

Gelman Sciences, Inc. d/b/a Pall Life Sciences 642 South Wagner Road Ann Arbor, MI 48103 734.436.4025 phone 734.436.4040 fax

CASE NARRATIVE

Monthly Data Pall Life Sciences Project: 1,4-Dioxane Remediation

Date: March, 2019

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.

Gelman Sciences, Inc. d/b/a Pall Life Sciences (PLS) attests to the validity of the laboratory data generated by PLS's Ann Arbor, Michigan Environmental Laboratory facilities reported herein. All analyses performed by PLS's Environmental Laboratory facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. PLS's Environmental group has 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.

All of 1,4-dioxane and bromate samples were analyzed by Pall Corporation's Environmental Laboratory with the exception of one drinking water sample (697 S. Wagner Rd.) that was analyzed at Ann Arbor Technical Services (ATS). ATS is a certified drinking water laboratory.

The test results in this report meet all NELAP requirements for parameters for which accreditation are required or available. Any exceptions to NELAP requirements are noted in this report. All exceptions are noted per laboratory standard operating procedure based on EPA Method 1624c. 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. The odd even rule is used for rounding. Holding times were met for all samples analyzed. Proper preservation was observed on all samples unless otherwise detailed in the individual sections below.

RECEIPT/ STORAGE

The samples were received on the days noted in the report for the Month; the samples arrived in good condition, properly preserved and on ice when necessary. Samples that require 1,4-dioxane analysis are collected in hydrochloric HCl acid-preserved vials to a pH of ≤2, with the exception of the Pall ozone treatment samples. These samples have chemicals that, when mixed with the HCl acid, cause interferences and trap damage. Every attempt is made to analyze these samples within 24 hours of receipt.

Samples that require Bromate analysis are collected and preserved in the laboratory with ethylene di-amine and refrigerated.

The barium sample was taken as a composite sample, preserved with nitric acid, and refrigerated before and after being sent to ATS for analysis. This sample is preserved with nitric acid and refrigeration.

Samples that are delivered to the laboratory the same day as they are collected are likely not to have reached a fully chilled temperature. This is acceptable as long as there is evidence that chilling has begun. All samples are iced or refrigerated at 4°C (±2°C) from the time of collection until sample preparation or analysis.

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1,4-Dioxane (GC-MS)

All ground water and treated water samples were analyzed for 1,4-Dioxane (GC-MS) in accordance with EPA 1624C, which has been modified to enhance detection limits. Samples that were diluted to bring them within the calibrated range of the instrument are noted with a "D" under the Qualifier Code section of the data report. Reporting limits were adjusted based on each dilution.

Reporting limit for undiluted samples is 1ppb (part per billion, micrograms per liter, µg/L). All quality control parameters were within the acceptance limits.

Bromate (Ion Chromatography)

All surface water and treated samples were analyzed for Bromate (Ion Chromatography) in accordance with EPA 300.1. Surrogates are added to all samples. All quality control parameters were within the acceptance limits with the balance of sample analyzed.

The reporting limit for treated samples is 5.0ppb and for surface samples is 2.0ppb.

Qualifiers

1,4-Dioxane Qualifier Codes:

| Qualifier Code | Description |
|----------------|---|
| nd: | The compound was analyzed for, but was not detected at or above the detection limit indicated. |
| D: | Analyte value quantified from a dilution, reporting limit is raised to reflect dilution. |
| E: | The compound result is greater than the upper quantitation limit in the associated calibration curve, reported as estimate. |
| В: | The sample vials contained air bubbles larger than 5mm, which may affect compound results. |
| J: | The compound was positively identified; the associated numerical value is the approximate concentration. |
| M: | Matrix effects, sample required dilution. |
| R: | The reported value is unusable and rejected due to variance from quality control criteria. |
| V: | The reported value is considered estimated due to variance from quality control criteria. |
| H: | Sample was analyzed past 14 day hold time, but within 28 days. |
| 0: | Samples analyzed in outside laboratory. |
| S: | Samples split with DEQ. |

Bromate Qualifier Codes:

| Qualifier Code | Description |
|----------------|--|
| nd: | The compound was analyzed for, but was not detected at or above the detection limit indicated. |
| E: | The compound result is greater than the upper quantitation limit in the associated calibration curve. |
| J: | The compound was positively identified; the associated numerical value is the approximate concentration. |
| R: | The reported value is unusable and rejected due to variance from quality control criteria. |
| V: | The reported value is considered estimated due to variance from quality control criteria. |
| H: | Sample was analyzed past 28 day hold time |

| Analyst: Susan E.O. Peters | CO Cream | uter | Date: <u>04-08</u> -10 |
|-----------------------------------|----------|------|------------------------|
| Report Checked by: Laurel Beyer _ | Janus | Beyn | Date: 4/8/19 |



Sample Analysis Report March, 2019

642 South Wagner Road Ann Arbor, MI 48103-9019 US 734.436.4025 phone

Analyst Initials: <u>ও ६०२</u> Date: <u>০৭-০৪-।৭</u>

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|--------------------------------------|------------------------------|---------------|--------------------------|---------------|--------------------------|---------------|----------|-------------------------|
| Residential Wells | | | | | | | | |
| Not Determined | | | | | | | | |
| 697 South Wagner Rd-03-28-19-10:50-1 | nd | 1.0 | | | | | | 0 |
| Extraction Wells | | | | | | | | |
| C3 | | | | | | | | |
| DOLPH-03-07-19-09:15-1 | 590 | 10.0 | | | | | | D, will be resampled |
| DOLPH-03-14-19-08:45-1 | 120 | 10.0 | | | | | | D |
| DOLPH-03-15-19-08:24-1 | 120 | 10.0 | | | | | | D |
| TW-20-03-07-19-10:11-1 | 840 | 10.0 | | | | | | D |
| D2 | | | | | | | | |
| LB-4-03-07-19-09:39-1 | 420 | 10.0 | | | | <u> </u> | | D |
| TW-21-03-07-19-09:34-1 | 220 | 2.0 | | | | | | D |
| E | | | | | | | | |
| TW-18-03-07-19-09:25-1 | 220 | 10.0 | | | | | | D |
| TW-19-03-07-19-09:41-1 | 460 | 10.0 | | | | | | D |
| TW-23-03-07-19-10:01-1 | 400 | 10.0 | | | | | | D |
| Marshy | | • | | | | | | |
| PW-1-03-07-19-09:19-1 | 790 | 10.0 | | | | | <u> </u> | D |
| SW | | | | · | | | | |

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|---------------------------------------|------------------------------|---------------|--------------------------|---------------|--------------------------|---------------|----------|--------------|
| TW-22-03-07-19-09:06-1 | 440 | 10.0 | | | | | | D |
| TW-28-03-07-19-09:05-1 | 620 | 10.0 | | | | | | D |
| Monitoring Wells | | | | | | | | |
| C3 | | | | | | | | |
| MW-125-03-29-19-10:11-1 | 200 | 5.0 | | | | | | D |
| MW-127s-03-27-19-10:30-1 | nd | 1.0 | | | | | - | |
| MW-128s-03-27-19-14;26-1 | nd | 1.0 | | | | | | |
| MW-18d-03-11-19-09:29-1 | 57 | 5.0 | | | | | | D |
| MW-28-03-27-19-15:50-1 | nd | 1.0 | | | | | | |
| MW-35-03-08-19-13:55-1 | 3.3 | 1.0 | | | | | | |
| MW-37-03-11-19-12:20-1 | 210 | 10.0 | | | | | | D |
| MW-38s-03-08-19-14:25-1 | nd | 1.0 | | | | | | |
| D0 | | | | | | | | |
| A2 Cleaning Supply-03-08-19-13:05-1 | 61 | 10.0 | | | | | | D |
| A2 Cleaning Supply-03-15-19-14:16-1 | 93 | 1.0 | ***** | | | | | |
| MW-53d-03-11-19-15:14-1 | nd | 1.0 | | | | | | |
| MW-53i-03-11-19-16:46-1 | 30 | 1.0 | | | | | | |
| MW-53s-03-08-19-12:09-1 | nd | 1.0 | | | | | | |
| MW-93-03-08-19-12:46-1 | 2.0 | 1.0 | | | | | | |
| D2 | | | | | | | | |
| 373 Pinewood Shallow-03-11-19-08:30-1 | 200 | 5.0 | | | | | | D |
| 465 Dupont-03-22-19-13:30-1 | 1000 | 25.0 | | | | | | D |
| MVV-120s-03-18-19-10:46-1 | nd | 1.0 | | | | | | |
| MVV-121s-03-14-19-17:30-1 | nd | 1.0 | | | : | | | |
| MW-122s-03-20-19-12:26-1 | 210 | 5.0 | | | | | | D |
| MW-123s-03-18-19-13:35-1 | nd | 1.0 | | | | | | |

| MW-124s-03-18-19-18:30-1 nd 1.0 MW-17-03-12-19-10:48-1 270 10.0 MW-38d-03-11-19-13:25-1 32 1.0 MW-54d-03-15-19-14:35-1 nd 1.0 MW-54s-03-15-19-13:17-1 nd 1.0 MW-56s-03-08-19-09:52-1 68 1.0 MW-77-03-22-19-15:01-1 1300 50.0 MW-92-03-20-19-15:34-1 56 1.0 MW-94s-03-11-19-17:30-1 630 5.0 | | |
|--|--|-------------|
| MW-38d-03-11-19-13:25-1 32 1.0 MW-54d-03-15-19-14:35-1 nd 1.0 MW-54s-03-15-19-13:17-1 nd 1.0 MW-56s-03-08-19-09:52-1 68 1.0 MW-77-03-22-19-15:01-1 1300 50.0 MW-92-03-20-19-15:34-1 56 1.0 MW-94s-03-11-19-17:30-1 630 5.0 | | |
| MW-54d-03-15-19-14:35-1 nd 1.0 MW-54s-03-15-19-13:17-1 nd 1.0 MW-56s-03-08-19-09:52-1 68 1.0 MW-77-03-22-19-15:01-1 1300 50.0 MW-92-03-20-19-15:34-1 56 1.0 MW-94s-03-11-19-17:30-1 630 5.0 | | ם |
| MW-54s-03-15-19-13:17-1 nd 1.0 MW-56s-03-08-19-09:52-1 68 1.0 MW-77-03-22-19-15:01-1 1300 50.0 MW-92-03-20-19-15:34-1 56 1.0 MW-94s-03-11-19-17:30-1 630 5.0 | | |
| MW-56s-03-08-19-09:52-1 68 1.0 — MW-77-03-22-19-15:01-1 1300 50.0 — MW-92-03-20-19-15:34-1 56 1.0 — MW-94s-03-11-19-17:30-1 630 5.0 — | | |
| MW-77-03-22-19-15:01-1 1300 50.0 | | - |
| MW-92-03-20-19-15:34-1 56 1.0 | | |
| MW-94s-03-11-19-17:30-1 630 5.0 | | D |
| | | |
| E | | D |
| | | |
| 373 Pinewood Deep-03-20-19-09:37-1 nd 1.0 | | |
| MVV-100-03-22-19-16:34-1 2400 50.0 | | D |
| MW-103d-03-14-19-12:01-1 8.3 1.0 | | |
| MW-103s-03-14-19-11:23-1 81 1.0 | | |
| MW-105d-03-13-19-12:20-1 190 5.0 | | D |
| MW-108d-03-13-19-15:31-1 750 25.0 | | D |
| MW-108s-03-13-19-14:01-1 250 10.0 | | D |
| MW-112d-03-13-19-18:00-1 nd 1.0 | | |
| MW-112i-03-13-19-19:18-1 9.8 1.0 | | |
| MW-112s-03-13-19-17:56-1 nd 1.0 | | |
| MW-115-03-02-19-10:52-1 290 10.0 | | D |
| MW-116-03-19-19-12:51-1 340 5.0 | | D |
| MW-119-03-02-19-13:01-1 36 5.0 | | D |
| MW-120d-03-18-19-12:03-1 nd 1.0 | | 1 |
| MW-121d-03-15-19-11:13-1 2.0 1.0 | | |
| MW-122d-03-20-19-11:08-1 nd 1.0 | | |

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|---|------------------------------|---------------|--------------------------|---------------|--------------------------|--|----------|--------------|
| MVV-123d-03-18-19-15:31-1 | nd | 1.0 | | | | | | |
| MVV-124d-03-18-19-17:13-1 | nd | 1.0 | | | | | | |
| MVV-127d-03-27-19-11:43-1 | nd | 1.0 | | | | | | |
| MVV-128d-03-27-19-13:10-1 | nd | 1.0 | | | | | | |
| MVV-135-03-22-19-09:44-1 | nd | 1.0 | | | | | | |
| MW-30d-03-19-19-14:17-1 | 170 | 5.0 | | | | | | D |
| MW-56d-03-07-19-14:05-1 | nd | 1.0 | | | | | | |
| MVV-66-03-13-19-10:45-1 | 1.8 | 1.0 | | | | | | |
| MW-72d-03-19-19-15:52-1 | 190 | 25.0 | | | | | | D |
| MW-76i-03-14-19-13:04-1 | 100 | 1.0 | | | | | | |
| MW-76s-03-14-19-14:21-1 | 260 | 5.0 | | | | | | Ď |
| MW-84s-03-14-19-16:01-1 | 140 | 1.0 | | | | | | |
| MW-90-03-20-19-14:07-1 | 15 | 1.0 | | | | | | |
| Surface Water | , | | | - | | | | |
| Not Applicable | | | | | | | | |
| Allen Creek-Chapin-West Park-03-19-19-09:40-1 | 9.8 | 1.0 | | | | | | |
| Allen Creek-Eighth-Waterworks-03-19-19-11:06-1 | nd | 1.0 | | | | | | |
| Allen Creek-Maple Ridge-Arborview-03-19-19-10:16-1 | nd | 1.0 | | | | | | |
| Allen Creek-Maryfield-Wildwood Park-03-19-19-10:44-1 | nd | 1.0 | | | | | | |
| Allen Creek-Murray-Washington-03-19-19-11:20-1 | 1.3 | 1.0 | | | | | | |
| Allen Creek-West Park SW-03-19-19-10:02-1 | 18 | 1.0 | | | | | | |
| Allen Creek-Wildwood-Arborview-03-19-19-10:30-1 | nd | 1.0 | | | | ************************************** | | |
| HC/HR-03-01-19-08:32-1 | | | nd | 2.0 | | | | |
| HC/HR-03-04-19-07:41-1 | | | nd | 2.0 | | | | |
| HC/HR-03-05-19-07:47-1 | | | nd | 2.0 | | | | |

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|---------------------------------|------------------------------|---------------|--------------------------|---------------|--------------------------|---|----------|--------------|
| HC/HR-03-06-19-07:56-1 | | | nd | 2.0 | | *************************************** | | |
| HC/HR-03-07-19-08:01-1 | | | nd | 2.0 | | | | |
| HC/HR-03-08-19-07:55-1 | | | nd | 2.0 | | | | |
| HC/HR-03-11-19-07:41-1 | | | nd | 2.0 | | | | |
| HC/HR-03-12-19-08:03-1 | | ********** | nd | 2.0 | | | | |
| HC/HR-03-13-19-07:48-1 | | | nd | 2.0 | | | | |
| HC/HR-03-14-19-08:00-1 | | | nd | 2.0 | | | | |
| HC/HR-03-15-19-08:11-1 | | | nd | 2.0 | | | | |
| HC/HR-03-18-19-08:05-1 | | | nd | 2.0 | | | | |
| HC/HR-03-19-19-07:45-1 | | | nd | 2.0 | | | | |
| HC/HR-03-20-19-07:47-1 | | | nd | 2.0 | | | | **** |
| HC/HR-03-21-19-07:49-1 | | | nd | 2.0 | | | | |
| HC/HR-03-22-19-08:10-1 | | | nd | 2.0 | | | | |
| HC/HR-03-25-19-07:46-1 | | | nd | 2.0 | | | | |
| HC/HR-03-26-19-07:50-1 | | | nd | 2.0 | | | | |
| HC/HR-03-27-19-07:35-1 | | | nd | 2.0 | | | | |
| HC/HR-03-28-19-07:46-1 | | | nd | 2.0 | | | | |
| HC/HR-03-29-19-07:43-1 | | | nd | 2.0 | | | | |
| Treatment System | | | | | | | , | |
| OUTFALL-03-03-19-1 | 4.7 | 1.0 | | | | | | , |
| OUTFALL-03-03-19-2 | | | 7.6 | 5.0 | | | | |
| OUTFALL-03-04-19-2 | | | 6.9 | 5.0 | | | | |
| OUTFALL-03-04-19-1 | 4.9 | 1.0 | | | | | | |
| OUTFALL-03-05-19-1 | 4.6 | 1.0 | | | | | | |
| OUTFALL-03-05-19-2 | | | 7.1 | 5.0 | | | | |
| OUTFALL-03-06-19-2 | | | 7.7 | 5.0 | | | | |

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|---------------------------------|------------------------------|---------------|--------------------------|---------------|--------------------------|---|----------|---------------------------------------|
| OUTFALL-03-06-19-1 | 4.8 | 1.0 | | | | *********** | | |
| OUTFALL-03-07-19-2 | | | 7.8 | 5.0 | | | | , , , , , , , , , , , , , , , , , , , |
| OUTFALL-03-07-19-1 | 4.8 | 1.0 | | | | | | |
| OUTFALL-03-10-19-1 | 4.5 | 1.0 | | *** | | | | |
| OUTFALL-03-10-19-2 | | | 8.4 | 5.0 | | | | |
| OUTFALL-03-11-19-1 | 4.3 | 1.0 | | | | | | V.V. |
| OUTFALL-03-11-19-2 | | | 8.6 | 5.0 | | | | |
| OUTFALL-03-12-19-1 | 4.3 | 1.0 | | | | **** | | |
| OUTFALL-03-12-19-2 | | | 8.0 | 5.0 | | | | |
| OUTFALL-03-13-19-1 | 4.5 | 1.0 | | | | | | |
| OUTFALL-03-13-19-2 | | | 9.2 | 5.0 | | | | |
| OUTFALL-03-14-19-2 | | | 8.2 | 5.0 | | | | |
| OUTFALL-03-14-19-1 | 4.8 | 1.0 | | | | | | |
| OUTFALL-03-17-19-2 | | | 9.7 | 5.0 | | | | |
| OUTFALL-03-17-19-1 | 4.9 | 1.0 | | | | *************************************** | | |
| OUTFALL-03-18-19-2 | | | 7.6 | 5.0 | | | | |
| OUTFALL-03-18-19-1 | 5.4 | 1.0 | | | | | | |
| OUTFALL-03-19-19-2 | | | 9.0 | 5.0 | | | | |
| OUTFALL-03-19-1 | 5.6 | 1.0 | | | | • | | |
| OUTFALL-03-20-19-1 | 4.6 | 1.0 | | | | | | |
| OUTFALL-03-20-19-2 | | | 8.0 | 5.0 | | | | |
| OUTFALL-03-21-19-1 | 4.7 | 1.0 | | | | ***** | | |
| OUTFALL-03-21-19-2 | | | 8.9 | 5.0 | | | | |
| OUTFALL-03-24-19-2 | | | 7.6 | 5.0 | | | | |
| OUTFALL-03-24-19-1 | 5.6 | 1.0 | | | | | | |
| OUTFALL-03-25-19-1 | 5.2 | 1.0 | | | | | | |
| OUTFALL-03-25-19-2 | | | 8.4 | 5.0 | | | | |

| Sample Name - Date/Time Sampled | 1,4-Dioxane Results (ppb) | R.L. (ppb) | Bromate Results (ppb) | R.L. (ppb) | Bromide Results (ppb) | R.L. (ppb) | Comments | Qualifier(s) |
|---------------------------------|------------------------------|---------------|--------------------------|---------------|--------------------------|---------------|----------|---|
| OUTFALL-03-26-19-1 | 5.4 | 1.0 | | : | | | | |
| OUTFALL-03-26-19-2 | | | 7.2 | 5.0 | | | | |
| OUTFALL-03-27-19-1 | 5.2 | 1.0 | | | | | | *************************************** |
| OUTFALL-03-27-19-2 | | | 7.4 | 5.0 | | | | |
| OUTFALL-03-28-19-2 | | | 8.8 | 5.0 | | | | |
| OUTFALL-03-28-19-1 | 5.3 | 1.0 | | | ***** | | | |
| OUTFALL-03-31-19-1 | 4.2 | 1.0 | | | | | | |
| OUTFALL-03-31-19-2 | | | 21 | 5.0 | | | | |
| Red Pond-03-04-19-12:10-1 | 360 | 10.0 | | | | | | D |
| Red Pond-03-11-19-07:18-1 | 350 | 10.0 | | | | | | D |
| Red Pond-03-18-19-08:20-1 | 370 | 10.0 | | | | | | D |
| Red Pond-03-26-19-07:31-1 | 390 | 10.0 | | | | | | D |

PLS Qualifier Codes:

nd:

The compound was analyzed for, but was not detected at or above the detection limit indicated.

Analyte value quantified from a dilution, reporting limit is raised to reflect dilution.

Sample was analyzed past 14 day hold time, but within 28 days used by ATS for same method with EPA approval. Samples analyzed in outside laboratory, Ann Arbor Technical Services (ATS). D:

H: O:



290 South Wagner Road Ann Arbor, Michigan 48103 Tel. 734/995-0995 Fax. 734/995-3731 Michigan Laboratory ID: 9604 Wisconsin Laboratory ID: 998321720

Data Transmittal Cover Page

Project Name:

Pall Corporation

ATS Project Number:

G001-002

ATS Report Number(s):

SRF_0402191 (Rush)

Project Description:

This data report contains the results of one water sample, received by ATS on

4/2/19 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

| Recipient: | Ms. Sue Peters | | Email: FAX Number: | Sue Peters@Pall.com |
|--------------|--|-----------------------|--|----------------------------------|
| No. of Page | es (including cover pg.): | 7 | | |
| From: | Sarah Stubblefield Senior Chemist / Lab Manager | Email: FAX Number: | Sarah. Stubblefie 734-995-3731 | ld@AnnArborTechnicalServices.com |
| , Additional | Message: | | | |
| | - Address - Addr | | 4444 | |
| | | | 11.4.5.000 (1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1. | |
| Date: | 4/5/19 | Signed: | SA | J.S. |

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LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002

Report Date: 4/5/19

SDG Number's: 0402191

Case Narrative Summary

This case narrative applies to the following sample that was received by Ann Arbor Technical Services, Inc. (ATS) on 4/2/19, and associated matrix-specific QA/QC.

Samples

| Samples | | | | , |
|------------------------------|-------------|-------------------------------|-------------|----------------|
| Client Sample Identification | Sample Date | Requested Turn Around Time | Analysis | Matrix |
| Received 4/2/19 | | | | |
| 697 S. Wagner Road | 3/28/19 | Rush | 1,4-Dioxane | Drinking Water |

Matrix Specific QC

| Client Sample Identification | Sample Date | Analysis | Matrix |
|---|-------------|-------------|----------------|
| 697 S. Wagner Road Matrix Spike | 3/28/19 | 1,4-Dioxane | Drinking Water |
| 697 S. Wagner Road Matrix Spike Duplicate | 3/28/19 | 1,4-Dioxane | Drinking Water |

Upon receipt, samples were scheduled for the following analyses:

■ 1,4-Dioxane by EPA method 1624

Sample Receipt and Chain of Custody Records

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies are presented in the "Chain of Custody and Sample Receipt Documentation" section of this report.

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by US EPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LR).

G001-002.19\SRF_0402191.doc

SDG CASE NARRATIVE Page 2 of 3

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed in accordance with EPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits.

Anomalies Noted:

None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the running of a mid-level initial calibration verification (CV) standard at a frequency of every 12 hours. All verification standards met the acceptance criteria with the following exceptions:

• None

Instrument Blanks

Instrument blanks were analyzed at a frequency of every 12 hours. All blanks met the acceptance criteria with the following exceptions:

None

QA/QC Batch Summary

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with each QA/QC batch. The LRB's met the acceptance criteria with the following exceptions:

None

Laboratory Fortified Blanks and Matrix Spikes

A laboratory fortified blank (LFB) / laboratory control sample (LCS) was analyzed with each QA/QC batch. The LCS/LFB's met the acceptance criteria with the following exceptions:

• None

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The MS/MSD met the acceptance criteria with the following exceptions:

None



SDG CASE NARRATIVE

Page 3 of 3

Matrix Duplicates

A replicate analysis was analyzed with each QA/QC batch. All replicates met the acceptance criteria with the following exceptions:

None

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted:

None

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/ April 5, 2019

Mark T. DeLong (Quality Assurance Coordinator)

Philip B. Simon (Laboratory Director)

/ April 5, 2019





290 South Wagner Road Ann Arbor, Michigan 48103 Tel. 734/995-0955 Fax. 734/995-3731 Michigan Laboratory ID: 9604 Wisconsin Laboratory ID: 998321720

Organic Analysis Data Summary Sheet

For: Ms. Sue Peters

Pall Corporation

642 South Wagner Road Ann Arbor, MI 48103

ATS Project:

Pall Corporation

#G001-002

Report Date:

4/5/19 ATS SRF: 0402191 (Rush)

Sample Identification:

697 S. Wagner Road

Sample Date:

3/28/19

Sample Time:

10:11 AM

Sampled By:

Client

Laboratory Receipt Date:

4/2/19

Sample Matrix:

Drinking Water

| Parameter | Method | Units | Result | Reporting Limit | Analysis Date | Analysis <u>Time</u> | Analyzed By |
|------------------|----------|-------|--------|-----------------|------------------|-------------------------|----------------|
| Organic Analysis | | | | | | | |
| 1,4-Dioxane | EPA 1624 | mg/L | <0.001 | 0.001 | 4/3/19 | 12:19 | JEB |

Comments

All methods reference USEPA methods unless otherwise noted.



290 South Wagner Road Ann Arbor, Michigan 48103 Tel. 734/995-0995 Fax. 734/995-3731 Michigan Laboratory ID: 9604 Wisconsin Laboratory ID: 998321720

Quality Assurance / Quality Control Data Summary

QC Batch Number: QCINORG0403191-G

ATS Project: Pall Corporation

#G001-002

Parameter: 1,4-Dioxane (EPA 1624)

Report Date: 4/5/19

Results of QA Samples run concurrently with project samples

REPLICATE ANALYSIS

| Sample | Replicate #1 | Replicate #2 | Mean | Relative Range (percent) | | | |
|--|--------------|--------------|------------|--------------------------------|--|--|--|
| #G001-002 697 S. Wagner Road 3/28/19 Matrix Spike | 0.008 mg/L | 0.009 mg/L | 0.008 mg/L | 11.8 | | | |
| | | | | | | | |
| | | | | | | | |

SPIKES and/or QC CHECK SAMPLES

| Sample/Analyte | Known Concentration | Spike Concentration | Analyzed Concentration | Recovery (percent) | | | |
|---|------------------------|------------------------|---------------------------|--------------------|--|--|--|
| | | | | | | | |
| ¢G001-002 | | | | | | | |
| Laboratory Fortified Blank | <0,001 mg/L | 0.010 mg/L | 0,009 mg/L | 92.2 | | | |
| 697 S. Wagner Road 3/28/19 Matrix Spike | <0.001 mg/L | 0.010 mg/L | 0.008 mg/L | 80.4 | | | |
| 697 S. Wagner Road 3/28/19 Matrix Spike Duplicate | <0.001 mg/L | 0.010 mg/L | 0,009 mg/L | 90.5 | | | |
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BLANK ANALYSIS

| Sample | Analyzed Concentration | QC Decision | | | |
|--------------------------|------------------------|-------------|--|--|--|
| #G001-002 | | | | | |
| Laboratory Reagent Blank | <0.001 mg/L | Acceptable | | | |
| | | | | | |
| | | | | | |

Comments:

Calculations performed prior to rounding.

Control Limits:

Recoveries

Laboratory Control Sample Recovery (85 - 115%)

Matrix Spike Recovery (80 - 120%)

Relative Range

Replicates (<20%)

CHAIN OF CUSTODY RECORD

Page 1

| PROJECT ID / MAMBER | LABORATORY | NFORMA | אסו | SHIPPIN | G INFOR | MATION | 9H)PPER | (Check on |)/TRACI | KING MUI | ABER(S) (| ii opplicat | že) | _ | | | |
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| Pall Drinking Water Sample | | | Date | | Fed Ex | | UPS | | DHL | | Courier | | Tracking | g Number | | | |
| SAMPLE CUSTODIAN (PARL 4-50-007) | | | Date | | Fed Ex | | UPS | | DHL | | Cavilet | ľ | Tracking | Number | | 3 . | |
| Susan Peters, Pall Corporation, 645 S | . Wagne | er Ro | nad Ann Arbor Mi | Date | | Fed Ex | | UPS | | DHL | | Courier | | Tracking | Mumber | | : |
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