US EPA RECORDS CENTER REGION 5
549057

July 10, 2017

Reference No. 032504

Mr. Howard Caine
United States Environmental Protection Agency
Region V (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois
60604

Dear Mr. Caine:

Re: Progress Report No. 139
Groundwater and Landfill RD/RA
Reporting Period: April 1 through June 30, 2017
Rasmussen Landfill (Site), Livingston Co., Michigan

1. Introduction

This Progress Report is submitted in accordance with Paragraph 26 of the Consent Decree, Civil Action No. 92 40071. This report summarizes the activities performed during the reporting period and describes the activities to continue or which are scheduled to start during the next reporting period.

2. Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on June 30, 2017. The corresponding groundwater contour map is provided on Figure 1.

GHD collected quarterly groundwater samples on June 7 through June 13, 2017, for the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

2.2 Reports

Quarterly Progress Report No. 138 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on April 10, 2017.

3. Summary of Findings

The results of the second quarter 2017 sampling are provided in Tables 1 through 5. Figure 2 is a Site location map showing the wells included in the quarterly Groundwater Remediation Monitoring Program and the annual Landfill Monitoring Program.

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REGISTERED COMPANY FOR
ISO 9001
ENGINEERING DESIGN

During the second quarter 2017 sampling, 5 of the 25 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria (RDWCC).

Specifically, the five monitoring wells with COCs exceeding RDWCC are:

- CRA-RA-22 2.6 µg/L vinyl chloride
- CRA-RA-24 4.4 µg/L vinyl chloride
- CRA-RA-26S 98 µg/L trichloroethene
- CRA-RA-27 12 µg/L vinyl chloride
- CRA-RA-30 3.5 µg/L vinyl chloride

These same five monitoring wells had COCs above RDWCC during the first quarter 2017 sampling event.

The results of the 2017 round of the annual Landfill Monitoring Program are provided in Table 5. Volatile organic compounds were detected in some of the Landfill Monitoring Program samples but concentrations did not exceed their respective RDWCC. No semi-volatile organic compounds or metals were detected in any of the 2017 Annual Landfill Monitoring Program samples.

4. Problems Encountered

None encountered.

5. Corrective Measures to Rectify Problems

None required.

6. Contacts and Significant Correspondence with Public Representatives

Communication	Date	Subject of Correspondence/Discussion
Quarterly Report	April 10, 2017	Report No. 138 submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ)

7. Planned Upcoming Activities/Schedule

Activities planned for the third quarter of 2017 include:

- Continue the operation of ozone sparging system

- Continue to monitor for the presence of ozone at each sparge vault
- The third quarter 2017 groundwater sampling event is scheduled for the week of September 11, 2017
- The wells to be sampled in the third quarter of 2017 are listed in Table 6

Should you have any questions on the above, please do not hesitate to contact the undersigned.

Yours truly,

GHD

J. Lucas on behalf

Bart Bartholomy

AJD/ks/51

Encl.

cc: Mike Stoelton, JCI
Colleen Liddell, Ford
Karyllan Dodson Mack, BASF
Michael Simpson
Steven Nadeau, Honigman

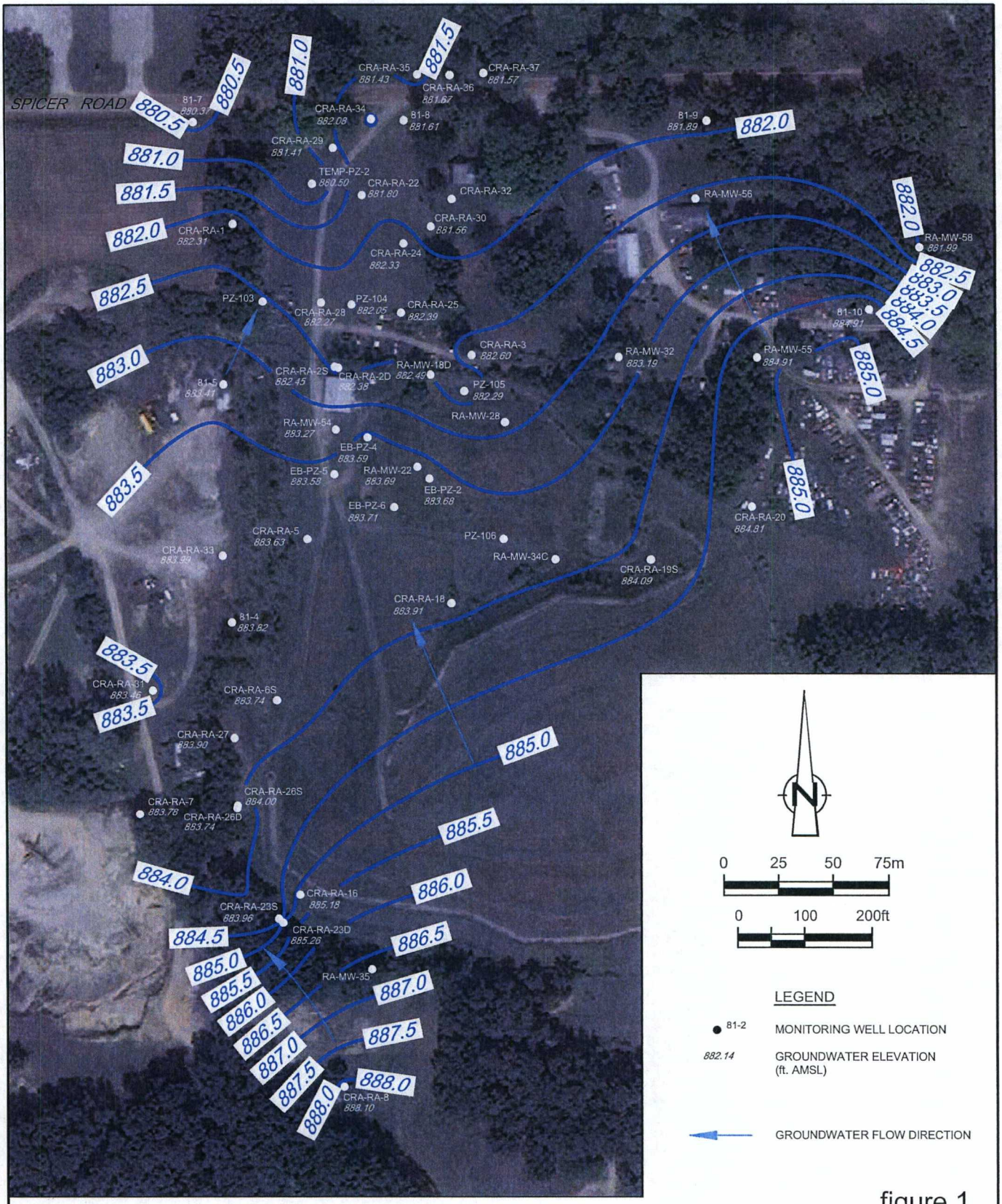

figure 1

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
JUNE 2017
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

GHD

32504-15(CAIN051)GN-WA001 JUL 6, 2017

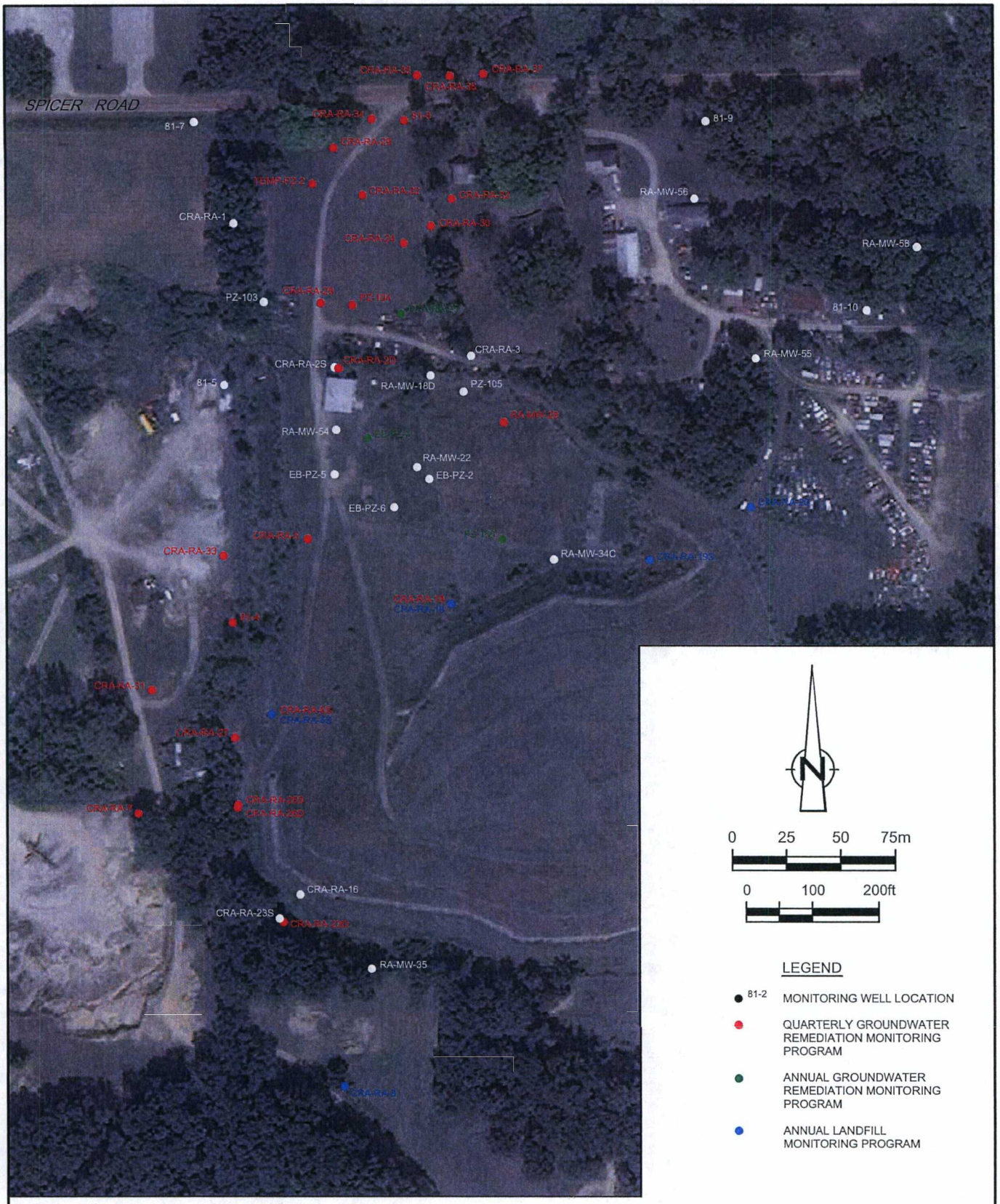

figure 2

2017 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN051)GN-WA002 JUL 6, 2017

Table 1

Analytical Results - Northern Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-22	GW-SR-2015	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-22	GW-SR-2048	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	11	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-22	GW-SR-2069	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
CRA-RA-22	GW-SR-2070	3/15/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
CRA-RA-22	GW-SR-2088	6/8/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.1)	ND(1.0)	ND(1.0)	2.6	ND(1.0)
			Change					Stable							Down 1.0 µg/L	
CRA-RA-24	GW-SR-2012	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.9	ND(1.0)
CRA-RA-24	GW-SR-2044	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.8	ND(1.0)
CRA-RA-24	GW-SR-2066	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.7	ND(1.0)
CRA-RA-24	GW-SR-2085	6/7/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.4	ND(1.0)
			Change												Down 0.3 µg/L	
CRA-RA-25	GW-SR-1826	9/2/2014		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-25	GW-SR-1921	9/2/2015		ND(1.0)	1.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-25	GW-SR-2011	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Stable											
CRA-RA-28	GW-SR-2009	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2042	11/17/2016		ND(1.0)	3.1	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2064	3/15/2017		ND(1.0)	2.8	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-28	GW-SR-2083	6/7/2017		ND(1.0)	2.8	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change		Stable											
CRA-RA-29	GW-SR-2018	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29	GW-SR-2050	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-29		3/21/2017							Not sampled; insufficient water in well							
CRA-RA-29	GW-SR-2090	6/8/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change													
CRA-RA-30	GW-SR-2014	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.3	ND(1.0)
CRA-RA-30	GW-SR-2045	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.7	ND(1.0)
CRA-RA-30	GW-SR-2046	11/17/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.6	ND(1.0)
CRA-RA-30	GW-SR-2067	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.5	ND(1.0)
CRA-RA-30	GW-SR-2087	6/7/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	3.5	ND(1.0)
			Change												Stable	
CRA-RA-32	GW-SR-2013	9/1/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2047	11/17/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2047	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-32	GW-SR-2086	6/7/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-34	GW-BW-01	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-02	8/6/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-01	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(.0)
CRA-RA-34	GW-BW-001	6/9/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-34	GW-BW-002	6/9/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-35	GW-BW-05	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-35	GW-BW-04	11/3/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.2	ND(1.0)
CRA-RA-35	GW-BW-04	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-35	GW-BW-05	3/10/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.0	ND(1.0)
CRA-RA-35	GW-BW-05	6/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change												Down 0.1 µg/L	
CRA-RA-36	GW-BW-04	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-03	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-03	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-36	GW-BW-004	6/9/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
CRA-RA-37	GW-BW-03	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-02	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-37	GW-BW-003	6/9/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
PZ-104	GW-SR-2010	9/1/2016		ND(1.0)	3.0	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2043	11/17/2016		ND(1.0)	2.3	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-104	GW-SR-2065	3/15/2017		ND(1.0)	2.6	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.0	ND(1.0)
PZ-104	GW-SR-2084	6/7/2017		ND(1.0)	2.6	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.0	ND(1.0)
			Change		Stable										Stable	
TEMP-PZ-2	GW-SR-2017	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2049	11/18/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2071	3/15/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
TEMP-PZ-2	GW-SR-2089	6/8/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							
81-8	GW-SR-2016	9/2/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2081	3/21/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
81-8	GW-SR-2091	6/8/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change						Stable; all Non-Detect							

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria.
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 2

Analytical Results - PDSLD Area Plumes
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-2D	GW-SR-2008	9/1/2016		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	68	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-2036	11/16/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	79	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-2D	GW-SR-2060	3/14/2017		ND(2.9)	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	75	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
CRA-RA-2D	GW-SR-2082	6/7/2017		ND(2.5)	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	72	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
			Change							Down 3 µg/L						
CRA-RA-18	GW-SR-2022	9/4/2016		79	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-18	GW-SR-2039	11/16/2016		60	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)
CRA-RA-18	GW-SR-2063	3/14/2017		66	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
CRA-RA-18	GW-SR-2104	6/13/2017		61	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
			Change	Down 5 µg/L												
EB-PZ-4	GW-SR-1657	12/4/2012		ND(2.0)	ND(2.0)	ND(20)	ND(20)	ND(20)	ND(2.0)	39	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	4.0	ND(2.0)
EB-PZ-4	GW-SR-1729	8/27/2013		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	41	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	2.2	ND(1.4)
EB-PZ-4	GW-SR-1827	9/2/2014		ND(1.4)	ND(1.4)	ND(14)	ND(14)	ND(14)	ND(1.4)	43	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)	ND(1.4)
EB-PZ-4	GW-SR-1911	9/1/2015		ND(1.8)	ND(1.8)	ND(10)	ND(10)	ND(10)	ND(1.8)	46	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)	ND(1.8)
EB-PZ-4	GW-SR-2026	9/5/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	46	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable						
PZ-106	GW-SR-1731	8/27/2013		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1732	8/27/2013	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1828	9/2/2014		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-1912	9/1/2015		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
PZ-106	GW-SR-2023	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
RA-MW-28	GW-SR-2025	9/5/2016		7.8	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2038	11/16/2016		7.4	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2062	3/14/2017		6.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
RA-MW-28	GW-SR-2101	6/13/2017		7.5	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Up 1.5 µg/L												

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 3

Analytical Results - Southern Vinyl Chloride Plume
Rasmussen Landfill Site
Livingston County, Michigan

Sample Location	Sample ID	Date Sampled	Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-5	GW-SR-2027	9/6/2016		19	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2037	11/16/2016		17	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2061	3/14/2017		16	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-5	GW-SR-2096	6/12/2017		29	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change	Up 13 µg/L												
CRA-RA-6S	GW-SR-2028	9/6/2016		2.2	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2040	11/16/2016		2.0	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2078	3/20/2017		1.6	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-6S	GW-SR-2097	6/12/2017		2.1	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.2	ND(1.0)
			Change	Up 0.5 µg/L											Up 0.2 µg/L	
CRA-RA-7	GW-SR-2021	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2053	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2080	3/20/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-7	GW-SR-2093	6/11/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-27	GW-SR-2029	9/6/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	9.1	ND(1.0)
CRA-RA-27	GW-SR-2041	11/17/2016		ND(1.0)	1.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.6	ND(1.0)
CRA-RA-27	GW-SR-2072	3/16/2017		ND(1.0)	1.9	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8.6	ND(1.0)
CRA-RA-27	GW-SR-2098	6/12/2017		ND(1.0)	2.5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	12	ND(1.0)
			Change		Up 0.6 µg/L										Up 3.4 µg/L	
CRA-RA-31	GW-SR-2019	9/4/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2020	9/4/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2051	11/21/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2079	3/20/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-31	GW-SR-2092	6/11/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-33	GW-BW-06	8/6/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.8	ND(1.0)
CRA-RA-33	GW-BW-05	11/13/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	4.4	ND(1.0)
CRA-RA-33	GW-BW-06	3/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.1	ND(1.0)
CRA-RA-33	GW-BW-006	6/10/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	1.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)
									Stable						Up 0.2 µg/L	
81-4	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2034	9/7/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)
81-4	GW-SR-2054	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2055	11/28/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2075	3/14/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)
81-4	GW-SR-2105	6/13/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.9	ND(1.0)
			Change												Up 0.2 µg/L	

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 4

Analytical Results - Southern TCE Plume
Rasmussen Landfill Site
Livingston County, Michigan

				Volatile Organics												
			Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
			Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Sample Location	Sample ID	Date Sampled	RDWCC(1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
CRA-RA-23D	GW-SR-2032	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2058	11/29/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2059	11/29/2016	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.7	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2076	3/19/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2077	3/19/2017	*Duplicate*	ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.3	ND(1.0)	ND(1.0)
CRA-RA-23D	GW-SR-2106	6/13/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)
			Change											Up 0.8 µg/L		
CRA-RA-26D	GW-SR-2033	9/7/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2057	11/28/2016		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2074	3/16/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
CRA-RA-26D	GW-SR-2100	6/12/2017		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
			Change							Stable; all Non-Detect						
CRA-RA-26S	GW-SR-2030	9/7/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	78	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-2056	11/28/2016		ND(3.3)	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	76	ND(3.3)	ND(3.3)
CRA-RA-26S	GW-SR-2073	3/16/2017		ND(4.0)	ND(4.0)	ND(40)	ND(40)	ND(40)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	75	ND(4.0)	ND(4.0)
CRA-RA-26S	GW-SR-2099	6/12/2017		ND(5.0)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	98	ND(5.0)	ND(5.0)
			Change											Up 23 µg/L		

Notes:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria.
(2) The criterion provided is for the isomer cis-1,2-dichloroethene, the lower of the two criteria for 1,2-dichloroethene isomers. The criterion for trans 1,2-dichloroethene is 100 µg/L.

Table 5

Analytical Results - Landfill Monitoring Program
Rasmussen Landfill Site
Livingston County, Michigan

					Volatile Organics													Semi-volatile Organics			Metals			
Sample Location	Sample ID	Date Sampled		Parameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)	2-METHYLPHENOL	BIS(2-ETHYLHEXYL)PHTHALATE	ISOPHORONE	CADMIUM, DISSOLVED	CADMIUM, TOTAL	LEAD, DISSOLVED	LEAD, TOTAL
				RDWCC(1)	200	70 (1)	13,000	1,800	730	5	100	74	5	790	5	2	280	370	6	900	5		4	
				Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CRA-RA-6S	GW-SR-1513	6/14/2011			ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	1.8	ND(1)	ND(5)	ND(5)	ND(5)	ND(1)	ND(1)	ND(3)	ND(3)
CRA-RA-6S	GW-SR-1803	6/18/2014			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(8.6)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-6S	GW-SR-1804	6/18/2014	Duplicate		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(6.0)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-6S	GW-SR-1891	6/18/2015			1.9	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-6S	GW-SR-1993	6/9/2016			1.9 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(5.1)	ND(5.1)	ND(5.1)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-6S	GW-SR-1994	6/9/2016	Duplicate		1.8 J	ND(1.0) J	ND(10) J	ND(10) J	ND(10) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(1.0) J	ND(5.0)	ND(5.0)	ND(5.0)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-6S	GW-SR-2097	6/12/2017			2.1	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.2	ND(1.0)	ND(5.1)	ND(5.1)	ND(5.1)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
			Change		Up 0.03 µg/L											Up 0.03 µg/L								
CRA-RA-8	GW-SR-1521	6/15/2011			ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5.2)	ND(5.2)	ND(5.2)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
CRA-RA-8	GW-SR-1522	6/15/2011	Duplicate		ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5.3)	ND(5.3)	ND(5.3)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
CRA-RA-8	GW-SR-1628	6/21/2012			ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(2.0)	ND(2.0)	ND(2.0)	ND(0.2)	ND(0.2)	ND(3)	ND(3)
CRA-RA-8	GW-SR-1707	6/19/2013			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.9)	ND(4.9)	ND(4.9)	ND(0.2)	ND(0.2)	ND(3)	ND(3)
CRA-RA-8	GW-SR-1807	6/20/2014			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(6.4)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-8	GW-SR-2001	6/11/2016			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(4.8)	ND(4.8)	0.49	0.3	ND(3.0)	ND(3.0)
CRA-RA-8	GW-SR-2094	6/11/2017			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.3)	ND(5.3)	ND(5.3)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
CRA-RA-8	GW-SR-2095	6/11/2017	Duplicate		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.2)	ND(5.2)	ND(5.2)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
			Change												Stable; All Non-Detect									
CRA-RA-18	GW-SR-1505	6/10/2011			107	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	2.3	ND(1)	ND(1)	ND(5.3)	ND(5.3)	ND(5.3)	ND(1.0)	ND(1.0)	5.1	ND(3.0)
CRA-RA-18	GW-SR-1506	6/10/2011	Duplicate		107	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	2.3	ND(1)	ND(1)	ND(5.3)	ND(5.3)	ND(5.3)	ND(1.0)	ND(1.0)	4.9	ND(3.0)
CRA-RA-18	GW-SR-1528	8/18/2011			90.8	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	1.1	ND(1)	2.0	ND(1)	ND(1)	- -	- -	- -	- -	- -	ND(3)	ND(3)
CRA-RA-18	GW-SR-1617	6/20/2012			86.3	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	2.0	ND(1)	ND(1)	ND(2.2)	ND(2.2)	ND(2.2)	ND(0.0.067)	ND(0.0.067)	ND(1.7)	ND(1.7)
CRA-RA-18	GW-SR-1633	6/17/2013			88	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(4.9)	ND(4.9)	ND(4.9)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-1634	6/17/2013	Duplicate		90	ND(3.3)	ND(33)	ND(33)	ND(33)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(3.3)	ND(4.8)	ND(4.8)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-1799	6/17/2014			76	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(4.8)	5.6 J	ND(4.8)	ND(0.2)	ND(0.29)	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-1888	6/17/2015			85	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(4.8)	ND(4.8)	ND(4.8)	0.43	0.29	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-1889	6/17/2015	Duplicate		85	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(4.8)	ND(4.8)	ND(4.8)	0.22	0.27	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-1997	6/10/2016			87	ND(2.9)	ND(29)	ND(29)	ND(29)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(4.8)	ND(4.8)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-18	GW-SR-2104	6/13/2017			61	ND(2.5)	ND(25)	ND(25)	ND(25)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(4.8)	ND(4.8)	ND(4.8)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
			Change		Down 26 µg/L																			
CRA-RA-19S	GW-SR-1619	6/20/2012			ND(1)	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(2.1)	ND(2.1)	ND(2.1)	ND(0.2)	ND(0.2)	ND(3)	ND(3)
CRA-RA-19S	GW-SR-1636	6/17/2013			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(4.8)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-1801	6/18/2014			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	5.5 J	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-1903	6/20/2015			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(4.8)	ND(4.8)	0.45	0.27	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-2002	6/12/2016			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(4.8)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-2003	6/12/2016	Duplicate		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(4.8)	ND(4.8)	ND(4.8)	ND(0.2)	ND(0.2)	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-2102	6/13/2017			ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.4)	ND(5.4)	ND(5.4)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
CRA-RA-19S	GW-SR-2103	6/13/2017	Duplicate		ND(1.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(1.0)	ND(1.0)	ND(3.0)	ND(3.0)
			Change		Stable; all non-detect																			
CRA-RA-20	GW-BN-419	11/28/2000			7	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(6.2)	ND(6.2)	ND(6.2)	ND(0.2)	ND(3)	ND(0.2)	ND(3)
CRA-RA-20	GW-RW-487	11/19/2001			11	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)	ND(5)	ND(5)	ND(0.2)	ND(3)	NA	NA
CRA-RA-20	GW-SR-633	12/12/2002			5	ND(1)	ND(10)	ND(10)	ND(10)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(5)	ND(5)	ND(5)	ND(0.5)	ND(0.5)	ND(1)	ND(1)
															Insufficient Groundwater to Collect Sample									

Note:

(1) Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria

Table 6

2017 Groundwater Sampling Program
Rasmussen Landfill Site
Livingston County, Michigan

Quarterly Sampling - VOCs	Annual Landfill Monitoring Program - VOCs, SVOCs & Metals	Additional Annual Samples - VOCs
	(2nd Quarter)	*(3rd Quarter)*
81-4	CRA-RA-6S (included in quarterly sampling)	CRA-RA-25
81-8	CRA-RA-8	EB-PZ-4
CRA-RA-2D	CRA-RA-18 (included in quarterly sampling)	PZ-106
CRA-RA-5	CRA-RA-19S	RA-MW-47
CRA-RA-6S	CRA-RA-20	Rasmussen Water Supply Well
CRA-RA-7		
CRA-RA-18		
CRA-RA-22		
CRA-RA-23D		
CRA-RA-24		
CRA-RA-26D		
CRA-RA-26S		
CRA-RA-27		
CRA-RA-28		
CRA-RA-29		
CRA-RA-30		
CRA-RA-31		
CRA-RA-32		
CRA-RA-33		
CRA-RA-34		
CRA-RA-35		
CRA-RA-36		
CRA-RA-37		
PZ-104		
RA-MW-28		
TEMP-PZ-2		

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: WED. APRIL 12, 2017
Time: 10:00 AM

Weather Conditions: CLOUDY, 45°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GRASS STARTING TO GREEN, BUDS ON SOME TREES

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: FRIDAY, APRIL 28, 2017
Time: 11:00 AM

Weather Conditions: PARTLY CLOUDY, 58°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GRASS IS GREEN, TREES LEAFING OUT

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: WEDNESDAY, MAY 10, 2017
Time: 2:30 PM

Weather Conditions: CLOUDY 64°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: THURSDAY, MAY 25, 2017
Time: 3:00 PM

Weather Conditions: CLOUDY 67°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: WET

Drainage Spillways & Outfalls: WET

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: SUNDAY, JUNE 11, 2017
Time: 1:00PM

Weather Conditions: SUN 90°F (HOT)

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK - DRY

Drainage Spillways & Outfalls: OK - DRY

Roadways: GOOD

Vegetation: OK

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPA **Signature:** Steve Rapa

Date: THURSDAY, JUNE 29, 2017
Time: 3:00 PM

Weather Conditions: SUN, 87° (HOT)

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK-DRY

Drainage Spillways & Outfalls: OK-DRY

Roadways: GOOD

Vegetation: GOOD

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

Rasmussen 32504

Ozone Sparge System Inspection

DATE	April 7, 2017	April 12, 2017	April 19, 2017	April 28, 2017	May 5, 2017
OPERATOR SIGNATURE	A. Rapai	A. Rapai	A. Rapai	A. Rapai	A. Rapai

Air Compressor					
Output Pressure psi	110	110	105	105	105
Temperature F	183	183	185	180	179
Run Time hours	999	1117	1285	1495	1663

Air Sep					
Receiver Pressure psi	58	54	60	54	54
Feed Air Pressure psi	110	110	110	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	115729.7	115849.9	116017.5	116228.7	116397.8

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	38	35	36	36	35
Regulator #2 psi	22	21	20	22	22
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	1	1	1	1	1
Zone Time hours	1/2	1/2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3	–				

Comments:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	May 10, 2017	May 18, 2017	May 25, 2017	June 7, 2017	June 11, 2017
OPERATOR SIGNATURE	A Rapai	A Rapai	A Rapai	A Rapai	A Rapai

Air Compressor					
Output Pressure psi	120	120	115	115	115
Temperature F	181	183	181	182	181
Run Time hours	1783	1977	2145	2459	2547

Air Sep					
Receiver Pressure psi	54	54	54	54	56
Feed Air Pressure psi	110	110	105	110	100
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	116518.4	116714.1	116883.3	117197.6	117288.1

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	34	35	34	36
Regulator #2 psi	21	21	22	22	22
Alarm Reading ppm, O3	-	-	-	-	-
Zone On	3	1	1	1	1
Zone Time hours	2	1/2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments: PERFORMED 2,000 HR PREVENTATIVE MAINTENANCE ON COMPRESSOR.

Rasmussen 32504

Ozone Sparge System Inspection

DATE	June 13, 2017	June 20, 2017	June 29, 2017		
OPERATOR SIGNATURE	A Rapai	A Rapai			

Air Compressor					
Output Pressure psi	115	120	120		
Temperature F	184	184	184		
Run Time hours			2971		

Air Sep					
Receiver Pressure psi	54	54	54		
Feed Air Pressure psi	110	115	115		
Cycle Pressure psi	70	70	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours			117721.4		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	7	7		
% O3 capacity	45	45	45		
Regulator #1 psi	36	34	35		
Regulator #2 psi	24	22	22		
Alarm Reading ppm, O3	–	–	–		
Zone On	1	2	3		
Zone Time hours	1/2	1/2	2		

Distribution Panel					
CFM	0.8	0.8	0.8		
O3 Feed Conc. Ppm O3					

Comments:

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	April 12 & 28		DATE:	May 10 & 18		DATE:	June 7-13	
WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL
SW-1	0.8	9	SW-1	0.8	8	SW-1	0.8	8
SW-2	0.7	8	SW-2	0.8	9	SW-2	0.7	8
SW-3	0.7	15	SW-3	0.8	15	SW-3	0.7	15
SW-4	0.8	15	SW-4	0.8	16	SW-4	0.8	16
SW-5	0.8	15	SW-5	0.8	15	SW-5	0.8	16
SW-6	0.8	15	SW-6	0.7	16	SW-6	0.8	16
SW-7	0.7	15	SW-7	0.7	14	SW-7	0.8	16
SW-8	—	—	SW-8	—	—	SW-8	—	—
SW-9	—	—	SW-9	—	—	SW-9	—	—
SW-10	—	—	SW-10	—	—	SW-10	—	—
SW-11	—	—	SW-11	—	—	SW-11	—	—
SW-12	0.8	15	SW-12	0.8	15	SW-12	0.8	15
SW-13	0.8	2	SW-13	0.7	2	SW-13	0.8	2
SW-14	—	—	SW-14	—	—	SW-14	—	—
SW-15	—	—	SW-15	—	—	SW-15	—	—
SW-16	—	—	SW-16	—	—	SW-16	—	—
SW-17	0.8	16	SW-17	0.8	17	SW-17	0.8	16
SW-18	0.7	16	SW-18	0.8	16	SW-18	0.7	17
SW-19	0.8	16	SW-19	0.7	16	SW-19	0.7	16
SW-20	0.8	16	SW-20	0.8	17	SW-20	0.7	17
SW-21	—	—	SW-21	—	—	SW-21	—	—
SW-22	0.8	14	SW-22	0.8	15	SW-22	0.8	15
SW-23	0.8	15	SW-23	0.8	15	SW-23	0.8	15
SW-24	0.7	15	SW-24	0.8	15	SW-24	0.8	14
SW-25	0.8	15	SW-25	0.7	16	SW-25	0.8	16
SW-26	0.8	7	SW-26	0.7	7	SW-26	0.8	7
SW-27	0.7	6	SW-27	0.8	7	SW-27	0.7	6
SW-28	0.7	6	SW-28	0.8	7	SW-28	0.8	6
SW-29	0.8	7	SW-29	0.8	7	SW-29	0.7	7
SW-30	—	—	SW-30	—	—	SW-30	—	—

3/31/2017 32504-25

WELL ID	LEVEL
MW-35	34.26
MW-41	47.70
MW-42	63.89
MW-47	53.99
MW-54	56.38
MW-55	37.11
MW-56	34.27
MW-58	21.69
EB-PZ-2	40.79
EB-PZ-4	53.80
EB-PZ-5	55.52
EB-PZ-6	55.25
PZ-103	58.51
PZ-104	55.77
PZ-105	52.15
PZ-106	39.97
TEMP-PZ-2	54.29

32504-25 5/7/17

TASK: BEGIN 1ST/LY SAMPLE EVENT
GND: STEVE RAPA
WEATHER: SUN 65°, HIGH 75°
H&S: LEVEL D
TAILGATE: PINCH POINTS, LIFTING, STINGING/BITING INSECTS, WORKING WITH ACID PRESERVED & GLASS SAMPLE BOTTLES.
CALIBRATION OF U-22 HORIBA NF07597
pH=4.00, COND=4.50, TURB=0.0, D.O.=9.52 mg/L, TEMP.=17.03°C

SAMPLE OF CRA-RA-2D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1135	6.68	1.89	15.0	7.64	11.76
1150	6.73	1.75	6.5	0.15	11.49
1200	6.72	1.74	4.4	0.12	11.56
1205	6.72	1.74	3.0	0.11	11.61
1210	6.72	1.74	2.1	0.11	11.61
1215	6.72	1.74	2.0	0.11	11.61

SAMPLED @ 1216 ID: GW-32504-060717-SR-2082

SAMPLE OF CRA-RA-2B

1225	7.01	0.95	1.3	9.18	11.59
1240	6.77	1.00	0.0	0.10	11.42

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6/7/17 32504.25

SAMPLE OF CRA-RA-28 (CONTINUED)

TIME	pH	COND	TURB.	D.O.	TEMP.
1245	6.78	1.00	0.7	0.12	11.42
1250	6.80	1.00	0.0	0.09	11.42
1255	6.80	1.00	0.0	0.10	11.42
1300	6.80	1.00	0.0	0.10	11.42

SAMPLED @ 1301 ID: GW-32504-060717-SR-2083

SAMPLE OF PZ-104

1315	7.29	1.46	1.7	9.10	12.07
1330	6.87	1.42	2.3	6.13	11.68
1340	6.87	1.42	1.5	0.08	11.68
1345	6.88	1.43	1.4	0.10	11.67
1350	6.88	1.43	1.8	0.10	11.67
1355	6.87	1.43	1.4	0.09	11.67

SAMPLED @ 1356 ID: GW-32504-060717-SR-2084

SAMPLE OF CRA-RA-24

1410	7.12	1.10	6.0	5.61	12.54
1430	6.89	1.11	3.0	0.12	12.04
1435	6.88	1.11	1.0	0.10	12.07
1440	6.88	1.11	1.0	0.09	11.86
1445	6.88	1.11	1.2	0.11	11.89
1450	6.88	1.11	1.1	0.09	11.89

SAMPLED @ 1451 ID: GW-32504-060717-SR-2085

32504.25 6/7/17

SAMPLE OF CRA-RA-32

TIME	pH	COND.	TURB.	D.O.	TEMP.
1510	7.27	0.014	7.2	8.52	12.20
1525	6.98	0.015	1.3	0.21	11.87
1530	6.97	0.016	0.0	0.15	11.65
1535	6.97	0.016	0.0	0.11	11.64
1540	6.96	0.016	0.0	0.12	11.65
1545	6.96	0.016	0.0	0.10	11.65

SAMPLED @ 1546 ID: GW-32504-060717-SR-2086

SAMPLE OF CRA-RA-30

1555	6.96	1.15	26.0	3.03	11.54
1605	6.96	1.15	7.0	0.19	11.40
1615	6.96	1.15	3.3	0.14	11.36
1620	6.96	1.15	2.9	0.11	11.34
1625	6.96	1.15	1.7	0.10	11.34
1630	6.96	1.15	1.3	0.10	11.34

SAMPLED @ 1631 ID: GW-32504-060717-SR-2087

SAMPLES PACKED IN COOLER WITH ICE

6/8/17 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: SUN 64°, HIGH 80°F

H&S: LEVEL D

TAILGATE: CONNECTING MP50 TO TRUCK BATTERY, WORKING WITH PRESERVED/GLASS SAMPLE BOTTLES, LIFTING.

CALIBRATION OF HORIBA U-22, NF07597: pH=4.00, COND.=4.49, TURB=0.0 NTU, D.O.=8.02 mg/L, TEMP.=29.43°C

SAMPLE OF

TIME	pH	COND.	TURB.	D.O.	TEMP.
1125	6.21	1.09	3.1	4.84	12.48
1145	6.14	0.866	0.0	1.05	11.99
1150	6.10	0.850	2.3	1.14	11.96
1155	6.13	0.878	1.9	1.53	12.02
1200	6.19	0.917	1.3	2.20	12.04
1205	6.25	0.931	1.4	5.22	11.64
1210	6.25	0.945	0.9	3.22	11.65
1215	6.26	0.975	1.0	1.93	11.78
1220	6.29	0.987	0.9	1.39	11.67
1225	6.32	0.990	0.9	1.05	11.86
1230	6.34	0.995	0.3	0.99	11.64

PURGED WELL FOR OVER 1 HOUR.

SAMPLED @ 1231 ID: GW-32504-060817-SR-2088

32504-25 6/8/17

SAMPLE OF TEMP-PZ-2

TIME	pH	COND.	TURB.	D.O.	TEMP.
1245	6.64	2.10	0.0	8.04	12.54
1305	6.66	2.07	0.0	0.10	12.26
1310	6.69	2.09	0.0	0.10	12.04
1315	6.71	2.09	0.0	0.08	11.90
1320	6.73	2.08	0.0	0.11	11.73
1325	6.74	2.08	0.0	0.09	11.73
1330	6.74	2.08	0.0	0.10	11.74

SAMPLED @ 1331 ID: GW-32504-060817-SR-2089

SET UP AT CRA-RA-29 BUT COULD NOT GET WELL TO PRODUCE. CHECKED WATER LEVEL & FOUND SEVERAL INCHES OF WATER ABOVE TOP OF PUMP. PULLED PUMP OUT OF WELL & DISMANTLED. FOUND COLLAPSED BLADDER INSIDE PUMP. HAD ONE EXTRA ON HAND IN TREATMENT BUILDING. INSTALLED REPAIRED PUMP BACK DOWN WELL & RESTARTED. WILL ALLOW WELL TO PURGE FOR 1/2 HR BEFORE TAKING READINGS IN FLOW CELL

6/8/17 32504-25

SAMPLE OF CRA-RA-29

TIME	pH	COND.	TURB.	D.O.	TEMP.
1430	7.60	1.10	3.2	10.55	14.16
1440	6.82	1.07	2.8	5.89	12.21
1445	6.77	1.07	3.0	5.81	11.84
1450	6.71	1.07	2.7	5.76	11.81
1455	6.67	1.07	2.5	5.74	11.82
1500	6.66	1.07	2.3	5.73	11.82
1505	6.66	1.07	2.6	5.74	11.81

SAMPLED @ 1506 ID: GW-32504-060817-SR-2090

SAMPLE OF 81-8

1515	7.30	0.642	0.0	14.89	12.99
1530	7.59	0.536	0.0	+19.99	12.23
1535	7.61	0.534	0.0	+19.99	12.28
1540	7.63	0.534	0.0	+19.99	11.67
1545	7.64	0.533	0.0	+19.99	11.73
1550	7.65	0.531	0.0	+19.99	11.72
1555	7.65	0.531	0.0	+19.99	11.72

SAMPLED @ 1556 ID: GW-32504-060817-SR-2091

SAMPLES PACKED IN COOLER WITH ICE FOR DROP OFF @ TEST AMERICA

32504-25 6/11/17

TASK: CONTINUE 1/4LY SAMPLE EVENT
GHD: STEVE RAPA
WEATHER: SUN, HIGH 90°F
H&S: LEVEL D
TAILGATE: HEAT STRESS, PRESERVED SAMPLE BOTTLES, PINCH POINTS, LIFTING, CONNECTING MP50 TO TRUCK BATTERY
CALIBRATION OF U-22 HORIBA NF07597
pH=4.00, COND=4.49, TURB=0.0, D.O.=8.25
TEMP=34.36

SAMPLE OF CRA-RA-31

TIME	pH	COND.	TURB.	D.O.	TEMP.
1030	6.02	0.601	2.9	7.55	12.58
1045	6.16	0.90	1.5	0.18	11.56
1050	6.16	0.90	0.0	0.12	11.55
1055	6.16	0.90	0.0	0.11	11.53
1100	6.16	0.90	0.0	0.11	11.54
1105	6.16	0.90	0.0	0.12	11.54

SAMPLED @ 1106 ID: GW-32504-061117-SR-2092

SAMPLE OF CRA-RA-7

1115	6.36	0.442	2.5	5.14	11.35
1130	6.28	0.424	0.0	0.13	10.99

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6/8/17 32504-25

SAMPLE OF CRA-RA-29

TIME	pH	COND.	TURB.	D.O.	TEMP.
1430	7.60	1.10	3.2	10.55	14.16
1440	6.82	1.07	2.8	5.89	12.21
1445	6.77	1.07	3.0	5.81	11.84
1450	6.71	1.07	2.7	5.76	11.81
1455	6.67	1.07	2.5	5.74	11.82
1500	6.66	1.07	2.3	5.73	11.82
1505	6.66	1.07	2.6	5.74	11.81

SAMPLED @ 1506 ID: GW-32504-060817-SR-2090

SAMPLE OF 81-8

1515	7.30	0.642	0.0	14.89	12.99
1530	7.59	0.536	0.0	+19.99	12.23
1535	7.61	0.534	0.0	+19.99	12.28
1540	7.63	0.534	0.0	+19.99	11.67
1545	7.64	0.533	0.0	+19.99	11.73
1550	7.65	0.531	0.0	+19.99	11.72
1555	7.65	0.531	0.0	+19.99	11.72

SAMPLED @ 1556 ID: GW-32504-060817-SR-2091

SAMPLES PACKED IN COOLER WITH ICE FOR DROP OFF @ TEST AMERICA

32504-25 6/11/17

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPA

WEATHER: SUN, HIGH 90°F

H&S: LEVEL D

TAILGATE: HEAT STRESS, PRESERVED SAMPLE BOTTLES, PINCH POINTS, LIFTING, CONNECTING MP50 TO TRUCK BATTERY

CALIBRATION OF U-22 HORIBA NF0759 7

pH=4.00, COND=4.49, TURB=0.0, D.O.=8.25

TEMP=34.36

SAMPLE OF CRA-RA-31

TIME	pH	COND.	TURB.	D.O.	TEMP.
1030	6.02	0.601	2.9	7.55	12.58
1045	6.16	0.90	1.5	0.18	11.56
1050	6.16	0.90	0.0	0.12	11.55
1055	6.16	0.90	0.0	0.11	11.53
1100	6.16	0.90	0.0	0.11	11.54
1105	6.16	0.90	0.0	0.12	11.54

SAMPLED @ 1106 ID: GW-32504-061117-SR-2092

SAMPLE OF CRA-RA-7

1115	6.36	0.442	2.5	5.14	11.35
1130	6.28	0.424	0.0	0.13	10.99

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6/11/17 32504-25

SAMPLE OF CRA-RA-7 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1140	6.33	0.399	0.0	0.20	11.00
1145	6.37	0.389	0.0	0.36	10.98
1150	6.38	0.387	0.0	0.35	10.99
1155	6.38	0.386	0.0	0.36	11.00

SAMPLED @ 1156 ID:GW-32504-061117-SR-2093

SAMPLE OF CRA-RA-8

1210	6.63	0.403	2.1	7.39	9.56
1225	6.60	0.432	0.0	5.72	9.53
1235	6.65	0.434	0.0	5.69	9.47
1240	6.70	0.435	0.0	5.67	9.46
1245	6.69	0.435	0.0	5.66	9.46
1250	6.69	0.435	0.0	5.67	9.47

SAMPLED @ 1251 ID:GW-32504-061117-SR-2094

SAMPLED @ 1300 ID:GW-32504-061117-SR-2095

BOTH SAMPLES PART OF ANNUAL PROGRAM & SAMPLED FOR VOC, SVOC, TOTAL & DISSOLVED METALS. SAMPLES FOR DISSOLVED METALS HAVE BEEN FIELD FILTERED

SAMPLES PACKED IN COOLER WITH ICE

32504-25 6/12/17

TASK: CONTINUE 1/4LY SAMPLE EVENT

GRD: STEVE RAPA

WEATHER: SUN 93°F

H&S: LEVEL D

TAILGATE: HEAT STRESS, LIFTING, MP50, SAMPLE BOTTLES, STINGING/BITING INSECTS

CALIBRATION OF U-22 HORIBA, NF 07597: pH=4.00, COND.=4.49, TURB.=0.0, D.O.=8.68, TEMP.=35.38.

SAMPLE OF CRA-RA-5

TIME	pH	COND.	TURB.	D.O.	TEMP.
1200	5.99	1.07	5.4	5.56	12.89
1220	5.97	0.98	0.0	0.27	12.20
1225	5.95	1.05	0.0	0.13	12.42
1230	5.94	1.05	0.0	0.11	12.45
1235	5.95	0.97	0.0	0.08	12.46
1245	5.95	0.97	0.0	0.08	12.45
1250	5.95	0.97	0.0	0.08	12.44

SAMPLED @ 1251 ID:GW-32504-061217-SR-2096

SAMPLE OF CRA-RA-6S

1300	6.02	0.786	3.9	2.75	14.11
1315	6.01	0.93	0.0	0.17	13.85

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6/12/17 32504.25

SAMPLE OF CRA-RA-65 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1325	6.07	0.90	0.0	0.13	13.92
1330	6.08	0.90	0.0	0.09	13.92
1335	6.08	0.90	0.0	0.10	13.92
1340	6.08	0.90	0.0	0.11	13.91

SAMPLED @ 1341 ID: GW-32504-061217-SR-2097

ANNUAL LANDFILL SAMPLE: VOC, SVOC, TOTAL & DISSOLVED METALS. DISSOLVED METALS HAVE BEEN FIELD FILTERED.

SAMPLE OF CRA-RA-27

1400	6.64	1.40	0.0	0.65	12.42
1415	6.43	1.43	0.0	0.10	12.04
1420	6.38	1.41	0.0	0.10	12.00
1425	6.36	1.40	0.0	0.10	11.99
1430	6.35	1.40	0.0	0.10	11.99
1435	6.35	1.40	0.0	0.10	11.99

SAMPLED @ 1436 ID: GW-32504-061217-SR-2098

SAMPLE OF CRA-RA-26S

1455	6.72	1.04	0.0	3.52	13.34
1515	6.50	1.01	0.0	2.25	12.69
1520	6.50	1.01	0.0	2.25	12.59
1525	6.50	1.01	0.0	2.25	12.57

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32504.25 6/12/17

SAMPLE OF CRA-RA-26S (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1530	6.50	1.01	0.0	2.25	12.57

SAMPLED @ 1531 ID: GW-32504-061217-SR-2099

SAMPLE OF CRA-RA-26D

~~1500~~ 1540	7.08	1.24	3.9	5.63	14.50
1600	6.59	1.32	0.0	0.15	12.69
1605	6.60	1.38	0.0	0.12	12.64
1610	6.60	1.47	0.0	0.10	12.59
1615	6.60	1.32	0.0	0.13	12.58
1620	6.60	1.32	0.0	0.11	12.58

SAMPLED @ 1621 ID: GW-32504-061217-SR-2100

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

6/13/17 32504-25

TASK: FINISH 2ND QTLY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: SUN, HIGH 89°; STORMS LATER

H&S: LEVEL D

TAILGATE: HEAT STRESS, SAMPLE BOTTLES, TICKS & WASPS, MP50 CONNECTION TO TRUCK BATTERY, TRIP HAZARDS.

CALIBRATION OF U-22 HORIBA, NF07597

pH=4.00, COND.=4.49, TURB=0.0, D.O.=9.21

TEMP=36.47

SAMPLE OF RA-MW-28

TIME	pH	COND.	TURB	D.O.	TEMP.
1005	6.22	1.02	2.3	3.69	11.91
1025	6.10	0.97	0.0	2.77	11.59
1030	6.03	0.97	0.0	2.77	11.61
1035	6.02	0.97	0.0	2.72	11.59
1040	6.02	0.97	0.0	2.75	11.59

SAMPLED @ 1041 ID: GW-32504-061317-SR-2101

SAMPLE OF CRA-RA-19S

1055	6.07	1.11	5.0	0.86	10.90
1115	6.04	1.09	1.0	0.13	10.98
1120	6.07	1.11	0.0	0.08	11.01
1125	6.12	1.11	0.0	0.08	11.05

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32504-25 6/13/17

SAMPLE OF CRA-RA-19S (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1130	6.17	1.11	0.0	0.08	11.06
1135	6.18	1.11	0.0	0.08	11.06
1140	6.18	1.11	0.0	0.08	11.06

SAMPLED @ 1141 ID: GW-32504-061317-SR-2102

SAMPLED @ 1150 ID: GW-32504-061317-SR-2103

ANNUAL LANDFILL WELL SAMPLED FOR: VOC, SVOC, TOTAL & DISSOLVED METALS.

DISSOLVED METALS HAVE BEEN FIELD FILTERED.

SAMPLE OF CRA-RA-18

1210	6.84	1.54	0.0	6.37	11.82
1230	6.68	1.50	0.0	5.28	11.81
1235	6.69	1.51	0.0	5.29	11.82
1240	6.71	1.51	0.0	5.27	11.82
1245	6.73	1.51	0.0	5.28	11.81
1250	6.74	1.51	0.0	5.27	11.83
1255	6.74	1.51	0.0	5.27	11.81

SAMPLED @ 1256 ID: GW-32504-061317-SR-2104

MS/MSD

ANNUAL LANDFILL WELL SAMPLED FOR VOC, SVOC, TOTAL & DISSOLVED METALS.

DISSOLVED METALS HAVE BEEN FIELD FILTERED.

6/13/17 32504-25

SAMPLE OF 81-4

TIME	pH	COND.	TURB.	D.O.	TEMP.
1415	6.90	1.41	6.2	2.36	12.42
1435	6.41	1.40	0.0	0.39	11.81
1440	6.39	1.40	0.0	0.17	11.94
1445	6.36	1.40	0.0	0.11	11.71
1450	6.36	1.39	0.0	0.10	11.72
1455	6.36	1.39	0.0	0.15	11.72

SAMPLED @ 1456 ID: GW-32504-061317-SR-2105

SAMPLE OF RA-RA-23D

1515	6.64	0.796	0.0	1.62	10.82
1535	6.41	0.801	0.0	0.51	10.90
1540	6.44	0.798	0.0	0.50	10.87
1545	6.46	0.797	0.0	0.48	10.90
1550	6.47	0.797	0.0	0.48	10.90
1555	6.47	0.797	0.0	0.47	10.90

SAMPLED @ 1556 ID: GW-32504-061317-SR-2106

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

32504-25 6/30/17

TASK: QUARTERLY WATER LEVELS

GHD: STEVE RAPAI

WEATHER: PARTLY CLOUDY, CHANCE OF STORMS HIGH 88°F

H&S: LEVEL D

TAILGATE: PINCH POINTS, STINGING INSECTS, HEAT STRESS

WELL ID	LEVEL
81-4	28.00
81-5	32.36
81-7	45.94
81-8	41.58
81-9	14.11
RA-1	67.20
RA-2D	54.01
RA-2S	53.70
RA-3	50.75
RA-5	52.86
RA-6S	57.29
RA-7	30.69
RA-8	14.79
RA-16	55.96
RA-18	39.66
RA-18D	54.33

32504.25 6/30/17

WELL ID	LEVEL
CRA-RA-19D	48.28
CRA-RA-19S	45.65
" RA-20	56.48
" RA-22	51.88
RA-23D	29.80
RA-23S	31.23
RA-24	54.71
RA-25	52.22
RA-26D	47.95
RA-26S	47.77
RA-27	59.59
RA-28	52.54
RA-29	44.39
RA-30	56.53
RA-31	30.22
RA-32	33.10
RA-33	30.36
RA-34	39.89
RA-35	30.35
RA-36	34.60
RA-37	34.28
MW-22	40.25
MW-28	55.20
MW-32	32.96

32504.25 6/30/17

WELL ID	LEVEL
MW-34C	21.85
MW-35	31.85
MW-41	45.86
MW-42	61.49
MW-47	51.55
MW-54	54.03
MW-55	34.74
MW-56	34.59
MW-58	19.39
EB-PZ-2	38.43
EB-PZ-4	51.41
EB-PZ-5	53.21
EB-PZ-6	52.98
PZ-103	56.10
PZ-104	53.35
PZ-105	49.75
PZ-106	34.36
TEMP-PZ-2	51.93
81-10	30.40

October 10, 2017

Reference No. 032504

Mr. Howard Caine
United States Environmental Protection Agency
Region V (SR-6J)
77 W. Jackson Boulevard
Chicago, Illinois
60604

Dear Mr. Caine:

Re: Progress Report No. 140
Groundwater and Landfill RD/RA
Reporting Period: July 1 through September 30, 2017
Rasmussen Landfill (Site), Livingston Co., Michigan

1. Introduction

This Progress Report is submitted in accordance with Paragraph 26 of the Consent Decree, Civil Action No. 92 40071. This report summarizes the activities performed during the reporting period and describes the activities to continue or which are scheduled to start during the next reporting period.

2. Activities Performed During this Reporting Period

2.1 Operation and Maintenance

The quarterly round of groundwater elevations were measured on September 27, 2017. The corresponding groundwater contour map is provided on Figure 1.

GHD collected quarterly groundwater samples on September 6-7 and September 11-13, 2017, for the Groundwater Remediation Monitoring Program. The results from these samples are discussed below.

2.2 Reports

Quarterly Progress Report No. 139 was submitted to USEPA and Michigan Department of Environmental Quality (MDEQ) on July 10, 2017.

3. Summary of Findings

Third Quarter 2017 Groundwater Quality Monitoring

The results of the third quarter 2017 sampling are provided in Tables 1 through 4. Figure 2 is a Site location map showing the wells included in the quarterly Groundwater Remediation Monitoring Program and the annual Landfill Monitoring Program.

During the third quarter 2017 sampling, six of the 25 monitoring wells sampled had Compounds of Concern (COCs) at concentrations above Part 201 December 2013 Generic Residential Drinking Water Cleanup Criteria (RDWCC).

Specifically, the six monitoring wells with COCs exceeding RDWCC are:

- CRA-RA-22 4.0 µg/L vinyl chloride
- CRA-RA-24 4.5 µg/L vinyl chloride
- CRA-RA-26S 69 J µg/L trichloroethene
- CRA-RA-27 9.9 µg/L vinyl chloride
- CRA-RA-30 4.4 µg/L vinyl chloride
- CRA-RA-33 3.2 µg/L vinyl chloride

The concentration of vinyl chloride in the groundwater samples collected from CRA-RA-33 increased from 1.3 µg/L in the second quarter of 2017 to 3.2 µg/L in the third quarter. Since CRA-RA-33 was installed in June 2015, the concentration of vinyl chloride has ranged from 1.1 µg/L to 4.4 µg/L. The other five monitoring wells had COCs above RDWCC during the second quarter 2017 sampling event.

GHD collected the annual Rasmussen residential water well sample in the third quarter 2017. No COCs were detected.

Lower Aquifer monitoring well RA-MW-47 serves as a sentry well for the Lower Aquifer. An annual groundwater sample was collected from RA-MW-47 during the third quarter 2016 sampling. No COCs were detected in the groundwater sample collected from this well.

COC Contours

The Rasmussen Site Remediation Group (RSRG) provides contour maps of current COC distribution following completion of the third quarter sampling. GHD prepared an update of COC distribution based on data collected in 2017. The 2015 COC plume map is provided on Figure 3. Figure 4 provides a COC plume map based on the data collected in 2017. There were minor changes in the concentration of COCs in 2017 as compared to 2016, as follows:

Vinyl Chloride

Monitoring Well	Q3 2016 Result (µg/L)	Q3 2017 Result (µg/L)
CRA-RA-22	3.3	4.0
CRA-RA-24	4.9	4.5
CRA-RA-27	9.1	9.9
CRA-RA-30	3.3	4.4

Monitoring Well	Q3 2016 Result (µg/L)	Q3 2017 Result (µg/L)
CRA-RA-33	2.8	3.2
CRA-RA-35	1.1	ND(1.0)
81-4	1.6	2.0
PZ-104	ND(1.0)	1.0
(D) – duplicate sample		

The concentration of vinyl chloride at CRA-RA-24 and CRA-RA-35 decreased slightly in 2015, while concentrations of vinyl chloride increased slightly at 81-4, CRA-RA-22, CRA-RA-30 , CRA-RA-27, CRA-RA-33 and PZ-104.

Trichloroethene

Monitoring Well	Q3 2016 Result (µg/L)	Q3 2017 Result (µg/L)
CRA-RA-23D	2.1	1.5/1.6 (duplicate)
CRA-RA-26S	78	69

The trichloroethene concentrations decreased slightly in the groundwater samples collected from CRA-RA-23D and more significantly in the groundwater samples collected from CRA-RA-26S.

Trend Analysis

GHD completed trend analysis for benzene, trichloroethene and vinyl chloride groundwater data from monitoring wells included in the Groundwater Remediation Monitoring Program and the Annual Landfill Monitoring Program. Statistical analysis of concentration trends over the last eight quarterly monitoring events was completed using the Mann-Kendall Trend Test to provide insight into recent changes in COC concentrations. Tables 5 through 7 provide a summary of the trend analyses. No increasing trends were observed.

A total of 99 data sets (3 parameters x 33 wells) were analyzed. Eighty five data sets (86%) did not include detectable concentrations and another three data sets (3%) included more than 50% non-detects. These data sets are not suitable for trends analysis. Of the remaining 11 data sets, eight exhibited no trend and three data sets were decreasing, as follows:

Compound	Well
Trichloroethene	CRA-RA-23D
Vinyl Chloride	CRA-RA-24
Vinyl Chloride	CRA-RA-35

Trend analysis indicated that benzene, trichloroethene, and vinyl chloride concentrations have remained stable or decreased over the last two years at all monitoring points analyzed.

4. Problems Encountered

None encountered.

5. Corrective Measures to Rectify Problems

None required.

6. Contacts and Significant Correspondence with Public Representatives

Communication	Date	Subject of Correspondence/Discussion
Quarterly Report	July 10, 2017	Report No. 139 submitted to H. Caine (USEPA) and K. Krawczyk (MDEQ)
Emails	September 18, 2017	H. Caine (EPA) and B. Bartholomy coordinating Site visit

7. Planned Upcoming Activities/Schedule

Activities planned for the fourth quarter of 2017 include:

- Continue the operation of ozone sparging system
- Continue to monitor for the presence of ozone at each sparge vault
- The fourth quarter 2017 groundwater sampling event is scheduled for the week of November 20, 2017
- The wells to be sampled in the fourth quarter of 2017 are listed in Table 8

Should you have any questions on the above, please do not hesitate to contact the undersigned.

Yours truly,

GHD

For Bart Bartholomy

AJD/cb/52

Encl.

cc: Mike Stoelton, JCI
Colleen Liddell, Ford
Karyllan Dodson Mack, BASF
Michael Simpson
Steven Nadeau, Honigman

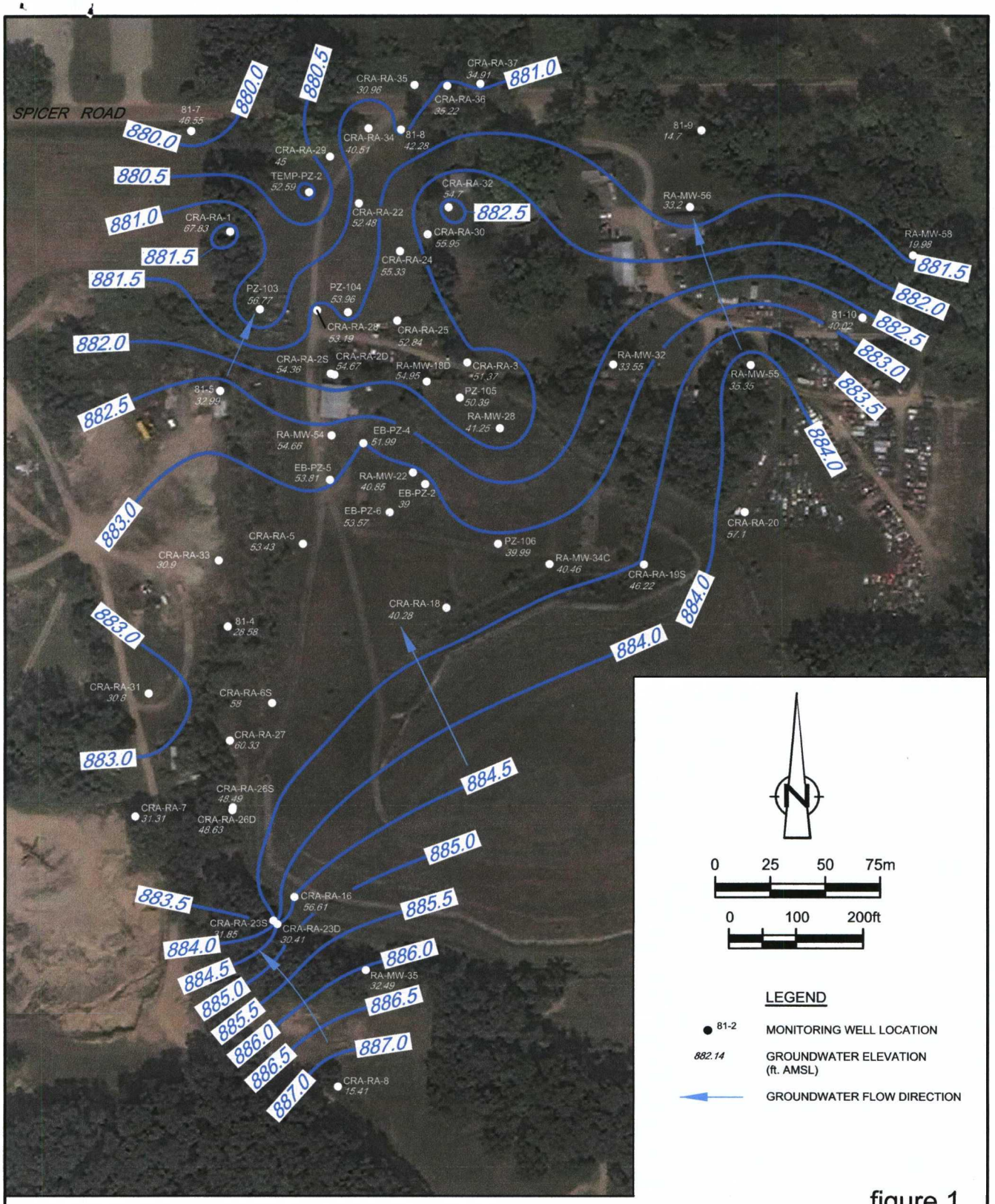


figure 1

GROUNDWATER ELEVATION CONTOURS (UPPER AQUIFER)
SEPTEMBER 27 2017
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

GHD

32504-15(CAIN052)GN-WA001 OCT 3, 2017

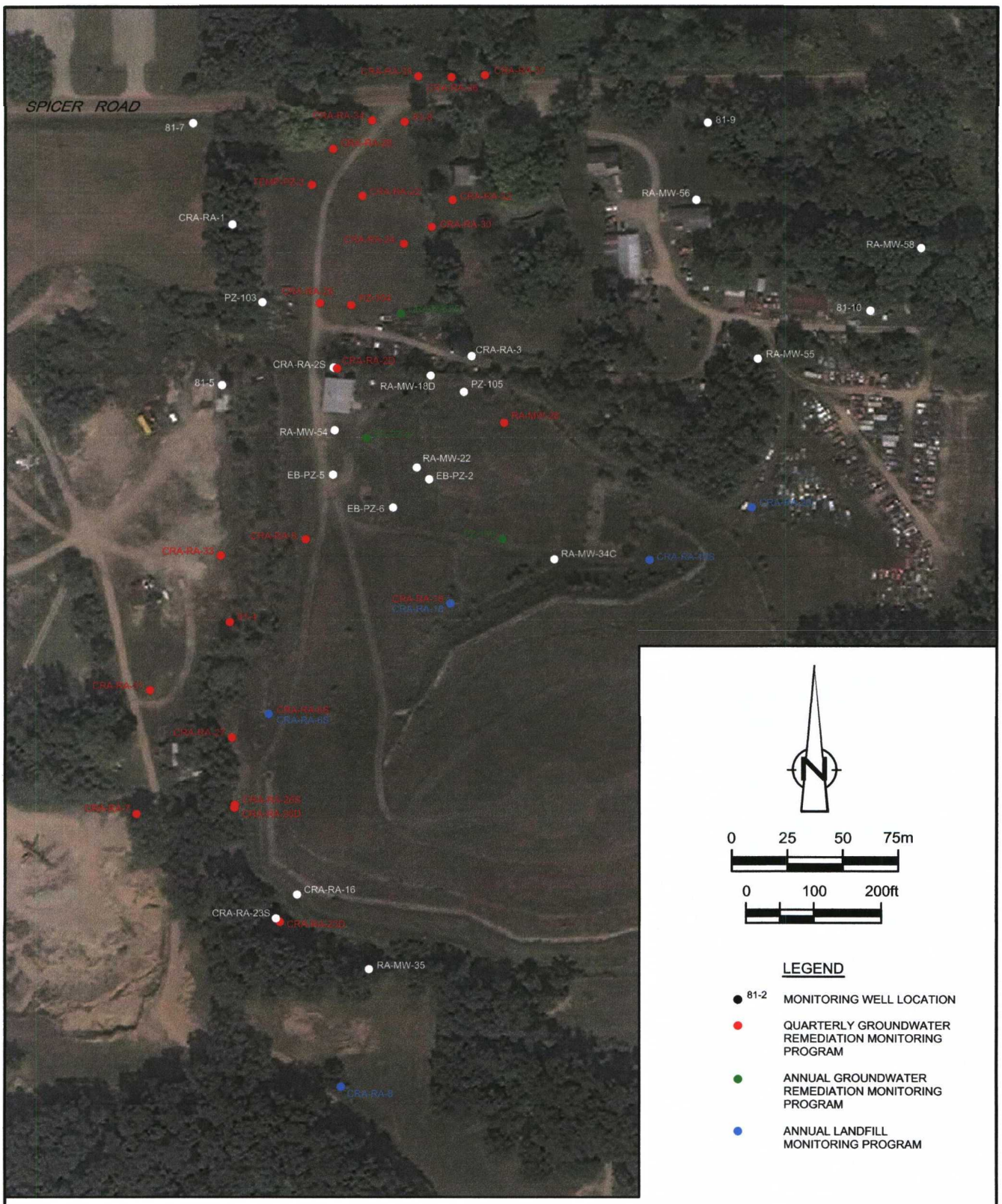
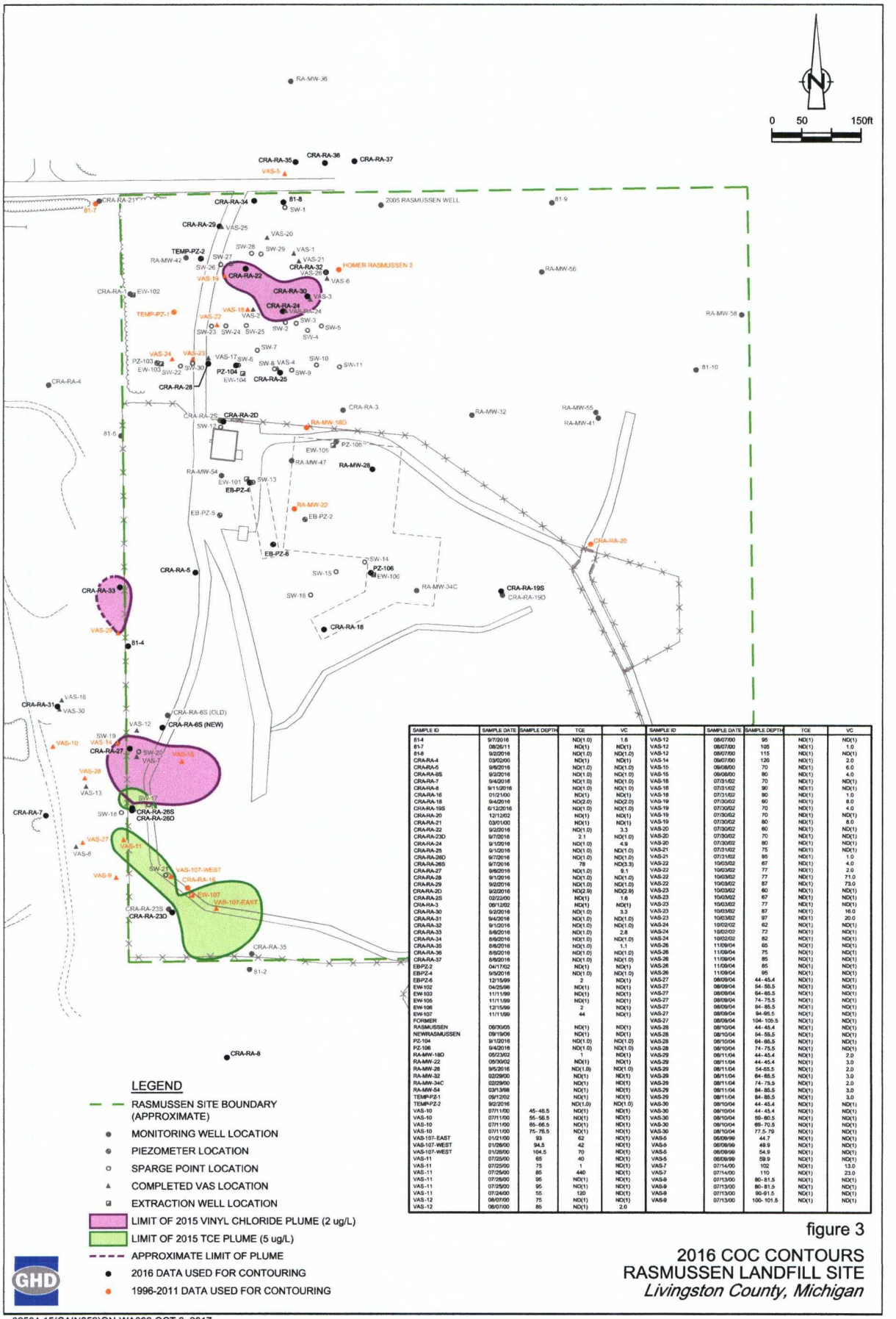


figure 2

2017 GROUNDWATER MONITORING PROGRAMS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN052)GN-WA002 OCT 3, 2017



SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC
81-4	9/7/2016		ND(1.0)	1.6
81-7	08/26/11		ND(1)	ND(1)
81-8	9/2/2016		ND(1.0)	ND(1.0)
CRA-RA-4	03/02/00		ND(1)	ND(1)
CRA-RA-5	9/8/2016		ND(1.0)	ND(1.0)
CRA-RA-6S	9/2/2016		ND(1.0)	ND(1.0)
CRA-RA-7	9/4/2016		ND(1.0)	ND(1.0)
CRA-RA-8	9/11/2016		ND(1.0)	ND(1.0)
CRA-RA-16	01/21/00		ND(1)	ND(1)
CRA-RA-18	9/4/2016		ND(2.0)	ND(2.0)
CRA-RA-19S	6/12/2016		ND(1.0)	ND(1.0)
CRA-RA-20	12/12/02		ND(1)	ND(1)
CRA-RA-21	03/01/00		ND(1)	ND(1)
CRA-RA-22	9/2/2016		ND(1.0)	3.3
CRA-RA-23D	9/7/2016		2.1	ND(1.0)
CRA-RA-24	9/1/2016		ND(1.0)	4.9
CRA-RA-25	9/1/2016		ND(1.0)	ND(1.0)
CRA-RA-26D	9/7/2016		ND(1.0)	ND(1.0)
CRA-RA-26S	9/7/2016		78	ND(3.3)
CRA-RA-27	9/8/2016		ND(1.0)	9.1
CRA-RA-28	9/1/2016		ND(1.0)	ND(1.0)
CRA-RA-29	9/2/2016		ND(1.0)	ND(1.0)
CRA-RA-2D	9/2/2016		ND(2.9)	ND(2.9)
CRA-RA-2S	02/22/00		ND(1)	1.6
CRA-RA-3	06/12/02		ND(1)	ND(1)
CRA-RA-30	9/2/2016		ND(1.0)	3.3
CRA-RA-31	9/4/2016		ND(1.0)	ND(1.0)
CRA-RA-32	9/1/2016		ND(1.0)	ND(1.0)
CRA-RA-33	8/8/2016		ND(1.0)	2.8
CRA-RA-34	8/8/2016		ND(1.0)	ND(1.0)
CRA-RA-35	8/8/2016		ND(1.0)	1.1
CRA-RA-36	8/8/2016		ND(1.0)	ND(1.0)
CRA-RA-37	8/8/2016		ND(1.0)	ND(1.0)
EBPZ-2	04/17/02		ND(1)	ND(1)
EBPZ-4	9/8/2016		ND(1.0)	ND(1.0)
EBPZ-6	12/15/99		2	ND(1)
EW-102	04/25/96		ND(1)	ND(1)
EW-103	11/11/99		ND(1)	ND(1)
EW-105	11/11/99		ND(1)	ND(1)
EW-106	12/15/99		2	ND(1)
EW-107	11/11/99		44	ND(1)
FORMER RASMUSSEN	06/30/05		ND(1)	ND(1)
NEWRASMUSSEN	09/19/06		ND(1)	ND(1)
PZ-104	9/1/2016		ND(1.0)	ND(1.0)
PZ-106	9/4/2016		ND(1.0)	ND(1.0)
RA-MW-18D	05/23/02		1	ND(1)
RA-MW-22	05/30/02		ND(1)	ND(1)
RA-MW-28	9/5/2016		ND(1.0)	ND(1.0)
RA-MW-32	02/29/00		ND(1)	ND(1)
RA-MW-34C	02/29/00		ND(1)	ND(1)
RA-MW-54	03/13/98		ND(1)	ND(1)
TEMP-PZ-1	09/12/02		ND(1)	ND(1)
TEMP-PZ-2	9/2/2016		ND(1.0)	ND(1.0)
VAS-10	07/11/00	45- 46.5	ND(1)	ND(1)
VAS-10	07/11/00	55- 56.5	ND(1)	ND(1)
VAS-10	07/11/00	65- 66.5	ND(1)	ND(1)
VAS-10	07/11/00	75- 76.5	ND(1)	ND(1)
VAS-107-EAST	01/21/00	93	62	ND(1)
VAS-107-WEST	01/28/00	94.5	42	ND(1)
VAS-107-WEST	01/26/00	104.5	70	ND(1)
VAS-11	07/25/00	65	40	ND(1)
VAS-11	07/25/00	75	1	ND(1)
VAS-11	07/25/00	85	440	ND(1)
VAS-11	07/25/00	95	ND(1)	ND(1)
VAS-11	07/25/00	95	ND(1)	ND(1)
VAS-11	07/24/00	55	130	ND(1)
VAS-12	08/07/00	75	ND(1)	ND(1)
VAS-12	08/07/00	85	ND(1)	2.0

SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC
VAS-12	08/07/00	95	ND(1)	ND(1)
VAS-12	08/07/00	105	ND(1)	1.0
VAS-12	08/07/00	115	ND(1)	ND(1)
VAS-14	09/07/00	120	ND(1)	2.0
VAS-15	09/08/00	70	ND(1)	6.0
VAS-15	09/08/00	80	ND(1)	4.0
VAS-18	07/31/02	70	ND(1)	ND(1)
VAS-18	07/31/02	90	ND(1)	ND(1)
VAS-19	07/30/02	60	ND(1)	1.0
VAS-19	07/30/02	60	ND(1)	8.0
VAS-19	07/30/02	70	ND(1)	4.0
VAS-19	07/30/02	70	ND(1)	ND(1)
VAS-20	07/30/02	80	ND(1)	8.0
VAS-20	07/30/02	60	ND(1)	ND(1)
VAS-20	07/30/02	70	ND(1)	ND(1)
VAS-20	07/31/02	80	ND(1)	ND(1)
VAS-21	07/31/02	75	ND(1)	ND(1)
VAS-21	07/31/02	85	ND(1)	1.0
VAS-22	10/03/02	67	ND(1)	4.0
VAS-22	10/03/02	77	ND(1)	2.0
VAS-22	10/03/02	77	ND(1)	71.0
VAS-22	10/03/02	87	ND(1)	73.0
VAS-23	10/03/02	60	ND(1)	ND(1)
VAS-23	10/03/02	67	ND(1)	ND(1)
VAS-23	10/03/02	77	ND(1)	ND(1)
VAS-23	10/03/02	87	ND(1)	16.0
VAS-23	10/03/02	97	ND(1)	20.0
VAS-24	10/02/02	62	ND(1)	ND(1)
VAS-24	10/02/02	72	ND(1)	ND(1)
VAS-24	10/02/02	82	ND(1)	ND(1)
VAS-26	11/09/04	65	ND(1)	ND(1)
VAS-26	11/09/04	75	ND(1)	ND(1)
VAS-26	11/09/04	85	ND(1)	ND(1)
VAS-26	11/09/04	95	ND(1)	ND(1)
VAS-26	11/09/04	95	ND(1)	ND(1)
VAS-27	08/09/04	44- 45.4	ND(1)	ND(1)
VAS-27	08/09/04	54- 55.5	ND(1)	ND(1)
VAS-27	08/09/04	64- 65.5	ND(1)	ND(1)
VAS-27	08/09/04	74- 75.5	ND(1)	ND(1)
VAS-27	08/09/04	84- 85.5	ND(1)	ND(1)
VAS-27	08/09/04	94-95.5	ND(1)	ND(1)
VAS-27	08/09/04	104- 105.5	ND(1)	ND(1)
VAS-28	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-28	08/10/04	54- 55.5	ND(1)	ND(1)
VAS-28	08/10/04	64- 65.5	ND(1)	ND(1)
VAS-28	08/10/04	74- 75.5	ND(1)	ND(1)
VAS-29	08/11/04	44- 45.4	ND(1)	2.0
VAS-29	08/11/04	44- 45.4	ND(1)	3.0
VAS-29	08/11/04	54-55.5	ND(1)	2.0
VAS-29	08/11/04	64- 65.5	ND(1)	3.0
VAS-29	08/11/04	74- 75.5	ND(1)	2.0
VAS-29	08/11/04	84- 85.5	ND(1)	3.0
VAS-29	08/11/04	84- 85.5	ND(1)	3.0
VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-30	08/10/04	44- 45.4	ND(1)	ND(1)
VAS-30	08/10/04	59- 60.5	ND(1)	ND(1)
VAS-30	08/10/04	69- 70.5	ND(1)	ND(1)
VAS-30	08/10/04	77.5- 79	ND(1)	ND(1)
VAS-5	06/09/99	44.7	ND(1)	ND(1)
VAS-5	06/09/99	49.9	ND(1)	ND(1)
VAS-5	06/09/99	54.9	ND(1)	ND(1)
VAS-5	06/09/99	59.9	ND(1)	ND(1)
VAS-7	07/14/00	102	ND(1)	13.0
VAS-7	07/14/00	110	ND(1)	23.0
VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-9	07/13/00	80- 81.5	ND(1)	ND(1)
VAS-9	07/13/00	90-91.5	ND(1)	ND(1)
VAS-9	07/13/00	100- 101.5	ND(1)	ND(1)

figure 3

2016 COC CONTOURS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN052)GN-WA003 OCT 6, 2017

SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC	SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	TCE	VC
81-4	9/13/2017	1	ND(1.0)	2.0	VAS-12	8/7/2000	95	ND(1)	ND(1)
81-7	8/26/2011	1	ND(1)	ND(1)	VAS-12	8/7/2000	105	ND(1)	1.0
81-8	9/7/2017	1	ND(1.0)/ND(1.0)	ND(1.0)/ND(1.0)	VAS-12	8/7/2000	115	ND(1)	ND(1)
CRA-RA-4	3/2/2000	1	ND(1)	ND(1)	VAS-14	9/7/2000	120	ND(1)	2.0
CRA-RA-5	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-15	9/8/2000	70	ND(1)	6.0
CRA-RA-6S	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-15	9/8/2000	80	ND(1)	4.0
CRA-RA-7	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-18	7/31/2002	70	ND(1)	ND(1)
CRA-RA-8	6/11/2017	1	ND(1.0)	ND(1.0)	VAS-18	7/31/2002	90	ND(1)	ND(1)
CRA-RA-16	1/21/2000	1	ND(1)	ND(1)	VAS-18	7/31/2002	80	ND(1)	1.0
CRA-RA-18	9/11/2017	1	ND(2.0)	ND(2.0)	VAS-19	7/30/2002	60	ND(1)	8.0
CRA-RA-19S	6/13/2017	1	ND(1.0)/ND(1.0)	ND(1.0)/ND(1.0)	VAS-19	7/30/2002	70	ND(1)	4.0
CRA-RA-20	12/12/2002	1	ND(1)	ND(1)	VAS-19	7/30/2002	70	ND(1)	ND(1)
CRA-RA-21	3/1/2000	1	ND(1)	ND(1)	VAS-19	7/30/2002	80	ND(1)	8.0
CRA-RA-22	9/7/2017	1	ND(1.0)	4.0	VAS-20	7/30/2002	60	ND(1)	ND(1)
CRA-RA-23D	9/13/2017	1	1.5/1.6	ND(1.0)	VAS-20	7/30/2002	70	ND(1)	ND(1)
CRA-RA-24	9/6/2017	1	ND(1.0)	4.5	VAS-20	7/30/2002	80	ND(1)	ND(1)
CRA-RA-25	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-21	7/31/2002	75	ND(1)	ND(1)
CRA-RA-26D	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-21	7/31/2002	85	ND(1)	1.0
CRA-RA-26S	9/12/2017	1	69 J	ND(3.3)	VAS-22	10/3/2002	67	ND(1)	4.0
CRA-RA-27	9/12/2017	1	ND(1.0)	9.9	VAS-22	10/3/2002	77	ND(1)	2.0
CRA-RA-28	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-22	10/3/2002	77	ND(1)	71.0
CRA-RA-29	9/7/2017	1	ND(1.0)	ND(1.0)	VAS-22	10/3/2002	87	ND(1)	73.0
CRA-RA-2D	9/6/2017	1	ND(3.3)	ND(3.3)	VAS-23	10/3/2002	60	ND(1)	ND(1)
CRA-RA-2S	2/22/2000	1	ND(1)	1.6	VAS-23	10/3/2002	67	ND(1)	ND(1)
CRA-RA-3	6/12/2002	1	ND(1)	ND(1)	VAS-23	10/3/2002	77	ND(1)	ND(1)
CRA-RA-30	9/13/2017	1	ND(1.0)	4.4	VAS-23	10/3/2002	87	ND(1)	16.0
CRA-RA-31	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-23	10/3/2002	97	ND(1)	20.0
CRA-RA-32	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-24	10/2/2002	62	ND(1)	ND(1)
CRA-RA-33	9/6/2017	1	ND(1.0)	3.3	VAS-24	10/2/2002	72	ND(1)	ND(1)
CRA-RA-34	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-24	10/2/2002	82	ND(1)	ND(1)
CRA-RA-35	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-26	11/9/2004	65	ND(1)	ND(1)
CRA-RA-36	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-26	11/9/2004	75	ND(1)	ND(1)
CRA-RA-37	9/6/2017	1	ND(1.0)	ND(1.0)	VAS-26	11/9/2004	85	ND(1)	ND(1)
EB-PZ-2	4/17/2002	1	ND(1)	ND(1)	VAS-26	11/9/2004	85	ND(1)	ND(1)
EB-PZ-4	9/12/2017	1	ND(1.7)	ND(1.7)	VAS-26	11/9/2004	95	ND(1)	ND(1)
EB-PZ-6	12/15/1999	1	2	ND(1)	VAS-27	8/9/2004	44 - 45.4	ND(1)	ND(1)
EW-102	4/25/1996	1	ND(1)	ND(1)	VAS-27	8/9/2004	54 - 55.5	ND(1)	ND(1)
EW-103	11/11/1999	1	ND(1)	ND(1)	VAS-27	8/9/2004	64 - 65.5	ND(1)	ND(1)
EW-105	11/11/1999	1	ND(1)	ND(1)	VAS-27	8/9/2004	74 - 75.5	ND(1)	ND(1)
EW-106	12/15/1999	1	2	ND(1)	VAS-27	8/9/2004	84 - 85.5	ND(1)	ND(1)
EW-107	11/11/1999	1	44	ND(1)	VAS-27	8/9/2004	94 -95.5	ND(1)	ND(1)
FORMER RASMUSSEN	6/30/2005	1	ND(1)	ND(1)	VAS-27	8/9/2004	104 - 105.5	ND(1)	ND(1)
NEWRASMUSSEN	9/13/2017	1	ND(1.0)	ND(1.0)	VAS-28	8/10/2004	44 - 45.4	ND(1)	ND(1)
PZ-104	9/6/2017	1	ND(1.0)	1	VAS-28	8/10/2004	54 - 55.5	ND(1)	ND(1)
PZ-106	9/11/2017	1	ND(1.0)	ND(1.0)	VAS-28	8/10/2004	64 - 65.5	ND(1)	ND(1)
RA-MW-18D	5/23/2002	1	1	ND(1)	VAS-28	8/10/2004	74 - 75.5	ND(1)	ND(1)
RA-MW-22	5/30/2002	1	ND(1)	ND(1)	VAS-29	8/11/2004	44 - 45.4	ND(1)	2.0
RA-MW-28	9/12/2017	1	ND(1.0)	ND(1.0)	VAS-29	8/11/2004	44 - 45.4	ND(1)	3.0
RA-MW-32	2/29/2000	1	ND(1)	ND(1)	VAS-29	8/11/2004	54 -55.5	ND(1)	2.0
RA-MW-34C	2/29/2000	1	ND(1)	ND(1)	VAS-29	8/11/2004	64 - 65.5	ND(1)	3.0
RA-MW-54	3/13/1998	1	ND(1)	ND(1)	VAS-29	8/11/2004	74 - 75.5	ND(1)	2.0
TEMP-PZ-1	9/12/2002	1	ND(1)	ND(1)	VAS-29	8/11/2004	84 - 85.5	ND(1)	3.0
TEMP-PZ-2	9/7/2017	1	ND(1.0)	ND(1.0)	VAS-29	8/11/2004	84 - 85.5	ND(1)	3.0
VAS-10	7/11/2000	45 - 46.5	ND(1)	ND(1)	VAS-30	8/10/2004	44 - 45.4	ND(1)	ND(1)
VAS-10	7/11/2000	55 - 56.5	ND(1)	ND(1)	VAS-30	8/10/2004	44 - 45.4	ND(1)	ND(1)
VAS-10	7/11/2000	65 - 66.5	ND(1)	ND(1)	VAS-30	8/10/2004	59 - 60.5	ND(1)	ND(1)
VAS-10	7/11/2000	75 - 76.5	ND(1)	ND(1)	VAS-30	8/10/2004	69 - 70.5	ND(1)	ND(1)
VAS-107-EAST	1/21/2000	93	82	ND(1)	VAS-30	8/10/2004	77.5 - 79	ND(1)	ND(1)
VAS-107-WEST	1/26/2000	94.5	42	ND(1)	VAS-5	6/9/1999	44.7	ND(1)	ND(1)
VAS-107-WEST	1/26/2000	104.5	70	ND(1)	VAS-5	6/9/1999	49.9	ND(1)	ND(1)
VAS-11	7/25/2000	65	40	ND(1)	VAS-5	6/9/1999	54.9	ND(1)	ND(1)
VAS-11	7/25/2000	75	1	ND(1)	VAS-5	6/9/1999	59.9	ND(1)	ND(1)
VAS-11	7/25/2000	85	440	ND(1)	VAS-7	7/14/2000	102	ND(1)	13.0
VAS-11	7/25/2000	95	ND(1)	ND(1)	VAS-7	7/14/2000	110	ND(1)	23.0
VAS-11	7/25/2000	95	ND(1)	ND(1)	VAS-9	7/13/2000	80 - 81.5	ND(1)	ND(1)
VAS-11	7/24/2000	55	120	ND(1)	VAS-9	7/13/2000	80 - 81.5	ND(1)	ND(1)
VAS-12	8/7/2000	75	ND(1)	ND(1)	VAS-9	7/13/2000	90 -91.5	ND(1)	ND(1)
VAS-12	8/7/2000	85	ND(1)	2.0	VAS-9	7/13/2000	100 - 101.5	ND(1)	ND(1)

LEGEND

- RASMUSSEN SITE BOUNDARY (APPROXIMATE)
- MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- SPARGE POINT LOCATION
- COMPLETED VAS LOCATION
- EXTRACTION WELL LOCATION
- LIMIT OF 2017 VINYL CHLORIDE PLUME (2 ug/L)
- LIMIT OF 2017 TCE PLUME (5 ug/L)
- APPROXIMATE LIMIT OF PLUME
- 2017 DATA USED FOR CONTOURING
- 1999-2011 DATA USED FOR CONTOURING
- ESTIMATED CONCENTRATION

GHD

figure 4

2017 COC CONTOURS
RASMUSSEN LANDFILL SITE
Livingston County, Michigan

32504-15(CAIN052)GN-WA004 OCT 6, 2017

Table 1

Analytical Results - Northern Plumes
Rasmussen Landfill Site
Livingston County, Michigan

rameter	1,1,1-TRICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WCC (1)	200	70 (2)	13,000	1,800	730	5	100	74	5	790	5	2	280
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	11	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 1)	ND(1 0)	ND(1 0)	4 9	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 1)	ND(1 0)	ND(1 0)	3 6	ND(1 0)
plicate	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 1)	ND(1 0)	ND(1 0)	3 6	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 1)	ND(1 0)	ND(1 0)	2 8	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 1)	ND(1 0)	ND(1 0)	4 0	ND(1 0)
hange												Up 1 4 µg/L	
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	4 8	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	4 7	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	4 4	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	4 5	ND(1 0)
hange												Up 0 1 µg/L	
	ND(1 0)	1 1	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 1	ND(1 0)
	ND(1 0)	1 1	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
hange							Stable, all Non-Detect						
	ND(1 0)	3 1	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	2 8	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	2 8	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	3 6	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange		Stable											
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
						Not sampled, insufficient water in well							
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange							Stable, all Non-Detect						
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	3 7	ND(1 0)
plicate	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	3 6	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	3 5	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	3 5	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	4 4	ND(1 0)
ange												Up 0 9 µg/L	
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange							Stable, all Non-Detect						
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
licate	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange							Stable, all Non-Detect						
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 2	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
licate	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 0	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
licate	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
enge							Stable, all Non-Detect						
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange							Stable, all Non-Detect						
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ange							Stable, all Non-Detect						
	ND(1 0)	2 3	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	2 6	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 0	ND(1 0)
	ND(1 0)	2 6	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 0	ND(1 0)

Table 2

Analytical Results - PDSLD Area Plumes
Rasmussen Landfill Site
Livingston County, Michigan

ETHANE	1,2-DICHLOROETHENE (TOTAL) µg/L 70 (2)	2-BUTANONE µg/L 13,000	4-METHYL-2-PENTANONE µg/L 1,800	ACETONE µg/L 730	BENZENE µg/L 5	CHLOROBENZENE µg/L 100	ETHYLBENZENE µg/L 74	METHYLENE CHLORIDE µg/L 5	TOLUENE µg/L 790	TRICHLOROETHENE µg/L 5	VINYL CHLORIDE µg/L 2	XYLENES (TOTAL) µg/L 280
	ND(3 3)	ND(33)	ND(33)	ND(33)	ND(3 3)	79	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)
	ND(2 9)	ND(29)	ND(29)	ND(29)	ND(2 9)	75	ND(2 9)	ND(2 9)	ND(2 9)	ND(2 9)	ND(2 9)	ND(2 9)
	ND(2 5)	ND(25)	ND(25)	ND(25)	ND(2 5)	72	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)
	ND(3 3)	ND(33)	ND(33)	ND(33)	ND(3 3)	78	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)
						Up 6 µg/L						
	ND(3 3)	ND(33)	ND(33)	ND(33)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)
	ND(2 0)	ND(20)	ND(20)	ND(20)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)
	ND(2 5)	ND(25)	ND(25)	ND(25)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)	ND(2 5)
	ND(2 0)	ND(20)	ND(20)	ND(20)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)	ND(2 0)
L												
	ND(1 4)	ND(14)	ND(14)	ND(14)	ND(1 4)	41	ND(1 4)	ND(1 4)	ND(1 4)	ND(1 4)	2 2	ND(1 4)
	ND(1 4)	ND(14)	ND(14)	ND(14)	ND(1 4)	43	ND(1 4)	ND(1 4)	ND(1 4)	ND(1 4)	ND(1 4)	ND(1 4)
	ND(1 8)	ND(10)	ND(10)	ND(10)	ND(1 8)	46	ND(1 8)	ND(1 8)	ND(1 8)	ND(1 8)	ND(1 8)	ND(1 8)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	46	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 7)	ND(20)	ND(20)	ND(20)	ND(1 7)	37	ND(1 7)	ND(1 7)	ND(1 7)	ND(1 7)	ND(1 7)	ND(1 7)
						Down 9 µg/L						
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
						Stable, all Non-Detect						
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
L												

nteria for 1,2-dichloroethene isomers The criterion for trans 1,2-dichloroethene is 100 µg/L

Table 3

Analytical Results - Southern Vinyl Chloride Plume
Rasmussen Landfill Site
Livingston County, Michigan

NE	1,2-DICHLOROETHENE (TOTAL)	2-BUTANONE	4-METHYL-2-PENTANONE	ACETONE	BENZENE	CHLOROBENZENE	ETHYLBENZENE	METHYLENE CHLORIDE	TOLUENE	TRICHLOROETHENE	VINYL CHLORIDE	XYLENES (TOTAL)
	µg/L 70 (2)	µg/L 13,000	µg/L 1,800	µg/L 730	µg/L 5	µg/L 100	µg/L 74	µg/L 5	µg/L 790	µg/L 5	µg/L 2	µg/L 280
	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1.0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	1 2	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1.0)
											Down 0.2 µg/L	
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
						Stable, all Non-Detect						
	1 5	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	8.6	ND(1 0)
	1 9	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	8 6	ND(1.0)
	2 5	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	12	ND(1 0)
	2 2	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	9 9	ND(1 0)
	Down 0 3 µg/L										Down 2.1 µg/L	
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1.0)
	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
						Stable, all Non-Detect						
	ND(1.0)	ND(10)	ND(10)	ND(10)	1.9	ND(1 0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	4 4	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	1 9	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 1	ND(1 0)
	ND(1.0)	ND(10)	ND(10)	ND(10)	1.5	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	1 3	ND(1 0)
	ND(1.0)	ND(10)	ND(10)	ND(10)	1.6	ND(1 0)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	3.2	ND(1.0)
					Up 0 1 µg/L						Up 1 9 µg/L	
	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1.0)	ND(1 0)	1 7	ND(1 0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 7	ND(1.0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1 0)	ND(1 0)	1 7	ND(1.0)
	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1.9	ND(1 0)
	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	2 0	ND(1.0)
											Up 0 1 µg/L	

Table 4

Analytical Results - Southern TCE Plume
Rasmussen Landfill Site
Livingston County, Michigan

Volatile Organics											
-DICHLOROETHENE (TOTAL) µg/L 70 (2)	2-BUTANONE µg/L 13,000	4-METHYL-2-PENTANONE µg/L 1,800	ACETONE µg/L 730	BENZENE µg/L 5	CHLOROBENZENE µg/L 100	ETHYLBENZENE µg/L 74	METHYLENE CHLORIDE µg/L 5	TOLUENE µg/L 790	TRICHLOROETHENE µg/L 5	VINYL CHLORIDE µg/L 2	XYLENES (TOTAL) µg/L 280
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 7	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 7	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 3	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 3	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	2 1	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 5	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	1 6	ND(1 0)	ND(1 0)
									Down 0 5 µg/L		
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
ND(1 0)	ND(10)	ND(10)	ND(10)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)	ND(1 0)
					Stable, all Non-Detect						
ND(3 3)	ND(33)	ND(33)	ND(33)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	76	ND(3 3)	ND(3 3)
ND(4 0)	ND(40)	ND(40)	ND(40)	ND(4 0)	ND(4 0)	ND(4 0)	ND(4 0)	ND(4 0)	75	ND(4 0)	ND(4 0)
ND(5 0)	ND(50)	ND(50)	ND(50)	ND(5 0)	ND(5 0)	ND(5 0)	ND(5 0)	ND(5 0)	98	ND(5 0)	ND(5 0)
ND(3 3)	ND(33)	ND(33)	ND(33)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	ND(3 3)	69 J	ND(3 3)	ND(3 3)
									Down 29 µg/L		

2-dichloroethene isomers The criterion for trans 1,2-dichloroethene is 100 µg/L

Table 5

Bezene Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

	Benzene					
	Mann-Kendall Trend test					
Well	**Number of Samples**	**Percent Non-Detect**	**Statistic**	**Probability**	**2017 Conclusion**	**2016 Conclusion**
81-4	8	100%	--	--	No detected results	No detected results
81-8	8	100%	--	--	No detected results	No detected results
CRA-RA-2D	8	100%	--	--	No detected results	No detected results
CRA-RA-5	8	100%	--	--	No detected results	No detected results
CRA-RA-6S	8	100%	--	--	No detected results	No detected results
CRA-RA-7	8	100%	--	--	No detected results	No detected results
CRA-RA-8	8	100%	--	--	No detected results	No detected results
CRA-RA-18	8	100%	--	--	No detected results	No detected results
CRA-RA-19S	8	100%	--	--	No detected results	No detected results
CRA-RA-22	8	100%	--	--	No detected results	No detected results
CRA-RA-23D	8	100%	--	--	No detected results	No detected results
CRA-RA-24	8	100%	--	--	No detected results	No detected results
CRA-RA-25	8	100%	--	--	No detected results	Over 50% non-detects
CRA-RA-26D	8	100%	--	--	No detected results	No detected results
CRA-RA-26S	8	100%	--	--	No detected results	No detected results
CRA-RA-27	8	100%	--	--	No detected results	No detected results
CRA-RA-28	8	100%	--	--	No detected results	No detected results
CRA-RA-29	8	100%	--	--	No detected results	No detected results
CRA-RA-30	8	100%	--	--	No detected results	No detected results
CRA-RA-31	8	100%	--	--	No detected results	No detected results
CRA-RA-32	8	100%	--	--	No detected results	No detected results
CRA-RA-33	8	0%	-5	0 621	No trend identified	**Decreasing Trend**
CRA-RA-34	8	100%	--	--	No detected results	No detected results
CRA-RA-35	8	100%	--	--	No detected results	No detected results
CRA-RA-36	8	100%	--	--	No detected results	No detected results
CRA-RA-37	8	100%	--	--	No detected results	No detected results
EB-PZ-4	8	100%	--	--	No detected results	No detected results
PZ-104	8	100%	--	--	No detected results	No detected results
PZ-106	8	100%	--	--	No detected results	No detected results
RA-MW-28	8	100%	--	--	No detected results	No detected results
RA-MW-47	8	100%	--	--	No detected results	No detected results
Stanley Rasmusser	8	100%	--	--	No detected results	No detected results
TEMP-PZ-2	8	100%	--	--	No detected results	No detected results

Notes

Mann-Kendall Test Statistic sum of the signs of all possible pair-wise data comparisons
Probability of Significance for 95 percent confidence, a P-value equal to or below 0 05 is required
A 90 percent confidence was used for datasets with 4 observations A P-value equal to or below 0 1 is required

Trichloroethene Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

	Trichloroethene					
	Mann-Kendall Trend test					
Well	Number of Samples	Percent Non-Detect	Statistic	Probability	2017 Conclusion	2016 Conclusion
81-4	8	100%	--	--	No detected results	No detected results
81-8	8	100%	--	--	No detected results	No detected results
CRA-RA-2D	8	100%	--	--	No detected results	No detected results
CRA-RA-5	8	100%	--	--	No detected results	No detected results
CRA-RA-6S	8	100%	--	--	No detected results	No detected results
CRA-RA-7	8	100%	--	--	No detected results	No detected results
CRA-RA-8	8	100%	--	--	No detected results	No detected results
CRA-RA-18	8	100%	--	--	No detected results	No detected results
CRA-RA-19S	8	100%	--	--	No detected results	No detected results
CRA-RA-22	8	100%	--	--	No detected results	No detected results
CRA-RA-23D	8	0%	-21	0 013	**Decreasing Trend**	**Decreasing Trend**
CRA-RA-24	8	100%	--	--	No detected results	No detected results
CRA-RA-25	8	100%	--	--	No detected results	No detected results
CRA-RA-26D	8	100%	--	--	No detected results	No detected results
CRA-RA-26S	8	0%	-11	0.212	No trend identified	No trend identified
CRA-RA-27	8	100%	--	--	No detected results	No detected results
CRA-RA-28	8	100%	--	--	No detected results	No detected results
CRA-RA-29	8	100%	--	--	No detected results	No detected results
CRA-RA-30	8	100%	--	--	No detected results	No detected results
CRA-RA-31	8	100%	--	--	No detected results	No detected results
CRA-RA-32	8	100%	--	--	No detected results	No detected results
CRA-RA-33	8	100%	--	--	No detected results	No detected results
CRA-RA-34	8	100%	--	--	No detected results	No detected results
CRA-RA-35	8	100%	--	--	No detected results	No detected results
CRA-RA-36	8	100%	--	--	No detected results	No detected results
CRA-RA-37	8	100%	--	--	No detected results	No detected results
EB-PZ-4	8	100%	--	--	No detected results	No detected results
PZ-104	8	100%	--	--	No detected results	No detected results
PZ-106	8	100%	--	--	No detected results	No detected results
RA-MW-28	8	100%	--	--	No detected results	No detected results
RA-MW-47	8	100%	--	--	No detected results	No detected results
Stanley Rasmussei	8	100%	--	--	No detected results	No detected results
TEMP-PZ-2	8	100%	--	--	No detected results	No detected results

Notes.
Mann-Kendall Test Statistic: sum of the signs of all possible pair-wise data comparisons
Probability of Significance. for 95 percent confidence, a P-value equal to or below 0 05 is required

Table 7

Vinyl Chloride Concentration vs. Time Trend Tests Results
for Current Monitoring Data (Last 8 Data Points)
Rasmussen Landfill Site
Livingston County, Michigan

	Vinyl Chloride					
	Mann-Kendall Trend Test					
Well	Number of Samples	Percent Non-Detect	Statistic	Probability	2017 Conclusion	2016 Conclusion
81-4	8	0%	5	0.618	No trend identified	No trend identified
81-8	8	100%	--	--	No detected results	No detected results
CRA-RA-2D	8	100%	--	--	No detected results	No detected results
CRA-RA-5	8	100%	--	--	No detected results	No detected results
CRA-RA-6S	8	88%	--	--	Over 50% non-detects	No detected results
CRA-RA-7	8	100%	--	--	No detected results	No detected results
CRA-RA-8	8	100%	--	--	No detected results	No detected results
CRA-RA-18	8	100%	--	--	No detected results	No detected results
CRA-RA-19S	8	100%	--	--	No detected results	No detected results
CRA-RA-22	8	0%	-5	0 618	No trend identified	No trend identified
CRA-RA-23D	8	100%	--	--	No detected results	No detected results
CRA-RA-24	8	0%	-25	0 003	**Decreasing Trend**	No trend identified
CRA-RA-25	8	75%	--	--	Over 50% non-detects	Over 50% non-detects
CRA-RA-26D	8	100%	--	--	No detected results	No detected results
CRA-RA-26S	8	100%	--	--	No detected results	No detected results
CRA-RA-27	8	0%	-1	1 000	No trend identified	No trend identified
CRA-RA-28	8	100%	--	--	No detected results	Over 50% non-detects
CRA-RA-29	8	100%	--	--	No detected results	No detected results
CRA-RA-30	8	0%	2	0.900	No trend identified	No trend identified
CRA-RA-31	8	100%	--	--	No detected results	No detected results
CRA-RA-32	8	100%	--	--	No detected results	No detected results
CRA-RA-33	8	13%	-3	0.803	No trend identified	No trend identified
CRA-RA-34	8	100%	--	--	No detected results	No detected results
CRA-RA-35	8	25%	-23	0.006	**Decreasing Trend**	**Decreasing Trend**
CRA-RA-36	8	100%	--	--	No detected results	No detected results
CRA-RA-37	8	100%	--	--	No detected results	No detected results
EB-PZ-4	8	63%	--	--	Over 50% non-detects	Over 50% non-detects
PZ-104	8	50%	5	0.583	No trend identified	Over 50% non-detects
PZ-106	8	100%	--	--	No detected results	No detected results
RA-MW-28	8	100%	--	--	No detected results	No detected results
RA-MW-47	8	100%	--	--	No detected results	No detected results
Stanley Rasmussei	8	100%	--	--	No detected results	No detected results
TEMP-PZ-2	8	100%	--	--	No detected results	No detected results

Notes·

Mann-Kendall Test Statistic: sum of the signs of all possible pair-wise data comparisons
Probability of Significance for 95 percent confidence, a P-value equal to or below 0 05 is required

Table 8

2017 Groundwater Sampling Program
Rasmussen Landfill Site
Livingston County, Michigan

Quarterly Sampling - VOCs	Annual Landfill Monitoring Program - VOCs, SVOCs & Metals	Additional Annual Samples - VOCs
	(2nd Quarter)	*(3rd Quarter)*
81-4	CRA-RA-6S (included in quarterly sampling)	CRA-RA-25
81-8	CRA-RA-8	EB-PZ-4
CRA-RA-2D	CRA-RA-18 (included in quarterly sampling)	PZ-106
CRA-RA-5	CRA-RA-19S	RA-MW-47
CRA-RA-6S	CRA-RA-20	Rasmussen Water Supply Well
CRA-RA-7		
CRA-RA-18		
CRA-RA-22		
CRA-RA-23D		
CRA-RA-24		
CRA-RA-26D		
CRA-RA-26S		
CRA-RA-27		
CRA-RA-28		
CRA-RA-29		
CRA-RA-30		
CRA-RA-31		
CRA-RA-32		
CRA-RA-33		
CRA-RA-34		
CRA-RA-35		
CRA-RA-36		
CRA-RA-37		
PZ-104		
RA-MW-28		
TEMP-PZ-2		

Rasmussen 32504

Ozone Sparge System Inspection

DATE	July 5, 2017	July 13, 2017	July 21, 2017	July 29, 2017	~~July~~ August 3, 2017
OPERATOR SIGNATURE	A Rapai	A Rapai	A Rapai	A Rapai	A Rapai

Air Compressor					
Output Pressure psi	120	125	110	120	110
Temperature F	185	180	184	184	186
Run Time hours	3115	3305	3494	3673	3806

Air Sep					
Receiver Pressure psi	55	54	56	54	54
Feed Air Pressure psi	115	120	115	110	110
Cycle Pressure psi	70	70	70	70	70
Holding Tank Pressure psi	42	42	42	42	42
Run Time hours	117866.1	118057.7	118247.1	118461.5	118561.8

Air Dryer					
Temp Indicator - color	GREEN	GREEN	GREEN	GREEN	GREEN

Ozone Generator					
Oxygen Supply, LPM	7	7	7	7	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	35	35	35	36	35
Regulator #2 psi	20	20	20	22	25
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	3	1	1	1
Zone Time hours	2	2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc Ppm O3					

Comments:

Rasmussen 32504

Ozone Sparge System Inspection

DATE	August 9, 2017	August 19, 2017	August 25, 2017	Sept. 1, 2017	Sept 7, 2017
OPERATOR SIGNATURE	John York	A Rapai	A Rapai	A Rapai	A Rapai

Air Compressor					
Output Pressure psi	120	122	115	123	120
Temperature F	175	179	176	176	175
Run Time hours		4184	4305	4469	

Air Sep					
Receiver Pressure psi	55	50	50	52	54
Feed Air Pressure psi	120	120	120	120	120
Cycle Pressure psi	70	70	65	70	70
Holding Tank Pressure psi	42	42	40	42	42
Run Time hours		118965.4	119063.3	119228.8	

Air Dryer					
Temp. Indicator - color	Green	Green	Green	Green	Green

Ozone Generator					
Oxygen Supply, LPM	7	5	7	6	7
% O3 capacity	45	45	45	45	45
Regulator #1 psi	32	32	33	40	35
Regulator #2 psi	25	25	22	25	27
Alarm Reading ppm, O3	–	–	–	–	–
Zone On	3	1	1	1	2
Zone Time hours	2	1/2	1/2	1/2	1/2

Distribution Panel					
CFM	0.8	0.8	0.8	0.8	0.8
O3 Feed Conc. Ppm O3					

Comments: Performed 2,000 hour Preventative Maintenance @ 4305

Rasmussen 32504

Ozone Sparge System Inspection

DATE	SEPT. 14, 2017	SEPT. 21, 2017	SEPT 27 2017		
OPERATOR SIGNATURE	A Rupai	A Rupai	A Rupai		

Air Compressor					
Output Pressure psi	110	120	120		
Temperature F	185	181	180		
Run Time hours	4781	4947	5092		

Air Sep					
Receiver Pressure psi	54	56	55		
Feed Air Pressure psi	110	110	115		
Cycle Pressure psi	70	70	70		
Holding Tank Pressure psi	42	42	42		
Run Time hours	119542.3	119708.5	119854.5		

Air Dryer					
Temp. Indicator - color	GREEN	GREEN	GREEN		

Ozone Generator					
Oxygen Supply, LPM	7	7	7		
% O3 capacity	45	45	45		
Regulator #1 psi	38	36	37		
Regulator #2 psi	22	21	21		
Alarm Reading ppm, O3	—	-	-		
Zone On	1	3	2		
Zone Time hours	1/2	2	1/2		

Distribution Panel					
CFM	0.8	0.8	0.8		
O3 Feed Conc Ppm O3					

Comments:

SPARGE WELL PRESSURE READINGS
RASMUSSEN SITE
CRA PROJECT #32504

DATE:	July 5 & 13		DATE:	August 24 & 25, 2017		DATE:		
WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL	WELL ID	CFM @ DIST. PANEL	PSI @ WELL
SW-1	0.8	9	SW-1	0.8	8	SW-1		
SW-2	0.8	9	SW-2	0.8	9	SW-2		
SW-3	0.8	15	SW-3	0.7	14	SW-3		
SW-4	0.7	15	SW-4	0.8	15	SW-4		
SW-5	0.7	15	SW-5	0.7	14	SW-5		
SW-6	0.8	15	SW-6	0.8	14	SW-6		
SW-7	0.8	15	SW-7	0.8	15	SW-7		
SW-8	–	–	SW-8	–	–	SW-8		
SW-9	–	–	SW-9	–	–	SW-9		
SW-10	–	–	SW-10	–	–	SW-10		
SW-11	–	–	SW-11	–	–	SW-11		
SW-12	0.7	15	SW-12	0.8	14	SW-12		
SW-13	0.8	2	SW-13	0.8	2	SW-13		
SW-14	–	–	SW-14	–	–	SW-14		
SW-15	–	–	SW-15	–	–	SW-15		
SW-16	–	–	SW-16	–	–	SW-16		
SW-17	0.7	15	SW-17	0.8	15	SW-17		
SW-18	0.7	16	SW-18	0.8	14	SW-18		
SW-19	0.8	16	SW-19	0.8	15	SW-19		
SW-20	0.8	15	SW-20	0.9	14	SW-20		
SW-21	–	–	SW-21	–	–	SW-21		
SW-22	0.8	14	SW-22	0.8	14	SW-22		
SW-23	0.8	14	SW-23	0.8	13	SW-23		
SW-24	0.8	15	SW-24	0.8	14	SW-24		
SW-25	0.8	14	SW-25	0.8	14	SW-25		
SW-26	0.7	6	SW-26	0.8	5	SW-26		
SW-27	0.8	6	SW-27	0.8	6	SW-27		
SW-28	0.8	6	SW-28	0.8	6	SW-28		
SW-29	0.8	7	SW-29	0.8	6	SW-29		
SW-30	–	–	SW-30	–	–	SW-30		

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RADAI **Signature:** Steve Radai

Date: THURSDAY, JULY 13, 2017
Time: 3:00 PM

Weather Conditions: MOSTLY CLOUDY, VERY HUMID 87°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: OK

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: SATURDAY JULY 29, 2017
Time: 11:00 AM

Weather Conditions: CLEAR 80°

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK-DRY

Drainage Spillways & Outfalls: OK-DRY

Roadways: OK

Vegetation: OK

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** Steve Rapai

Date: SATURDAY, AUGUST 19, 2017
Time: 11:30 AM

Weather Conditions: CLEAR 75°

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: OK - DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: VERY DRY - LACK OF RAIN

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** [signature]

Date: FRIDAY, SEPTEMBER 1, 2017
Time: 10:00AM

Weather Conditions: MOSTLY CLOUDY, 62°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: LACK OF RAIN - STRESSED

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

RASMUSSEN LANDFILL SITE
Livingston County, Michigan

Landfill Inspection Form

Inspector: STEVE RAPAI **Signature:** [signature]

Date: WEDNESDAY, SEPT. 27, 2017
Time: 11:30 AM

Weather Conditions: PARTLY CLOUDY 79°F

Observations

Erosion-North Face: OK

Erosion-South Face: OK

Erosion-East Face: OK

Erosion-West Face: OK

Erosion-Misc.: OK

Storm Water Ponds: DRY

Drainage Spillways & Outfalls: DRY

Roadways: OK

Vegetation: STRESSED BY LACK OF RAIN

Signs, Gates, & Fences: OK

Actions Taken:
NONE

Recommendations:
NONE

9/6/2017 32504-25

TASK: BEGIN 1/4LY SAMPLE EVENT

GHD: STEVE RAPA

WEATHER: 48° CLEAR, AFTERNOON STORMS HIGH 67°, WIND NW 5 MPH

H&S: LEVEL D

TAILGATE: WORKING WITH GLASS & PRESERVED SAMPLE BOTTLES, LIFTING, STINGING INSECTS, PINCH POINTS.

CALIBRATION OF HORIBA NF0759 7 (U-22) pH=4.00, COND.=4.49mS, TURB.=0.0 NTU, D.O.=8.24 mg/L, TEMP=25.50°C

SAMPLE OF CRA-RA-2D

TIME	pH	COND.	TURB	D.O.	TEMP
1005	6.30	2.27	0.0	2.59	12.70
1020	6.79	1.76	0.0	0.10	11.90
1030	6.83	1.75	0.0	0.09	11.99
1035	6.85	1.75	0.0	0.09	11.78
1040	6.88	1.74	0.0	0.11	11.64
1045	6.90	1.73	0.0	0.10	11.64
1050	6.94	1.74	0.0	0.08	11.60
1055	6.95	1.73	0.0	0.10	11.59
1100	6.95	1.73	0.0	0.10	11.59

SAMPLED @ 1101 ID: GW-32504-090617-SR-2107

32504-25 9/6/2017

SAMPLE OF CRA-RA-2B

TIME	pH	COND.	TURB.	D.O.	TEMP. °C
1115	7.12	1.14	165.0	1.26	12.07
1125	7.07	1.11	14.3	0.21	11.98
1135	7.11	1.11	0.0	0.13	11.77
1140	7.12	1.11	0.0	0.11	11.84
1145	7.15	1.11	0.0	0.11	11.86
1150	7.18	1.11	0.0	0.10	11.92
1155	7.19	1.11	0.0	0.11	11.91
1200	7.20	1.11	0.0	0.10	11.91
1205	7.20	1.11	0.0	0.11	11.90
1210	7.20	1.11	0.0	0.11	11.90

SAMPLED @ 1211 ID: GW-32504-090617-SR-2108

SAMPLE OF PZ-104

TIME	pH	COND.	TURB.	D.O.	TEMP.
1255	7.67	1.58	180.0	4.81	12.69
1315	7.29	1.53	0.0	0.27	11.55
1325	7.25	1.53	0.0	0.13	11.80
1330	7.25	1.53	0.0	0.08	11.81
1335	7.25	1.52	0.0	0.10	11.82
1340	7.25	1.53	0.0	0.10	11.81

SAMPLED @ 1341 ID: GW-32504-090617-SR-2109

SAMPLE OF CRA-RA-25 (ANNUAL SAMPLE)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1355	7.44	1.14	204	1.41	12.12
1420	7.36	1.39	0.0	0.51	12.45
1430	7.36	1.32	0.0	0.18	12.00
1435	7.36	1.33	0.0	0.15	11.78
1440	7.36	1.35	0.0	0.11	11.77
1445	7.36	1.35	0.0	0.13	11.76
1450	7.36	1.35	0.0	0.11	11.76

SAMPLED @ 1451 ID: GW-32504-090617-SR-210

SAMPLE OF CRA-RA-24

1500	7.53	1.29	31.2	8.45	12.69
1520	7.28	1.38	9.4	1.13	11.74
1530	7.31	1.49	5.5	0.36	11.79
1535	7.29	1.67	3.6	0.27	11.82
1540	7.30	1.67	3.1	0.22	11.83
1545	7.29	1.66	2.7	0.19	11.82
1550	7.29	1.66	2.9	0.19	11.82

SAMPLED @ 1551 ID: GW-32504-090617-SR-211

SAMPLES PACKED IN COOLER WITH ICE

TASK: CONTINUE 1/4 MW SAMPLE EVENT
GHD: STEVE RAPAI
WEATHER: 49° CLEAR, RAIN LATER, HIGH 67°, WIND W 8 MPH
H&S: LEVEL D
TAILGATE: PRESERVED SAMPLE BOTTLES, CONTROL BOX OPERATION (BLADDER PUMPS) TRIP HAZARDS, STINGING INSECTS.
CALIBRATION OF HORIBA (U-22) NF07597: pH = 4.01, COND. = 4.50, TURB = 0.3, D.O. = 8.21, TEMP = 26.73

SET UP @ CRA-RA-30, WELL WAS FULL OF ANTS. TUBING & FITTINGS FILLED WITH SAND. PULLED PUMP & TUBING, FOR REPAIR LATER

SAMPLE OF CRA-RA-32

TIME	pH	COND.	TURB.	D.O.	TEMP.
0955	6.46	5.75	9.1	0.50	11.53
1015	6.63	1.19	1.4	0.11	11.37
1020	6.72	1.16	0.7	0.11	11.51
1025	6.71	1.16	0.0	0.11	11.53
1030	6.71	1.16	0.0	0.13	11.53
1035	6.72	1.16	0.0	0.10	11.52

SAMPLED @ 1036 ID: GW-32504-090717-SR-212

SAMPLE OF CRA-RA-22

TIME	pH	COND.	TURB.	D.O.	TEMP.
1045	6.79	1.32	10.9	0.87	11.95
1105	6.91	1.26	1.3	0.23	11.78
1110	6.93	1.26	0.8	0.07	11.78
1115	6.96	1.25	0.0	0.14	11.80
1120	6.99	1.25	0.0	0.11	11.80
1125	7.00	1.25	0.0	0.10	11.80
1130	7.00	1.25	0.0	0.11	11.79

SAMPLED @ 1131 ID:GW-32504-090717-SR-2113

SAMPLE OF TEMP-PZ-2

1210	7.36	2.18	3.0	4.23	12.37
1225	7.17	2.12	7.3	0.35	12.23
1235	7.17	2.14	0.9	0.21	12.26
1240	7.17	2.14	0.0	0.15	11.85
1245	7.17	2.14	0.0	0.17	11.83
1250	7.17	2.15	0.0	0.15	11.84

SAMPLED @ 1251 ID:GW-32504-090717-SR-2114

SAMPLE OF CRA-RA-29

1305	7.32	1.19	2.7	8.90	11.99
1325	7.22	1.19	4.7	10.15	11.88
1330	7.22	1.16	3.6	10.18	11.88

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SAMPLE OF CRA-RA-29 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1335	7.23	1.16	1.8	10.32	12.06
1340	7.24	1.16	1.7	10.39	12.09
1345	7.24	1.16	1.3	10.41	12.09
1350	7.24	1.16	1.0	10.40	12.09

SAMPLED @ 1351 ID:GW-32504-090717-SR-2115

SAMPLE OF 81-8

1400	7.44	0.95	13.9	6.75	12.21
1415	8.08	0.625	4.4	+19.99	11.83

1425 7.88 PUMP STOPPED WORKING. HAD TO PULL PUMP & CLEAR DEBRIS FROM AIR LINE.

1445	8.20	0.636	33.5	+19.99	11.91
1500	8.40	0.612	4.1	+19.99	11.40
1505	8.39	0.611	2.2	+19.99	11.39
1510	8.39	0.611	1.8	+19.99	11.39

SAMPLED @ 1511 ID:GW-32504-090717-SR-2116

SAMPLED @ 1515 ID:GW-32504-090717-SR-2117

SWA FOR LIGHTNING @ 3:20 PM.

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

9/11/17 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: CLEAR 72°

H&S: LEVEL D

TAILGATE: LIFTING, PINCH POINTS, SAMPLE BOTTLES, OPERATING MP50 CONTROL BOX.

CALIBRATION OF HORIBA (U-22)

NF0597: pH=4.00, COND=4.49, TURB D.O.= 0.0, ~~TEQ~~ = 7.76, TEMP = 30.76

SAMPLE OF CRA-RA-18

TIME	pH	COND.	TURB.	D.O.	TEMP.
1505	6.58	1.61	21.0	7.38	11.34
1525	6.42	1.52	4.5	5.93	11.16
1530	6.39	1.52	2.0	5.86	11.14
1535	6.38	1.52	2.3	5.78	11.11
1540	6.38	1.52	3.0	5.76	11.05
1545	6.39	1.52	0.8	5.75	11.05
1550	6.39	1.52	1.1	5.75	11.05

SAMPLED @ 1551 ID: GW-32504-091117-SR-2118

SAMPLE OF PZ-106 (ANNUAL SAMPLE)

1600	6.47	1.22	216.0	3.15	12.20
1615	6.52	45.3	63.4	0.21	11.57

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32504-25 9/11/17

SAMPLE OF PZ-106 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1635	6.72	2.04	8.0	0.17	11.58
1640	6.76	1.51	6.0	0.13	11.57
1645	6.81	1.26	3.0	0.11	11.57
1650	6.85	1.18	2.8	0.11	11.48
1655	6.87	1.16	3.7	0.10	11.53
1700	6.89	1.15	1.4	0.12	11.56
1705	6.89	1.16	2.1	0.10	11.55

SAMPLED @ 1706 ID: GW-32504-091117-SR-2119

SAMPLE OF RA-MW-47 (ANNUAL SAMPLE)

1715	7.26	0.747	84.5	2.03	11.89
1730	7.42	0.750	2.4	0.09	11.55
1735	7.46	0.749	3.2	0.10	11.56
1740	7.49	0.748	3.0	0.13	11.54
1745	7.56	0.747	2.0	0.11	11.54
1750	7.56	0.747	2.3	0.10	11.53
1755	7.55	0.747	1.9	0.11	11.54

SAMPLED @ 1756 ID: GW-32504-091117-SR-2120

SAMPLES PACKED IN COOLER WITH ICE.

9/12/17 32504-25

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: 50° CLEAR, HIGH 70°, WIND NE 5 MPH

H&S: LEVEL D

TAILGATE: SAMPLE BOTTLES, LIFTING, TRIP HAZARDS, MP50 CONTROL BOX

CALIBRATION OF HORIBA (U-22) NF07597: pH=4.00, COND.=4.49, TURB.=0.0, D.O.=8.13, TEMP=28.13°C

SAMPLE OF RA-MW-28

TIME	pH	COND.	TURB.	D.O.	TEMP.
0940	6.20	0.92	4.0	3.24	11.96
0955	6.51	0.652	0.0	2.83	11.36
1000	6.43	0.648	0.0	2.92	11.46
1010	6.42	0.646	0.0	2.99	11.45
1015	6.43	0.645	0.0	2.98	11.44
1020	6.43	0.645	0.0	2.99	11.45

SAMPLED @ 1021 ID: GW-32504-091217-SR-2121

SAMPLE OF EB-PZ-4 (ANNUAL SAMPLE)

1035	6.69	0.659	830.0	1.18	12.63
1055	6.95	0.649	82.0	4.30	12.87

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32504-25 9/12/17

SAMPLE OF EB-PZ-4 (CONTINUED)

TIME	pH	COND.	TURB.	D.O.	TEMP.
1100	7.00	0.648	31.0	4.11	13.07
1105	7.07	0.648	19.4	3.78	13.14
1110	7.10	0.649	11.1	3.78	13.14
1115	7.17	0.648	6.9	4.17	13.21
1120	7.21	0.648	3.4	4.50	13.49
1125	7.26	0.649	2.8	4.68	13.45
1130	7.28	0.649	3.4	4.90	13.44
1135	7.30	0.649	3.7	4.97	13.50
1140	7.34	0.650	3.5	5.01	13.57
1145	7.37	0.651	4.0	4.95	15.54

PURGED WELL FOR ONE HOUR AND FIFTEEN MINUTES.

SAMPLED @ 1146 ID: GW-32504-091217-SR-2122

SAMPLE OF CRA-RA-5

1225	7.33	1.18	7.2	1.23	12.37
1245	7.00	2.24	1.0	0.10	11.89
1250	6.98	2.02	0.0	0.11	11.95
1255	7.00	2.02	0.0	0.11	12.01
1300	7.00	2.03	0.0	0.13	11.99
1305	7.00	2.03	0.0	0.11	12.00

SAMPLED @ 1306 ID: GW-32504-091217-SR-2123

9/12/17 32504-25

SAMPLE OF CRA-RA-31

TIME	pH	COND.	TURB.	D.O.	TEMP.
1325	7.44	0.524	0.0	1.30	11.40
1335	7.39	0.999	0.0	0.14	11.38
1345	7.44	1.50	0.0	0.10	11.44
1350	7.45	1.48	0.0	0.08	11.48
1355	7.47	1.48	0.0	0.11	11.50
1400	7.47	1.48	0.0	0.09	11.50

SAMPLED @ 1401 ID: GW-32504-091217-SR-2124

SAMPLE OF CRA-RA-7

1410	7.50	0.433	2.6	1.20	11.35
1420	7.38	0.999	2.0	0.10	11.07
1430	7.36	0.90	0.0	0.11	11.08
1435	7.31	0.397	0.0	0.10	11.08
1440	7.31	0.385	0.0	0.10	11.04
1445	7.31	0.378	0.0	0.10	11.04
1450	7.30	0.373	0.0	0.11	11.03
1455	7.31	0.373	0.0	0.11	11.03

SAMPLED @ 1456 ID: GW-32504-091217-SR-2125

SAMPLE OF CRA-RA-65

1505	7.00	0.867	2.0	3.39	13.47
1515	6.90	0.899	0.0	0.71	14.11

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32504-25 9/12/17

SAMPLE OF CRA-RA-65

TIME	pH	COND.	TURB.	D.O.	TEMP.
1525	6.90	0.898	0.0	0.46	13.84
1530	6.87	0.896	0.0	0.47	13.56
1535	6.87	0.893	0.0	0.35	13.46
1540	6.86	0.895	0.0	0.35	13.47
1545	6.86	0.895	0.0	0.35	13.47

SAMPLED @ 1546 ID: GW-32504-091217-SR-2126

SAMPLE OF CRA-RA-27

1605	7.08	1.51	3.9	2.10	12.12
1615	6.86	1.52	0.0	0.10	11.73
1625	6.85	1.53	0.0	0.05	11.73
1630	6.85	1.53	0.0	0.05	11.72
1635	6.85	1.53	0.0	0.05	11.70
1640	6.85	1.53	0.0	0.05	11.72

SAMPLED @ 1641 ID: GW-32504-091217-SR-2127

SAMPLE OF CRA-RA-265

1655	7.09	1.18	6.7	6.75	11.69
1715	6.96	1.18	0.0	5.67	11.32
1720	6.93	1.18	0.0	5.77	11.32
1725	6.93	1.18	0.0	5.81	11.31
1730	6.93	1.18	0.0	5.80	11.32

SAMPLED @ 1731 ID: GW-32504-091217-SR-2128

9/12/17 32504-25

SAMPLE OF CRA-RA-26D

TIME	pH	COND.	TURB.	D.O.	TEMP
1740	7.27	1.35	0.0	7.44	11.95
1750	7.01	1.30	0.0	0.35	11.43
1800	7.01	1.32	0.0	0.18	11.49
1805	6.96	1.33	0.0	0.15	11.46
1810	6.97	1.33	0.0	0.17	11.45
1815	6.97	1.33	0.0	0.13	11.44
1820	6.98	1.32	0.0	0.13	11.44

SAMPLED @ 1821 ID:GW-32504-091217-SR-2129

SAMPLES PACKED IN COOLER WITH ICE.

32504-25 9/13/17

TASK: CONTINUE 1/4LY SAMPLE EVENT

GHD: STEVE RAPAI

WEATHER: 55°, CHANCE OF RAIN, HIGH 75°

H2S: LEVEL D

TAILGATE: WORKING IN RAIN, SLIPS/TRIPS/FALLS, SAMPLE BOTTLES.

CALIBRATION OF HORIBA (U-22) NF07597

pH=4.00, COND.=4.49, TURB.=0.0, D.O.=7.90, TEMP.=29.45°C

SAMPLE OF CRA-RA-23D

TIME	pH	COND.	TURB.	D.O.	TEMP.
1105	6.22	0.612	3.4	5.24	12.94
1120	6.47	1.17	1.0	3.27	14.19
1130	6.38	0.586	0.0	3.22	15.16
1135	6.42	0.581	0.0	0.87	10.75
1140	6.39	0.577	0.0	0.78	10.80
1145	6.38	0.576	0.0	0.76	10.81
1150	6.38	0.576	0.0	0.75	10.81

SAMPLED @ 1151 ID:GW-32504-091317-SR-2130

SAMPLED @ 1155 ID:GW-32504-091317-SR-2131

SAMPLE OF 81-4

BEGAN PURGING WELL @ 1215

CONTINUED ON NEXT PAGE

9/13/17 32504-25

SAMPLE OF 81-4

TIME	pH	COND.	TURB.	D.O.	TEMP.
1215	BEGAN	WELL	PURGE	—	—
1245	6.94	1.11	1.9	1.33	12.19
1250	6.79	1.10	1.4	0.17	11.87
1255	6.77	1.10	1.8	0.13	11.84
1300	6.69	1.10	0.0	0.10	11.83
1305	6.70	1.10	0.0	0.11	11.83
1310	6.70	1.11	0.0	0.10	11.83

SAMPLED @ 1311 ID: GW-32504-091317-SR-2132

SAMPLE OF CRA-RA-30

1345	7.29	0.93	196.0	1.64	12.13
1400	6.88	0.93	22.1	0.06	11.64
1410	6.93	0.93	3.0	0.09	11.56
1415	6.89	0.93	3.8	0.11	11.52
1420	6.89	0.93	3.6	0.10	11.51
1425	6.88	0.93	3.2	0.11	11.52
1430	6.89	0.93	3.3	0.11	11.52

SAMPLED @ 1431 ID: GW-32504-091317-SR-2133

SAMPLES PACKED IN COOLER WITH ICE FOR GHD DROP OFF @ TEST AMERICA, BRIGHTON, MICHIGAN.

32504-25 9/14/17

TASK: COMPLETE 1/4LY SAMPLE EVENT.
GHD: STEVE RAPAI
WEATHER: SUN 75°, WIND S 3MPH
H&S: LEVEL D
TAILGATE: SAMPLE BOTTLES, TRIP HAZARDS, STINGING INSECTS, POISON IVY.

SAMPLE OF RASMUSSEN RESIDENTIAL WELL FROM SPIGOT ON SOUTH SIDE OF HOUSE. ALLOWED WELL TO PURGE FOR 25 MINUTES BEFORE SAMPLING.
SAMPLED @ 1305 ID: GW-32504-091417-SR-2134
MS/MSD.

SAMPLES PACKED IN COOLER WITH ICE FOR DROP OFF AT TEST AMERICA, BRIGHTON, MICHIGAN.

9/27/2017 32504-25

TASK: MLY WATER LEVELS

GHD: STEVE RAPAI

WEATHER: DRIZZLE 71°F, SUN LATER

H&S: LEVEL D

TAILGATE: PINCH POINTS, STINGING INSECTS, SLIPS/TRIPS/FALLS

WELL ID	LEVEL
81-4	28.58
81-5	32.99
81-7	46.55
81-8	42.28
81-9	14.70
81-10	40.02
RA-1	67.83
RA-2D	54.67
RA-2S	54.36
RA-3	51.37
RA-5	53.43
RA-6S	58.00
RA-7	31.31
RA-8	15.41
RA-16	56.61
RA-18	40.28
RA-18D	54.95

32504-25 9/27/17

WELL ID	LEVEL
RA-19D	48.84
RA-19S	46.22
RA-20	57.10
RA-22	52.48
RA-23D	30.41
RA-23S	31.85
RA-24	55.33
RA-25	52.84
RA-26D	48.63
RA-26S	48.49
RA-27	60.33
RA-28	53.19
RA-29	45.00
RA-30	55.95
RA-31	30.80
RA-32	33.70
RA-33	30.98
RA-34	40.51
RA-35	30.96
RA-36	35.22
RA-37	34.91
MW-22	40.85
MW-28	41.25
MW-32	33.55

9/27/17

973

32504.25

Well ID	Level
MW-34C	22.46
MW-35	32.49
MW-41	46.43
MW-42	62.11
MW-47	52.18
MW-54	54.66
MW-55	35.35
MW-56	35.20
MW-58	19.98
EB-PZ-2	39.00
EB-PZ-4	51.99
EB-PZ-5	53.81
EB-PZ-6	53.57
PZ-103	56.77
PZ-104	53.96
PZ-105	50.39
PZ-106	34.99
TEMP-PZ-2	52.59