



2015 ANNUAL GROUNDWATER MONITORING REPORT

FOR

**CAMP RIPLEY CLOSED
MIXED MUNICIPAL LANDFILL
Little Falls, Minnesota**

Prepared for:

**Mr. Mark Erickson
Minnesota Department of Military Affairs
Minnesota Army National Guard Facilities Management Office
Little Falls, MN 56345**



January 12, 2016

WSN No. 0283B0009.015

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January 12, 2016

Mr. Neal Wilson, P.G.
MPCA
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

RE: Camp Ripley Closed Mixed Municipal Landfill
2015 Annual Groundwater Monitoring Report
WSN No. 0283B0009.015

Dear Mr. Wilson:

This report has been prepared in accordance with Minnesota Rule 7035.2585, item H and Minnesota Rule part 7035.2815, subpart 14, item Q. Item Q requires to report to identify recent and long term trends in water elevations and concentrations of monitored constituents. The report should also evaluate the effect the Camp Ripley Closed Mixed Municipal Landfill (landfill) is having on groundwater and surface water quality, and any recommendations for changes to the system.

The closed landfill occupies approximately 11 acres and is located within the Camp Ripley Training Facility. More specifically, the landfill is located in the Northeast $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of Section 5, Township 130 North, Range 29 West, Green Prairie Township, Morrison County, Minnesota. The location of the closed landfill is shown on the attached Figure 1.

The Minnesota Pollution Control Agency (MPCA) issued a Letter of Closure to the Camp Ripley Closed Mixed Municipal Landfill on January 29, 1988. Since closure, the landfill's groundwater monitoring network has been sampled and monitored as required. In 2009, the MPCA requested the installation of two new monitoring wells, one along the east border of the landfill and the other on the southeast border. Consequently, monitoring wells MMLF-7 and MMLF-8 were install during the fall of 2009. This report summarizes the sampling events and results for 2015.

The site is located within the central glacial drift region of Minnesota. The topography of the surrounding area consists of rolling hills and lowlands generally ranging in elevation from 1,140 ft above mean sea level (MSL) to 1,275 ft MSL. Original ground elevation across the landfill varies from approximately 1,160 ft MSL to 1,155 ft MSL from west to east.

In December 2006, J.J. Quinn of the Environmental Science Division of the Argonne National Laboratory published a paper titled Delineation of a Wellhead Protection Zone and Determination of Flow Paths from Potential Groundwater Contaminant Source Areas at Camp Ripley, Little Falls, Minnesota. The following glacial geological summary for the region is an excerpt from this paper:

“The geology and topography of the Camp Ripley property and its vicinity are the result of a complex glacial depositional history involving three ice lobes that deposited drifts of various characters and colors. These lobes were thought to have been concurrently active in central Minnesota; however, a detailed geologic characterization of the site by UMD (2002) suggests new, previously unrecognized possibilities for the juxtapositioning of the ice lobes and for the



nature of the St. Croix moraine at Camp Ripley. The lobes appear to have been present in the Camp Ripley vicinity concurrently, depositing well-sorted sands into an ice-bounded lacustrine basin. Occasional ice advances deposited discontinuous till units in the basin at various elevations.”

On site geological information has been collected during the installation of the various landfill monitoring wells. Well installation field logs indicate the soil profile consists primarily of fine sand. Previous reports document bedrock varies from 20 feet below ground surface (BGS) to over 100 feet BGS in the area of the closed landfill. Monitoring wells on the west side of the landfill were installed up to 53 feet BGS and did not encounter bedrock; however, monitoring well installations on the east side of the landfill encountered bedrock as shallow as 28 feet BGS.

The site is located within the Mississippi River watershed. Area waterways include the Mississippi River located approximately 2,000 feet east of the landfill, the Crow Wing River located approximately 13 miles north of the landfill, and the Little Elk River located approximately four miles southwest of the landfill. Green Prairie Fish Lake lies approximately three miles southwest of the landfill.

The groundwater table beneath the landfill is approximately 30 feet BGS. A regional groundwater model reported by Quinn (2006) describes the regional groundwater flow direction as southeast. Historically, groundwater elevation measurements from the landfill monitoring wells and the related flow maps document the local groundwater flow direction is also to the southeast.

Included in this report are the analytical results of the 2015 fall quarter sampling events for the closed landfill’s groundwater-monitoring network. The groundwater monitoring network consists of monitoring wells MW-3(MMLF-3), MW-7(MMLF-7), and MW-8(MMLF-8). Their respective locations are displayed on the groundwater contour map included as Figure 2. The fall sampling event was conducted on November 5, 2015, by Widseth Smith Nolting’s (WSN) environmental technician, Mike Bogart.

In 2015, the analytical schedule required samples from the three wells to be analyzed only for the Minnesota Department of Health (MDH) method 468 volatile organic compounds (VOCs). A complete list of the VOCs is included in Table 1. The analytical results for the 2015 fall sampling event are summarized in Table 5 through Table 7. The tables include analytical data back to the October 2009 sampling event. Copies of the 2015 analytical reports are included in Appendix A. The samples were tested by Legend Technical Services in St. Paul.

Similar to the results for 2014, Tables 5 and 7 indicates VOCs were not identified in the 2015 sample from MW-3 or MW-8 at or above the laboratory’s reporting limits (RLs). Table 6 documents four VOCs were found in the groundwater sample from MW-7 above the RLs. Dichlorofluoromethane and cis-1,2-dichloroethene were quantified in the sample at concentrations of 1.4 parts per billion (ppb) and 4.5 ppb, respectively. Ethyl ether was also detected in MW-7 above the RL. The compound was quantified at a concentration of 12 ppb. One VOC was identified in the sample from MW-7 above its respective intervention limit (IL). Vinyl chloride, which has an IL of 0.05 ppb, was identified in the sample at a concentration of 0.12 ppb.

Although the 2015 samples were not required to be tested for the inorganic analytes and the general chemistry parameters, for reference, Table 2 through Table 4 are included in this report. The tables have been updated with the 2015 well stabilization field readings. The well stabilization parameters were measured and recorded prior to sample collection. A HydroLab Data Sonde 4A water quality multi-probe and a flow through cell were used to measure the stabilization parameters. The well stabilization forms



are attached as Appendix B.

Depths to water measurements from the three monitoring wells were recorded prior to sample collection. The fall groundwater elevations are listed in Table 8 and the associated groundwater flow map is attached as Figure 2. The elevations in Table 8, when compared to the fall of 2014, indicate a water table elevation decrease of approximately 1.5 feet in MW-7, a decrease of about 2.1 feet in MW-8, and a decrease of almost 3 feet in MW-3. As shown on the flow map, the groundwater flow direction continues to be consistent with the historical flow direction, which is to the southeast.

Based on two letters from the MPCA, one sent in mid-2014 and the second in September 2015, “the commissioner must require the lowest reporting limits if necessary and feasible” for the analysis of groundwater samples from solid waste facilities. Consequently, the landfill is required to use a laboratory with reporting limits at or below the permit’s ILs. Because Legend Technical Services is the only Minnesota certified laboratory capable of meeting this requirement, as stated earlier, the 2015 groundwater samples were submitted to Legend for VOC analysis.

Only one compound of concern was found in the 2015 groundwater samples. Vinyl chloride was detected in the sample from MW-7 at a concentration of 0.12 ppb, above the established IL of 0.05 ppb. The last time vinyl chloride was detected in a sample from MW-7 above the RLs was on December 10, 2009. At that time, vinyl chloride was quantified at a concentration of 0.59 ppb. Past results do not reflect a trend or pattern of detections for vinyl chloride; however, using a laboratory with a much lower RL for vinyl chloride a trend might become evident in the future. It should be noted the health risk limit for vinyl chloride is 0.2 ppb.

Based on the analytical results for 2015 and the historical results, we do not believe it is necessary to make any changes to the landfill’s current monitoring system or the established analytical schedule. Please let me know if there is any additional information that you might need. My direct telephone number is 218.316.3623 or you can send an email to Greg.Smith@wsn.us.com.

Sincerely,

WIDSETH SMITH NOLTING

Gregory W. Smith, P.G.

Cc: Mr. Mark Erickson, Facilities Management Office, Minnesota Army National Guard

FIGURES

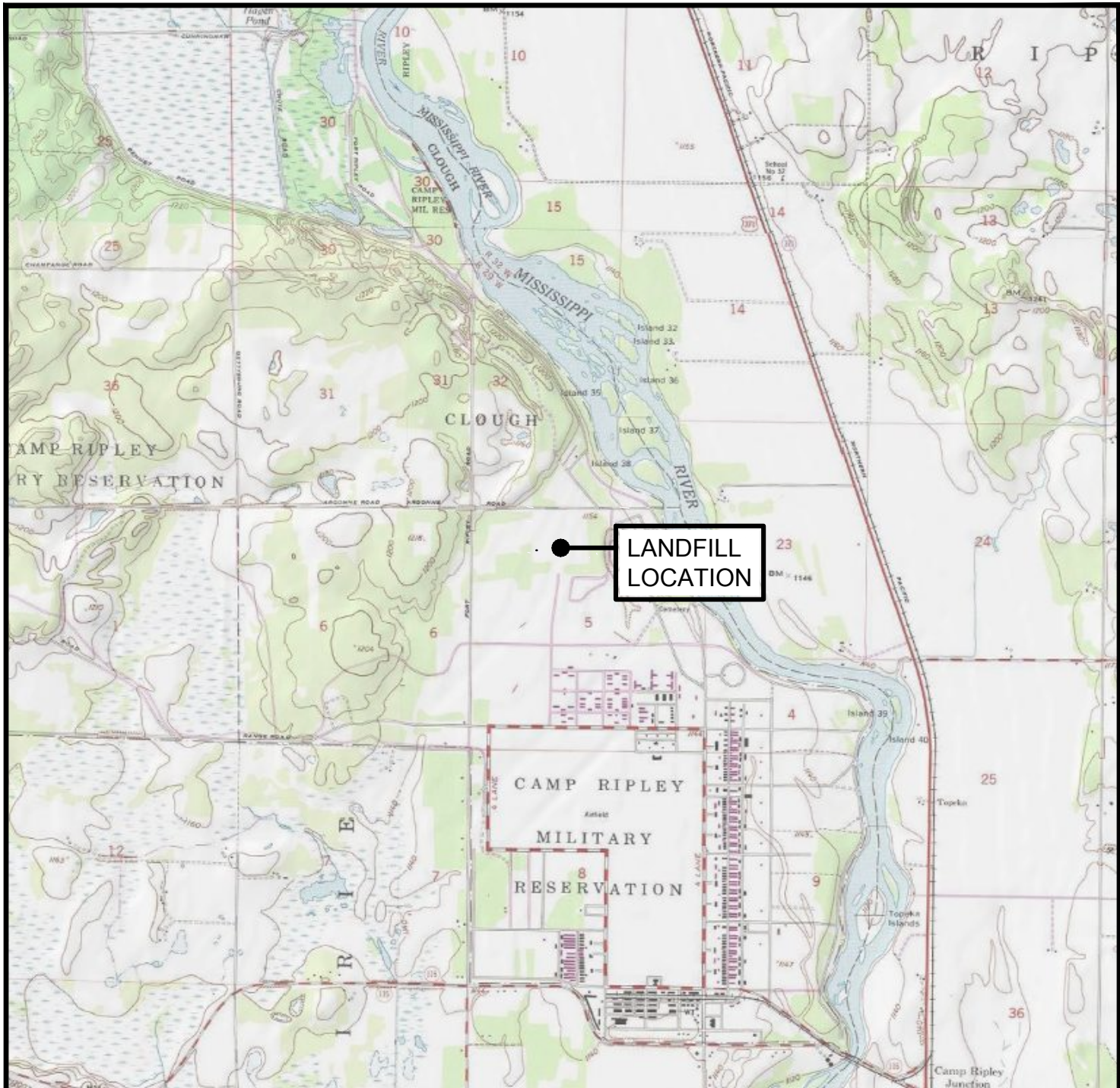
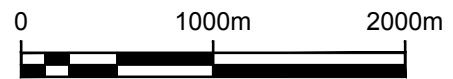
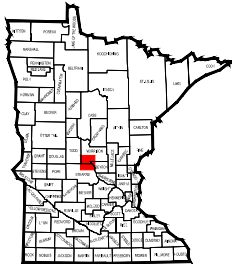


IMAGE: UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY

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AREA LOCATION



SCALE (IN METERS)

U.S.G.S. QUADRANGLE MAPS:
 BELLE PRAIRIE, BELL PRAIRIE NW, FORT RIPLEY, RANDALL EAST
 PUBLISHED: 1956, 1956, 1956, 1956
 PHOTOREVISED: 1979, 1979, NA, 1979



Engineering
 Architecture
 Surveying
 Environmental

CLOSED MMSW LANDFILL - 2015 G.W. MONITORING
 MN DEPARTMENT OF MILITARY AFFAIRS
 LITTLE FALLS, MN

DATE:

JANUARY 2016

JOB No.





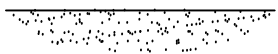
FIGURE

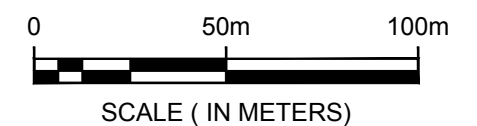
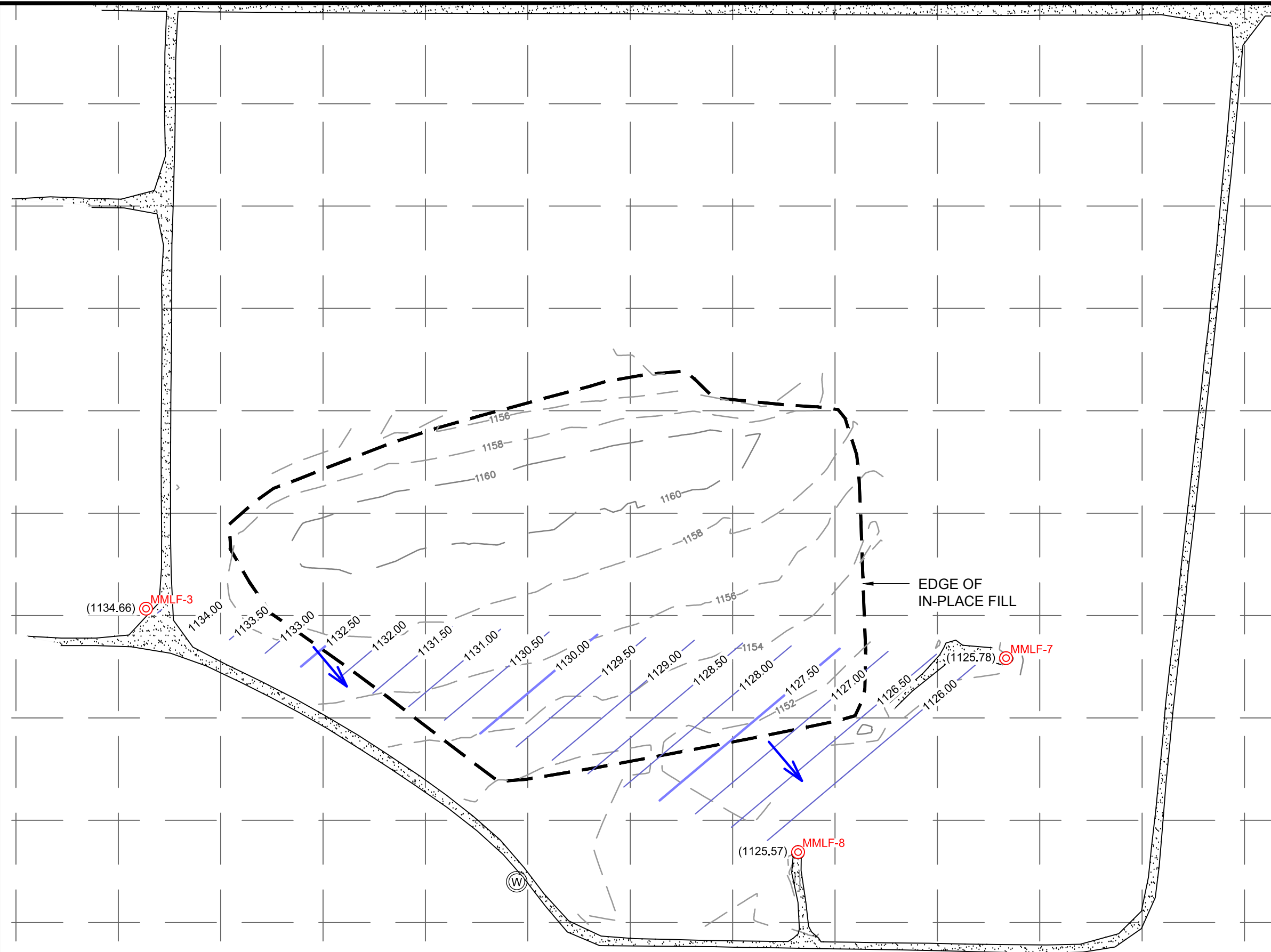
SITE LOCATION MAP

0283B0009.015

01

LEGEND


-  DENOTES MONITORING WELL
-  DENOTES GROUNDWATER SURFACE MAJOR CONTOUR LINE
-  DENOTES GROUNDWATER ELEVATION AT LOCATION
-  DENOTES GROUNDWATER FLOW DIRECTION
-  DENOTES GRAVEL ROAD SURFACE



REFERENCE NOTE:

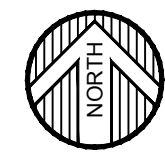
HORIZONTAL COORDINATES ARE SHOWN IN GRID METERS BASED ON UTM COORDINATES, ZONE 15 NORTH, NAD83 DATUM. VERTICAL CONTOURS AND ELEVATIONS ARE SHOWN IN FEET BASED ON NAVD.

BASE CONTROL POINT COORDINATES AND ELEVATIONS PROVIDED BY MN DEPT. OF MILITARY AFFAIRS.



**WIDSETH
SMITH
NOLTING**

Engineering
Architecture
Surveying
Environmental



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MN DEPARTMENT OF MILITARY AFFAIRS
LITTLE FALLS, MN
GROUNDWATER ELEVATIONS ON 11-05-15

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DATE: JANUARY 2016	
JOB No. 0283B0009.015	FIGURE 02

TABLES

Table 1

Parameters for Analysis

Inorganics
Alkalinity , total as calcium carbonate
Ammonia Nitrogen
Arsenic , dissolved
Barium , dissolved
Boron , dissolved
Cadmium , dissolved
Chloride
Chromium , total dissolved
Copper , dissolved
Iron , dissolved
Lead , dissolved
Manganese , dissolved
Mercury , dissolved
Nitrate+Nitrite as Nitrogen
Sodium , dissolved
Sulfate
Suspended Solids , total
Appearance (field and lab)
Dissolved Oxygen (field)
pH (field and lab)
Specific Conductance (field and lab)
Temperature (field and lab)
Turbidity (field)
Static Water Elevation

468 List

1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1,2-Trichlorotrifluoroethane
1,1-Dichloroethane
1,1-Dichloroethylene (Vinylidene chloride)
1,2-Dichloropropane
trans-1,2-Dichloroethylene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Bromomethane; (Ethylene dibromide); EDB
1,2-Dichlorobenzene (ortho)
1,2-Dichloroethane
1,2-Dichloroethylene (cis)
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene (meta-)
1,3-Dichloropropane
1,3-Dichloropropane (cis + trans)
1,4-Dichlorobenzene (para)
2,2-Dichloropropane
2-Chlorotoluene (ortho-)
4-Chlorotoluene (para-)
Acetone
Allyl chloride; (3-Chloropropene)
Benzene
Bromobenzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dichlorobromomethane)
Bromoform
Bromomethane (Methyl chloride)
Carbon tetrachloride
Chlorobenzene (monochlorobenzene)
Chlorodibromomethane; (Dibromochloromethane)
Chloroethane
Chloroform
Chloromethane; (Methyl chloride)
Cumene; (Isopropylbenzene)
Dibromochloropropane; (DBCP)
Dibromomethane; Methylene bromide)

Dichlorodifluoromethane
Dichlorofluoromethane
Dichloromethane (methylene chloride)
Ethyl benzene
Ethyl ether
Hexachlorobutadiene
Methyl ethyl ketone (MEK)
Methyl isobutyl ketone; (4-Methyl-2-pentanone)
Methyl tertiary-butyl ether (MTBE)
Naphthalene
n-Butyl benzene
n-Propyl benzene
p-Isopropyltoluene
sec-Butyl benzene
Styrene
tert-Butyl benzene
Tetrachloroethylene; (Perchloroethylene)
Tetrahydrofuran
Toluene
Trichloroethylene; (TCE)
Trichlorofluoromethane
Vinyl Chloride
Xylenes (mixture of o, m, p)

Table 2

Summary of Inorganic Groundwater Quality - MMLF-3 Camp Ripley Closed Mixed Municipal Landfill State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3	MMLF-3	MMLF-3
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Alkalinity	mg/L	NL	NA	NA	NA	120	128	NA	330	NA
Ammonia Nitrogen	mg/L	NL	NA	NA	NA	<0.01	<0.1	NA	<0.10	NA
Arsenic (dissolved)	ug/L	2.5	NA	NA	NA	<1.6	<2.5	NA	<2.0	NA
Barium (dissolved)	mg/L	0.5	NA	NA	NA	0.027	0.0343	NA	0.0303	NA
Boron (dissolved)	ug/L	250	NA	0.23	0.39	0.17	0.26	NA	<100	NA
Cadmium (dissolved)	ug/L	1.0	NA	NA	NA	18	<1	NA	<0.80	NA
Calcium (dissolved)	mg/L	NL	NA	NA	NA	39	46.1	NA	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	1.6	NA	NA	NA
Chloride	mg/L	NL	NA	NA	NA	2	19.8	NA	2.1	NA
Chromium	ug/L	25.0	NA	NA	NA	<5	<5	NA	<5.0	NA
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA	NA
Chromium, Hexavalent	ug/L	NL	NA	NA	NA	<4	<10	NA	NA	NA
Conductance (Field)	umhos/cm	NL	NA	NA	NA	239	266.5	260	224	263
Conductance (Lab)	umhos/cm	NL	NA	NA	NA	260	360	NA	276	NA
Copper (dissolved)	ug/L	250	NA	NA	NA	<10	<5	NA	<5.0	NA
Dissolved Oxygen (Field)	mg/L	NL	NA	NA	NA	NA	3.39	0.68	3.37	2.05
Eh (Lab)	mV	NL	NA	NA	NA	150	159	NA	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	532	61	243	109
Iron (dissolved)	mg/L	NL	NA	NA	NA	0.048	<0.05	NA	<50.0	NA
Lead (dissolved)	ug/L	1.25	NA	NA	NA	<0.4	<2.5	NA	<2.0	NA
Magnesium (dissolved)	mg/L	NL	NA	NA	NA	11	12.6	NA	NA	NA
Manganese (dissolved)	mg/L	0.025	NA	NA	NA	0.098	0.0825	NA	0.0808	NA
Mercury (dissolved)	ug/L	0.5	NA	NA	NA	<0.1	<0.20	NA	<0.20	NA
Nitrate/Nitrite as N	mg/L	2.5	NA	NA	NA	NA	NA	NA	0.12	NA
Nitrate as N	mg/L	NL	NA	NA	NA	<0.05	0.15	NA	NA	NA
Nitrite as N	mg/L	NL	NA	NA	NA	<0.05	<0.1	NA	NA	NA
pH (Field)	Standard Units	NL	NA	NA	NA	7.91	8.17	9.2	7.82	7.98
pH (Lab)	Standard Units	NL	NA	NA	NA	8	7.7	NA	8.0	NA
Potassium (dissolved)	mg/L	NL	NA	NA	NA	1	1	NA	NA	NA
Sodium (dissolved)	mg/L	NL	NA	NA	NA	3.4	NA	NA	3.2	NA
Sulfate	mg/L	NL	NA	NA	NA	13	15.9	NA	15.3	NA
Temp (Field)	oC	NL	NA	NA	NA	9.3	8.95	9.62	8.6	9.56
Total Dissolved Solids (TDS)	mg/L	NL	NA	NA	NA	160	195	NA	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	NA	NA	NA	30	404	NA	9.2	NA
Turbidity	NTU	NL	NA	NA	NA	24	38	83	29.4	70.3
Zinc (dissolved)	ug/L	500	NA	NA	NA	<5	<10	NA	NA	NA

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

mg/L = milligrams per liter = parts per million

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 3

**Summary of Inorganic Groundwater Quality - MMLF-7
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7	MMLF-7	MMLF-7
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Alkalinity	mg/L	NL	360	280	330	340	416	NA	121	NA
Ammonia Nitrogen	mg/L	NL	0.83	0.52	0.33	0.42	1.1	NA	0.19	NA
Arsenic (dissolved)	ug/L	2.5	<1	<1	<1	<1.6	<2.5	NA	<2.0	NA
Barium (dissolved)	mg/L	0.5	72	<40	64	NA	NA	NA	0.335	NA
Boron (dissolved)	ug/L	250	0.23	0.39	0.17	0.26	0.44	NA	<100	NA
Cadmium (dissolved)	ug/L	1.0	<0.2	<0.2	<0.2	<2	<1	NA	<0.80	NA
Calcium (dissolved)	mg/L	NL	120	86	100	98	128	NA	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	1.3	NA	NA	NA
Chloride	mg/L	NL	19	19	20	24	21	NA	3.4	NA
Chromium	ug/L	25.0	<5	4	<5	<5	<5	NA	<5.0	NA
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA	NA
Chromium, Hexavalent	ug/L	NL	<3	<3	<3	<4	<10	NA	NA	NA
Conductance (Field)	umhos/cm	NL	624	490	574	599	802	850	630	813
Conductance (Lab)	umhos/cm	NL	750	580	690	690	900	NA	656	NA
Copper (dissolved)	ug/L	250	<10	<10	<10	<10	<5	NA	<5.0	NA
Dissolved Oxygen (Field)	mg/L	NL	140	130	130	140	0.88	3.72	4.35	0.98
Eh (Lab)	mV	NL	NA	NA	NA	NA	165	NA	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	584	144	257	223
Iron (dissolved)	mg/L	NL	0.02	<0.01	0.04	0.038	0.051	NA	<0.050	NA
Lead (dissolved)	ug/L	1.25	<0.4	<0.4	<0.4	<0.4	<2.5	NA	<2.0	NA
Magnesium (dissolved)	mg/L	NL	28	23	24	25	28.7	NA	NA	NA
Manganese (dissolved)	mg/L	0.025	3.4	2.6	2.2	2.3	2.24	NA	0.593	NA
Mercury (dissolved)	ug/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.20	NA	<0.20	NA
Nitrate/Nitrite as N	mg/L	2.5	NA	0.64	NA	NA	NA	NA	1.5	NA
Nitrate as N	mg/L	NL	0.76	NA	0.43	0.38	<0.1	NA	NA	NA
Nitrite as N	mg/L	NL	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA
pH (Field)	Standard Units	NL	6.83	6.83	6.9	7.07	7.19	8.16	7.14	6.36
pH (Lab)	Standard Units	NL	7.2	7.1	7.2	7.1	7	NA	7.4	NA
Potassium (dissolved)	mg/L	NL	2.1	1.6	1.8	2.2	2.9	NA	NA	NA
Sodium (dissolved)	mg/L	NL	16	11	15	13	NA	NA	4.5	NA
Sulfate	mg/L	NL	12	7.8	9.6	9.7	6.3	NA	5.2	NA
Temp (Field)	oC	NL	8.3	8.7	7.1	10.6	9.27	8.28	9.5	9.8
Total Dissolved Solids (TDS)	mg/L	NL	440	340	400	400	501	NA	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	6	8	2	16	4	NA	3.2	NA
Turbidity	NTU	NL	8.2	4	2	2	0.8	40.1	12.5	14.7
Zinc (dissolved)	ug/L	500	8	<5	<5	8	<10	NA	NA	NA

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

mg/L = milligrams per liter = parts per million

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 4

**Summary of Inorganic Groundwater Quality - MMLF-8
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8	MMLF-8	MMLF-8
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Alkalinity	mg/L	NL	160	150	170	170	163	NA	337	NA
Ammonia Nitrogen	mg/L	NL	<0.01	<0.01	<0.01	<0.01	<0.1	NA	<0.10	NA
Arsenic (dissolved)	ug/L	2.5	<1	<1	<1	<1.6	<2.5	NA	<2.0	NA
Barium (dissolved)	mg/L	0.5	0.072	<0.04	0.064	NA	NA	NA	0.0339	NA
Boron (dissolved)	ug/L	250	0.044	0.035	0.029	0.023	0.03	NA	<100	NA
Cadmium (dissolved)	ug/L	1.0	<0.2	<0.2	<0.2	<2	<1	NA	<0.80	NA
Calcium (dissolved)	mg/L	NL	54	53	49	52	55.3	NA	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	0.58	NA	NA	NA
Chloride	mg/L	NL	13	21	17	17	20.6	NA	14.4	NA
Chromium	ug/L	25.0	<5	5.2	<5	<5	<5	NA	<5.0	NA
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA	NA
Chromium, Hexavalent	ug/L	NL	<3	<3	<3	<4	<10	NA	NA	NA
Conductance (Field)	umhos/cm	NL	308	326	316	339	384	310	407	499
Conductance (Lab)	umhos/cm	NL	350	370	380	370	410	NA	420	NA
Copper (dissolved)	ug/L	250	<10	<10	<10	<10	<5	NA	<5.0	NA
Dissolved Oxygen (Field)	mg/L	NL	NA	NA	NA	NA	8.75	NA	9.31	7.76
Eh (Lab)	mV	NL	150	140	190	140	154	NA	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	514	155	307	224
Iron (dissolved)	mg/L	NL	<0.01	<0.01	<0.01	<0.01	<0.05	NA	<0.050	NA
Lead (dissolved)	ug/L	1.25	<0.4	<0.4	<0.4	<0.4	<2.5	NA	<2.0	NA
Magnesium (dissolved)	mg/L	NL	13	14	12	13	14.2	NA	NA	NA
Manganese (dissolved)	mg/L	0.025	0.081	0.03	0.006	<0.005	<0.01	NA	<0.010	NA
Mercury (dissolved)	ug/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.20	NA	<0.20	NA
Nitrate/Nitrite as N	mg/L	2.5	NA	1.1	NA	NA	NA	NA	0.55	NA
Nitrate as N	mg/L	NL	0.65	NA	0.73	0.67	0.48	NA	NA	NA
Nitrite as N	mg/L	NL	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA
pH (Field)	Standard Units	NL	7.51	7.05	7.08	7.84	8.44	9.09	7.63	7.5
pH (Lab)	Standard Units	NL	7.9	7.8	7.9	7.8	7.7	NA	8	NA
Potassium (dissolved)	mg/L	NL	0.6	0.8	0.4	0.75	0.64	NA	NA	NA
Sodium (dissolved)	mg/L	NL	2.6	3.1	2.5	2.8	NA	NA	2.8	NA
Sulfate	mg/L	NL	7.4	7.6	7.4	7.4	6.9	NA	5.3	NA
Temp (Field)	oC	NL	8.3	8.7	7.1	10.6	7.97	8.34	8	8.2
Total Dissolved Solids (TDS)	mg/L	NL	200	200	220	390	235	NA	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	4	4	8	6	5.5	NA	6.4	NA
Turbidity	NTU	NL	6.8	2.7	10	3.8	1.4	46.7	14.9	14
Zinc (dissolved)	ug/L	500	<5	<5	<5	<5	10.1	NA	NA	NA

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

mg/L = milligrams per liter = parts per million

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 5

**Summary of Organic Groundwater Quality Data - MMLF-3
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3	MMLF-3	MMLF-3
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Acetone	ug/L	175	NA	NA	NA	<4	<25.0	<20.0	<20.0	<20.0
Allylchloride	ug/L	7.5	NA	NA	NA	<0.16	<4.0	<4.0	<4.0	<5.0
Benzene	ug/L	2.5	NA	NA	NA	<0.2	<1.0	<1.0	<1.0	<0.50
Bromobenzene	ug/L	NL	NA	NA	NA	<0.12	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	NA	NA	NA	<0.12	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	10	NA	NA	NA	<0.13	<4.0	<4.0	<4.0	<5.0
Bromomethane	ug/L	3	NA	NA	NA	<0.16	<4.0	<4.0	<4.0	<2.5
Methyl Ethyl Ketone (MEK)/2-Butanone	ug/L	1000	NA	NA	NA	<1.0	<4.0	<5.0	<5.0	<20.0
n-Butylbenzene	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0	<2.5
sec-Butylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	NA	NA	NA	<0.16	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	0.75	NA	NA	NA	<0.28	<1.0	<1.0	<1.0	<0.50
Chlorobenzene	ug/L	25	NA	NA	NA	<0.20	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	NA	NA	NA	<0.24	<1.0	<4.0	<1.0	<2.5
Chloroform	ug/L	15	NA	NA	NA	<0.20	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	NA	NA	NA	<0.20	<4.0	<4.0	<4.0	<2.5
2-Chlorotoluene	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	NL	NA	NA	NA	<0.23	<4.0	<4.0	<4.0	<5.0
Dibromochloromethane	ug/L	13	NA	NA	NA	<0.13	<1.0	<1.0	<1.0	<0.50
1,2-Dibromoethane (EDB)	ug/L	0.001	NA	NA	NA	<0.11	<1.0	<1.0	<1.0	<0.50
Dibromomethane	ug/L	--	NA	NA	NA	<0.10	<4.0	<4.0	<4.0	<2.5
1,2-Dichlorobenzene	ug/L	150	NA	NA	NA	<0.096	<1.0	<1.0	<1.0	<0.50
1,3-Dichlorobenzene	ug/L	150	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	NA	NA	NA	<0.084	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	NA	NA	NA	<0.23	<1.0	<1.0	<1.0	<5.0
1,1-Dichloroethane	ug/L	17.5	NA	NA	NA	<0.20	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<0.25
1,1-Dichloroethene	ug/L	1.5	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	17.5	NA	NA	NA	<0.10	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	1.5	NA	NA	NA	<0.23	<1.0	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	1.25	NA	NA	NA	<0.19	<4.0	<4.0	<4.0	<1.0
1,3-Dichloropropane	ug/L	NL	NA	NA	NA	<0.14	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	NA	NA	NA	<0.36	<4.0	<4.0	<4.0	<5.0
1,1-Dichloropropene	ug/L	NL	NA	NA	NA	<0.21	<1.0	<1.0	<1.0	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 5 (con't)

**Summary of Organic Groundwater Quality Data - MMLF-3
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3*	MMLF-3	MMLF-3	MMLF-3
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
cis-1,3-Dichloropopene	ug/L	0.5	NA	NA	NA	<0.21	<4.0	<4.0	<4.0	<0.50
trans-1,3-Dichloropropene	ug/L	0.5	NA	NA	NA	<0.16	<4.0	<4.0	<4.0	<0.50
Diethyl Ether (Ethyl Ether)	ug/L	250	NA	NA	NA	<0.14	<4.0	<4.0	<4.0	<5.0
Ethylbenzene	ug/L	175	NA	NA	NA	<0.15	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	NL	NA	NA	NA	<0.20	<5.0	<1.0	<1.0	<2.5
Isopropylbenzene (Cumene)	ug/L	NL	NA	NA	NA	<0.20	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<2.5
Methylene Chloride	ug/L	0.25	NA	NA	NA	<0.20	<4.0	<4.0	<4.0	<2.5
Methyl isobutyl ketone	ug/L	75	NA	NA	NA	<0.18	<4.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	NA	NA	NA	<0.20	<4.0	<4.0	<4.0	<5.0
n-Propylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	25	NA	NA	NA	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	NA	NA	NA	<0.13	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	NA	NA	NA	<0.10	<1.0	<1.0	<1.0	<0.50
Tetrachloroethene	ug/L	7	NA	NA	NA	<0.29	<1.0	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	NA	NA	NA	<1.0	<10.0	<10.0	<10.0	<20.0
Toluene	ug/L	250	NA	NA	NA	<0.20	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	NA	NA	NA	<0.12	<1.0	<1.0	<1.0	<5.0
1,2,4-Trichlorobenzene	ug/L	10	NA	NA	NA	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	NA	NA	NA	<0.11	<1.0	<1.0	<1.0	<0.50
Trichloroethene	ug/L	NL	NA	NA	NA	<0.19	<1.0	<0.40	<0.40	<0.50
Trichlorofluoromethane	ug/L	500	NA	NA	NA	<0.19	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	NA	NA	NA	<0.17	<4.0	<4.0	<4.0	<0.20
1,1,2-Trichlorotrifluoroethane	ug/L	50	NA	NA	NA	<0.27	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.05	NA	NA	NA	<0.20	<0.40	<0.40	<0.40	<0.050
m,p&o-Xylene (Xylene Total)	ug/L	75	NA	NA	NA	<0.32	<3.0	<3.0	<3.0	NA
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA	<2.0
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 6

**Summary of Organic Groundwater Quality Data - MMLF-7
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7	MMLF-7	MMLF-7
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Acetone	ug/L	175	<4	<4	<4	<4	<25.0	<20.0	<20.0	<20.0
Allylchloride	ug/L	7.5	<0.042	<0.042	<0.042	<0.16	<4.0	<4.0	<4.0	<5.0
Benzene	ug/L	2.5	0.36	0.43	0.47	0.33	<1.0	<1.0	<1.0	<0.50
Bromobenzene	ug/L	NL	<0.17	<0.17	<0.17	<0.12	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	<0.082	<0.082	<0.082	<0.18	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	<0.086	<0.086	<0.086	<0.12	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	10	<0.16	<0.16	<0.16	<0.13	<4.0	<4.0	<4.0	<5.0
Bromomethane	ug/L	3	<0.060	<0.060	<0.060	<0.16	<4.0	<4.0	<4.0	<2.5
Methyl Ethyl Ketone (MEK)/2-Butanone	ug/L	1000	<1.0	<1.0	<1.0	<1.0	<4.0	<5.0	<5.0	<20.0
n-Butylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.18	<1.0	<1.0	<1.0	<2.5
sec-Butylbenzene	ug/L	NL	<0.087	<0.087	<0.087	<0.17	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	<0.15	<0.15	<0.15	<0.16	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	0.75	<0.074	<0.074	<0.074	<0.28	<1.0	<1.0	<1.0	<0.50
Chlorobenzene	ug/L	25	0.58	<0.14	0.56	0.63	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	<0.089	<0.089	<0.089	<0.24	<1.0	<4.0	<1.0	<2.5
Chloroform	ug/L	15	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	<0.068	<0.068	<0.068	<0.20	<4.0	<4.0	<4.0	<2.5
2-Chlorotoluene	ug/L	NL	<0.080	<0.080	<0.080	<0.13	<1.0	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	<0.11	<0.11	<0.11	<0.13	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	NL	<0.12	<0.12	<0.12	<0.23	<4.0	<4.0	<4.0	<5.0
Dibromochloromethane	ug/L	13	<0.12	<0.12	<0.12	<0.13	<1.0	<1.0	<1.0	<0.50
1,2-Dibromoethane (EDB)	ug/L	0.001	<0.12	<0.12	<0.12	<0.11	<1.0	<1.0	<1.0	<0.50
Dibromomethane	ug/L	--	<0.15	<0.15	<0.15	<0.10	<4.0	<4.0	<4.0	<2.5
1,2-Dichlorobenzene	ug/L	150	<0.10	<0.10	<0.10	<0.096	<1.0	<1.0	<1.0	<0.50
1,3-Dichlorobenzene	ug/L	150	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	0.61	<0.10	0.53	0.54	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	2	0.56	2.6	2	<1.0	<1.0	<1.0	<5.0
1,1-Dichloroethane	ug/L	17.5	0.12	0.2	0.19	<0.20	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0	<0.25
1,1-Dichloroethene	ug/L	1.5	<0.12	<0.12	<0.12	<0.17	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	17.5	6.1	7	8.1	7.2	6.2	8.7	<1.0	4.5
trans-1,2-Dichloroethene	ug/L	1.5	<0.053	0.068	<0.053	<0.23	<1.0	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	1.3	1.4	2.1	1.1	2.5	2.0	<1.0	1.4
1,2-Dichloropropane	ug/L	1.25	<0.055	<0.055	<0.055	<0.19	<4.0	<4.0	<4.0	<1.0
1,3-Dichloropropane	ug/L	NL	<0.091	<0.091	<0.091	<0.14	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	<0.063	<0.063	<0.063	<0.36	<4.0	<4.0	<4.0	<5.0
1,1-Dichloropropene	ug/L	NL	<0.081	<0.081	<0.081	<0.081	<1.0	<1.0	<1.0	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 6 (con't)

**Summary of Organic Groundwater Quality Data - MMLF-7
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7*	MMLF-7	MMLF-7	MMLF-7
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
cis-1,3-Dichloropopene	ug/L	0.5	<0.089	<0.089	<0.089	<0.21	<4.0	<4.0	<4.0	<0.50
trans-1,3-Dichloropropene	ug/L	0.5	<0.098	<0.098	<0.098	<0.16	<4.0	<4.0	<4.0	<0.50
Diethyl Ether (Ethyl Ether)	ug/L	250	12	15	17	18	14.7	14.8	<4.0	12
Ethylbenzene	ug/L	175	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	NL	<0.12	<0.12	<0.12	<0.20	<5.0	<1.0	<1.0	<2.5
Isopropylbenzene (Cumene)	ug/L	NL	<0.096	<0.096	<0.096	<0.20	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	<0.055	<0.055	<0.055	<0.17	<1.0	<1.0	<1.0	<2.5
Methylene Chloride	ug/L	0.25	<0.20	<0.20	<0.20	<0.20	<4.0	<4.0	<4.0	<2.5
Methyl isobutyl ketone	ug/L	75	<0.13	<0.13	<0.13	<0.18	<4.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	ug/L	NL	0.11	0.12	0.15	<0.13	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	<0.13	<0.13	<0.13	<0.20	<4.0	<4.0	<4.0	<5.0
n-Propylbenzene	ug/L	NL	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	25	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	<0.099	<0.099	<0.099	<0.13	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.094	<0.094	<0.094	<0.10	<1.0	<1.0	<1.0	<0.50
Tetrachloroethene	ug/L	7	<0.12	<0.12	<0.12	<0.29	<1.0	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	<1.0	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<20.0
Toluene	ug/L	250	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	<0.12	<0.12	<0.12	<0.12	<1.0	<1.0	<1.0	<5.0
1,2,4-Trichlorobenzene	ug/L	10	<0.073	<0.073	<0.073	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	<0.076	<0.076	<0.076	<0.17	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	<0.11	<0.11	<0.11	<0.11	<1.0	<1.0	<1.0	<0.50
Trichloroethene	ug/L	NL	<0.16	<0.16	<0.16	<0.19	<1.0	<0.40	<0.40	<0.50
Trichlorofluoromethane	ug/L	500	<0.095	<0.095	<0.095	<0.19	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	<0.092	<0.092	<0.092	<0.17	<4.0	<4.0	<4.0	<0.20
1,1,2-Trichlorotrifluoroethane	ug/L	50	<0.074	<0.074	<0.074	<0.27	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	<0.042	<0.042	<0.042	<0.18	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.05	0.18	0.27	0.59	<0.20	<0.40	<0.40	<0.40	0.12
m,p&o-Xylene (Xylene Total)	ug/L	75	<0.20	<0.20	<0.20	<0.32	<3.0	<3.0	<3.0	NA
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA	<2.0
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 7

**Summary of Organic Groundwater Quality Data - MMLF-8
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8	MMLF-8	MMLF-8
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
Acetone	ug/L	175	<4	<4	<4	<4	<25.0	<20.0	<20.0	<20.0
Allylchloride	ug/L	7.5	<0.042	<0.042	<0.042	<0.16	<4.0	<4.0	<4.0	<5.0
Benzene	ug/L	2.5	<0.069	<0.069	<0.069	<0.2	<1.0	<1.0	<1.0	<0.50
Bromobenzene	ug/L	NL	<0.17	<0.17	<0.17	<0.12	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	<0.082	<0.082	<0.082	<0.18	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	<0.086	<0.086	<0.086	<0.12	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	10	<0.16	<0.16	<0.16	<0.13	<4.0	<4.0	<4.0	<5.0
Bromomethane	ug/L	3	<0.060	<0.060	<0.060	<0.16	<4.0	<4.0	<4.0	<2.5
Methyl Ethyl Ketone (MEK)/2-Butanone	ug/L	1000	<1.0	<1.0	<1.0	<1.0	<4.0	<5.0	<5.0	<20.0
n-Butylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.18	<1.0	<1.0	<1.0	<2.5
sec-Butylbenzene	ug/L	NL	<0.087	<0.087	<0.087	<0.17	<1.0	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	<0.15	<0.15	<0.15	<0.16	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	0.75	<0.074	<0.074	<0.074	<0.28	<1.0	<1.0	<1.0	<0.50
Chlorobenzene	ug/L	25	<0.14	<0.14	<0.14	<0.20	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	<0.089	<0.089	<0.089	<0.24	<1.0	<4.0	<1.0	<2.5
Chloroform	ug/L	15	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	<0.068	<0.068	<0.068	<0.20	<4.0	<4.0	<4.0	<2.5
2-Chlorotoluene	ug/L	NL	<0.080	<0.080	<0.080	<0.13	<1.0	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	<0.11	<0.11	<0.11	<0.13	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	NL	<0.12	<0.12	<0.12	<0.23	<4.0	<4.0	<4.0	<5.0
Dibromochloromethane	ug/L	13	<0.12	<0.12	<0.12	<0.13	<1.0	<1.0	<1.0	<0.50
1,2-Dibromoethane (EDB)	ug/L	0.001	<0.12	<0.12	<0.12	<0.11	<1.0	<1.0	<1.0	<0.50
Dibromomethane	ug/L	--	<0.15	<0.15	<0.15	<0.10	<4.0	<4.0	<4.0	<2.5
1,2-Dichlorobenzene	ug/L	150	<0.10	<0.10	<0.10	<0.096	<1.0	<1.0	<1.0	<0.50
1,3-Dichlorobenzene	ug/L	150	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	<0.10	<0.10	<0.10	<0.084	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	<0.084	<0.084	<0.084	<0.23	<1.0	<1.0	<1.0	<5.0
1,1-Dichloroethane	ug/L	17.5	<0.077	<0.077	<0.077	<0.20	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0	<0.25
1,1-Dichloroethene	ug/L	1.5	<0.12	<0.12	<0.12	<0.17	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	17.5	<0.081	<0.081	<0.081	<0.10	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	1.5	<0.053	<0.053	<0.053	<0.23	<1.0	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	<0.097	<0.097	<0.097	<0.17	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	1.25	<0.055	<0.055	<0.055	<0.19	<4.0	<4.0	<4.0	<1.0
1,3-Dichloropropane	ug/L	NL	<0.091	<0.091	<0.091	<0.14	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	<0.063	<0.063	<0.063	<0.36	<4.0	<4.0	<4.0	<5.0
1,1-Dichloropropene	ug/L	NL	<0.081	<0.081	<0.081	<0.081	<1.0	<1.0	<1.0	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 7 (con't)

**Summary of Organic Groundwater Quality Data - MMLF-8
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

Parameter	Units	IL	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8*	MMLF-8	MMLF-8	MMLF-8
			10/26/2009	11/11/2009	12/10/2009	11/8/2010	11/1/2012	10/25/2013	11/12/2014	11/5/2015
cis-1,3-Dichloropropene	ug/L	0.5	<0.089	<0.089	<0.089	<0.21	<4.0	<4.0	<4.0	<0.50
trans-1,3-Dichloropropene	ug/L	0.5	<0.098	<0.098	<0.098	<0.16	<4.0	<4.0	<4.0	<0.50
Diethyl Ether (Ethyl Ether)	ug/L	250	<0.041	<0.041	<0.041	<0.14	<4.0	<4.0	<4.0	<5.0
Ethylbenzene	ug/L	175	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	ug/L	NL	<0.12	<0.12	<0.12	<0.20	<5.0	<1.0	<1.0	<2.5
Isopropylbenzene (Cumene)	ug/L	NL	<0.096	<0.096	<0.096	<0.20	<1.0	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	<0.055	<0.055	<0.055	<0.17	<1.0	<1.0	<1.0	<2.5
Methylene Chloride	ug/L	0.25	<0.20	<0.20	<0.20	<0.20	<4.0	<4.0	<4.0	<2.5
Methyl isobutyl ketone	ug/L	75	<0.13	<0.13	<0.13	<0.18	<4.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	ug/L	NL	<0.044	<0.044	<0.044	<0.13	<1.0	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	<0.13	<0.13	<0.13	<0.20	<4.0	<4.0	<4.0	<5.0
n-Propylbenzene	ug/L	NL	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	25	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	<0.099	<0.099	<0.099	<0.13	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.094	<0.094	<0.094	<0.10	<1.0	<1.0	<1.0	<0.50
Tetrachloroethene	ug/L	7	<0.12	<0.12	<0.12	<0.29	<1.0	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	<1.0	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0	<20.0
Toluene	ug/L	250	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	<0.12	<0.12	<0.12	<0.12	<1.0	<1.0	<1.0	<5.0
1,2,4-Trichlorobenzene	ug/L	10	<0.073	<0.073	<0.073	<0.15	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	<0.076	<0.076	<0.076	<0.17	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	<0.11	<0.11	<0.11	<0.11	<1.0	<1.0	<1.0	<0.50
Trichloroethene	ug/L	NL	<0.16	<0.16	<0.16	<0.19	<1.0	<0.40	<0.40	<0.50
Trichlorofluoromethane	ug/L	500	<0.095	<0.095	<0.095	<0.19	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	<0.092	<0.092	<0.092	<0.17	<4.0	<4.0	<4.0	<0.20
1,1,2-Trichlorotrifluoroethane	ug/L	50	<0.074	<0.074	<0.074	<0.27	<1.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	<0.042	<0.042	<0.042	<0.18	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.05	<0.10	<0.10	<0.10	<0.20	<0.40	<0.40	<0.40	<0.050
m,p&o-Xylene (Xylene Total)	ug/L	75	<0.20	<0.20	<0.20	<0.32	<3.0	<3.0	<3.0	NA
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA	<2.0
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA	<1.0

NA = Not Analyzed

*Data obtained from previous reports

IL = Intervention Limit

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 8

**Groundwater Elevations
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs**

	MMLF-3	MMLF-7	MMLF-8
Unique Well Number	250125	774333	773250
Top of Casing Elevation (ft MSL)*	1158.24	1153.51	1156.39
Well Depth (ft)	47	37	40

Date of Data Collection	MMLF-3	MMLF-7	MMLF-8
1982-2007*	1127.96-1136.65	NA	NA
11/1/2012	1133.08 ft.	1122.9 ft.	1122.86 ft.
10/25/2013	1135.06 ft.	1125.07 ft.	1125.88 ft.
11/12/2014	1137.61 ft.	1127.37 ft.	1127.63 ft.
11/5/2015	1134.66 ft.	1125.78 ft.	1125.57 ft.

*Data from Camp Ripley

NA = Not Available

APPENDIX A
ANALYTICAL REPORTS

November 23, 2015

Greg Smith
Widseth, Smith & Nolting
7804 Industrial Park Road
PO Box 2720
Baxter, MN 56425

RE: Project: Camp Ripley MMLF
Pace Project No.: 1256795

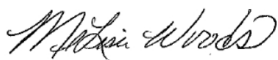
Dear Greg Smith:

Enclosed are the analytical results for sample(s) received by the laboratory on November 06, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Melisa M Woods
melisa.woods@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

SAMPLE SUMMARY

Project: Camp Ripley MMLF

Pace Project No.: 1256795

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1256795001	MW-3	Water	11/05/15 11:36	11/06/15 11:00
1256795002	MW-7	Water	11/05/15 09:50	11/06/15 11:00
1256795003	MW-8	Water	11/05/15 10:45	11/06/15 11:00
1256795004	FLD DUP	Water	11/05/15 00:00	11/06/15 11:00
1256795005	Equip Blank	Water	11/05/15 10:00	11/06/15 11:00
1256795006	Trip Blank	Water	11/05/15 00:00	11/06/15 11:00

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc..



ALEXANDRIA
610 Fillmore St.
Alexandria, MN 56308-1028
TEL: 320.762.8149
FAX: 320.762.0263

BEMDJI
315 S. St. NW
Bemidji, MN 56601
TEL: 218.444.1859
FAX: 218.444.1860

BRAINERD/BAXTER
7804 Industrial Park Rd.
Baxter, MN 56425
TEL: 218.829.5117
FAX: 218.829.2517

CROOKSTON
216 South Main
Crookston, MN 56716
TEL: 218.281.6522
FAX: 218.281.6545

GRAND FORKS
2715 S. Washington
Grand Forks, ND 58201
TEL: 701.795.1975
FAX: 701.795.1978

CHAIN-OF-CUSTODY RECORD

ENGINEERING ARCHITECTURE LAND SURVEYING ENVIRONMENTAL SERVICES

PROJECT NUMBER: 0283B0009.015
PROJECT NAME: Camp Ripley MNL
LOCATION: Radar 11, MN

SAMPLERS: (Signature) *MLL*

SAMPLERS: (Print) *Michael Boyce*

SAMPLE DESCRIPTION	DATE	TIME	COMP	GRAB	SAMPLE MATERIAL	NUMBER OF CON-TAINERS	ANALYSES REQUEST
<i>MW-3</i>	<i>11/5/15</i>	<i>11:36</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>3</i>	<i>X</i>
<i>MW-7</i>	<i>11/5/15</i>	<i>9:50</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>3</i>	<i>X</i>
<i>MW-8</i>	<i>11/5/15</i>	<i>10:45</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>3</i>	<i>X</i>
<i>FLD Dup</i>	<i>11/5/15</i>	<i>✓</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>3</i>	<i>X</i>
<i>Equip Blank</i>	<i>11/5/15</i>	<i>10:00</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>3</i>	<i>X</i>
<i>Trap Blank</i>	<i>11/5/15</i>	<i>✓</i>		<input checked="" type="checkbox"/>	<i>H₂O</i>	<i>2</i>	<i>X</i>

MDH 468 L

WO#: 1256795
Due Date: 11/20/15
PM: MNM
CLIENT: MSN

001
002
003
004
005
006

Relinquished by: (Signature) *MLL*
Date / Time: *11/5/15 16:00*
Received by: (Signature) *CHM*

Relinquished by: (Signature) _____
Date / Time: _____
Report To: *Greg Smith*

Relinquished by: (Signature) _____
Date / Time: _____
Received by: (Signature) _____

Distribution: White - Accompanies Shipment; Pink - Project File; Yellow - Laboratory

No: 5413

Bill To: *WSN 0283B0009.015*

Sample Condition Upon Receipt

Client Name: Camp Ripley

Project #: **WO#: 1256795**

 1256795

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other:

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.9 Cooler Temp Corrected °C: 1.2 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: CR 11-6-15

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. ✓
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 11/9/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

November 20, 2015

MeLisa M Woods
Pace Analytical Services, Inc. Virginia
315 Chestnut Street
Virginia, MN 55792

Work Order Number: 1504960
RE: Vinyl Chloride Analysis

Enclosed are the results of analyses for samples received by the laboratory on 11/10/15. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

All test results and QC meet requirements of the 2003 NELAC standard.

MDH (NELAP) Accreditation #027-123-295

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Samantha Jaworski
Organic Department Manager
sjaworski@legend-group.com

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
--	--	--

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-3	1504960-01	Groundwater	11/05/15 11:36	11/10/15 09:50
MW-7	1504960-02	Groundwater	11/05/15 09:50	11/10/15 09:50
MW-8	1504960-03	Groundwater	11/05/15 10:45	11/10/15 09:50
FLD DUP	1504960-04	Groundwater	11/05/15 00:00	11/10/15 09:50
Equip Blank	1504960-05	Water	11/05/15 10:00	11/10/15 09:50
Trip Blank	1504960-06	Water	11/05/15 00:00	11/10/15 09:50

Shipping Container Information

Default Cooler Temperature (°C): 0.7

Received on ice: Yes Temperature blank was present Received on ice pack: No
Received on melt water: No Ambient: No Acceptable (IH/ISO only): No
Custody seals: Yes

Case Narrative:

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (1504960-01) Groundwater Sampled: 11/05/15 11:36 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	"	"	"	"	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	"	"	"	"	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	"	"	"	"	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	"	"	"	"	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (1504960-01) Groundwater Sampled: 11/05/15 11:36 Received: 11/10/15 9:50										
cis-1,2-Dichloroethene	<1.0	1.0	0.097	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	<1.0	1.0	0.059	ug/L	1	"	"	"	"	T5
Ethyl ether	<5.0	5.0	0.091	ug/L	1	"	"	"	"	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	"	"	"	"	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5
Toluene	<1.0	1.0	0.064	ug/L	1	"	"	"	"	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	<0.050	0.050	0.0083	ug/L	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	89.6			80-121 %		"	"	"	"	
Surrogate: Dibromofluoromethane	93.1			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	92.7			80-120 %		"	"	"	"	

MW-7 (1504960-02) Groundwater Sampled: 11/05/15 09:50 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-7 (1504960-02) Groundwater Sampled: 11/05/15 09:50 Received: 11/10/15 9:50										
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	"	"	"	"	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	"	"	"	"	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	"	"	"	"	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
cis-1,2-Dichloroethene	4.5	1.0	0.097	ug/L	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	1.4	1.0	0.059	ug/L	1	"	"	"	"	T5

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-7 (1504960-02) Groundwater Sampled: 11/05/15 09:50 Received: 11/10/15 9:50										
Ethyl ether	12	5.0	0.091	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	"	"	"	"	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5
Toluene	<1.0	1.0	0.064	ug/L	1	"	"	"	"	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	0.12	0.050	0.0083	ug/L	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	87.7			80-121 %		"	"	"	"	
Surrogate: Dibromofluoromethane	91.3			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	90.6			80-120 %		"	"	"	"	

MW-8 (1504960-03) Groundwater Sampled: 11/05/15 10:45 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	"	"	"	"	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (1504960-03) Groundwater Sampled: 11/05/15 10:45 Received: 11/10/15 9:50										
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	"	"	"	"	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	"	"	"	"	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	"	"	"	"	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
cis-1,2-Dichloroethene	<1.0	1.0	0.097	ug/L	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	<1.0	1.0	0.059	ug/L	1	"	"	"	"	T5
Ethyl ether	<5.0	5.0	0.091	ug/L	1	"	"	"	"	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (1504960-03) Groundwater Sampled: 11/05/15 10:45 Received: 11/10/15 9:50										
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	"	"	"	"	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5
Toluene	<1.0	1.0	0.064	ug/L	1	"	"	"	"	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	<0.050	0.050	0.0083	ug/L	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	88.8			80-121 %		"	"	"	"	
Surrogate: Dibromofluoromethane	92.3			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	93.4			80-120 %		"	"	"	"	

FLD DUP (1504960-04) Groundwater Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	"	"	"	"	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
FLD DUP (1504960-04) Groundwater Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	"	"	"	"	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	"	"	"	"	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
cis-1,2-Dichloroethene	4.3	1.0	0.097	ug/L	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	1.3	1.0	0.059	ug/L	1	"	"	"	"	T5
Ethyl ether	12	5.0	0.091	ug/L	1	"	"	"	"	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
FLD DUP (1504960-04) Groundwater Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5
Toluene	<1.0	1.0	0.064	ug/L	1	"	"	"	"	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	0.085	0.050	0.0083	ug/L	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	88.4			80-121 %		"	"	"	"	
Surrogate: Dibromofluoromethane	90.8			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	92.9			80-120 %		"	"	"	"	

Equip Blank (1504960-05) Water Sampled: 11/05/15 10:00 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	"	"	"	"	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	"	"	"	"	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Equip Blank (1504960-05) Water Sampled: 11/05/15 10:00 Received: 11/10/15 9:50										
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	"	"	"	"	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
cis-1,2-Dichloroethene	<1.0	1.0	0.097	ug/L	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	<1.0	1.0	0.059	ug/L	1	"	"	"	"	T5
Ethyl ether	<5.0	5.0	0.091	ug/L	1	"	"	"	"	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	"	"	"	"	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Equip Blank (1504960-05) Water Sampled: 11/05/15 10:00 Received: 11/10/15 9:50										
Toluene	<1.0	1.0	0.064	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	<0.050	0.050	0.0083	ug/L	1	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	90.3			80-121 %		"	"	"	"	
Surrogate: Dibromofluoromethane	93.0			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	95.5			80-120 %		"	"	"	"	

Trip Blank (1504960-06) Water Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
1,1,1,2-Tetrachloroethane	<1.0	1.0	0.024	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
1,1,1-Trichloroethane	<1.0	1.0	0.069	ug/L	1	"	"	"	"	
1,1,2,2-Tetrachloroethane	<0.50	0.50	0.051	ug/L	1	"	"	"	"	
1,1,2-Trichloroethane	<0.50	0.50	0.10	ug/L	1	"	"	"	"	
1,1,2-Trichlorotrifluoroethane	<1.0	1.0	0.081	ug/L	1	"	"	"	"	T5
1,1-Dichloroethane	<1.0	1.0	0.050	ug/L	1	"	"	"	"	
1,1-Dichloroethene	<1.0	1.0	0.065	ug/L	1	"	"	"	"	
1,1-Dichloropropene	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,2,3-Trichlorobenzene	<5.0	5.0	0.45	ug/L	1	"	"	"	"	
1,2,3-Trichloropropane	<0.20	0.20	0.056	ug/L	1	"	"	"	"	
1,2,4-Trichlorobenzene	<1.0	1.0	0.091	ug/L	1	"	"	"	"	
1,2,4-Trimethylbenzene	<1.0	1.0	0.054	ug/L	1	"	"	"	"	
1,2-Dibromo-3-chloropropane	<5.0	5.0	0.033	ug/L	1	"	"	"	"	
1,2-Dibromoethane (EDB)	<0.50	0.50	0.042	ug/L	1	"	"	"	"	
1,2-Dichlorobenzene	<0.50	0.50	0.052	ug/L	1	"	"	"	"	
1,2-Dichloroethane	<0.25	0.25	0.064	ug/L	1	"	"	"	"	
1,2-Dichloropropane	<1.0	1.0	0.034	ug/L	1	"	"	"	"	
1,3,5-Trimethylbenzene	<1.0	1.0	0.046	ug/L	1	"	"	"	"	
1,3-Dichlorobenzene	<1.0	1.0	0.068	ug/L	1	"	"	"	"	
1,3-Dichloropropane	<1.0	1.0	0.15	ug/L	1	"	"	"	"	
1,4-Dichlorobenzene	<1.0	1.0	0.047	ug/L	1	"	"	"	"	
2,2-Dichloropropane	<5.0	5.0	0.28	ug/L	1	"	"	"	"	
2-Butanone	<20	20	0.33	ug/L	1	"	"	"	"	
2-Chlorotoluene	<1.0	1.0	0.052	ug/L	1	"	"	"	"	
4-Chlorotoluene	<1.0	1.0	0.041	ug/L	1	"	"	"	"	
Acetone	<20	20	0.32	ug/L	1	"	"	"	"	
Allyl chloride	<5.0	5.0	0.078	ug/L	1	"	"	"	"	
Benzene	<0.50	0.50	0.034	ug/L	1	"	"	"	"	
Bromobenzene	<1.0	1.0	0.042	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (1504960-06) Water Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
Bromochloromethane	<1.0	1.0	0.10	ug/L	1	B5K1325	11/13/15	11/13/15	EPA 8260B	
Bromodichloromethane	<1.0	1.0	0.042	ug/L	1	"	"	"	"	
Bromoform	<5.0	5.0	0.080	ug/L	1	"	"	"	"	
Bromomethane	<2.5	2.5	0.17	ug/L	1	"	"	"	"	
Carbon tetrachloride	<0.50	0.50	0.029	ug/L	1	"	"	"	"	
Chlorobenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
Chloroethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
Chloroform	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Chloromethane	<2.5	2.5	0.062	ug/L	1	"	"	"	"	
cis-1,2-Dichloroethene	<1.0	1.0	0.097	ug/L	1	"	"	"	"	
cis-1,3-Dichloropropene	<0.50	0.50	0.041	ug/L	1	"	"	"	"	
Dibromochloromethane	<0.50	0.50	0.070	ug/L	1	"	"	"	"	
Dibromomethane	<2.5	2.5	0.088	ug/L	1	"	"	"	"	
Dichlorodifluoromethane	<5.0	5.0	0.14	ug/L	1	"	"	"	"	
Dichlorofluoromethane	<1.0	1.0	0.059	ug/L	1	"	"	"	"	T5
Ethyl ether	<5.0	5.0	0.091	ug/L	1	"	"	"	"	
Ethylbenzene	<1.0	1.0	0.033	ug/L	1	"	"	"	"	
Hexachlorobutadiene	<2.5	2.5	0.19	ug/L	1	"	"	"	"	
Isopropylbenzene	<1.0	1.0	0.037	ug/L	1	"	"	"	"	
m,p-Xylene	<2.0	2.0	0.087	ug/L	1	"	"	"	"	
Methyl isobutyl ketone	<5.0	5.0	0.17	ug/L	1	"	"	"	"	
Methyl tert-butyl ether	<1.0	1.0	0.056	ug/L	1	"	"	"	"	
Methylene chloride	<2.5	2.5	0.10	ug/L	1	"	"	"	"	
Naphthalene	<5.0	5.0	0.032	ug/L	1	"	"	"	"	
n-Butylbenzene	<2.5	2.5	0.028	ug/L	1	"	"	"	"	
n-Propylbenzene	<1.0	1.0	0.040	ug/L	1	"	"	"	"	
o-Xylene	<1.0	1.0	0.053	ug/L	1	"	"	"	"	
p-Isopropyltoluene	<2.5	2.5	0.052	ug/L	1	"	"	"	"	
sec-Butylbenzene	<1.0	1.0	0.055	ug/L	1	"	"	"	"	
Styrene	<1.0	1.0	0.048	ug/L	1	"	"	"	"	
tert-Butylbenzene	<1.0	1.0	0.028	ug/L	1	"	"	"	"	
Tetrachloroethene	<1.0	1.0	0.035	ug/L	1	"	"	"	"	
Tetrahydrofuran	<20	20	0.34	ug/L	1	"	"	"	"	T5
Toluene	<1.0	1.0	0.064	ug/L	1	"	"	"	"	
trans-1,2-Dichloroethene	<1.0	1.0	0.058	ug/L	1	"	"	"	"	
trans-1,3-Dichloropropene	<0.50	0.50	0.067	ug/L	1	"	"	"	"	
Trichloroethene	<0.50	0.50	0.096	ug/L	1	"	"	"	"	
Trichlorofluoromethane	<1.0	1.0	0.26	ug/L	1	"	"	"	"	
Vinyl chloride	<0.050	0.050	0.0083	ug/L	1	"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (1504960-06) Water Sampled: 11/05/15 00:00 Received: 11/10/15 9:50										
Surrogate: 4-Bromofluorobenzene	88.0			80-121 %		B5K1325	11/13/15	11/13/15	EPA 8260B	
Surrogate: Dibromofluoromethane	91.4			79.9-121 %		"	"	"	"	
Surrogate: Toluene-d8	93.4			80-120 %		"	"	"	"	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B5K1325 - EPA 5030 Water (Purge and Trap)

Blank (B5K1325-BLK1)

Prepared & Analyzed: 11/13/15

1,1,1,2-Tetrachloroethane	< 1.0	1.0	0.024	ug/L							
1,1,1-Trichloroethane	< 1.0	1.0	0.069	ug/L							
1,1,2,2-Tetrachloroethane	< 0.50	0.50	0.051	ug/L							
1,1,2-Trichloroethane	< 0.50	0.50	0.10	ug/L							
1,1,2-Trichlorotrifluoroethane	< 1.0	1.0	0.081	ug/L							
1,1-Dichloroethane	< 1.0	1.0	0.050	ug/L							
1,1-Dichloroethene	< 1.0	1.0	0.065	ug/L							
1,1-Dichloropropene	< 1.0	1.0	0.15	ug/L							
1,2,3-Trichlorobenzene	< 5.0	5.0	0.45	ug/L							
1,2,3-Trichloropropane	< 0.20	0.20	0.056	ug/L							
1,2,4-Trichlorobenzene	< 1.0	1.0	0.091	ug/L							
1,2,4-Trimethylbenzene	< 1.0	1.0	0.054	ug/L							
1,2-Dibromo-3-chloropropane	< 5.0	5.0	0.033	ug/L							
1,2-Dibromoethane (EDB)	< 0.50	0.50	0.042	ug/L							
1,2-Dichlorobenzene	< 0.50	0.50	0.052	ug/L							
1,2-Dichloroethane	< 0.25	0.25	0.064	ug/L							
1,2-Dichloropropane	< 1.0	1.0	0.034	ug/L							
1,3,5-Trimethylbenzene	< 1.0	1.0	0.046	ug/L							
1,3-Dichlorobenzene	< 1.0	1.0	0.068	ug/L							
1,3-Dichloropropane	< 1.0	1.0	0.15	ug/L							
1,4-Dichlorobenzene	< 1.0	1.0	0.047	ug/L							
2,2-Dichloropropane	< 5.0	5.0	0.28	ug/L							
2-Butanone	< 20	20	0.33	ug/L							
2-Chlorotoluene	< 1.0	1.0	0.052	ug/L							
4-Chlorotoluene	< 1.0	1.0	0.041	ug/L							
Acetone	< 20	20	0.32	ug/L							
Allyl chloride	< 5.0	5.0	0.078	ug/L							
Benzene	< 0.50	0.50	0.034	ug/L							
Bromobenzene	< 1.0	1.0	0.042	ug/L							
Bromochloromethane	< 1.0	1.0	0.10	ug/L							
Bromodichloromethane	< 1.0	1.0	0.042	ug/L							
Bromoform	< 5.0	5.0	0.080	ug/L							
Bromomethane	< 2.5	2.5	0.17	ug/L							
Carbon tetrachloride	< 0.50	0.50	0.029	ug/L							
Chlorobenzene	< 1.0	1.0	0.037	ug/L							
Chloroethane	< 2.5	2.5	0.062	ug/L							
Chloroform	< 1.0	1.0	0.056	ug/L							
Chloromethane	< 2.5	2.5	0.062	ug/L							
cis-1,2-Dichloroethene	< 1.0	1.0	0.097	ug/L							

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B5K1325 - EPA 5030 Water (Purge and Trap)

Blank (B5K1325-BLK1)

Prepared & Analyzed: 11/13/15

cis-1,3-Dichloropropene	< 0.50	0.50	0.041	ug/L							
Dibromochloromethane	< 0.50	0.50	0.070	ug/L							
Dibromomethane	< 2.5	2.5	0.088	ug/L							
Dichlorodifluoromethane	< 5.0	5.0	0.14	ug/L							
Dichlorofluoromethane	< 1.0	1.0	0.059	ug/L							
Ethyl ether	< 5.0	5.0	0.091	ug/L							
Ethylbenzene	< 1.0	1.0	0.033	ug/L							
Hexachlorobutadiene	< 2.5	2.5	0.19	ug/L							
Isopropylbenzene	< 1.0	1.0	0.037	ug/L							
m,p-Xylene	< 2.0	2.0	0.087	ug/L							
Methyl isobutyl ketone	< 5.0	5.0	0.17	ug/L							
Methyl tert-butyl ether	< 1.0	1.0	0.056	ug/L							
Methylene chloride	< 2.5	2.5	0.10	ug/L							
Naphthalene	< 5.0	5.0	0.032	ug/L							
n-Butylbenzene	< 2.5	2.5	0.028	ug/L							
n-Propylbenzene	< 1.0	1.0	0.040	ug/L							
o-Xylene	< 1.0	1.0	0.053	ug/L							
p-Isopropyltoluene	< 2.5	2.5	0.052	ug/L							
sec-Butylbenzene	< 1.0	1.0	0.055	ug/L							
Styrene	< 1.0	1.0	0.048	ug/L							
tert-Butylbenzene	< 1.0	1.0	0.028	ug/L							
Tetrachloroethene	< 1.0	1.0	0.035	ug/L							
Tetrahydrofuran	< 20	20	0.34	ug/L							
Toluene	< 1.0	1.0	0.064	ug/L							
trans-1,2-Dichloroethene	< 1.0	1.0	0.058	ug/L							
trans-1,3-Dichloropropene	< 0.50	0.50	0.067	ug/L							
Trichloroethene	< 0.50	0.50	0.096	ug/L							
Trichlorofluoromethane	< 1.0	1.0	0.26	ug/L							
Vinyl chloride	< 0.050	0.050	0.0083	ug/L							
Surrogate: 4-Bromofluorobenzene	50.0			ug/L	56.0		89.3	80-121			
Surrogate: Dibromofluoromethane	51.6			ug/L	56.0		92.1	79.9-121			
Surrogate: Toluene-d8	51.8			ug/L	56.0		92.5	80-120			

LCS (B5K1325-BS1)

Prepared & Analyzed: 11/13/15

1,1,2,2-Tetrachloroethane	55.7	0.50	0.051	ug/L	50.0		111	80-121			
1,1-Dichloroethane	50.2	1.0	0.050	ug/L	50.0		100	80-125			
1,1-Dichloroethene	47.2	1.0	0.065	ug/L	50.0		94.5	80-125			
1,3,5-Trimethylbenzene	50.2	1.0	0.046	ug/L	50.0		100	75.4-125			
1,4-Dichlorobenzene	47.6	1.0	0.047	ug/L	50.0		95.1	75-125			
2-Chlorotoluene	51.3	1.0	0.052	ug/L	50.0		103	75.4-125			

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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Batch B5K1325 - EPA 5030 Water (Purge and Trap)

LCS (B5K1325-BS1)

Prepared & Analyzed: 11/13/15

Benzene	48.2	0.50	0.034	ug/L	50.0		96.3	80-120			
Bromoform	44.3	5.0	0.080	ug/L	50.0		88.7	80-120			
Chlorobenzene	46.4	1.0	0.037	ug/L	50.0		92.7	80-120			
Chloroform	45.8	1.0	0.056	ug/L	50.0		91.7	80-123			
Ethylbenzene	45.4	1.0	0.033	ug/L	50.0		90.8	80-120			
n-Butylbenzene	49.9	2.5	0.028	ug/L	50.0		99.8	75-125			
n-Propylbenzene	52.9	1.0	0.040	ug/L	50.0		106	75.8-125			
Toluene	46.8	1.0	0.064	ug/L	50.0		93.6	80-120			
Trichloroethene	48.0	0.50	0.096	ug/L	50.0		96.0	80-120			
Vinyl chloride	48.4	0.050	0.0083	ug/L	50.0		96.8	75-130			
Surrogate: 4-Bromofluorobenzene	49.8			ug/L	56.0		89.0	80-121			
Surrogate: Dibromofluoromethane	52.0			ug/L	56.0		92.8	79.9-121			
Surrogate: Toluene-d8	53.8			ug/L	56.0		96.1	80-120			

Matrix Spike (B5K1325-MS1)

Source: 1504960-01

Prepared & Analyzed: 11/13/15

1,1,2,2-Tetrachloroethane	54.4	0.50	0.051	ug/L	50.0	<0.50	109	76.8-125			
1,1-Dichloroethane	51.3	1.0	0.050	ug/L	50.0	<1.0	103	80-125			
1,1-Dichloroethene	49.5	1.0	0.065	ug/L	50.0	<1.0	99.0	80-125			
1,3,5-Trimethylbenzene	49.7	1.0	0.046	ug/L	50.0	<1.0	99.3	75-125			
1,4-Dichlorobenzene	47.8	1.0	0.047	ug/L	50.0	<1.0	95.5	75-125			
2-Chlorotoluene	51.4	1.0	0.052	ug/L	50.0	<1.0	103	75-125			
Benzene	49.7	0.50	0.034	ug/L	50.0	<0.50	99.4	80-120			
Bromoform	45.4	5.0	0.080	ug/L	50.0	<5.0	90.9	80-120			
Chlorobenzene	46.6	1.0	0.037	ug/L	50.0	<1.0	93.2	80-120			
Chloroform	46.5	1.0	0.056	ug/L	50.0	<1.0	93.1	79.8-125			
Ethylbenzene	45.8	1.0	0.033	ug/L	50.0	<1.0	91.7	80-120			
n-Butylbenzene	50.3	2.5	0.028	ug/L	50.0	<2.5	101	75-130			
n-Propylbenzene	52.5	1.0	0.040	ug/L	50.0	<1.0	105	75-125			
Toluene	46.9	1.0	0.064	ug/L	50.0	<1.0	93.8	80-120			
Trichloroethene	48.2	0.50	0.096	ug/L	50.0	<0.50	96.4	80-120			
Vinyl chloride	51.0	0.050	0.0083	ug/L	50.0	<0.050	102	75-130			
Surrogate: 4-Bromofluorobenzene	52.2			ug/L	56.0		93.3	80-121			
Surrogate: Dibromofluoromethane	51.7			ug/L	56.0		92.2	79.9-121			
Surrogate: Toluene-d8	53.6			ug/L	56.0		95.7	80-120			

Matrix Spike Dup (B5K1325-MSD1)

Source: 1504960-01

Prepared & Analyzed: 11/13/15

1,1,2,2-Tetrachloroethane	54.8	0.50	0.051	ug/L	50.0	<0.50	110	76.8-125	0.638	20	
1,1-Dichloroethane	52.5	1.0	0.050	ug/L	50.0	<1.0	105	80-125	2.40	20	
1,1-Dichloroethene	49.8	1.0	0.065	ug/L	50.0	<1.0	99.6	80-125	0.638	20	
1,3,5-Trimethylbenzene	50.8	1.0	0.046	ug/L	50.0	<1.0	102	75-125	2.22	20	

Pace Analytical Services, Inc. Virginia 315 Chestnut Street Virginia, MN 55792	Project: Vinyl Chloride Analysis Project Number: 1256795 Project Manager: MeLisa M Woods	Work Order #: 1504960 Date Reported: 11/20/15
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VOC 8260B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B5K1325 - EPA 5030 Water (Purge and Trap)											
Matrix Spike Dup (B5K1325-MSD1)			Source: 1504960-01			Prepared & Analyzed: 11/13/15					
1,4-Dichlorobenzene	48.7	1.0	0.047	ug/L	50.0	<1.0	97.3	75-125	1.87	20	
2-Chlorotoluene	51.0	1.0	0.052	ug/L	50.0	<1.0	102	75-125	0.670	20	
Benzene	49.4	0.50	0.034	ug/L	50.0	<0.50	98.8	80-120	0.524	20	
Bromoform	46.9	5.0	0.080	ug/L	50.0	<5.0	93.8	80-120	3.12	20	
Chlorobenzene	48.1	1.0	0.037	ug/L	50.0	<1.0	96.3	80-120	3.21	20	
Chloroform	47.9	1.0	0.056	ug/L	50.0	<1.0	95.8	79.8-125	2.91	20	
Ethylbenzene	46.9	1.0	0.033	ug/L	50.0	<1.0	93.8	80-120	2.26	20	
n-Butylbenzene	50.7	2.5	0.028	ug/L	50.0	<2.5	101	75-130	0.795	20	
n-Propylbenzene	53.2	1.0	0.040	ug/L	50.0	<1.0	106	75-125	1.39	20	
Toluene	47.7	1.0	0.064	ug/L	50.0	<1.0	95.4	80-120	1.63	20	
Trichloroethene	48.8	0.50	0.096	ug/L	50.0	<0.50	97.6	80-120	1.25	20	
Vinyl chloride	51.2	0.050	0.0083	ug/L	50.0	<0.050	102	75-130	0.417	20	
Surrogate: 4-Bromofluorobenzene	51.9			ug/L	56.0		92.7	80-121			
Surrogate: Dibromofluoromethane	52.0			ug/L	56.0		92.8	79.9-121			
Surrogate: Toluene-d8	52.8			ug/L	56.0		94.3	80-120			

Pace Analytical Services, Inc. Virginia
315 Chestnut Street
Virginia, MN 55792

Project: Vinyl Chloride Analysis
Project Number: 1256795
Project Manager: MeLisa M Woods

Work Order #: 1504960
Date Reported: 11/20/15

Notes and Definitions

T5 Laboratory not licensed for this parameter.
< Less than value listed
dry Sample results reported on a dry weight basis
NA Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL Method Detection Limit; Equivalent to the method LOD (Limit of Detection)
RL Reporting Limit
RPD Relative Percent Difference
LCS Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS Matrix Spike = Laboratory Fortified Matrix (LFM)

1504900



Chain of Custody

Workorder: 1256795 Workorder Name: Camp Ripley MMLF Results Requested: 11/20/2015

Report / Invoice To: Subcontract To: Legend P.O. # 1256795

Melissa M Woods
Pace Analytical Virginia
315 Chestnut Street
Virginia, MN 55792
Phone (218) 742-1042
Email: melissa.woods@pacefab.com

Item	Sample ID	Collect Date/Time	Lib ID	Matrix	Preserved Containers	LAB USE ONLY
1	MW-3	11/5/2015 11:36	1256795001	Water	04	01 AC
2	MW-7	11/5/2015 09:50	1256795002	Water		02
3	MW-8	11/5/2015 10:45	1256795003	Water		03
4	FLD DUP	11/5/2015 00:00	1256795004	Water		04
5	Equip Blank	11/5/2015 10:00	1256795005	Water		05
6	Trip Blank	11/5/2015 00:00	1256795006	Water		06 ND

Comments: DL 0.05, See attached, 1517 897 FLOW

Transfers	Released By	Date/Time	Received By	Date/Time
1	Melissa Woods	11/15 12:15		
2				
3				11/15/15

Cooler Temperature on Receipt: 0.7°C Custody Seal: Y or N Received on Ice: Y or N Samples Intact: Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

NDF Samples

MDH 468 List (Organics)

Analytes
 1,1,1,2-Tetrachloroethane
 1,1,1-Trichloroethane
 1,1,2,2-Tetrachloroethane

1,2,3-Trichlorobenzene
 1,2,3-Trichloropropane
 1,2,4-Trichlorobenzene

Project No. 13134
 410-01XA

EXHIBIT A
 Page 5 of 8

Contract No. 68852

- 1,1,2-Trichloroethane
- 1,1,2-Trichlorotrifluoroethane
- 1,1-Dichloroethane
- 1,1-Dichloroethylene (Vinylidene chloride)
- 1,1-Dichloropropene
- 1,2-Dichloroethylene (trans)
- Organics (con't.)**
- 1,2-Dichloropropane
- 1,3,5-Trimethylbenzene
- 1,3-Dichlorobenzene (meta-)
- 1,3-Dichloropropane
- 1,3-Dichloropropene (cis + trans)
- 1,4-Dichlorobenzene (para-)
- 2,2-Dichloropropane
- 2-Chlorotoluene (ortho-)
- 4-Chlorotoluene (para-)
- Acetone
- Allyl chloride (3 chloropropene)
- Benzene
- Bromobenzene
- Bromochloromethane (Chlorobromomethane)
- Bromodichloromethane (Dichlorobromomethane)
- Bromoform
- Bromomethane (Methyl bromide)
- Carbon tetrachloride
- Chlorobenzene (monochlorobenzene)
- Chlorodibromomethane (Dibromochloromethane)
- Chloroethane
- Chloroform
- Chloromethane (Methyl chloride)
- Cumene (Isopropylbenzene)
- Dibromochloropropane (DBCP)
- Dibromomethane (Methylene bromide)
- Dichlorodifluoromethane
- Dichlorofluoromethane
- Dichloromethane (Methylene chloride)
- Ethyl benzene
- Ethyl ether
- Hexachlorobutadiene
- Methyl ethyl ketone (MEK)
- Methyl isobutyl ketone (4-Methyl-2-pentanone)
- Methyl tertiary-butyl ether (MTBE)
- Naphthalene

- 1,2,4-Trimethylbenzene
- 1,2-Dibromoethane (Ethylene dibromide or EDB)
- 1,2-Dichlorobenzene (ortho-)
- 1,2-Dichloroethane
- 1,2-Dichloroethylene (cis-)
- n-Butyl benzene
- n-Propyl benzene
- p-Isopropyltoluene
- sec-Butyl benzene
- Styrene
- tert-Butyl benzene
- Tetrachloroethylene (Perchloroethylene)
- Tetrahydrofuran
- Toluene
- Trichloroethylene (TCE)
- Trichlorofluoromethane
- Vinyl chloride (chloroethene)
- Xylenes (mixture of o, m, p)

- Inorganics**
- Alkalinity, total as calcium carbonate
 - Ammonia Nitrogen
 - Arsenic, dissolved
 - Barium, dissolved
 - Boron, dissolved
 - Cadmium, dissolved
 - Chloride
 - Chromium, total dissolved
 - Copper, dissolved
 - Iron, dissolved
 - Lead, dissolved
 - Manganese, dissolved
 - Mercury, dissolved
 - Nitrate + Nitrite, as N
 - Sodium, dissolved
 - Sulfate
 - Suspended Solids, total
 - Appearance (b);
 - Dissolved Oxygen, field
 - pH (a)
 - Specific Conductance (a)
 - Temperature (a)
 - Turbidity, field

APPENDIX B

WELL STABILIZATION FORMS

DATE: 11/5/15

PROJECT NAME: Camp Ripley PROJECT NUMBER: 0283B000905

LOCATION: Reidall, MN WEATHER: Overcast / Lt. Rain

TEMP. MIN. 43°F TEMP MAX. 48°F ENGINEER PERSONNEL: MBS

CONTRACTOR (S): _____

SUBCONTRACTOR WORKING: _____

WORK DONE BY ENGINEER: Fall Sampling Event

DAILY PROGRESS- (Subcontractors & Sub contractors): On site @ 8:15. Checked in at front


gate. Checked in with Tim @ Range Control and completed training. Picked up a key for the
wells from Sara at Adama bldg. Checked stake marker level and sampled MW-7, MW-8
and MW-3 in that order. After sampling the closed landfill I stopped at the transfer
station and grabbed a key for the demolition landfill gate. I sampled DDLF-4 &
DDLF-5. Also checked stake on DDLF-1, DDLF-2 & DDLF-3. I returned
the gate key for the Demo land fill to range control & returned the well key
to Sara. Samples will be sent to Pace Virginia

REMARKS: _____

SIGNED: [Signature] DATE SIGNED: 11/5/15

(If more space is required, use other side)

WIDSETH SMITH NOLTING & ASSOCIATES
MONITORING/TEST WELL STABILIZATION FORM

SITE: <i>Camp Ripley</i>		 <p>Engineering Architecture Surveying Environmental</p>					
DATE: <i>11/5/15</i>							
TIME:							
SAMPLE DESIGNATION: <i>MW-7</i>		<p>FIELD DUPLICATE FLOW CELL USED</p> <p>YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/></p> <p>NO <input type="checkbox"/> NO <input type="checkbox"/></p> <p>EXCEPTIONS TO PROTOCOL: NONE <input type="checkbox"/></p>					
WEATHER CONDITIONS: <i>Overcast</i>							
PERSONNEL: <i>MB</i>							
PUMP RATE (GPM): <i>.50/1.10</i>							
WELL DEPTH: <i>37</i>							
STATIC LEVEL: <i>27.73</i>							
WELL VOLUME (GAL): <i>1.48</i>							
LOCK: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>							
WELL LABEL: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>							
CONDITION OF WELL: <i>Good</i>							
PURGE METHOD: <i>whale</i>							
SAMPLE METHOD: <i>whale</i>							
APPEARANCE:							
TIME	TEMP. FAHRENHEIT (+/- 0.5)	SPECIFIC CONDUCTANCE (mS/cm +/- 5%)	DISSOLVED OXYGEN (+/- 0.5 mg/l)	Ph (+/- 0.04 SU)	ORP (mv)	TURBIDITY (+/- 10 NTU)	VOL. REMOVED (gal.)
<i>9:40</i>	<i>49.8</i>	<i>813</i>	<i>1.01</i>	<i>6.30</i>	<i>228</i>	<i>17.5</i>	<i>1.50</i>
<i>9:43</i>	<i>49.8</i>	<i>804</i>	<i>1.03</i>	<i>6.35</i>	<i>224</i>	<i>15.4</i>	<i>3.00</i>
<i>9:46</i>	<i>49.8</i>	<i>813</i>	<i>.98</i>	<i>6.36</i>	<i>223</i>	<i>14.7</i>	<i>4.50</i>
INITIAL							
2nd RECHARGE							
3rd RECHARGE							
COMMENTS:							
TIME SAMPLED	<i>9:50</i>						

