Gelman Sciences, Inc. d/b/a
Pall Life Sciences
642 South Wagner Road
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## CASE NARRATIVE

**Monthly Data Pall Life Sciences**
**Project: 1,4-Dioxane Remediation**
**Date: July 2015**

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.

The following drinking water samples were sent to Brighton Analytical for analysis: Saginaw Forest Cabin #4; 5005 Jackson Road; 5115 Jackson Road; 371 Parkland Plaza #1; 697 South Wagner Road; 723 South Wagner Road; 745 South Wagner Road; and 777 South Wagner Road. Brighton Analytical, L.L.C., is a NELAP, TNI, and MDEQ Drinking Water Accredited Laboratory.

The balance of the samples were analyzed by PLS's Environmental 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 but one sample that expired during time off due to illness. Proper preservation noted for the methods performed on these 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.

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.

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.

## 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.

No other difficulties were encountered during the 1,4-dioxane analyses. 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 and standards and analyzed by Ion Chromatography utilizing background ion suppression and a conductivity detector. No difficulties were encountered during the Bromate analyses. All quality control parameters were within the acceptance limits.

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

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## 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. |
| **B:** | 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. |
| **O:** | 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* Susan E.O. Peters Date: 08-12-15

**Report Checked by:** *Cristian Dumas* Date: 8-12-15

PALL Life Sciences

# Sample Analysis Report

## July, 2015

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

Analyst Initials: SEOP
Date: 08-12-15

| 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** | | | | | | | | |
| **C3** | | | | | | | | |
| Saginaw Forest Cabin #4-07-29-15-11:12-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| **D0** | | | | | | | | |
| 110 Parkland Plaza-07-30-15-13:49-1 | 2 | 1.0 | | | | | | |
| 4141 Jáckson Rd-07-30-15-16:49-1 | 4 | 1.0 | | | | | | |
| 4401 Park West-07-30-15-10:09-1 | 6 | 1.0 | | | | | | |
| 4742 Park Rd-07-30-15-11:07-1 | 9 | 1.0 | | | | | | |
| 5005 Jackson Rd-07-23-15-10:23-1 | 17 | 1.0 | | | | | Brighton Analytical | O |
| 5115 Jackson Rd-07-23-15-10:01-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| **Miscellaneous Wells** | | | | | | | | |
| ARTESIAN #3-07-23-15-10:40-1 | 11 | 1.0 | | | | | | |
| **Residential Wells** | | | | | | | | |
| **D2** | | | | | | | | |
| 170 Aprill-07-30-15-17:42-1 | 10 | 1.0 | | | | | | |
| **E** | | | | | | | | |
| 371 Parkland Plaza #1-07-24-15-13:15-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| **Not Determined** | | | | | | | | |
| 697 South Wagner Rd-07-23-15-09:53-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| 723 S. Wagner Road-07-23-15-09:46-1 | 1 | 1.0 | | | | | Brighton Analytical | O |

| 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) |
|---|---|---|---|---|---|---|---|---|
| 745 S. Wagner Road-07-23-15-09:40-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| 777 S. Wagner Road-07-23-15-09:34-1 | nd | 1.0 | | | | | Brighton Analytical | O |
| **Extraction Wells** | | | | | | | | |
| **C3** | | | | | | | | |
| DOLPH-07-01-15-08:22-1 | 280 | 10.0 | | | | | | D |
| TW-20-07-01-15-09:37-1 | 820 | 50.0 | | | | | | D |
| **D2** | | | | | | | | |
| LB-4-07-01-15-07:48-1 | 470 | 25.0 | | | | | | D |
| TW-21-07-01-15-09:30-1 | 120 | 5.0 | | | | | | D |
| **E** | | | | | | | | |
| TW-16-07-01-15-09:15-1 | 870 | 50.0 | | | | | | D |
| TW-18-07-01-15-08:24-1 | 260 | 10.0 | | | | | | D |
| TW-19-07-01-15-09:16-1 | 690 | 50.0 | | | | | | D |
| **Marshy** | | | | | | | | |
| PW-1-07-01-15-08:20-1 | 490 | 50.0 | | | | | | D |
| **SW** | | | | | | | | |
| TW-22-07-01-15-09:52-1 | 610 | 50.0 | | | | | | D |
| TW-8-07-01-15-09:51-1 | 660 | 25.0 | | | | | | D |
| **Monitoring Wells** | | | | | | | | |
| **C2** | | | | | | | | |
| MW-25s-07-29-15-14:08-1 | 270 | 5.0 | | | | | | D |
| **C3** | | | | | | | | |
| MW-105s-07-29-15-16:53-1 | 610 | 10.0 | | | | | | D |
| MW-125-07-29-15-12:03-1 | 210 | 5.0 | | | | | | D |
| MW-127s-07-29-15-10:53-1 | 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) |
|---|---|---|---|---|---|---|---|---|
| MW-128s-07-29-15-10:24-1 | nd | 1.0 | | | | | | |
| MW-15d-07-31-15-13:17-1 | 1 | 1.0 | | | | | | |
| MW-15s-07-31-15-13:26-1 | 4 | 1.0 | | | | | | |
| MW-16-07-31-15-11:49-1 | 4 | 1.0 | | | | | | |
| MW-18d-07-28-15-16:36-1 | 92 | 5.0 | | | | | | D |
| MW-20-07-10-15-14:26-1 | nd | 1.0 | | | | | | |
| MW-22-07-29-15-14:33-1 | 280 | 5.0 | | | | | | D |
| MW-25d-07-29-15-14:03-1 | 110 | 5.0 | | | | | | D |
| MW-2d-07-22-15-10:26-1 | 31 | 1.0 | | | | | | |
| MW-2s-07-22-15-10:37-1 | 3 | 1.0 | | | | | | |
| MW-32-07-28-15-11:43-1 | 14 | 1.0 | | | | | | |
| MW-35-07-28-15-10:14-1 | 4 | 1.0 | | | | | | |
| MW-36-07-28-15-11:04-1 | nd | 1.0 | | | | | | |
| MW-37-07-29-15-13:33-1 | 270 | 5.0 | | | | | | D |
| MW-39s-07-30-15-13:11-1 | 3 | 1.0 | | | | | | |
| **D0** | | | | | | | | |
| A2 Cleaning Supply-07-01-15-12:27-1 | 58 | 1.0 | | | | | | |
| MW-31-07-30-15-11:32-1 | 15 | 1.0 | | | | | | |
| MW-40d-07-22-15-13:34-1 | nd | 1.0 | | | | | | |
| MW-40s-07-22-15-13:49-1 | nd | 1.0 | | | | | | |
| MW-42d-07-22-15-16:51-1 | nd | 1.0 | | | | | | |
| MW-42s-07-22-15-17:03-1 | nd | 1.0 | | | | | | |
| MW-53d-07-01-15-13:29-1 | nd | 1.0 | | | | | | |
| MW-53i-07-01-15-14:27-1 | 33 | 1.0 | | | | | | |
| MW-53s-07-01-15-13:42-1 | nd | 1.0 | | | | | | |
| MW-59s-07-10-15-12:59-1 | nd | 1.0 | | | | | | |
| MW-60-07-30-15-09:21-1 | 4 | 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) |
|---|---|---|---|---|---|---|---|---|
| MW-93-07-10-15-14:02-1 | 4 | 1.0 | | | | | | |
| **D2** | | | | | | | | |
| 3365 Jackson Rd-07-23-15-17:25-1 | 160 | 10.0 | | | | | | D |
| MW-107-07-27-15-14:06-1 | 670 | 10.0 | | | | | | D |
| MW-113-07-27-15-15:50-1 | 60 | 1.0 | | | | | | |
| MW-11d-07-28-15-16:11-1 | 160 | 5.0 | | | | | | D |
| MW-120s-07-09-15-14:20-1 | nd | 1.0 | | | | | | |
| MW-121s-07-21-15-08:54-1 | nd | 1.0 | | | | | | |
| MW-122s-07-21-15-12:13-1 | 95 | 1.0 | | | | | | |
| MW-123s-07-09-15-11:26-1 | nd | 1.0 | | | | | | |
| MW-124s-07-20-15-10:11-1 | nd | 1.0 | | | | | | |
| MW-126s-07-10-15-10:53-1 | nd | 1.0 | | | | | | |
| MW-129i-07-21-15-10:23-1 | nd | 1.0 | | | | | | |
| MW-129s-07-21-15-09:53-1 | nd | 1.0 | | | | | | |
| MW-130i-07-07-15-10:31-1 | 2 | 1.0 | | | | | | |
| MW-130s-07-07-15-10:00-1 | nd | 1.0 | | | | | | |
| MW-131s-07-10-15-10:04-1 | nd | 1.0 | | | | | | |
| MW-133i-07-08-15-10:39-1 | 2 | 1.0 | | | | | | |
| MW-133s-07-08-15-10:58-1 | 2 | 1.0 | | | | | | |
| MW-134i-07-08-15-14:43-1 | 9 | 1.0 | | | | | | |
| MW-134s-07-08-15-14:10-1 | 8 | 1.0 | | | | | | |
| MW-17-07-23-15-11:37-1 | 290 | 10.0 | | | | | | D |
| MW-30i-07-23-15-15:15-1 | 13 | 1.0 | | | | | | |
| MW-39d-07-30-15-13:34-1 | 66 | 1.0 | | | | | | |
| MW-43-07-31-15-11:13-1 | nd | 1.0 | | | | | | |
| MW-47d-07-21-15-13:34-1 | nd | 1.0 | | | | | | |
| MW-47s-07-21-15-13:48-1 | 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) |
|---|---|---|---|---|---|---|---|---|
| MW-92-07-24-15-15:26-1 | 26 | 1.0 | | | | | | |
| MW-BE-1d-07-27-15-14:41-1 | 800 | 10.0 | | | | | | D |
| MW-BE-1s-07-27-15-15:12-1 | 940 | 10.0 | | | | | | D |
| MW-KD-1d-07-24-15-16:20-1 | 215 | 5.0 | | | | | | D |
| MW-KD-1s-07-24-15-15:55-1 | 51 | 1.0 | | | | | | |
| **E** | | | | | | | | |
| MW-101-07-27-15-13:36-1 | 160 | 5.0 | | | | | | D |
| MW-103d-07-02-15-13:52-1 | 10 | 1.0 | | | | | | |
| MW-103s-07-02-15-14:02-1 | 62 | 1.0 | | | | | | |
| MW-104-07-24-15-10:57-1 | 6 | 1.0 | | | | | | |
| MW-105d-07-29-15-16:35-1 | 240 | 5.0 | | | | | | D |
| MW-106d-07-27-15-17:00-1 | nd | 1.0 | | | | | | |
| MW-106s-07-27-15-17:28-1 | 250 | 5.0 | | | | | | D |
| MW-110-07-24-15-11:36-1 | 61 | 1.0 | | | | | | |
| MW-111-07-20-15-10:30-1 | nd | 1.0 | | | | | | |
| MW-112d-07-02-15-10:29-1 | nd | 1.0 | | | | | | |
| MW-112i-07-02-15-11:12-1 | 8 | 1.0 | | | | | | |
| MW-112s-07-02-15-10:42-1 | 1 | 1.0 | | | | | | |
| MW-115-07-27-15-10:40-1 | 440 | 10.0 | | | | | | D |
| MW-116-07-27-15-10:05-1 | 450 | 10.0 | | | | | | D |
| MW-119-07-24-15-09:20-1 | 84 | 1.0 | | | | | | |
| MW-120d-07-09-15-13:54-1 | nd | 1.0 | | | | | | |
| MW-121d-07-21-15-09:31-1 | 1 | 1.0 | | | | | | |
| MW-121d-07-31-15-10:42-1 | 2 | 1.0 | | | | | | |
| MW-122d-07-21-15-11:38-1 | nd | 1.0 | | | | | | |
| MW-123d-07-09-15-11:01-1 | nd | 1.0 | | | | | | |
| MW-124d-07-20-15-09:48-1 | 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) |
|---|---|---|---|---|---|---|---|---|
| MW-126d-07-10-15-11:47-1 | nd | 1.0 | | | | | | |
| MW-127d-07-29-15-11:37-1 | nd | 1.0 | | | | | | |
| MW-128d-07-29-15-10:06-1 | nd | 1.0 | | | | | | |
| MW-130d-07-07-15-09:49-1 | nd | 1.0 | | | | | | |
| MW-131d-07-10-15-09:38-1 | nd | 1.0 | | | | | | |
| MW-133d-07-08-15-10:00-1 | 3 | 1.0 | | | | | | |
| MW-134d-07-08-15-13:49-1 | 5 | 1.0 | | | | | | |
| MW-135-07-20-15-15:36-1 | nd | 1.0 | | | | | | |
| MW-30d-07-23-15-16:19-1 | 350 | 10.0 | | | | | | D |
| MW-59d-07-10-15-13:36-1 | nd | 1.0 | | | | | | |
| MW-64-07-28-15-15:38-1 | 44 | 1.0 | | | | | | |
| MW-66-07-28-15-10:03-1 | 2 | 1.0 | | | | | | |
| MW-67-07-23-15-13:58-1 | nd | 1.0 | | | | | | |
| MW-69-07-31-15-09:56-1 | nd | 1.0 | | | | | | |
| MW-70-07-31-15-14:33-1 | nd | 1.0 | | | | | | |
| MW-72d-07-27-15-09:27-1 | 1600 | 100.0 | | | | | | D |
| MW-76d-07-06-15-09:48-1 | 5 | 1.0 | | | | | | |
| MW-76i-07-06-15-10:31-1 | 92 | 5.0 | | | | | | D |
| MW-76s-07-06-15-10:47-1 | 260 | 5.0 | | | | | | D |
| MW-79d-07-22-15-09:25-1 | 2 | 1.0 | | | | | | |
| MW-79s-07-22-15-09:54-1 | 180 | 10.0 | | | | | | D |
| MW-82d-07-24-15-14:28-1 | 2 | 1.0 | | | | | | |
| MW-82s-07-24-15-14:46-1 | 230 | 10.0 | | | | | | D |
| MW-83d-07-21-15-15:00-1 | nd | 1.0 | | | | | | |
| MW-84d-07-06-15-13:59-1 | 3 | 1.0 | | | | | | |
| MW-84s-07-06-15-14:26-1 | 270 | 10.0 | | | | | | D |
| MW-86-07-21-15-16:40-1 | 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) |
|---|---|---|---|---|---|---|---|---|
| MW-88-07-24-15-10:07-1 | 78 | 10.0 | | | | | | D |
| MW-89-07-21-15-15:39-1 | 8 | 1.0 | | | | | | |
| MW-97d-07-20-15-13:45-1 | nd | 1.0 | | | | | | |
| MW-97s-07-20-15-13:58-1 | nd | 1.0 | | | | | | |
| MW-98s-07-20-15-14:57-1 | nd | 1.0 | | | | | | |
| MW-99d-07-20-15-11:28-1 | nd | 1.0 | | | | | | |
| MW-99s-07-20-15-11:48-1 | nd | 1.0 | | | | | | |
| **SW** | | | | | | | | |
| MW-52d-07-28-15-14:08-1 | nd | 1.0 | | | | | | |
| MW-52i-07-28-15-14:29-1 | 12 | 1.0 | | | | | | |
| MW-57-07-28-15-13:24-1 | 3 | 1.0 | | | | | | |
| **Surface Water** | | | | | | | | |
| **Not Applicable** | | | | | | | | |
| HC/HR-07-01-15-08:02-1 | | | nd | 2.0 | | | | |
| HC/HR-07-02-15-07:53-1 | | | nd | 2.0 | | | | |
| HC/HR-07-06-15-07:37-1 | | | nd | 2.0 | | | | |
| HC/HR-07-07-15-08:07-1 | | | nd | 2.0 | | | | |
| HC/HR-07-08-15-08:30-1 | | | nd | 2.0 | | | | |
| HC/HR-07-09-15-08:04-1 | | | nd | 2.0 | | | | |
| HC/HR-07-10-15-08:03-1 | | | nd | 2.0 | | | | |
| HC/HR-07-13-15-07:44-1 | | | nd | 2.0 | | | | |
| HC/HR-07-14-15-07:32-1 | | | nd | 2.0 | | | | |
| HC/HR-07-15-15-07:53-1 | | | nd | 2.0 | | | | |
| HC/HR-07-16-15-08:23-1 | | | nd | 2.0 | | | | |
| HC/HR-07-17-15-08:06-1 | | | nd | 2.0 | | | | |
| HC/HR-07-20-15-08:21-1 | | | 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-07-21-15-08:09-1 | | | nd | 2.0 | | | | |
| HC/HR-07-22-15-08:01-1 | | | nd | 2.0 | | | | |
| HC/HR-07-23-15-08:17-1 | | | nd | 2.0 | | | | |
| HC/HR-07-24-15-07:57-1 | | | nd | 2.0 | | | | |
| HC/HR-07-27-15-08:12-1 | | | nd | 2.0 | | | | |
| HC/HR-07-28-15-08:00-1 | | | nd | 2.0 | | | | |
| HC/HR-07-29-15-08:21-1 | | | nd | 2.0 | | | | |
| HC/HR-07-30-15-08:19-1 | | | nd | 2.0 | | | | |
| HC/HR-07-31-15-08:19-1 | | | nd | 2.0 | | | | |
| **Treatment System** | | | | | | | | |
| OUTFALL-07-01-15-1 | 6 | 1.0 | | | | | | |
| OUTFALL-07-01-15-2 | | | 6 | 5.0 | | | | |
| OUTFALL-07-05-15-1 | 6 | 1.0 | | | | | | |
| OUTFALL-07-05-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-06-15-1 | 6 | 1.0 | | | | | | |
| OUTFALL-07-06-15-2 | | | 5 | 5.0 | | | | |
| OUTFALL-07-07-15-1 | 6 | 1.0 | | | | | | |
| OUTFALL-07-07-15-2 | | | 5 | 5.0 | | | | |
| OUTFALL-07-08-15-1 | 5 | 1.0 | | | | | | |
| OUTFALL-07-08-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-09-15-1 | 5 | 1.0 | | | | | | |
| OUTFALL-07-09-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-12-15-1 | 7 | 1.0 | | | | | | |
| OUTFALL-07-12-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-13-15-1 | 9 | 1.0 | | | | | | |
| OUTFALL-07-13-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-17-15-14:30-1 | 7 | 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) |
|---|---|---|---|---|---|---|---|---|
| OUTFALL-07-17-15-14:30-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-19-15-1 | 9 | 1.0 | | | | | | |
| OUTFALL-07-19-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-20-15-1 | 8 | 1.0 | | | | | | |
| OUTFALL-07-20-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-21-15-1 | 8 | 1.0 | | | | | | |
| OUTFALL-07-21-15-2 | | | 6 | 5.0 | | | | |
| OUTFALL-07-22-15-1 | 5 | 1.0 | | | | | | |
| OUTFALL-07-22-15-2 | | | 6 | 5.0 | | | | |
| OUTFALL-07-23-15-1 | 6 | 1.0 | | | | | | |
| OUTFALL-07-23-15-2 | | | 6 | 5.0 | | | | |
| OUTFALL-07-26-15-1 | 8 | 1.0 | | | | | | |
| OUTFALL-07-26-15-2 | | | 5 | 5.0 | | | | |
| OUTFALL-07-27-15-1 | 8 | 1.0 | | | | | | |
| OUTFALL-07-27-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-28-15-1 | 7 | 1.0 | | | | | | |
| OUTFALL-07-28-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-29-15-1 | 7 | 1.0 | | | | | | |
| OUTFALL-07-29-15-2 | | | nd | 5.0 | | | | |
| OUTFALL-07-30-15-1 | 7 | 1.0 | | | | | | |
| OUTFALL-07-30-15-2 | | | nd | 5.0 | | | | |
| Red Pond-07-06-15-08:20-1 | 440 | 10.0 | | | | | | D |
| Red Pond-07-20-15-07:40-1 | 440 | 10.0 | | | | | | D |
| Red Pond-07-27-15-08:15-1 | 510 | 10.0 | | | | | | D |



**Qualifier Codes:**

**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
**O:** Sample analyzed by and outside laboratory specified in the comment section

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 09:40
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07785**

Project Name:
Project Number:
Sample ID: **745 S. Wagner Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 20:11 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 10:01
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07786**

Project Name:
Project Number:
Sample ID: **5115 Jackson Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 20:31 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 09:34
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07787**

Project Name:
Project Number:
Sample ID: **777 S. Wagner Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 20:51 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 10:23
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07788**

Project Name:
Project Number:
Sample ID: **5005 Jackson Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | 17 | ug/L | 1 | | EPA 1624(SIM) | 21:11 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
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Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 09:53
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07789**

Project Name:
Project Number:
Sample ID: **697 S. Wagner Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 21:32 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/23/2015 09:46
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07790**

Project Name:
Project Number:
Sample ID: **723 S. Wagner Rd.**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | 1 | ug/L | 1 | | EPA 1624(SIM) | 21:52 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/24/2015 13:15
Submit Date/Time: 7/24/2015 14:50
Report Date: 8/3/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35357**
BA Sample ID **CB07791**

Project Name:
Project Number:
Sample ID: **371 Parkland Plaza #1**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 22:12 | 07/30/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/3/15

**Brighton Analytical LLC**
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date/Time: 7/29/2015 11:12
Submit Date/Time: 7/31/2015 14:55
Report Date: 8/11/2015

Pall Corp.
600 S. Wagner
Bldg. 4
Ann Arbor, MI 48103

BA Project # **35434**
BA Sample ID **CB07998**

Project Name:
Project Number:
Sample ID: **Saginaw Forest #4**

| Analyte Name | Result | Units | RL | MCL | Method Reference | Analysis Time | Analysis Date |
|---|---|---|---|---|---|---|---|
| **1,4-Dioxane(SIM)** | | | | | | | |
| 1,4-Dioxane (SIM) | Not detected | ug/L | 1 | | EPA 1624(SIM) | 01:56 | 08/07/2015 |

RL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

MCL = Maximum contaminant Levels.
Analysis not specifically identified as drinking water are for non-regulatory compliance purposes.

Released by _____
Date 8/11/15

# GC/MS
# VOLATILE METHOD 1624 SIM
## REPRESENTATIVE BATCH PRECISION AND ACCURACY QUALITY CONTROL SUMMARY

Analysis Date: July 30, 2015 | Spike Std. ID: 2481.0 | Inst./Detec: Vol 6 GC/MS

Laboratory ID: LCS | Matrix: Water | Analyst: CW

| | Matrix Spike - Precision | | | | Matrix spike - Accuracy | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Spike 1 | Spike 2 | Relative Percent Difference | Spk Conc ug/L | % Recovery | % Recovery | Range (%) | Sample background | Method Blank | LCS |
| 1,4 Dioxane | 9.9 | 9.7 | 2.7 | 10 | 99 | 97 | 70-130 | ND | <1 | 99% |

ug/L is equivalent to ppb

Comments: