Bromofluorobenzene

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Method: 8260C - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 460-657584/9**  
**Matrix: Water**  
**Analysis Batch: 657584**

**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 | 0.26 | ug/L |   |          | 11/22/19 21:22 | 1       |
| cis-1,2-Dichloroethene   | 1.0       | U            | 1.0 | 0.22 | ug/L |   |          | 11/22/19 21:22 | 1       |
| Tetrachloroethene        | 1.0       | U            | 1.0 | 0.25 | ug/L |   |          | 11/22/19 21:22 | 1       |
| trans-1,2-Dichloroethene | 1.0       | U            | 1.0 | 0.24 | ug/L |   |          | 11/22/19 21:22 | 1       |
| Trichloroethene          | 1.0       | U            | 1.0 | 0.31 | ug/L |   |          | 11/22/19 21:22 | 1       |
| Vinyl chloride           | 1.0       | U            | 1.0 | 0.17 | ug/L |   |          | 11/22/19 21:22 | 1       |

| Surrogate                    | MB %Recovery | MB Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|--------------|--------------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 100          |              | 74 - 132 |          | 11/22/19 21:22 | 1       |
| Toluene-d8 (Surr)            | 103          |              | 80 - 120 |          | 11/22/19 21:22 | 1       |
| Dibromofluoromethane (Surr)  | 104          |              | 72 - 131 |          | 11/22/19 21:22 | 1       |
| 4-Bromofluorobenzene         | 99           |              | 77 - 124 |          | 11/22/19 21:22 | 1       |

**Lab Sample ID: LCS 460-657584/3**  
**Matrix: Water**  
**Analysis Batch: 657584**

**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       | 20.0        | 21.5       |               | ug/L |   | 107  | 74 - 123     |
| cis-1,2-Dichloroethene   | 20.0        | 20.4       |               | ug/L |   | 102  | 80 - 120     |
| Tetrachloroethene        | 20.0        | 21.2       |               | ug/L |   | 106  | 78 - 122     |
| trans-1,2-Dichloroethene | 20.0        | 21.2       |               | ug/L |   | 106  | 79 - 120     |
| Trichloroethene          | 20.0        | 21.5       |               | ug/L |   | 108  | 77 - 120     |
| Vinyl chloride           | 20.0        | 22.8       |               | ug/L |   | 114  | 62 - 138     |

| Surrogate                    | LCS %Recovery | LCS Qualifier | Limits   |
|------------------------------|---------------|---------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 98            |               | 74 - 132 |
| Toluene-d8 (Surr)            | 103           |               | 80 - 120 |
| Dibromofluoromethane (Surr)  | 104           |               | 72 - 131 |
| 4-Bromofluorobenzene         | 101           |               | 77 - 124 |

**Lab Sample ID: LCSD 460-657584/4**  
**Matrix: Water**  
**Analysis Batch: 657584**

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

| Analyte                  | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|--------------------------|-------------|-------------|----------------|------|---|------|--------------|-----|-----------|
| 1,1-Dichloroethene       | 20.0        | 18.6        |                | ug/L |   | 93   | 74 - 123     | 14  | 30        |
| cis-1,2-Dichloroethene   | 20.0        | 19.1        |                | ug/L |   | 96   | 80 - 120     | 6   | 30        |
| Tetrachloroethene        | 20.0        | 19.1        |                | ug/L |   | 95   | 78 - 122     | 10  | 30        |
| trans-1,2-Dichloroethene | 20.0        | 19.6        |                | ug/L |   | 98   | 79 - 120     | 8   | 30        |
| Trichloroethene          | 20.0        | 18.6        |                | ug/L |   | 93   | 77 - 120     | 14  | 30        |
| Vinyl chloride           | 20.0        | 19.8        |                | ug/L |   | 99   | 62 - 138     | 14  | 30        |

| Surrogate                    | LCSD %Recovery | LCSD Qualifier | Limits   |
|------------------------------|----------------|----------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 101            |                | 74 - 132 |
| Toluene-d8 (Surr)            | 106            |                | 80 - 120 |
| Dibromofluoromethane (Surr)  | 105            |                | 72 - 131 |

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# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCSD 460-657584/4**  
**Matrix: Water**  
**Analysis Batch: 657584**

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

| Surrogate            | LCSD LCSD |           | Limits   |
|----------------------|-----------|-----------|----------|
|                      | %Recovery | Qualifier |          |
| 4-Bromofluorobenzene | 102       |           | 77 - 124 |

**Lab Sample ID: MB 460-657766/9**  
**Matrix: Water**  
**Analysis Batch: 657766**

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

| Analyte                  | MB MB  |           | RL  | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
|                          | Result | Qualifier |     |      |      |   |          |                |         |
| 1,1-Dichloroethene       | 1.0    | U         | 1.0 | 0.26 | ug/L |   |          | 11/23/19 18:29 | 1       |
| cis-1,2-Dichloroethene   | 1.0    | U         | 1.0 | 0.22 | ug/L |   |          | 11/23/19 18:29 | 1       |
| Tetrachloroethene        | 1.0    | U         | 1.0 | 0.25 | ug/L |   |          | 11/23/19 18:29 | 1       |
| trans-1,2-Dichloroethene | 1.0    | U         | 1.0 | 0.24 | ug/L |   |          | 11/23/19 18:29 | 1       |
| Trichloroethene          | 1.0    | U         | 1.0 | 0.31 | ug/L |   |          | 11/23/19 18:29 | 1       |
| Vinyl chloride           | 1.0    | U         | 1.0 | 0.17 | ug/L |   |          | 11/23/19 18:29 | 1       |

| Surrogate                    | MB MB     |           | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
|                              | %Recovery | Qualifier |          |          |                |         |
| 1,2-Dichloroethane-d4 (Surr) | 92        |           | 74 - 132 |          | 11/23/19 18:29 | 1       |
| Toluene-d8 (Surr)            | 99        |           | 80 - 120 |          | 11/23/19 18:29 | 1       |
| Dibromofluoromethane (Surr)  | 100       |           | 72 - 131 |          | 11/23/19 18:29 | 1       |
| 4-Bromofluorobenzene         | 98        |           | 77 - 124 |          | 11/23/19 18:29 | 1       |

**Lab Sample ID: LCS 460-657766/4**  
**Matrix: Water**  
**Analysis Batch: 657766**

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

| Analyte                  | Spike Added | LCS LCS |           | Unit | D | %Rec | %Rec. Limits |
|--------------------------|-------------|---------|-----------|------|---|------|--------------|
|                          |             | Result  | Qualifier |      |   |      |              |
| 1,1-Dichloroethene       | 20.0        | 18.5    |           | ug/L |   | 93   | 74 - 123     |
| cis-1,2-Dichloroethene   | 20.0        | 19.0    |           | ug/L |   | 95   | 80 - 120     |
| Tetrachloroethene        | 20.0        | 18.5    |           | ug/L |   | 92   | 78 - 122     |
| trans-1,2-Dichloroethene | 20.0        | 18.9    |           | ug/L |   | 94   | 79 - 120     |
| Trichloroethene          | 20.0        | 19.0    |           | ug/L |   | 95   | 77 - 120     |
| Vinyl chloride           | 20.0        | 23.1    |           | ug/L |   | 116  | 62 - 138     |

| Surrogate                    | LCS LCS   |           | Limits   |
|------------------------------|-----------|-----------|----------|
|                              | %Recovery | Qualifier |          |
| 1,2-Dichloroethane-d4 (Surr) | 95        |           | 74 - 132 |
| Toluene-d8 (Surr)            | 101       |           | 80 - 120 |
| Dibromofluoromethane (Surr)  | 101       |           | 72 - 131 |
| 4-Bromofluorobenzene         | 101       |           | 77 - 124 |

**Lab Sample ID: LCSD 460-657766/5**  
**Matrix: Water**  
**Analysis Batch: 657766**

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

| Analyte                  | Spike Added | LCSD LCSD |           | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|--------------------------|-------------|-----------|-----------|------|---|------|--------------|-----|-----------|
|                          |             | Result    | Qualifier |      |   |      |              |     |           |
| 1,1-Dichloroethene       | 20.0        | 18.5      |           | ug/L |   | 92   | 74 - 123     | 0   | 30        |
| cis-1,2-Dichloroethene   | 20.0        | 18.5      |           | ug/L |   | 93   | 80 - 120     | 2   | 30        |
| Tetrachloroethene        | 20.0        | 18.0      |           | ug/L |   | 90   | 78 - 122     | 2   | 30        |
| trans-1,2-Dichloroethene | 20.0        | 19.0      |           | ug/L |   | 95   | 79 - 120     | 1   | 30        |
| Trichloroethene          | 20.0        | 18.9      |           | ug/L |   | 95   | 77 - 120     | 1   | 30        |

Eurofins TestAmerica, Edison

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCSD 460-657766/5**  
**Matrix: Water**  
**Analysis Batch: 657766**

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

| Analyte                      | Spike Added      | LCSD Result           | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|------------------------------|------------------|-----------------------|----------------|------|---|------|--------------|-----|-----------|
| Vinyl chloride               | 20.0             | 24.1                  |                | ug/L |   | 121  | 62 - 138     | 4   | 30        |
| <b>Surrogate</b>             |                  |                       |                |      |   |      |              |     |           |
|                              | <b>%Recovery</b> | <b>LCSD Qualifier</b> | <b>Limits</b>  |      |   |      |              |     |           |
| 1,2-Dichloroethane-d4 (Surr) | 96               |                       | 74 - 132       |      |   |      |              |     |           |
| Toluene-d8 (Surr)            | 102              |                       | 80 - 120       |      |   |      |              |     |           |
| Dibromofluoromethane (Surr)  | 103              |                       | 72 - 131       |      |   |      |              |     |           |
| 4-Bromofluorobenzene         | 100              |                       | 77 - 124       |      |   |      |              |     |           |

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

**Lab Sample ID: MB 460-656856/8**  
**Matrix: Water**  
**Analysis Batch: 656856**

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

| Analyte              | MB Result        | MB Qualifier        | RL            | MDL  | Unit | D | Prepared        | Analyzed        | Dil Fac        |
|----------------------|------------------|---------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,4-Dioxane          | 0.40             | U                   | 0.40          | 0.33 | ug/L |   |                 | 11/20/19 13:41  | 1              |
| <b>Surrogate</b>     |                  |                     |               |      |      |   |                 |                 |                |
|                      | <b>%Recovery</b> | <b>MB Qualifier</b> | <b>Limits</b> |      |      |   | <b>Prepared</b> | <b>Analyzed</b> | <b>Dil Fac</b> |
| 4-Bromofluorobenzene | 86               |                     | 72 - 133      |      |      |   |                 | 11/20/19 13:41  | 1              |

**Lab Sample ID: LCS 460-656856/3**  
**Matrix: Water**  
**Analysis Batch: 656856**

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

| Analyte              | Spike Added      | LCS Result           | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |  |  |
|----------------------|------------------|----------------------|---------------|------|---|------|--------------|--|--|
| 1,4-Dioxane          | 5.00             | 5.33                 |               | ug/L |   | 107  | 66 - 135     |  |  |
| <b>Surrogate</b>     |                  |                      |               |      |   |      |              |  |  |
|                      | <b>%Recovery</b> | <b>LCS Qualifier</b> | <b>Limits</b> |      |   |      |              |  |  |
| 4-Bromofluorobenzene | 84               |                      | 72 - 133      |      |   |      |              |  |  |

**Lab Sample ID: LCSD 460-656856/4**  
**Matrix: Water**  
**Analysis Batch: 656856**

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

| Analyte              | Spike Added      | LCSD Result           | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|----------------------|------------------|-----------------------|----------------|------|---|------|--------------|-----|-----------|
| 1,4-Dioxane          | 5.00             | 4.72                  |                | ug/L |   | 94   | 66 - 135     | 12  | 30        |
| <b>Surrogate</b>     |                  |                       |                |      |   |      |              |     |           |
|                      | <b>%Recovery</b> | <b>LCSD Qualifier</b> | <b>Limits</b>  |      |   |      |              |     |           |
| 4-Bromofluorobenzene | 82               |                       | 72 - 133       |      |   |      |              |     |           |

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## GC/MS VOA

### Analysis Batch: 656856

| Lab Sample ID     | Client Sample ID       | Prep Type | Matrix | Method    | Prep Batch |
|-------------------|------------------------|-----------|--------|-----------|------------|
| 460-196764-2      | MW-186S_111119         | Total/NA  | Water  | 8260C SIM |            |
| MB 460-656856/8   | Method Blank           | Total/NA  | Water  | 8260C SIM |            |
| LCS 460-656856/3  | Lab Control Sample     | Total/NA  | Water  | 8260C SIM |            |
| LCSD 460-656856/4 | Lab Control Sample Dup | Total/NA  | Water  | 8260C SIM |            |

### Analysis Batch: 657584

| Lab Sample ID     | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|-------------------|------------------------|-----------|--------|--------|------------|
| 460-196764-2      | MW-186S_111119         | Total/NA  | Water  | 8260C  |            |
| MB 460-657584/9   | Method Blank           | Total/NA  | Water  | 8260C  |            |
| LCS 460-657584/3  | Lab Control Sample     | Total/NA  | Water  | 8260C  |            |
| LCSD 460-657584/4 | Lab Control Sample Dup | Total/NA  | Water  | 8260C  |            |

### Analysis Batch: 657766

| Lab Sample ID     | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|-------------------|------------------------|-----------|--------|--------|------------|
| 460-196764-1      | TRIP BLANK             | Total/NA  | Water  | 8260C  |            |
| MB 460-657766/9   | Method Blank           | Total/NA  | Water  | 8260C  |            |
| LCS 460-657766/4  | Lab Control Sample     | Total/NA  | Water  | 8260C  |            |
| LCSD 460-657766/5 | Lab Control Sample Dup | Total/NA  | Water  | 8260C  |            |



# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-196764-1**

**Date Collected: 11/11/19 00:00**

**Matrix: Water**

**Date Received: 11/13/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | 8260C        |     | 1               | 657766       | 11/23/19 19:21       | VBP     | TAL EDI |

**Client Sample ID: MW-186S\_111119**

**Lab Sample ID: 460-196764-2**

**Date Collected: 11/11/19 14:17**

**Matrix: Water**

**Date Received: 11/13/19 10:00**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | 8260C        |     | 1               | 657584       | 11/23/19 02:42       | GXY     | TAL EDI |
| Total/NA  | Analysis   | 8260C SIM    |     | 1               | 656856       | 11/20/19 21:04       | KLB     | TAL EDI |

**Laboratory References:**

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

# Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

## Laboratory: Eurofins TestAmerica, Edison

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

| Authority                         | Program             | Identification Number | Expiration Date |
|-----------------------------------|---------------------|-----------------------|-----------------|
| Connecticut                       | State               | PH-0200               | 09-30-20        |
| DE Haz. Subst. Cleanup Act (HSCA) | State               | <cert No.>            | 12-31-21        |
| Georgia                           | State               | 12028 (NJ)            | 06-30-20        |
| Massachusetts                     | State Program       | M-NJ312               | 06-30-20        |
| New Jersey                        | NELAP               | 12028                 | 06-30-20        |
| New York                          | NELAP               | 11452                 | 04-01-20        |
| Pennsylvania                      | NELAP               | 68-00522              | 02-28-20        |
| Rhode Island                      | State               | LAO00132              | 12-30-19        |
| USDA                              | US Federal Programs | P330-18-00135         | 05-03-21        |

## Laboratory: Eurofins TestAmerica, Canton

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

| Authority             | Program             | Identification Number | Expiration Date |
|-----------------------|---------------------|-----------------------|-----------------|
| California            | State               | 2927                  | 02-23-20        |
| Connecticut           | State               | PH-0590               | 12-31-19        |
| Florida               | NELAP               | E87225                | 06-30-20        |
| Georgia               | State               | 4062                  | 02-23-20        |
| Illinois              | NELAP               | 004498                | 07-31-20        |
| Iowa                  | State               | 421                   | 06-01-20        |
| Kansas                | NELAP               | E-10336               | 04-30-20        |
| Kentucky (UST)        | State               | 112225                | 02-23-20        |
| Kentucky (WW)         | State               | KY98016               | 12-31-19        |
| Minnesota             | NELAP               | OH00048               | 12-31-19        |
| Minnesota (Petrofund) | State Program       | 3506                  | 07-31-21        |
| New Jersey            | NELAP               | OH001                 | 06-30-20        |
| New York              | NELAP               | 10975                 | 03-31-20        |
| Ohio VAP              | State               | CL0024                | 06-05-21        |
| Oregon                | NELAP               | 4062                  | 02-23-20        |
| Pennsylvania          | NELAP               | 68-00340              | 08-31-20        |
| Texas                 | NELAP               | T104704517-18-10      | 08-31-20        |
| USDA                  | US Federal Programs | P330-16-00404         | 12-28-19        |
| Virginia              | NELAP               | 010101                | 09-14-20        |
| Washington            | State               | C971                  | 01-12-20        |
| West Virginia DEP     | State               | 210                   | 12-31-19        |

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

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

**Protocol References:**

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

**Laboratory References:**

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900



# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

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| Lab Sample ID | Client Sample ID | Matrix | Collected      | Received       | Asset ID |
|---------------|------------------|--------|----------------|----------------|----------|
| 460-196764-1  | TRIP BLANK       | Water  | 11/11/19 00:00 | 11/13/19 10:00 |          |
| 460-196764-2  | MW-186S_111119   | Water  | 11/11/19 14:17 | 11/13/19 10:00 |          |

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# Chain of Custody Record



TestAmerica Laboratory location: Brighton -- 10448 Chatham Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program:  DW  NPPDS  RCRA  Other

TestAmerica Laboratories, Inc.

COC No: 1916764

|                                       |  |                         |  |                                      |  |                                |  |                              |  |
|---------------------------------------|--|-------------------------|--|--------------------------------------|--|--------------------------------|--|------------------------------|--|
| Client Contact                        |  | Company Name: Arcadis   |  | Client Project Manager: Kris Hinskey |  | Site Contact: Rachel Bielak    |  | Lab Contact: Mike DelMontico |  |
| Address: 28550 Cabot Drive, Suite 500 |  | Telephone: 248-994-2240 |  | Email: kris@arcadis.com              |  | Telephone: 248-946-6331        |  | Telephone: 330-497-9396      |  |
| City/State/Zip: Nov4, MI, 48317       |  | Phone: 248-994-2240     |  | Project Name: Ford LTP Off-Site      |  | Project Number: 30016346.0002B |  | PO # 30016346.0002B          |  |
| Sample Identification                 |  | Sample Date             |  | Sample Time                          |  | Air                            |  | Aqueous                      |  |
| TRIP BLANK                            |  | ---                     |  | ---                                  |  | X                              |  | X                            |  |
| MWS-1865-11119                        |  | 11/11/19                |  | 1417                                 |  | X                              |  | X                            |  |

|                              |  |                             |  |                       |  |                             |  |        |  |                                  |  |                                  |  |                                 |  |                                 |  |                                |  |
|------------------------------|--|-----------------------------|--|-----------------------|--|-----------------------------|--|--------|--|----------------------------------|--|----------------------------------|--|---------------------------------|--|---------------------------------|--|--------------------------------|--|
| Matrix:                      |  | H2SO4                       |  | HNO3                  |  | HCl                         |  | NaOH   |  | ZnAc                             |  | H2O                              |  | Unpres                          |  | Other:                          |  |                                |  |
| Sample Name: Heather Hinskey |  | Method of Shipment/Carrier: |  | Shipping/Tracking No: |  | TAT if different from below |  | 10 day |  | <input type="checkbox"/> 3 weeks |  | <input type="checkbox"/> 2 weeks |  | <input type="checkbox"/> 1 week |  | <input type="checkbox"/> 2 days |  | <input type="checkbox"/> 1 day |  |

|   |  |              |  |                 |  |                 |  |
|---|--|--------------|--|-----------------|--|-----------------|--|
| Sample Specific Notes / Special Instructions: |  | 1 Trip Blank |  | 3 VOA for 8260B |  | 3 for 8260B SIM |  |
|---|--|--------------|--|-----------------|--|-----------------|--|



| Sample ID      | Sample Date | Sample Time | Air | Aqueous | Sediment | Solid | Other: | H2SO4 | HNO3 | HCl | NaOH | ZnAc | H2O | Unpres | Other: | Filtered Sample (Y/N) | Composite (S/Grab/G) | 1,1-DCE 8260B | cis-1,2-DCE 8260B | Trans-1,2-DCE 8260B | PCE 8260B | TCE 8260B | Vinyl Chloride 8260B | 1,4-Dioxane 8260B SIM |  |  |
|----------------|-------------|-------------|-----|---------|----------|-------|--------|-------|------|-----|------|------|-----|--------|--------|-----------------------|----------------------|---------------|-------------------|---------------------|-----------|-----------|----------------------|-----------------------|--|--|
| MWS-1865-11119 | 11/11/19    | 1417        | X   | X       |          |       |        | X     | X    | X   | X    | X    | X   | X      |        |                       |                      | X             | X                 | X                   | X         | X         | X                    | X                     |  |  |

Submit all results through Cadena at jim.tomalia@cadena.com, Cadena #E203631

Level IV Reporting requested.

Special Instructions/QC Requirements & Comments:

|                                 |                  |                     |                              |                  |                     |
|---------------------------------|------------------|---------------------|------------------------------|------------------|---------------------|
| Reinquisitioned by: [Signature] | Company: Arcadis | Date/Time: 11/11/19 | Received by: [Signature]     | Company: Arcadis | Date/Time: 11/11/19 |
| Reinquisitioned by: [Signature] | Company: Arcadis | Date/Time: 11/11/19 | Received by: [Signature]     | Company: Arcadis | Date/Time: 11/11/19 |
| Reinquisitioned by: [Signature] | Company: Arcadis | Date/Time: 11/12/19 | Received in Lab: [Signature] | Company: Arcadis | Date/Time: 11/12/19 |

30-37

Step-Down Report

11/27/19



Eurofins TestAmerica Edison  
Receipt Temperature and pH Log

Job Number: 196764

Number of Coolers: 1 IR Gun # 9

### Cooler Temperatures

| Cooler #   | RAW       |    | CORRECTED |    |
|------------|-----------|----|-----------|----|
|            | Temp (°C) | pH | Temp (°C) | pH |
| Cooler #1: | 30        | 7  | 30        | 7  |
| Cooler #2: | °C        | pH | °C        | pH |
| Cooler #3: | °C        | pH | °C        | pH |
| Cooler #4: | °C        | pH | °C        | pH |
| Cooler #5: | °C        | pH | °C        | pH |
| Cooler #6: | °C        | pH | °C        | pH |
| Cooler #7: | °C        | pH | °C        | pH |
| Cooler #8: | °C        | pH | °C        | pH |
| Cooler #9: | °C        | pH | °C        | pH |

| TALS Sample Number | Ammonia |        | COD    |        | Nitrate Nitrite |        | Metals* |        | Hardness |        | Pest   |        | EPH or OAM |        | Phenols |        | Sulfide |        | TKN    |        | TOC    |        | Total Cyanide |         | Total Phos |        | Other  |        | Other |  |
|--------------------|---------|--------|--------|--------|-----------------|--------|---------|--------|----------|--------|--------|--------|------------|--------|---------|--------|---------|--------|--------|--------|--------|--------|---------------|---------|------------|--------|--------|--------|-------|--|
|                    | (pH<2)  | (pH<2) | (pH<2) | (pH<2) | (pH<2)          | (pH<2) | (pH<2)  | (pH<2) | (pH<2)   | (pH<2) | (pH<2) | (pH<2) | (pH<2)     | (pH<2) | (pH<2)  | (pH<2) | (pH<2)  | (pH<2) | (pH<2) | (pH<2) | (pH<2) | (pH<2) | (pH<2)        | (pH>12) | (pH<2)     | (pH<2) | (pH<2) | (pH<2) |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |
|                    |         |        |        |        |                 |        |         |        |          |        |        |        |            |        |         |        |         |        |        |        |        |        |               |         |            |        |        |        |       |  |

If pH adjustments are required record the information below:

Sample No(s), adjusted: \_\_\_\_\_

Preservative Name/Conc.: \_\_\_\_\_

Volume of Preservative used (ml): \_\_\_\_\_

Lot # of Preservative(s): \_\_\_\_\_

Expiration Date: \_\_\_\_\_

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.  
\*Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.

EDS-WI-038, Rev 4.1  
10/22/2019

Initials: RL

Date: 11/2/19

## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196764-1

**Login Number: 196764**

**List Number: 1**

**Creator: Jara, Kelly D**

**List Source: Eurofins TestAmerica, Edison**

| Question  | Answer | Comment |
|---|--------|---------|
| Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.      | N/A    |         |
| The cooler's custody seal, if present, is intact.   | True   |         |
| Sample custody seals, if present, are intact.   | True   |         |
| The cooler or samples do not appear to have been compromised or tampered with.                      | True   |         |
| Samples were received on ice.   | True   |         |
| Cooler Temperature is acceptable.   | True   |         |
| Cooler Temperature is recorded.   | True   |         |
| COC is present.   | True   |         |
| COC is filled out in ink and legible.   | True   |         |
| COC is filled out with all pertinent information.   | True   |         |
| Is the Field Sampler's name present on COC?   | True   |         |
| There are no discrepancies between the containers received and the COC.                             | True   |         |
| Samples are received within Holding Time (excluding tests with immediate HTs)                       | True   |         |
| Sample containers have legible labels.  | True   |         |
| Containers are not broken or leaking.   | True   |         |
| Sample collection date/times are provided.  | True   |         |
| Appropriate sample containers are used.   | True   |         |
| Sample bottles are completely filled.   | True   |         |
| Sample Preservation Verified.   | True   |         |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs                    | True   |         |
| Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4"). | True   |         |
| Multiphasic samples are not present.  | True   |         |
| Samples do not require splitting or compositing.  | True   |         |
| Residual Chlorine Checked.  | N/A    |         |



# DATA VERIFICATION REPORT



November 28, 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: 30016346.0002B  
Event Specific Scope of Work References: Sample COC  
Laboratory: TestAmerica - Edison  
Laboratory submittal: 196764-1  
Sample date: 2019-11-11  
Report received by CADENA: 2019-11-27  
Initial Data Verification completed by CADENA: 2019-11-28  
Number of Samples:2  
Sample Matrices:Water  
Test Categories:GCMS VOC

**Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.**

There were no significant QC anomalies or exceptions to report.

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

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.

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 Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

## 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-Edison

**Laboratory Submittal:** 196764-1

| Lab Sample ID | Sample ID      | Collection Date<br>(mm/yy/dd) | Collection Time<br>(hh:mm:ss) | GCMS VOC Volatiles | GCMS VOC SIM | Comment |
|---------------|----------------|-------------------------------|-------------------------------|--------------------|--------------|---------|
| 4601967641    | TRIP BLANK     | 11/11/2019                    | 12:00:00                      | X                  |              |         |
| 4601967642    | MW-186S_111119 | 11/11/2019                    | 2:17:00                       | X                  | X            |         |

# Analytical Results Summary

## Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - Edison

Laboratory Submittal: 196764-1

Sample Name: TRIP BLANK MW-186S\_111119  
Lab Sample ID: 4601967641 4601967642  
Sample Date: 11/11/2019 11/11/2019

| Analyte                  | Cas No.  | Report |       | Units | Valid<br>Qualifier | Report |       | Units | Valid<br>Qualifier |  |
|--------------------------|----------|--------|-------|-------|--------------------|--------|-------|-------|--------------------|--|
|                          |          | Result | Limit |       |                    | Result | Limit |       |                    |  |
| <b>GC/MS VOC</b>         |          |        |       |       |                    |        |       |       |                    |  |
| <u>OSW-8260C</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  | ---                |  |
| <b>GC/MS SVOC</b>        |          |        |       |       |                    |        |       |       |                    |  |
| <u>OSW-8260CSIM</u>      |          |        |       |       |                    |        |       |       |                    |  |
| 1,4-Dioxane              | 123-91-1 |        |       |       |                    | ND     | 0.40  | ug/l  | ---                |  |

# Ford Motor Company – Livonia Transmission Project

## DATA REVIEW

### Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 460-196764-1

CADENA Verification Report: 2019-11-28

Analyses Performed By:  
TestAmerica  
Edison, New Jersey

Report #35082R  
Review Level: Tier III  
Project: 30016346.00002



## DATA REVIEW

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 460-196764-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. 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 (Full Scan) | VOC (SIM) | MISC |
| 460-196764-1 | TRIP BLANK     | 460-196764-1 | Water  | 11/11/2019             |               | X               |           |      |
|              | MW-186S_111119 | 460-196764-2 | Water  | 11/11/2019             |               | X               | X         |      |



## 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. Holding Times

The specified holding times for the following methods are presented in the following table.

| Method                    | Matrix | Holding Time                        | Preservation                       |
|---------------------------|--------|-------------------------------------|------------------------------------|
| SW-846<br>8260B/8260B-SIM | Water  | 14 days from collection to analysis | Cool to < 6 °C;<br>pH < 2 with HCl |

All samples were analyzed within the specified holding time criteria.

#### 2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

#### 3. 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.

##### 3.1 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 (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

##### 3.2 Continuing Calibration

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

All compounds associated with the calibrations were within the specified control limits.

#### 4. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

## **DATA REVIEW**

### **5. Compound Identification**

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

### **6. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in 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 |              |
| <b>GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)</b>         |          |     |                        |     |              |
| <b>Tier II Validation</b>                                   |          |     |                        |     |              |
| Holding times/Preservation                                  |          | X   |                        | X   |              |
| <b>Tier III Validation</b>                                  |          |     |                        |     |              |
| System performance and column resolution                    |          | X   |                        | X   |              |
| Initial calibration %RSDs                                   |          | X   |                        | X   |              |
| Continuing calibration RRFs                                 |          | X   |                        | X   |              |
| Continuing calibration %Ds                                  |          | X   |                        | X   |              |
| Instrument tune and performance check                       |          | X   |                        | X   |              |
| Ion abundance criteria for each instrument used             |          | X   |                        | X   |              |
| Internal standard   |          | X   |                        | X   |              |
| 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   |              |
| D. Transcription/calculation errors present                 |          | X   |                        | X   |              |
| E. Reporting limits adjusted to reflect sample dilutions    |          | X   |                        | X   |              |

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: December 11, 2019

PEER REVIEW: Dennis Capria

DATE: December 12, 2019



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



**NO CORRECTIONS/QUALIFIERS ADDED  
TO SAMPLE ANALYSIS DATA SHEETS**





Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Chilton Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program:  DW  NPPDS  RCRA  Other

TestAmerica Laboratories, Inc.  
COC No: 1916764

|                                       |                                 |                                      |                             |                              |
|---------------------------------------|---------------------------------|--------------------------------------|-----------------------------|------------------------------|
| Client Contact                        | Company Name: Arcadis           | Client Project Manager: Kris Hinskey | Site Contact: Rachel Bielak | Lab Contact: Mike DelMontico |
| Address: 28550 Cabot Drive, Suite 500 | City/State/Zip: Nov4, MI, 48317 | Telephone: 248-994-2240              | Telephone: 248-946-6331     | Telephone: 330-497-9396      |
| Phone: 248-994-2240                   | Email: kris@hinskey.com         | Sampler Name: Heather Hinskey        | Analysises                  |                              |
| Project Name: Ford LTP Off-Site       | Method of Shipment/Carrier:     | Shipping/Tracking No:                | 1,1-DCE 8260B               |                              |
| Project Number: 30016346.0002B        |                                 |                                      | cis-1,2-DCE 8260B           |                              |
| PO # 30016346.0002B                   |                                 |                                      | Trans-1,2-DCE 8260B         |                              |

| Sample Identification | Sample Date | Sample Time | Matrix |         |          |       |        |       | Contaminants/Parameters |     |      |      |      |        | Filtered Sample (Y/N) | Composite (S/Grab/G) | Job/SDG No: | Walk-in client<br>Epo sampling | For lab use only<br>COCs |
|-----------------------|-------------|-------------|--------|---------|----------|-------|--------|-------|-------------------------|-----|------|------|------|--------|-----------------------|----------------------|-------------|--------------------------------|--------------------------|
|                       |             |             | Air    | Aqueous | Sediment | Solid | Other: | H2SO4 | HNO3                    | HCl | NaOH | ZnAc | HOAc | Unpres |                       |                      |             |                                |                          |
| TRIP BLANK            |             |             | X      |         |          |       |        |       |                         |     |      |      |      |        |                       |                      |             |                                |                          |
| MW-1865-11119         | 11/11/19    | 1417        | X      |         |          |       |        |       |                         |     |      |      |      |        |                       |                      |             |                                |                          |



Special Instructions/QC Requirements & Comments:  
 Non-Hazard  Immable  In Triant  Poison B  Unknown  
 Submit all results through Cadena at jim.tomalia@cadenalab.com. Cadena #E203631  
 Level IV Reporting requested.

| Reinquished by:    | Company: | Date/Time:    | Received by:       | Company: | Date/Time:    |
|--------------------|----------|---------------|--------------------|----------|---------------|
| <i>[Signature]</i> | Arcadis  | 11/11/19 1445 | <i>[Signature]</i> | Arcadis  | 11/11/19 1605 |
| <i>[Signature]</i> | Arcadis  | 11/12/19 1215 | <i>[Signature]</i> | TRN      | 11/12/19 1318 |

Reinquished by: *[Signature]* Company: Arcadis Date/Time: 11/11/19 1445  
 Received in Laboratory: *[Signature]* Company: TRN Date/Time: 11/12/19 1215  
 Reinquished by: *[Signature]* Company: Arcadis Date/Time: 11/11/19 1605  
 Received in Laboratory: *[Signature]* Company: TRN Date/Time: 11/12/19 1318  
 3037

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: Ford LTP Off-Site

Job ID: 460-196764-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-196764-1**

**Date Collected: 11/11/19 00:00**

**Matrix: Water**

**Date Received: 11/13/19 10:00**

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte                  | Result | Qualifier | RL  | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene       | 1.0    | U         | 1.0 | 0.26 | ug/L |   |          | 11/23/19 19:21 | 1       |
| cis-1,2-Dichloroethene   | 1.0    | U         | 1.0 | 0.22 | ug/L |   |          | 11/23/19 19:21 | 1       |
| Tetrachloroethene        | 1.0    | U         | 1.0 | 0.25 | ug/L |   |          | 11/23/19 19:21 | 1       |
| trans-1,2-Dichloroethene | 1.0    | U         | 1.0 | 0.24 | ug/L |   |          | 11/23/19 19:21 | 1       |
| Trichloroethene          | 1.0    | U         | 1.0 | 0.31 | ug/L |   |          | 11/23/19 19:21 | 1       |
| Vinyl chloride           | 1.0    | U         | 1.0 | 0.17 | ug/L |   |          | 11/23/19 19:21 | 1       |

| Surrogate                    | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 95        |           | 74 - 132 |          | 11/23/19 19:21 | 1       |
| Toluene-d8 (Surr)            | 99        |           | 80 - 120 |          | 11/23/19 19:21 | 1       |
| Dibromofluoromethane (Surr)  | 100       |           | 72 - 131 |          | 11/23/19 19:21 | 1       |
| 4-Bromofluorobenzene         | 97        |           | 77 - 124 |          | 11/23/19 19:21 | 1       |

**Client Sample ID: MW-186S\_111119**

**Lab Sample ID: 460-196764-2**

**Date Collected: 11/11/19 14:17**

**Matrix: Water**

**Date Received: 11/13/19 10:00**

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

| Analyte     | Result | Qualifier | RL   | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|-------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| 1,4-Dioxane | 0.40   | U         | 0.40 | 0.33 | ug/L |   |          | 11/20/19 21:04 | 1       |

| Surrogate            | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|----------------------|-----------|-----------|----------|----------|----------------|---------|
| 4-Bromofluorobenzene | 78        |           | 72 - 133 |          | 11/20/19 21:04 | 1       |

**Method: 8260C - Volatile Organic Compounds by GC/MS**

| Analyte                  | Result | Qualifier | RL  | MDL  | Unit | D | Prepared | Analyzed       | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene       | 1.0    | U         | 1.0 | 0.26 | ug/L |   |          | 11/23/19 02:42 | 1       |
| cis-1,2-Dichloroethene   | 1.0    | U         | 1.0 | 0.22 | ug/L |   |          | 11/23/19 02:42 | 1       |
| Tetrachloroethene        | 1.0    | U         | 1.0 | 0.25 | ug/L |   |          | 11/23/19 02:42 | 1       |
| trans-1,2-Dichloroethene | 1.0    | U         | 1.0 | 0.24 | ug/L |   |          | 11/23/19 02:42 | 1       |
| Trichloroethene          | 1.0    | U         | 1.0 | 0.31 | ug/L |   |          | 11/23/19 02:42 | 1       |
| Vinyl chloride           | 1.0    | U         | 1.0 | 0.17 | ug/L |   |          | 11/23/19 02:42 | 1       |

| Surrogate                    | %Recovery | Qualifier | Limits   | Prepared | Analyzed       | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 97        |           | 74 - 132 |          | 11/23/19 02:42 | 1       |
| Toluene-d8 (Surr)            | 99        |           | 80 - 120 |          | 11/23/19 02:42 | 1       |
| Dibromofluoromethane (Surr)  | 101       |           | 72 - 131 |          | 11/23/19 02:42 | 1       |
| 4-Bromofluorobenzene         | 96        |           | 77 - 124 |          | 11/23/19 02:42 | 1       |