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February 23, 2017

Ms. Demaree Collier
Remedial Project Manager
USEPA Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Subject: Transmittal of Data
Plume Monitoring and Background Wells
Lemberger Landfill Sites
Fourth Quarter 2016

Dear Ms. Collier:

On behalf of the Lemberger Site Remediation Group (LSRG), and in accordance with the Environmental Monitoring Plan, Revision 4 (February 2014), and the subsequent monitoring program revisions as approved by the United States Environmental Protection Agency (USEPA) and the Wisconsin Department of Natural Resources (WDNR), TRC Environmental Corporation (TRC) is submitting the following data:

- Attachment 1: Data Validation Comments and Qualifiers
- Attachment 2: Table of Wisconsin Administrative Code Chapter NR 140 Groundwater Quality Standards (Enforcement Standards [ESs], Preventive Action Limits [PALs], Maximum Contaminant Levels [MCLs], and Secondary Maximum Contaminant Levels [SMCLs]) for the Pertinent Parameters
- Attachment 3: Tabular Summary of Analytical Results at Each Monitoring Well
- Attachment 4: Laboratory Data Sheets for Monitoring Wells
- Attachment 5: Tabular Summary of Groundwater Standard Exceedances

A certified diskette containing field and laboratory data in an approved WDNR format has been attached to the copies provided to the WDNR and the USEPA, for their use. Groundwater samples were collected during December 2016, in accordance with a March 2016 revision to the post-MNA study program. The sampling was performed as specified for the fourth quarter (December) sampling event.

Please call if you have questions.

Sincerely,

TRC Environmental Corporation

Kristopher D. Krause, P.E.
Senior Project Manager

Attachments

cc: Tauren Beggs – WDNR
Gary Edelstein – WDNR
Brian Potts – Perkins Coie, LLP
Kristin Jones – Newell Rubbermaid
Nilaksh Kothari – Manitowoc Public Utilities
James Wallner – Red Arrow Products
Chris Meyer – The Manitowoc Company, Inc.
Kathleen McDaniel – City of Manitowoc
David Dougherty – Subterranean Research, Inc.
Doug Ucci – Quantum Management Group, Inc.
Kenny Ogilvie – EHS Support, LLC
Beth Hesse – EHS Support, LLC
GEMS Data Submittal Contact (w/diskette)



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# Attachment 1

# Data Validation Comments and Qualifiers

# Evaluation of the Data Quality for the Fourth Quarter 2016 Sampling at the Lemberger Landfill Sites

**February 2017**

*Prepared For*
*Lemberger Site Remediation Group*



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# Data Quality Evaluation

Data validation was accomplished by comparing the quality assurance and quality control (QA/QC) results contained in the laboratory data packages with the requirements specified in the Quality Assurance Project Plan (QAPP) for the Lemberger Landfill and Lemberger Transport and Recycling Site, Town of Franklin, Wisconsin, Revision 1 (TRC, 2011); the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 2010); the National Functional Guidelines for Organic Data Review (USEPA, 2008); and the general guidelines published in SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA, 1990 and 1996), where appropriate. One-hundred percent of the sample data were validated. Particular attention was paid to raw data, Chain-of-Custody Records, initial and continuing calibrations, blanks, laboratory control samples (LCSs), duplicate analyses, matrix spikes and matrix spike duplicates (MSs/MSDs), and ICP serial dilution and ICP interference check sample results. The discussion that follows describes the results of the QA/QC activities.

## Usability

Mark Brooks of Brooks Services, LLC (Brooks Services) collected groundwater samples from a total of 7 groundwater monitoring wells in December 2016. The sampling was performed as specified for the fourth quarter (December) sampling event in accordance with a March 2016 revision to the post-MNA study program presented in the Environmental Monitoring Program (EMP) Revision 4. In accordance with the EMP, Pace Analytical Services, Inc. (Pace), analyzed each of the samples for Target Compound List (TCL) volatile organic compounds (VOC Method 8260B, SW-846). Unfiltered samples were collected for all of the analyses.

Trip and field blanks, MSs/MSDs, and blind field duplicates were collected and analyzed for quality control purposes. The laboratory also prepared and analyzed method (procedural) blanks, laboratory duplicates, and laboratory control spikes (LCS) for internal quality control purposes.

The data quality objectives for the project were met, and the data are usable for the purposes of the Lemberger sites. The procedures specified in the methods were implemented, and the data packages were found to contain all of the deliverables specified in the QAPP.

## Sample Tracking

Laboratory reports received from Pace were compared with shipping records to confirm that results were received for each sample that was shipped. All of the results for all locations sampled were received.

## Holding Times and Sample Preservation

All VOC analyses on the monitoring wells were performed within the allowed 14 days of sample collection.

## Instrument Performance Check

Satisfactory gas chromatograph/mass spectrometer (GC/MS) instrument performance checks ensure adequate mass resolution, compound identification, and, to some degree, sensitivity. The criteria established for instrument performance checks were met at all times. The analyses of the instrument performance check solution were performed at the required frequency (every 12 hours of sample analysis per instrument). Bromofluorobenzene (BFB) was used as a check compound in the VOC analyses.

The ion abundance ratio, the signal-to-noise ratio, the retention times, and the mass assignment criteria were met for all instrument performance checks. The ion abundances were correctly normalized to the appropriate m/z (mass/charge) ratio.

## Calibrations

Initial calibration establishes that the instrument is capable of acceptable performance at the beginning of the analytical sequence, and that the calibration curve is linear. Continuing calibration verifies the calibration and evaluates daily instrument performance.

### Gas Chromatography/Mass Spectrometer (GC/MS) Calibration

Initial calibrations containing target compounds and system monitoring compounds were performed at the required frequency and concentration levels. Initial calibrations of the GC/MS at five to eight concentrations were performed after instrument performance check criteria were met and prior to the analysis of samples and blanks. Internal standards were added to all calibration standards and samples (including blanks and MSs/MSDs). The GC/MS calibration was verified every 12 hours with one mid-range standard.

The minimum Relative Response Factor (RRF) criterion was met in the GC/MS analyses. The stability of the compound Response Factors was indicated by acceptable percent Relative Standard Deviation (RSD) or correlation coefficient ($r^2$) values of the RRFs. The percent difference (%D) criteria for continuing calibration were met for all calibration check compounds (CCCs) and system performance check compounds (SPCCs).

## Internal Standard Responses and Retention Times in the GC/MS Analysis

The quantitative determination of the VOCs is based on the use of internal standards added immediately prior to analysis. Therefore, satisfactory internal standard responses in all calibration standards, samples, and blanks are critical.

Four internal standard constituents (pentafluorobenzene; 1,4-dichlorobenzene-d4; 1,4-difluorobenzene; and chlorobenzene-d5) were used in the VOC analysis. All internal standard area counts and retention times (RTs) were within the QC limits in the analysis of samples for VOCs.

## Compound Identification

To verify that VOCs were not erroneously identified, the relative retention times (RRTs) of the samples were checked to see if they were within the standard RRT and if the mass spectra of the samples and standards matched. All criteria of the GC/MS analyses were met.

## Method Blanks

Method blanks were analyzed to assess potential sample contamination resulting from laboratory procedures. A method blank is carried through the same analytical steps (preparation and analysis) as the samples. For analyses where there is no preparation (e.g., extraction) step, such as for VOCs or dissolved metals, laboratory reagent water is analyzed and used as the method blank.

Method blanks were analyzed with each group of samples analyzed. The method blank analyses were performed at the frequencies required in the methods. There were no target compounds detected in the method blanks analyzed for VOCs.

## Trip Blanks

To assess the potential for sample contamination during sample collection, shipment, and storage, trip blanks were analyzed for VOCs during the current monitoring event. Styrene was detected in one of the trip blanks analyzed for VOCs. There were no sample detections for styrene; therefore no samples were qualified for styrene.

## Field Blanks

To check for procedural contamination at the site, which may cause sample contamination, one field blank was analyzed for VOCs. Toluene was detected in the field blank. When the concentration of a VOC constituent is reported in a sample at a concentration less than 5 times the associated blank value, the apparent sample detections may be the result of instrument noise and/or laboratory or sample handling contamination. However, there were no detections of toluene in the groundwater samples; therefore no sample results were qualified for toluene based on the field blank results. No other VOCs were detected in the field blank.

## Matrix Spikes/Matrix Spike Duplicates (MSs/MSDs) and Post-Digestion Spikes and Post-Digestion Spike Duplicates (PSs/PSDs)

Matrix spikes (MSs) and matrix spike duplicates (MSDs) provide information about the effects of the sample matrix on the sample preparation and measurement performance. A matrix spike consists of a sample that is spiked with a group of target constituents representative of the method analytes and carried through the appropriate steps of the analysis, including distillation, digestion, and extraction (as appropriate). If the spike is added to the sample after the completion of sample preparation procedures, or if the sample does not undergo sample preparation procedures, it is referred to as a post-digestion spike.

Additional sample aliquots were collected at one well, RM-003XXD, for MS/MSD analysis. All target analytes were spiked into the MS/MSD samples analyzed for VOCs. All the MS/MSD results for VOCs met the laboratory's quality control criteria for percent recovery (accuracy), and relative percent difference (precision).

## Surrogate/System Monitoring Compound (SMC) Spikes

Surrogate/SMC spikes are compounds that are similar to the analytes of interest in chemical behavior, but are not normally found in environmental samples. Laboratory performance was established by spiking each of the individual samples, blanks, and MS/MSDs prior to extraction and/or analysis; calculating the percent recovery of each surrogate compound; and comparing the recoveries to statistical limits that were derived from historical data. Three surrogate compounds, toluene-d8, 4-bromofluorobenzene, and dibromofluoromethane, were used in the VOC analysis. All surrogate recoveries met method requirements in the groundwater and quality control samples.

## Laboratory Control Samples

Laboratory control samples (LCSs) are used to monitor the overall method accuracy of the analysis, including the sample preparation, for all parameters. The laboratory performs laboratory control sample duplicates (LCSDs) as needed to evaluate the overall method precision.

The laboratory performs LCS/LCSDs for the VOC analyses. All recoveries and RPDs were within the laboratory control limits.

## Blind Field Duplicate Samples

Field duplicates measure both field and laboratory precision. As expected, the variability in field duplicates is greater than it is for the laboratory duplicates, which measure only laboratory precision. Heterogeneity of samples, difficulty in replicating the analytical results from small sample aliquots, and low concentrations of analytes can all result in decreases in the precision.

One pair of blind field duplicates from wells RM-003D were compared for VOCs. Table 1 shows the comparison of the reported analytes in the duplicate pairs for detected parameters. Relative percent difference (RPD) values were calculated for only those pairs in which both reported results were above the Limit of Quantitation (LOQ) and were not qualified as not detected on the basis of blank contamination (i.e., "u"-flagged). Precision should not be evaluated for those analytes that are reported with values below the LOQ, since good precision cannot be expected at those levels. Constituents that were less than the Limit of Detection in both the primary and duplicate sample are not shown.

The precision of the groundwater samples expressed as Relative Percent Difference (RPD) is excellent, with RPDs of less than 10 percent for all of the duplicate results. No data were qualified based on the field duplicates.

## References


Malcolm Pirnie (with modifications by RMT). 1997. Final operation and maintenance plan, Lemberger Landfill RD/RA Operable Unit 1. February 1997.

TRC Environmental Corp. 2011. Quality assurance project plan. Lemberger Landfill and Lemberger Transport and Recycling Site, Town of Franklin, Wisconsin. Revision 1. September 2011.

TRC Environmental Corp. 2014. Environmental Monitoring Plan. Lemberger Landfill and Lemberger Transport and Recycling Site, Town of Franklin, Wisconsin. Revision 4. February 2014.

USEPA. 1990 and 1996. Test methods for evaluating solid waste; physical/chemical methods. SW-846.

USEPA. 2008. USEPA contract laboratory program, national functional guidelines for organic data review. USEPA-540-R-08-01. June 2008.

USEPA. 2010. USEPA contract laboratory program, national functional guidelines for inorganic data review. EPA 540-R-10-011. January 2004.

Table 1
Duplicate Sample Relative Percent Difference (RPD) Comparisons
Fourth Quarter 2016 Sampling Event
Lemberger Landfill Sites

| PARAMETER | LIMIT OF QUANTITATION | RM-003D 12/09/2016 | RM-003D DUP 12/09/2016 | RPD | UNITS |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1.0 | 36.9 | 38.6 | 4.5 | µg/L |
| 1,1-Dichloroethane | 1.0 | 21.1 | 23.2 | 9.5 | µg/L |
| 1,1-Dichloroethene | 1.0 | 3.5 | 3.5 | 0 | µg/L |
| Trichloroethene | 1.0 | 5.0 | 5.2 | 4.4 | µg/L |
| cis-1,2-dichloroethene | 1.0 | 6.9 | 6.6 | 3.9 | µg/L |

Note:

-- Either one or both values are less than the Limit of Quantitation or were qualified as not detected; therefore, an RPD calculation is of limited significance and was not done.

## Attachment 2

## Table of Wisconsin Administrative Code Chapter NR 140 Groundwater Quality Standards (Enforcement Standards [ESs], Preventive Action Limits [PALs], Maximum Contaminant Levels [MCLs], and Secondary Maximum Contaminant Levels [SMCLs]) for the Pertinent Parameters

Attachment 2
Groundwater Quality Standards

| PARAMETER NAME | UNITS | MCL | SMCL | NR PAL | NR ES |
|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | µg/L | | | 7 | 70 |
| 1,1,1-Trichloroethane | µg/L | 200 | | 40 | 200 |
| 1,1,2-Trichloroethane | µg/L | 5 | | 0.5 | 5 |
| 1,1-Dichloroethene | µg/L | 7 | | 0.7 | 7 |
| 1,2,3-Trichloropropane | µg/L | | | 12 | 60 |
| 1,2,4-Trichlorobenzene | µg/L | 70 | | 14 | 70 |
| 1,2-Dichlorobenzene | µg/L | 600 | | 60 | 600 |
| 1,2-Dichloroethane | µg/L | 5 | | 0.5 | 5 |
| 1,2-Dichloropropane | µg/L | 5 | | 0.5 | 5 |
| 1,4-Dichlorobenzene | µg/L | 75 | | 15 | 75 |
| 2,3,7,8-TCDD | ng/L | 0.03 | | 0.003 | 0.03 |
| Alpha-chlordane | µg/L | 2 | | 0.2 | 2 |
| Anthracene | µg/L | | | 600 | 3000 |
| Antimony, dissolved | µg/L | 6 | | 1.2 | 6 |
| Antimony, total | µg/L | 6 | | 1.2 | 6 |
| Aroclor-1016 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1221 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1232 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1242 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1248 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1254 | µg/L | 0.5 | | 0.003 | 0.03 |
| Aroclor-1260 | µg/L | 0.5 | | 0.003 | 0.03 |
| Arsenic, dissolved | µg/L | 10 | | 1 | 10 |
| Arsenic, total | µg/L | 10 | | 1 | 10 |
| Barium, dissolved | µg/L | 2000 | | 400 | 2000 |
| Barium, total | µg/L | 2000 | | 400 | 2000 |
| Bentazon | µg/L | | | 60 | 300 |
| Benzene | µg/L | 5 | | 0.5 | 5 |
| Benzo(a)pyrene | µg/L | 0.2 | | 0.02 | 0.2 |
| Benzo(b)fluoranthene | µg/L | | | 0.02 | 0.2 |

Attachment 2 (continued)
Groundwater Quality Standards

| PARAMETER NAME | UNITS | MCL | SMCL | NR PAL | NR ES |
|---|---|---|---|---|---|
| Beryllium, dissolved | µg/L | 4 | | 0.4 | 4 |
| Beryllium, total | µg/L | 4 | | 0.4 | 4 |
| bis(2-ethylhexyl)Phthalate | µg/L | 6 | | 0.6 | 6 |
| Cadmium, dissolved | µg/L | 5 | | 0.5 | 5 |
| Cadmium, total | µg/L | 5 | | 0.5 | 5 |
| Carbon disulfide | µg/L | | | 200 | 1000 |
| Carbon tetrachloride | µg/L | 5 | | 0.5 | 5 |
| Chlordane, technical | µg/L | 2 | | 0.2 | 2 |
| Chloride | mg/L | | 250 | 125 | 250 |
| Chlorobenzene | µg/L | 100 | | 20 | 100 |
| Chromium, dissolved | µg/L | 100 | | 10 | 100 |
| Chromium, total | µg/L | 100 | | 10 | 100 |
| Chrysene | µg/L | | | 0.02 | 0.2 |
| cis-1,2-Dichloroethene | µg/L | 70 | | 7 | 70 |
| Cobalt, dissolved | µg/L | | | 8 | 40 |
| Cobalt, total | µg/L | | | 8 | 40 |
| Copper, dissolved | µg/L | 1300 | 1000 | 130 | 1300 |
| Copper, total | µg/L | 1300 | 1000 | 130 | 1300 |
| Cyanazine | µg/L | | | 0.1 | 1 |
| Cyanide, total | mg/L | 0.2 | | 0.04 | 0.2 |
| di-n-butylphthalate | µg/L | | | 100 | 1000 |
| Endrin | µg/L | 2 | | 0.4 | 2 |
| Ethylbenzene | µg/L | 700 | | 140 | 700 |
| Fluoranthene | µg/L | | | 80 | 400 |
| Gamma-BHC (lindane) | µg/L | 0.2 | | 0.02 | 0.2 |
| Gamma-chlordane | µg/L | 2 | | 0.2 | 2 |
| Heptachlor | µg/L | 0.4 | | 0.04 | 0.4 |
| Heptachlor epoxide | µg/L | 0.2 | | 0.02 | 0.2 |
| Hexachlorobenzene | µg/L | 1 | | 0.1 | 1 |
| Hydrogen sulfide | µg/L | | | 6 | 30 |
| Iron, dissolved | µg/L | | 300 | 150 | 300 |
| Iron, total | µg/L | | 300 | 150 | 300 |

Attachment 2 (continued)
Groundwater Quality Standards

| PARAMETER NAME | UNITS | MCL | SMCL | NR PAL | NR ES |
|---|---|---|---|---|---|
| Lead, dissolved | µg/L | 15 | | 1.5 | 15 |
| Lead, total | µg/L | 15 | | 1.5 | 15 |
| Manganese, dissolved | µg/L | | 50 | 60 | 300 |
| Manganese, total | µg/L | | 50 | 60 | 300 |
| Mercury, dissolved | µg/L | 2 | | 0.2 | 2 |
| Mercury, total | µg/L | 2 | | 0.2 | 2 |
| Methanol | µg/L | | | 1000 | 5000 |
| Methoxychlor | µg/L | 40 | | 4 | 40 |
| Methylene chloride | µg/L | 5 | | 0.5 | 5 |
| N-hexane | µg/L | | | 120 | 600 |
| Nickel, dissolved | µg/L | | | 20 | 100 |
| Nickel, total | µg/L | | | 20 | 100 |
| Nitrogen, ammonia | mg/L | | | 0.97 | 9.7 |
| N-nitrosodiphenylamine | µg/L | | | 0.7 | 7 |
| Pentachlorophenol | µg/L | 1 | | 0.1 | 1 |
| Prometon | µg/L | | | 20 | 100 |
| Pyrene | µg/L | | | 50 | 250 |
| Pyridine | µg/L | | | 2 | 10 |
| Selenium, dissolved | µg/L | 50 | | 10 | 50 |
| Selenium, total | µg/L | 50 | | 10 | 50 |
| Silver, dissolved | µg/L | | 100 | 10 | 50 |
| Silver, total | µg/L | | 100 | 10 | 50 |
| Styrene | µg/L | 100 | | 10 | 100 |
| Tetrachloroethene | µg/L | 5 | | 0.5 | 5 |
| Thallium, dissolved | µg/L | 2 | | 0.4 | 2 |
| Thallium, total | µg/L | 2 | | 0.4 | 2 |
| Toluene | µg/L | 1000 | | 160 | 800 |
| Toxaphene | µg/L | 3 | | 0.3 | 3 |
| trans-1,2-Dichloroethene | µg/L | 100 | | 20 | 100 |
| Trichloroethene | µg/L | 5 | | 0.5 | 5 |
| Trimethylbenzenes, total | µg/L | | | 96 | 480 |
| Vanadium, dissolved | µg/L | | | 6 | 30 |

Attachment 2 (continued)
Groundwater Quality Standards

| PARAMETER NAME | UNITS | MCL | SMCL | NR PAL | NR ES |
|---|---|---|---|---|---|
| Vanadium, total | µg/L | | | 6 | 30 |
| Vinyl chloride | µg/L | 2 | | 0.02 | 0.2 |
| Xylenes, total | µg/L | 10000 | | 400 | 2000 |
| Zinc, dissolved | µg/L | | 5000 | 2500 | 5000 |
| Zinc, total | µg/L | | 5000 | 2500 | 5000 |

Note:
Table updated August 2016 to reflect July 2015 register (WDNR) and latest USEPA MCLs.

# Attachment 3

# Tabular Summary of Analytical Results at Each Monitoring Well

**LEMBERGER LANDFILL**
**RESIDENTIAL WELL VOLATILE ORGANIC ANALYSIS RESULTS**
**DECEMBER 2016**

| PARAMETER | UNITS | RM-002D 12/11/2016 40143363007 | RM-003D 12/9/2016 40143363001 | RM-003D DUP 12/9/2016 40143363003 | RM-003XXD 12/9/2016 40143363002 | RM-210D 12/11/2016 40143363008 | RM-401XD 12/10/2016 40143363006 | RM-401XXD 12/10/2016 40143363005 | RM-403XD 12/10/2016 40143363004 |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-TRICHLOROETHANE | UG/L | 8.3 | 36.9 | 38.6 | 16.9 | 12.4 | 20.9 | 9.3 | 131 |
| 1,1,2,2-TETRACHLOROETHANE | UG/L | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 |
| 1,1,2-TRICHLOROETHANE | UG/L | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| 1,1-DICHLOROETHANE | UG/L | 7.3 | 21.1 | 23.2 | 10.6 | 7.6 | 12.9 | 6.9 | 76.9 |
| 1,1-DICHLOROETHENE | UG/L | 1.2 | 3.5 | 3.5 | 1.4 | 1.6 | 2.8 | 3.4 | 10.4 |
| 1,2-DICHLOROETHANE | UG/L | < 0.17 | < 0.17 | < 0.17 | < 0.17 | < 0.17 | < 0.17 | < 0.17 | < 0.17 |
| 1,2-DICHLOROPROPANE | UG/L | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 |
| 2-BUTANONE | UG/L | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 |
| 2-HEXANONE | UG/L | < 1.1 | < 1.1 | < 1.1 | < 1.1 | < 1.1 | < 1.1 | < 1.1 | < 1.1 |
| 4-METHYL-2-PENTANONE | UG/L | < 2.1 | < 2.1 | < 2.1 | < 2.1 | < 2.1 | < 2.1 | < 2.1 | < 2.1 |
| ACETONE | UG/L | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 | < 3.0 |
| BENZENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| BROMODICHLOROMETHANE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| BROMOFORM | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| BROMOMETHANE | UG/L | < 2.4 | < 2.4 | < 2.4 | < 2.4 | < 2.4 | < 2.4 | < 2.4 | < 2.4 |
| CARBON DISULFIDE | UG/L | < 0.61 | < 0.61 | < 0.61 | < 0.61 | < 0.61 | < 0.61 | < 0.61 | < 0.61 |
| CARBON TETRACHLORIDE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| CHLOROBENZENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| CHLORODIBROMOMETHANE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| CHLOROETHANE | UG/L | < 0.37 | < 0.37 | < 0.37 | < 0.37 | < 0.37 | < 0.37 | < 0.37 | 0.38 J |
| CHLOROFORM | UG/L | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 |
| CHLOROMETHANE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| CIS-1,2-DICHLOROETHENE | UG/L | 2.5 | 6.9 | 6.6 | 3.8 | 3.4 | 5.6 | 8.6 | 20.8 |
| CIS-1,3-DICHLOROPROPENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| ETHYLBENZENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| METHYLENE CHLORIDE | UG/L | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 |
| STYRENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| TETRACHLOROETHENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | 1.2 |
| TOLUENE | UG/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| TRANS-1,2-DICHLOROETHENE | UG/L | < 0.26 | < 0.26 | < 0.26 | < 0.26 | < 0.26 | < 0.26 | < 0.26 | < 0.26 |
| TRANS-1,3-DICHLOROPROPENE | UG/L | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 | < 0.23 |
| TRICHLOROETHENE | UG/L | 2.5 | 5.0 | 5.2 | 4.1 | 2.3 | 3.4 | 1.7 | 15.5 |
| VINYL CHLORIDE | UG/L | < 0.18 | < 0.18 | < 0.18 | < 0.18 | < 0.18 | < 0.18 | < 0.18 | < 0.18 |
| XYLENE, TOTAL | UG/L | < 1.5 | < 1.5 | < 1.5 | < 1.5 | < 1.5 | < 1.5 | < 1.5 | < 1.5 |

NOTES:
Laboratory data qualifiers are included in the laboratory reports in Attachment 4. See specific laboratory report for Sample Delivery Group (SDG) definition.
Non-detect results are reported as "< Limit of Detection (LOD)"

**LEMBERGER LANDFILL**
**MONITORING WELL FIELD DATA**
**DECEMBER 2016**

| PARAMETER | UNITS | RM-002D 12/11/2016 40143363007 | RM-003D 12/9/2016 40143363001 | RM-003XXD 12/9/2016 40143363002 | RM-210D 12/11/2016 40143363008 | RM-401XD 12/10/2016 40143363006 | RM-401XXD 12/10/2016 40143363005 | RM-403XD 12/10/2016 40143363004 |
|---|---|---|---|---|---|---|---|---|
| COLOR, FIELD | | NONE | NONE | NONE | NONE | NONE | NONE | NONE |
| CONDUCTANCE, SPECIFIC | UMHOS/CM | 565 | 698 | 697 | 665 | 729 | 715 | 849 |
| DEPTH TO WATER | FEET | 23.50 | 17.37 | 15.05 | 31.55 | 31.42 | 26.42 | 38.08 |
| DISSOLVED OXYGEN, FIELD | MG/L | 0.61 | 2.53 | 1.05 | 0.67 | 2.49 | 4.36 | 3.86 |
| ODOR, FIELD | | NONE | NONE | NONE | NONE | NONE | NONE | NONE |
| OXIDATION REDUCTION POTENTIAL | MV | 17 | 171 | 246 | 65 | 254 | 242 | 234 |
| PH, FIELD | SU | 7.65 | 7.25 | 7.32 | 7.45 | 7.31 | 7.33 | 7.26 |
| TEMPERATURE | DEG C | 4.5 | 7.6 | 3.2 | 4.6 | 3.8 | 3.8 | 3.7 |
| TURBIDITY, FIELD NTU | NTU | 8 | 0 | 5 | 7 | 6 | 6 | 3 |
| WATER ELEVATION | FEET | 792.21 | 802.76 | 806.48 | 796.31 | 802.18 | 806.43 | 806.42 |

# Attachment 4

# Laboratory Data Sheets for Monitoring Wells

Pace Analytical Services, LLC
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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-003D** **Lab ID: 40143363001** Collected: 12/09/16 13:56 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **36.9** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 16:15 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 16:15 | 79-00-5 | |
| 1,1-Dichloroethane | **21.1** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 16:15 | 75-34-3 | |
| 1,1-Dichloroethene | **3.5** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 16:15 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 16:15 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:15 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:15 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 16:15 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 16:15 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:15 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 16:15 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 16:15 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 16:15 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 16:15 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:15 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 108-88-3 | |
| Trichloroethene | **5.0** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 16:15 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 16:15 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 16:15 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **6.9** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:15 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:15 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:15 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:15 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 92 | % | 70-130 | | 1 | | 12/15/16 16:15 | 460-00-4 | |
| Dibromofluoromethane (S) | 99 | % | 70-130 | | 1 | | 12/15/16 16:15 | 1868-53-7 | |
| Toluene-d8 (S) | 101 | % | 70-130 | | 1 | | 12/15/16 16:15 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-003XXD** **Lab ID: 40143363002** Collected: 12/09/16 15:42 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **16.9** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 15:52 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 15:52 | 79-00-5 | |
| 1,1-Dichloroethane | **10.6** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 15:52 | 75-34-3 | |
| 1,1-Dichloroethene | **1.4** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 15:52 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 15:52 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 15:52 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 15:52 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 15:52 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 15:52 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 15:52 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 15:52 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 15:52 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 15:52 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 15:52 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 15:52 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 108-88-3 | |
| Trichloroethene | **4.1** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 15:52 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 15:52 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 15:52 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **3.8** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 15:52 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 15:52 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 15:52 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 15:52 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 93 | % | 70-130 | | 1 | | 12/15/16 15:52 | 460-00-4 | |
| Dibromofluoromethane (S) | 103 | % | 70-130 | | 1 | | 12/15/16 15:52 | 1868-53-7 | |
| Toluene-d8 (S) | 101 | % | 70-130 | | 1 | | 12/15/16 15:52 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: FDUP-001** **Lab ID: 40143363003** Collected: 12/09/16 00:00 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **38.6** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 16:37 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 16:37 | 79-00-5 | |
| 1,1-Dichloroethane | **23.2** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 16:37 | 75-34-3 | |
| 1,1-Dichloroethene | **3.5** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 16:37 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 16:37 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:37 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:37 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 16:37 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 16:37 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:37 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 16:37 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 16:37 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 16:37 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 16:37 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:37 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 108-88-3 | |
| Trichloroethene | **5.2** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 16:37 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 16:37 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 16:37 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **6.6** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:37 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:37 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:37 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:37 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 92 | % | 70-130 | | 1 | | 12/15/16 16:37 | 460-00-4 | |
| Dibromofluoromethane (S) | 110 | % | 70-130 | | 1 | | 12/15/16 16:37 | 1868-53-7 | |
| Toluene-d8 (S) | 101 | % | 70-130 | | 1 | | 12/15/16 16:37 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-403XD** **Lab ID: 40143363004** Collected: 12/10/16 17:28 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **131** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 16:59 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 16:59 | 79-00-5 | |
| 1,1-Dichloroethane | **76.9** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 16:59 | 75-34-3 | |
| 1,1-Dichloroethene | **10.4** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 16:59 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 16:59 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:59 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:59 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 16:59 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 16:59 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 16:59 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 16:59 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 16:59 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 108-90-7 | |
| Chloroethane | **0.38J** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 16:59 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 16:59 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:59 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 100-42-5 | |
| Tetrachloroethene | **1.2** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 108-88-3 | |
| Trichloroethene | **15.5** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 16:59 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 16:59 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 16:59 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **20.8** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:59 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 16:59 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 16:59 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 16:59 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 89 | % | 70-130 | | 1 | | 12/15/16 16:59 | 460-00-4 | |
| Dibromofluoromethane (S) | 106 | % | 70-130 | | 1 | | 12/15/16 16:59 | 1868-53-7 | |
| Toluene-d8 (S) | 100 | % | 70-130 | | 1 | | 12/15/16 16:59 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-401XXD** **Lab ID: 40143363005** Collected: 12/10/16 19:34 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **9.3** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 17:22 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 17:22 | 79-00-5 | |
| 1,1-Dichloroethane | **6.9** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 17:22 | 75-34-3 | |
| 1,1-Dichloroethene | **3.4** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 17:22 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 17:22 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:22 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 17:22 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 17:22 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 17:22 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 17:22 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 17:22 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 17:22 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 17:22 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 17:22 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:22 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 108-88-3 | |
| Trichloroethene | **1.7** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 17:22 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 17:22 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 17:22 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **8.6** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 17:22 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:22 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 17:22 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:22 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 89 | % | 70-130 | | 1 | | 12/15/16 17:22 | 460-00-4 | |
| Dibromofluoromethane (S) | 103 | % | 70-130 | | 1 | | 12/15/16 17:22 | 1868-53-7 | |
| Toluene-d8 (S) | 99 | % | 70-130 | | 1 | | 12/15/16 17:22 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-401XD** **Lab ID: 40143363006** Collected: 12/10/16 21:02 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **20.9** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 17:45 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 17:45 | 79-00-5 | |
| 1,1-Dichloroethane | **12.9** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 17:45 | 75-34-3 | |
| 1,1-Dichloroethene | **2.8** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 17:45 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 17:45 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:45 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 17:45 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 17:45 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 17:45 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 17:45 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 17:45 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 17:45 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 17:45 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 17:45 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:45 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 108-88-3 | |
| Trichloroethene | **3.4** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 17:45 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 17:45 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 17:45 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **5.6** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 17:45 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 17:45 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 17:45 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 17:45 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 93 | % | 70-130 | | 1 | | 12/15/16 17:45 | 460-00-4 | |
| Dibromofluoromethane (S) | 104 | % | 70-130 | | 1 | | 12/15/16 17:45 | 1868-53-7 | |
| Toluene-d8 (S) | 101 | % | 70-130 | | 1 | | 12/15/16 17:45 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-002D** **Lab ID: 40143363007** Collected: 12/11/16 08:37 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **8.3** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 18:07 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 18:07 | 79-00-5 | |
| 1,1-Dichloroethane | **7.3** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 18:07 | 75-34-3 | |
| 1,1-Dichloroethene | **1.2** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 18:07 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 18:07 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:07 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 18:07 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 18:07 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 18:07 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 18:07 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 18:07 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 18:07 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 18:07 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 18:07 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:07 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 108-88-3 | |
| Trichloroethene | **2.5** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 18:07 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 18:07 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 18:07 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **2.5** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 18:07 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:07 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 18:07 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:07 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 90 | % | 70-130 | | 1 | | 12/15/16 18:07 | 460-00-4 | |
| Dibromofluoromethane (S) | 107 | % | 70-130 | | 1 | | 12/15/16 18:07 | 1868-53-7 | |
| Toluene-d8 (S) | 101 | % | 70-130 | | 1 | | 12/15/16 18:07 | 2037-26-5 | |



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# ANALYTICAL RESULTS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

**Sample: RM-210D** **Lab ID: 40143363008** Collected: 12/11/16 11:40 Received: 12/13/16 07:30 Matrix: Water

| Parameters | Results | Units | LOQ | LOD | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV** | Analytical Method: EPA 8260 | | | | | | | | |
| 1,1,1-Trichloroethane | **12.4** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 71-55-6 | |
| 1,1,2,2-Tetrachloroethane | **<0.25** | ug/L | 1.0 | 0.25 | 1 | | 12/15/16 18:30 | 79-34-5 | |
| 1,1,2-Trichloroethane | **<0.20** | ug/L | 1.0 | 0.20 | 1 | | 12/15/16 18:30 | 79-00-5 | |
| 1,1-Dichloroethane | **7.6** | ug/L | 1.0 | 0.24 | 1 | | 12/15/16 18:30 | 75-34-3 | |
| 1,1-Dichloroethene | **1.6** | ug/L | 1.0 | 0.41 | 1 | | 12/15/16 18:30 | 75-35-4 | |
| 1,2-Dichloroethane | **<0.17** | ug/L | 1.0 | 0.17 | 1 | | 12/15/16 18:30 | 107-06-2 | |
| 1,2-Dichloropropane | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:30 | 78-87-5 | |
| 2-Butanone (MEK) | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 18:30 | 78-93-3 | |
| 2-Hexanone | **<1.1** | ug/L | 5.0 | 1.1 | 1 | | 12/15/16 18:30 | 591-78-6 | |
| 4-Methyl-2-pentanone (MIBK) | **<2.1** | ug/L | 5.0 | 2.1 | 1 | | 12/15/16 18:30 | 108-10-1 | |
| Acetone | **<3.0** | ug/L | 20.0 | 3.0 | 1 | | 12/15/16 18:30 | 67-64-1 | |
| Benzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 71-43-2 | |
| Bromodichloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 75-27-4 | |
| Bromoform | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 75-25-2 | |
| Bromomethane | **<2.4** | ug/L | 5.0 | 2.4 | 1 | | 12/15/16 18:30 | 74-83-9 | |
| Carbon disulfide | **<0.61** | ug/L | 5.0 | 0.61 | 1 | | 12/15/16 18:30 | 75-15-0 | |
| Carbon tetrachloride | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 56-23-5 | |
| Chlorobenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 108-90-7 | |
| Chloroethane | **<0.37** | ug/L | 1.0 | 0.37 | 1 | | 12/15/16 18:30 | 75-00-3 | |
| Chloroform | **<2.5** | ug/L | 5.0 | 2.5 | 1 | | 12/15/16 18:30 | 67-66-3 | |
| Chloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 74-87-3 | |
| Dibromochloromethane | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 124-48-1 | |
| Ethylbenzene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 100-41-4 | |
| Methylene Chloride | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:30 | 75-09-2 | |
| Styrene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 100-42-5 | |
| Tetrachloroethene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 127-18-4 | |
| Toluene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 108-88-3 | |
| Trichloroethene | **2.3** | ug/L | 1.0 | 0.33 | 1 | | 12/15/16 18:30 | 79-01-6 | |
| Vinyl chloride | **<0.18** | ug/L | 1.0 | 0.18 | 1 | | 12/15/16 18:30 | 75-01-4 | |
| Xylene (Total) | **<1.5** | ug/L | 3.0 | 1.5 | 1 | | 12/15/16 18:30 | 1330-20-7 | |
| cis-1,2-Dichloroethene | **3.4** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 18:30 | 156-59-2 | |
| cis-1,3-Dichloropropene | **<0.50** | ug/L | 1.0 | 0.50 | 1 | | 12/15/16 18:30 | 10061-01-5 | |
| trans-1,2-Dichloroethene | **<0.26** | ug/L | 1.0 | 0.26 | 1 | | 12/15/16 18:30 | 156-60-5 | |
| trans-1,3-Dichloropropene | **<0.23** | ug/L | 1.0 | 0.23 | 1 | | 12/15/16 18:30 | 10061-02-6 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 93 | % | 70-130 | | 1 | | 12/15/16 18:30 | 460-00-4 | |
| Dibromofluoromethane (S) | 107 | % | 70-130 | | 1 | | 12/15/16 18:30 | 1868-53-7 | |
| Toluene-d8 (S) | 103 | % | 70-130 | | 1 | | 12/15/16 18:30 | 2037-26-5 | |



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**Pace Analytical Services, LLC**
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

# QUALIFIERS

Project: 249106.000 PHASE 5 LEMBERGER L
Pace Project No.: 40143363

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

PASI-G Pace Analytical Services - Green Bay



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# Attachment 5

# Tabular Summary of Groundwater Standard Exceedances

Summary of Groundwater Standard Exceedences at Plume Monitoring Wells
Lemberger Landfill Sites
4th Quarter 2016

| WELL ID | PARAMETER | RESULT | DATA QUALIFIERS | UNITS | STANDARD[1] ES[2] | STANDARD[1] PAL[3] | WELL LOCATION |
|---|---|---|---|---|---|---|---|
| RM-002D | 1,1-Dichloroethene | 1.2 | | UG/L | | X | 2,900' northwest of LL site |
| RM-002D | Trichloroethene | 2.5 | | UG/L | | X | 2,900' northwest of LL site |
| RM-003D | 1,1-Dichloroethene | 3.5 | | UG/L | | X | 1,000' west of LL site |
| RM-003D | Trichloroethene | 5 | | UG/L | X | | 1,000' west of LL site |
| RM-003D DUP | 1,1-Dichloroethene | 3.5 | | UG/L | | X | 1,000' west of LL site |
| RM-003D DUP | Trichloroethene | 5.2 | | UG/L | X | | 1,000' west of LL site |
| RM-003XXD | 1,1-Dichloroethene | 1.4 | | UG/L | | X | 1,000' west of LL site |
| RM-003XXD | Trichloroethene | 4.1 | | UG/L | | X | 1,000' west of LL site |
| RM-210D | 1,1-Dichloroethene | 1.6 | | UG/L | | X | 3,600' north of LL site |
| RM-210D | Trichloroethene | 2.3 | | UG/L | | X | 3,600' north of LL site |
| RM-401XD | 1,1-Dichloroethene | 2.8 | | UG/L | | X | 400' Northwest of LL Site |
| RM-401XD | Trichloroethene | 3.4 | | UG/L | | X | 400' Northwest of LL Site |
| RM-401XXD | 1,1-Dichloroethene | 3.4 | | UG/L | | X | 400' Northwest of LL Site |
| RM-401XXD | cis-1,2-Dichloroethene | 8.6 | | UG/L | | X | 400' Northwest of LL Site |
| RM-401XXD | Trichloroethene | 1.7 | | UG/L | | X | 400' Northwest of LL Site |
| RM-403XD | 1,1,1-Trichloroethane | 131 | | UG/L | | X | 400' West of LTR site |
| RM-403XD | 1,1-Dichloroethene | 10.4 | | UG/L | X | | 400' West of LTR site |
| RM-403XD | cis-1,2-Dichloroethene | 20.8 | | UG/L | | X | 400' West of LTR site |
| RM-403XD | Tetrachloroethene | 1.2 | | UG/L | | X | 400' West of LTR site |
| RM-403XD | Trichloroethene | 15.5 | | UG/L | X | | 400' West of LTR site |

Notes:

(1) Table includes exceedences where the reported concentration is between the Limit of Detection and Limit of Quantitation ("J' data qualifier).

(2) ES =Wisconsin Administrative Code NR140 Enforcement Standard

(3) PAL =Wisconsin Administrative Code NR140 Preventive Action Limit

(4) LTR = Lemberger Transport and Recycling

(5) LL = Lemberger Landfill

Laboratory qualifiers are included in the sample-specific laboratory reports. See laboratory reports for the SDG-specific definitions.

State of Wisconsin
Department of Natural Resources

# Environmental Monitoring Data Certification

Form 4400-231(R 1/04)

**Notice:** Personally identifiable information collected will be used for program administration and enforcement purposes. The Department may also provide this information to requesters as required under Wisconsin's Open Records law, ss. 19.31 to 19.39, Wis. Stats.
When submitting monitoring data, the owner or operator of the facility, practice or activity is required to notify the Department in writing that a groundwater standard or an explosive gas level has been attained or exceeded, as specified in ss. NR 140.24(1)(a); NR 140.26(1)(a); NR 507.30NR 635.14(9)(a); NR 635.18(20) and NR 507.30, Wis. Adm. Code. Failure to report may result in fines, forfeitures or other penalties resulting from enforcement under ss. 289.97, 291.97 or 299.95, Wis. Stats.

**Instructions:**

- **Prepare one form for each license or monitoring ID.**
- **Please type or print legibly.**
- Attach a notification of any values that attain or exceed groundwater standards (that is, preventive action limits, enforcement standards or alternative concentration limits). The notification must include a preliminary analysis of the cause and significance of each value.
- Attach a notification of any gas values that attain or exceed explosive gas levels.
- Send the original signed form, any notification, and Electronic Data Deliverable [EDD] to: GEMS Data Submittal Contact - WA/5
  Bureau of Waste Management
  Wisconsin Department of Natural Resources
  101 South Webster Street
  Madison WI 53707-7921

## Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

TRC Environmental Corp.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Meredith Westover Phone: (608) 826-3667

E-mail: mwestover@trcsolutions.com

| Facility name: | License # / Monitoring ID | Facility ID [ FID ] | Actual sampling dates (e.g., July 2-6, 2003) |
|---|---|---|---|
| Lemberger Landfill | 00753 436016790 | | 11/23, 12/6, 12/9-12/11, 2016 |

The enclosed results are for sampling required in the month(s) of: (e.g., June 2003)

October, November, and December 2016

Type of Data Submitted (Check all that apply)

- [x] Groundwater monitoring data from monitoring wells
- [ ] Groundwater monitoring data from private water supply wells
- [ ] Leachate monitoring data
- [x] Gas monitoring data
- [ ] Air monitoring data
- [x] Other (specify) treatment system effluent

Notification attached?

- [ ] No. No groundwater standards or explosive gas limits were exceeded.
- [x] Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- [ ] Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

## Certification

***To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.***

| Meredith Westover | Database Manager | (608) 826-3667 |
|---|---|---|
| Facility Representative Name (Print) | Title | (Area Code) Telephone No. |

Signature 2/3/2017 Date

**FOR DNR USE ONLY. Check action taken, and record date and your initials. Describe on back side if necessary.**

- [ ] **Found uploading problems on** _____ **Initials**
- [ ] **Notified contact of problems on** _____ **Uploaded data successfully on** _____

**EDD format(s):** [ ] **Diskette** [ ] **CD (initial submittal and follow-up)** [ ] **E-mail (follow-up only)** [ ] **Other**