#### MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

#### INTEROFFICE COMMUNICATION

TO:

Mike Jury, Project Manager, Saginaw Bay District Office

Remediation and Redevelopment Division

FROM:

Jeff Pincumbe, Geologist, Geological Services Section

Remediation and Redevelopment Division

DATE:

January 29, 2019

SUBJECT:

Oscoda Township Dump, Iosco County, Site ID #35010000

Site Investigation Report, GSS Job #710

This report is for Part 201 site investigation work requested by the Department of Environmental Quality (DEQ), Remediation and Redevelopment Division's (RRD's), Saginaw Bay District office for the subject site located in Oscoda Township, Iosco County, Michigan (Figure 1). It was reported that the Oscoda Township Dump received waste from Wurtsmith Air Force base that may have contained Per- and polyfluoroalkyl (PFAS) compounds. The site is located on the south side of Kings Corner Road, 0.5 miles east of Loud Drive. This is a rural area with residential homes approximately 700 feet to the east and 1,600 feet to the west. The purpose for the investigation was to determine if the groundwater at the site had been impacted with PFAS compounds.

The current PFAS analyses consist of 24 compounds with two being compounds of concern: Perfluoro octane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). The action level for the compounds of concern 70 parts per trillion (ng/l) for each compound or for a total of the two compounds added together.

This report includes the following:

- Site Location Map (Fig 1)
- Site Map (Fig 2)
- PFOA and PFOS Concentration Map (Fig 3)
- Total PFAS Concentration Map (Fig 4)
- Global Positioning System (GPS) Coordinates of Soil Borings and Monitor Wells (Table 1)
- Volatile Organic Compound (VOC) Laboratory Tables with Comparison to Risk-Based Screening Levels (RBSLs) (Table 2 and Table 3)
- PFC compounds of concern Laboratory Table with comparison to Action Levels (Table 4)
- DEQ Soil Boring Logs (Appendix A)
- DEQ Laboratory Results (Appendix B)
- Vista Analytical Laboratory Results (Appendix C)

Beginning on December 3, 2018, RRD's Geological Services Section (GSS) completed soil borings SB-1 through SB-15 (Fig 2) (Appendix A). The GPS coordinates for each location is included on Table 1. The soil borings and monitor wells were completed using a Geoprobe. Soil samples were collected from SB-1 to a depth of 16 feet to determine the lithology of the site. Soil samples were not collected below 16 feet due to refusal. There were no soil samples submitted to a laboratory for analyses.

Groundwater samples were collected from each location using Geoprobe drop out screens. The screens were set just below the top of groundwater at each location. Groundwater samples were collected from the depth shown on the boring log using a peristaltic pump. The samples were submitted to the MDEQ Laboratory and analyzed for VOCs using the United States Environmental Protection Agency (USEPA) Method 8260 (Table 2) and for metals (Table 3) (Appendix B). Duplicate groundwater samples were submitted to Vista Analytical Laboratory and analyzed for PFAS compounds (Table 4) (Appendix C).

In addition to the soil boring, one existing shallow well (Well-1) was located at the site (Fig 2). The total depth of this well was 27 feet below ground level with a static water level of approximately 17 feet. A groundwater sample was collected from Well-1 and is included in the analyses mentioned above.

A review of the VOC results (Table 2) indicates that low concentrations were detected in the samples from SB-1, SB-2, SB-4, SB-5, SB-6, SB-10, and SB-12. The only compounds detected above RBSLs were vinyl chloride in the sample from SB-2 (5.2 ug/L) and toluene in the sample from SB-5 (6.1 ug/L).

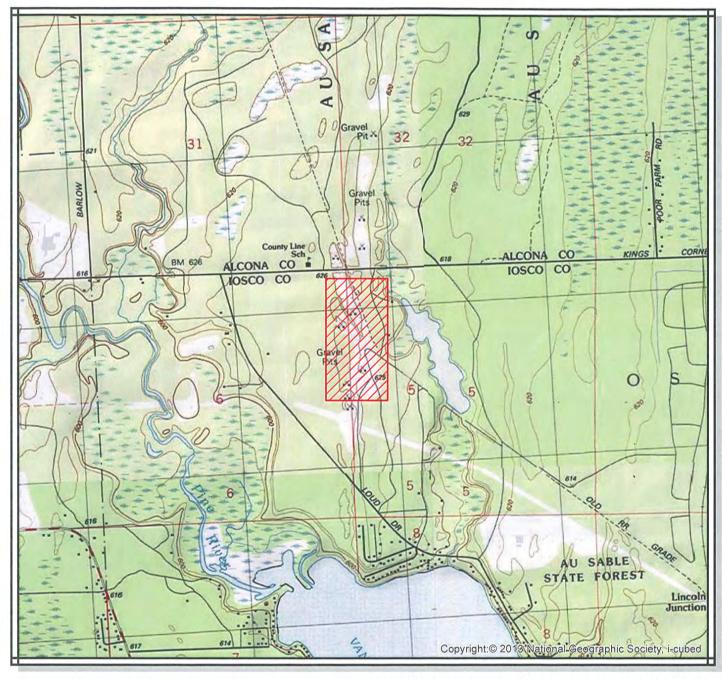
Metals were detected in all the groundwater samples collected from the site. Several metals exceeded at least one of the RBSLs in all the groundwater samples except for the samples collected from SB-14 and SB-15.

The PFOA and PFOS concentrations are included on Figure 3 and the total PFAS concentrations are included on Figure 4. PFAS compounds were detected in all the groundwater samples collected from the site except for SB-11. The combination of PFOA and PFOS exceeded the action level of 70 ng/L in the samples from SB-3, SB-4, and SB-5. These three samples were collected from the southeast corner of the site.

If you have any questions, contact me at 517-243-3171.

Attachments

cc: Burrell P. Shirey, DEQ



W E 0 195 390 780 Meters
0 1,000 2,000 4,000 Feet

**LEGEND** 



Site Location

Datum: NAD83 S Projection: Michigan GeoRef

Source: USGS 7.5 minute quadrangle

#### Oscoda Township Dump

Oscoda Township, Iosco County T24N R9E Sec 6

#### SITE LOCATION MAP

GEOLOGIST

Jeff Pincumbe

GEOLOGICAL SERVICES SECTION

Remediation and Redevelopment Division



**CREATION DATE** 

December 2018



# **LEGEND**

Soil Boring / Well Location

- DATUM NAD83
   PROJECTION: MICHIGAN GEOREF
   NORTHING AND EASTING COORDINATES (IN METERS)
   ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: ArcGIS



80 Meters 0 75 150 300 Feet 1 inch = 300 feet

# Oscoda Township Dump ERNIE ID 35010000

OSCODA TOWNSHIP, IOSCO COUNTY T24N R9E SECTION 6

### SITE MAP

GEOLOGIST Jeff Pincumbe Geological Services Section

Remediation and Redevelopment Division



CREATION DATE December 2018



### **LEGEND**

Soil Boring / Well Location

- DATUM NAD83
- PROJECTION: MICHIGAN GEOREF
   NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: ArcGIS



80 Meters 0 75 150 300 Feet 1 inch = 300 feet

# Oscoda Township Dump ERNIE ID 35010000

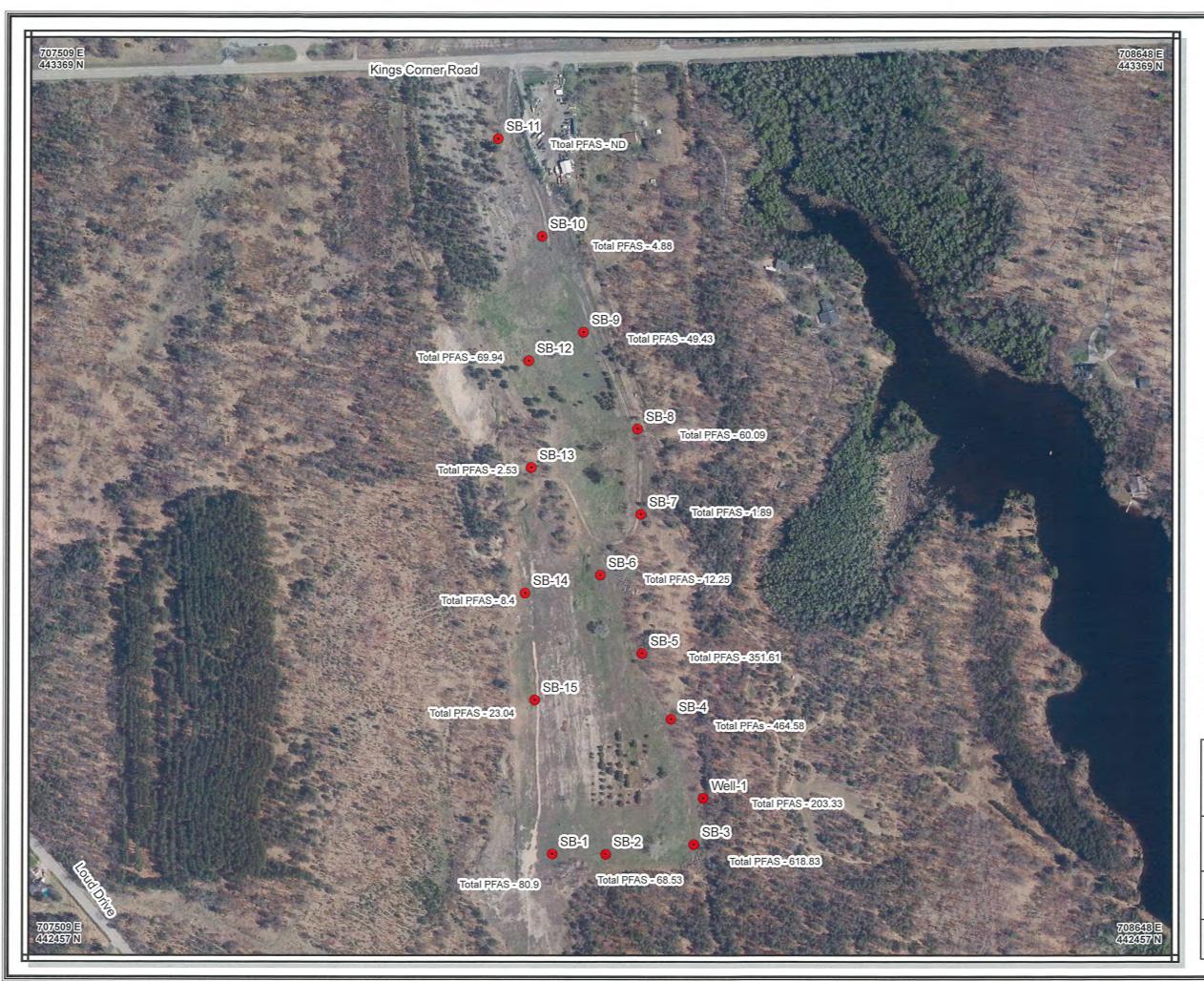
OSCODA TOWNSHIP, IOSCO COUNTY T24N R9E SECTION 6

### PFOA & PFOS CONCENTRATION MAP results are in ng/L (parts per trillion)

GEOLOGIST Jeff Pincumbe Geological Services Section

Remediation and Redevelopment Division

CREATION DATE January 2019



### **LEGEND**

Soil Boring / Well Location

- DATUM NAD83
- PROJECTION: MICHIGAN GEOREF
   NORTHING AND EASTING COORDINATES (IN METERS)
   ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: ArcGIS



80 Meters 0 75 150 300 Feet HHHHH 1 inch = 300 feet

# Oscoda Township Dump ERNIE ID 35010000

OSCODA TOWNSHIP, IOSCO COUNTY T24N R9E SECTION 6

### PFAS CONCENTRATION MAP results are in ng/L (parts per trillion)

GEOLOGIST Jeff Pincumbe Geological Services Section

Remediation and Redevelopment Division



CREATION DATE January 2019

## Oscoda Township Dump, losco County

Table #1 (Page 1 of 1)

Latitude	Longitude	Northing	Easting	Title	Max_PDOP	Corr_Type	GPS_Date	Unfilt_Pos	Std_Dev
44.504557078	-83.380744977	442556.973	708031.724	SB-1	6.7	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000121
44.504538832	-83.380076746	442556.645	708084.897	SB-2	3.7	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000049
44.504599492	-83.378961648	442566.217	708173.304	SB-3	2.7	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000067
44.505728190	-83.379206423	442690.943	708149.840	SB-4	3.5	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000037
44.506326934	-83.379541704	442756.584	708121.067	SB-5	5.6	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000279
44.507042602	-83.380038138	442834.801	708079.072	SB-6	3.5	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000055
44.507574717	-83.379504286	442895.252	708119.608	SB-7	3.6	Postprocessed Code	12/4/2018	30	0.000305
44.508342135	-83.379512752	442980.457	708116.208	SB-8	2.7	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000038
44.509226107	-83.380155174	443076.993	708062.015	SB-9	2.6	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000068
44.510093529	-83.380641558	443172.089	708020.282	SB-10	2.8	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000066
44.510982461	-83.381155468	443269.504	707976.286	SB-11	2.7	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000034
44.508985458	-83.380853800	443048.492	708007.350	SB-12	2.9	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000042
44.508027528	-83.380861678	442942.089	708010.126	SB-13	2.6	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000060
44.506902544	-83.380987627	442816.833	708004.111	SB-14	4.6	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000057
44.505941726	-83.380907985	442710.332	708013.852	SB-15	6.4	L1L2 Postprocessed Carrier Float	12/4/2018	30	0.000092
44.505010555	-83.378829077	442612.205	708182.380	Well-1	3.9	Postprocessed Code	12/4/2018	30 .	0.000550

Work Order:

1812039

Report Date: 1/2/2019 8:59 Client:

Attention:

MDEQ-RRD-SAGINAW BAY Mike Jury OSCODA TOWNSHIP DUMP 3501000 Project Name:

Project Number:

Project Number:	350100	00					-						
Sample Number			700 171		Control March	Groundwater	Rule 57	Management of the Control of the Con				1812039-05	1812039-06
Sample ID	_		Target	Drinking	Groundwater	Volatilization to	Final	WELL-1	SB-1	SB-2	SB-3	SB-4	SB-5
Sample Depth	_		Detection	Water	Surface Water	Indoor Air	Acute	1500000	27-31 feet	26-30 feet	22-26 feet	22-26 feet	22-26 feet
Date Collected		_	Limit	Criteria	Interface	Inhalation	Value	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/4/2018
Date Received	Units	Method	(TDL)	(DWC)		Criteria (GVIIC)	(FAV)	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018
Analyte	_		1	77	Organics-Vola		ID.	- 24					
1,1,1,2-Tetrachloroethane	ug/L	8260	1	77 200	ID	15,000	ID 1 COO	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/L	8260	-		89	660,000	1,600	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/L	8260	1	9	78	12,000	1,800	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	ug/L	8260	1	5	330	17,000	6,400	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	ug/L	8260	1	880 7	740	1,000,000	13,000	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	ug/L	8260			130	200	2,300	<1		<1	<1	<1	<1
1,2,3-Trichlorobenzene	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	ug/L	8260	1	42	NA	8,300	NA	<1	<1	<1	<1	<1	<1
1,2,3-Trimethylbenzene	ug/L	8260	NA	NA 70	NA	NA SOO SOO	NA	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	ug/L	8260	5	70	99	300,000	850	<5	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	ug/L	8260	1	63	17	56,000	310	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane	ug/L	8260	0	0	6	2,400	280	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	ug/L	8260	1	600	13	160,000	240	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	8260	1	5	360	9,600	16,000	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/L	8260	1	- 5	230	16,000	4,000	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	ug/L	8260	4	72	45	61,000	810	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	8260	1	7	28	18,000	200	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	8260	1 50	75	17	16,000	210	<1	<1	<1	<1	<1	<1
2,2,4-Trimethylpentane	ug/L	8260	50	ID	NA	2,300	NA	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	ug/L	8260	25	13,000	2,200	240,000,000	40,000	<5	<5	<5	<5	<5	<5
2-Methylnaphthalene	ug/L	8260	5	260	19	25,000	340	<5	<5	<5	<5	<5	<5
2-Propanone (acetone)	ug/L	8260	50	730	1,700	1,000,000,000	30,000	<20	<20	<20	<20	<20	<20
4-Methyl-2-pentanone (MIBK)	ug/L	8260	50	1,800	ID	20,000,000	ID	<5	<5	<5.	<5	<5	<5
Acrylonitrile	ug/L	8260	2	3	2	34,000	1,200	<5	<5	<5	<5	<5	<5
Benzene	ug/L	8260	1	5	200	5,600	1,900	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
Bromodichloromethane	ug/L	8260	1	80	ID	4,800	ID_	<1	<1	<1	<1	<1	<1
Bromoform	ug/L	8260	1	80	ID	470,000	ID	<1	<1	<1	<1	- <1	<1
Bromomethane	ug/L	8260	5	10	35	4,000	640	<5	<5	<5	<5	<5	<5
Carbon disulfide	ug/L	8260	5	800	ID	250,000	ID	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	ug/L	8260	1	5	45	370	1,400	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/L	8260	1	100	25	210,000	450	<1	<1	<1	<1	₹1	<1
Chloroethane	ug/L	8260	5	430	1,100	5,700,000	20,000	<5	<5	<5	<5	<5	<5
Chloroform	ug/L	8260	1	80	350	28,000	11,000	<1	<1	<1	<1	<1	<1
Chloromethane	ug/L	8260	5	260	ID	8,600	ID	<5	<5	<5	<5	≥5	<5
cis-1,2-Dichloroethylene	ug/L	8260	1	70	620	93,000	11,000	<1	1.9	<1	<1	<1	<1
cis-1,3-Dichloropropylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
Cyclohexane	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5
Dibromochloromethane	ug/L	8260	5	80	ID	14,000	ID	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/L	8260	.5	80	NA	ID	NA	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	ug/L	8260	5	1,700	ID	220,000	ID	<5	<5	<5	<5	<5	<5
Diethyl ether	ug/L	8260	10	10	ID	61,000,000	ID	<5	<5	8	<5	<5	<5
Diisopropyl Ether	ug/L	8260	5	30	1D	8,000	ID.	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/L	8260	1	74	18	110,000	320	<1	<1	<1	<1	<1	<1
Ethyltertiarybutylether	ug/L	8260	5	49	ID	2,900,000	ID	<5	<5	<5	<5	<5	<5
Hexachloroethane	ug/L	8260	5	7	7	27,000	210	<5	<5	<5	<5	<5	<5
Hexane	ug/L	8260	NA	3,000	NA	12,000	NA	<1	<1	<1	<1	<1	<1
Isopropylbenzene	ug/L	8260	5	800	28	56,000	500	<1	<1	<1	<1	<1	<1
m & p - Xylene	ug/L	8260	NA	NA	NA	NA	NA	<2	<2	<2	<2	<2	<2
Methylene chloride	ug/L	8260	5	5	1,500	220,000	17,000	<5	<5	<5	<5	<5	<5
Methyltertiarybutylether	ug/L	8260	5	40	7,100	47,000,000	420,000	<1	<1	<1	<1	<1	<1
Naphthalene	ug/L	8260	5	520	11	31,000	200	<5	<5	<5	<5	<5	<5
n-Butylbenzene	ug/L	8260		80	ID	ID	ID	<1	<1	<1	<1	<1	<1
n-Propylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1
o-Xylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1
Styrene	ug/L	8260	11	100	80	170,000	2,900	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	ug/L	8260	1	80	ID	ID	ID	<1	<1	<1	<1	<1	<1
tertiary Butyl Alcohol	ug/L	8260	50	3,900	NA	1,000,000,000	NA	<50	<50	<50	<50	<50	<50
tertiaryAmylmethylether	ug/L	8260	5	190	NA	260,000	NA	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/L	8260	1	5	60	25,000	2,900	<1	<1	<1	<1	1.8	6.1
Tetrahydrofuran	ug/L	8260	90	95	11,000	6,900,000	150,000	<5	<5	<5	<5	<5	<5
Toluene	ug/L	8260	1	790	270	530,000	2,600	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethylene	ug/L	8260	1	100	1,500	85,000	28,000	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
Trichloroethylene	ug/L	8260	1	5	200	2,200	3,500	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/L	8260	1	2,600	NA	1,100,000	NA	<1	<1	<1	<1	<1	<1
CONTRACTOR OF THE CONTRACTOR	- a -	8260	1	2	13	1,100	17,000	<1	<1	5.2	<1	<1	<1

Grey indicates contaminant was detected.

ellow indicates contaminant exceeds DW0

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background, not applicable.

"NLV" means hazardous substance is not likely to volatilize under most conditions,

Work Order:

Attention:

1812039

Report Date: 1/2/2019 8:59 Client: MDEQ-RRD-SAGINAW BAY

Mike Jury OSCODA TOWNSHIP DUMP

Project Name: Project Number: 3501000

Sample Number	350100					Coundwater	Dule 57	1812039-07	1812039-08	1812039-09	1812039-10	1812039-11	1812039-12
Sample ID			Target	Drinking	Groundwater	Groundwater Volatilization to	Rule 57 Final	SB-6	SB-7	SB-8	SB-8 DUP	SB-9	SB-10
Sample Depth			Detection	Water	Surface Water	Indoor Air	Acute	23-27 feet	23-27 feet	19-23 feet	19-23 feet	15-19 feet	11-15 fee
Date Collected			Limit	Criteria	Interface	Inhalation	Value	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
Date Received			(TDL)	(DWC)	Criteria (GSIC)		(FAV)	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018
Analyte	Units	Method			Organics-Vols								DOM: DV
1,1,1,2-Tetrachloroethane	ug/L	8260	1	77	ID	15,000	ID .	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	ug/L	8260	1	200	89	660,000	1,600	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane	ug/L	8260 8260	1	9	78 330	12,000	1,800 6,400	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	ug/L ug/L	8260	1	880	740	17,000	13,000	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	ug/L	8260	1	7	130	200	2,300	<1	<1	<1	<1	<1	<1
1.2.3-Trichlorobenzene	ug/L	8260	NA	NA	NA NA	NA NA	NA NA	<5	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	ug/L	8260	1	42	NA NA	8,300	NA	<1	<1	<1	<1	<1	<1
1,2,3-Trimethylbenzene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	ug/L	8260	5	70	99	300,000	850	<5	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	ug/L	8260	1	63	17	56,000	310	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane	ug/L	8260	0	0	6	2,400	280	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	ug/L	8260	1.	600	13	160,000	240	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	ug/L	8260	1	5	360	9,600	16,000	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	ug/L	8260	1	5	230	16,000	4,000	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	ug/L	8260	1	72	45	61,000	810	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	8260	1	7	28	18,000	200	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	8260	1	75	17	16,000	210	<1	<1	<1	<1	<1	<1
2,2,4-Trimethylpentane	ug/L	8260	50	ID	NA	2,300	NA	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	ug/L	8260	25	13,000	2,200	240,000,000	40,000	<5	<5	<5	<5	<5	<5
2-Methylnaphthalene	ug/L	8260	5	260	19	25,000	340	<5	<5	<5	<5	<5	<5
2-Propanone (acetone)	ug/L	8260	50	730	1,700	1,000,000,000	30,000	<20	<20	<20	<20	<20	<20
4-Methyl-2-pentanone (MIBK)	ug/L	8260	50	1,800	ID.	20,000,000	ID	<5	<5	<5	<5	<5	<5
Acrylonitrile	ug/L	8260	2	3	2	34,000	1,200	<5	<5	<5	<5	<5	<5
Benzene	ug/L	8260	1	5	200	5,600	1,900	<1	<1	<1	<1	<1	<1
Bromochloromethane	ug/L	8260	NA	NA	NA II	NA 1000	NA	<1	<1	<1	<1	<1	<1
Bromodichloromethane	ug/L	8260	1	80	ID ID	4,800	ID.	<1	<1	<1	<1	<1	<1
Bromoform	ug/L	8260 8260	5	80	1D 35	470,000	ID 640	<1 <5	<1 <5	<5	<1 <5	<5	<5
Bromomethane Carbon disulfide	ug/L	8260	5	800	ID ID	250,000	ID	<1	<1	<1	<1	<1	<1
Carbon distillide  Carbon tetrachloride	ug/L ug/L	8260	1	5	45	370	1,400	<1	<1	<1	<1	<1	<1
Chlorobenzene	ug/L	8260	1	100	25	210,000	450	<1	<1	<1	<1	*1	<1
Chloroethane	ug/L	8260	5	430	1,100	5,700,000	20,000	<5	<5	<5	<5	<5	<5
Chloroform	ug/L	8260	1	80	350	28,000	11,000	<1	<1	<1	<1	<1	<1
Chloromethane	ug/L	8260	5	260	ID	8,600	ID	<5	<5	<5	<5	<b>&gt;</b> 5	<5
cis-1,2-Dichloroethylene	ug/L	8260	1	70	620	93,000	11,000	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropylene	ug/L	8260	NA	NA	NA	NA	NA	<1	<1	<1	<1	<1	<1
Cyclohexane	ug/L	8260	NA	NA	NA	NA	NA	<5	<5	<5	<5	<5	<5
Dibromochloromethane	ug/L	8260	5	80	ID	14,000	ID	<1	<1	<1	<1	<1	<1
Dibromomethane	ug/L	8260	5	80	NA	ID	NA	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	ug/L	8260	5	1,700	ID	220,000	ID	<5	<5	<5	<5	<5	<5
Diethyl ether	ug/L	8260	10	10	1D	61,000,000	ID	<5	<5	<5	<5	<5	<5
Dilsopropyl Ether	ug/L	8260	- 5	30	1D	8,000	ID	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/L	8260	1	74	18	110,000	320	<1	<1	<1	<1	<1	<1
Ethyltertiarybutylether	ug/L	8260	5	49	ID	2,900,000	ID	<5	<5	<5	<5	<5	<5
Hexachloroethane	ug/L	8260	5	7	7	27,000	210	<5	<5	<5	<5	<5	<5
Hexane	ug/L	8260	NA	3,000	NA	12,000	NA	<1	<1	<1	<1	<1	<1
Isopropylbenzene	ug/L	8260	5	800	28	56,000	500	<1	<1	<1	<1	<1	<1
m & p - Xylene	ug/L	8260	NA	NA	NA	NA	NA	<2	<2	<2	<2	<2	<2
Methylene chloride	ug/L	8260	5	5	1,500	220,000	17,000	<5	<5	<5	<5	<5	<5
Methyltertiarybutylether	ug/L	8260	5	40	7,100	47,000,000	420,000	<1	<1	<1	<1	<1	<1
Naphthalene	ug/L	8260	5	520	11	31,000	200	<5	<5	<5	<5	<5	<5
n-Butylbenzene	ug/L	8260	1	80	ID ID	ID	ID	<1	<1	<1	<1	<1	<1
n-Propylbenzene	ug/L	8260	1	80	ID NA	ID NA	ID.	<1	<1	<1	<1	<1	<1
o-Xylene sec-Butylbenzene	ug/L	8260	NA 1	NA 80	NA ID	NA ID	NA ID	<1	<1	<1	<1	<1	<1
sec-Butylbenzene Styrene	ug/L ug/L	8260 8260	1	100	80	170,000	2,900	<1	<1	<1	<1	<1	<1
Styrene tert-Butylbenzene	ug/L ug/L	8260	1	80	ID	170,000 ID	2,900	<1	<1	<1	<1	<1	<1
tertiary Butyl Alcohol	ug/L	8260	50	3,900	NA NA	1,000,000,000	NA NA	<50	<50	<50	<50	<50	<50
tertiary Butyl Alcohol tertiaryAmylmethylether	ug/L ug/L	8260	5	190	NA NA	260,000	NA NA	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/L ug/L	8260	1	5	60	25,000	2,900	<1	<1	<1	<1	<1	<1
Tetrahydrofuran	ug/L	8260	90	95	11,000	6,900,000	150,000	<5	<5	<5	<5	<5	<5
Toluene	ug/L	8260	1	790	270	530,000	2,600	1.3	<1	<1	<1	1.4	<1
trans-1,2-Dichloroethylene	ug/L ug/L	8260	1	100	1,500	85,000	28,000	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropylene	ug/L	8260	NA	NA.	NA NA	NA	NA	<1	<1	<1	<1	<1	<1
Trichloroethylene	ug/L	8260	1	5	200	2,200	3,500	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	ug/L	8260	1	2,600	NA NA	1,100,000	NA	<1	<1	<1	<1	<1	<1
Vinyl chloride	ug/L	8260	1	2	13	1,100	17,000	<1	<1	<1	<1	<1	<1

Grey indicates contaminant was detected,

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background, not applicable.

"NLV" means hazardous substance is not likely to volatilize under most conditions.

Work Order: 1812039 Report Date: 1/2/2019 8:59

Client: MDEQ-RRD-SAGINAW BAY

Attention: Project Name:

Mike Jury OSCODA TOWNSHIP DUMP

Project Number: 3501000

Sample Number Sample ID Sample Depth Date Collected Date Received Analyte 1.1.1.2-Tetrachloroethane 1.1.1.2-Tetrachloroethane 1.1.2-Trichloroethane 1.1.2-Trichloroethane 1.1.2-Trichloroethane 1.1.2-Trichloroethane 1.1.2-Trichloroethane 1.2.3-Trichloroethane 1.2.3-Trichloroethane 1.2.3-Trichloropropane 1.2.3-Trichloropropane 1.2.4-Trichlorobenzene 1.2.4-Trimethylbenzene 1.2-Dichlorobenzene 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloropropane 1.2-Dichloropropane 1.2-Dichloropropane 1.2-Dichloropropane 1.2-Dichloropropane 1.2-Dichloropropane 1.3-Dichlorobenzene 1.3-Dichlorobenzene 1.3-Trimethylbenzene 1.3-Trimethylpenzene 1.3-Dichlorobenzene 1.3-Dichloromethane 1.3-Dichloromethane 1.3-Dichloromethane 1.3-Dichloromethane 1.3-Dichlorobenzene 1.3-Dichlorobenz		0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 NA 0 NA 0 5 0 1	77 200 9 5 880 7 NA 42 NA 70	Organics-Vola ID 89 78 330 740 130 NA NA	Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC) stiles 15,000 660,000 12,000 17,000 1,000,000 200 NA	Rule 57 Final Acute Value (FAV) ID 1,600 1,800 6,400	1812039-13 SB-11 11-15 feet 12/4/2018 12/5/2018 <1 <1 <1 <1	SB-12 15-19 feet 12/4/2018 12/5/2018 <1 <1 <1	SB-13 27-31 feet 12/4/2018 12/5/2018	1812039-16 SB-14 27-31 feet 12/4/2018 12/5/2018	1812039-17 SB-15 31-35 feet 12/4/2018 12/5/2018
Sample Depth Date Collected Date Received Analyte 1,1,1,2-Tetrachloroethane ug/ 1,1,1-Trichloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethylene ug/ 1,2,3-Trichloroethylene ug/ 1,2,3-Trichloroethylene ug/ 1,2,3-Trichloroethylene ug/ 1,2,3-Trichloroethylenzene ug/ 1,2,4-Trichloroethane ug/ 1,2,4-Trichloroethane ug/ 1,2-Dichloroethane ug/ 1,3-Trimethylbenzene ug/ 1,3-Dichlorobenzene ug/ 1,4-Dichlorobenzene ug/ 1,4-Dichlorobenzene ug/ 2,2-A-Trimethylpentane ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromochloromethane ug/ Bromooform ug/ Bromomethane ug/ Carbon tetrachloride ug/ Carbon tetrachloride ug/ Chloroethane ug/		Detectic Limit (TDL) od 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0	77 200 9 5 880 7 NA 42 NA 70	Surface Water Interface Criteria (GSIC) Organics-Vote ID 89 78 330 740 130 NA	Indoor Air Inhalation Criteria (GVIIC) Itiles 15,000 660,000 12,000 17,000 1,000,000	Acute Value (FAV) ID 1,600 1,800 6,400	11-15 feet 12/4/2018 12/5/2018 <1 <1 <1 <1	15-19 feet 12/4/2018 12/5/2018 <1 <1 <1 <1	27-31 feet 12/4/2018 12/5/2018 <1 <1	27-31 feet 12/4/2018 12/5/2018	31-35 feet 12/4/2018 12/5/2018 <1
Date Collected Date Received Analyte Uni 1,1,1,2-Tetrachloroethane ug/ 1,1,1,2-Trichloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethylene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2-Dichloroethane ug/ 1,2-Dichlorobenzene ug/ 2,2-Trimethylbenzene ug/ 1,2-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 2,3-Trimethylbenzene ug/ 2,4-Trimethylpentane ug/ 2-Butanone (MEK) ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromoform ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chloroethane ug/		Limit (TDL) od  0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 NA 0 1 0 NA 0 5 0 1 0 0	77 200 9 5 880 7 NA 42 NA 70	Interface Criteria (GSIC) Organics-Vola ID 89 78 330 740 130 NA NA	Inhalation Criteria (GVIIC) tities 15,000 680,000 12,000 17,000 1,000,000 200	Value (FAV) ID 1,600 1,800 6,400	12/4/2018 12/5/2018 <1 <1 <1 <1	12/4/2018 12/5/2018 <1 <1 <1 <1	12/4/2018 12/5/2018 <1 <1	12/4/2018 12/5/2018 <1	12/4/2018 12/5/2018 <1
Date Received           Analyte         Uni           1,1,2-Tetrachloroethane         ug/           1,1,1-Trichloroethane         ug/           1,1,2-Tetrachloroethane         ug/           1,1,2-Trichloroethane         ug/           1,1-Dichloroethane         ug/           1,1-Dichloroethane         ug/           1,2-3-Trichloroethane         ug/           1,2,3-Trichloropropane         ug/           1,2,3-Trichloropropane         ug/           1,2,3-Trimethylbenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           2,4-Trimethylpentane         ug/           2,2-Butanone (MEK)         ug/           2-Butanone (MEK)         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           2-Propanone (acetone)         ug/           Bromodichloromethane         ug/           Bromoform         ug/           Bromoform         ug/		O TDL)  O 1  O 1  O 1  O 1  O 1  O 1  O 1  O	77 200 9 5 880 7 NA 42 NA 70	Criteria (GSIC) Organics-Vola ID 89 78 330 740 130 NA NA	Criteria (GVIIC)  tiles  15,000 660,000 12,000 17,000 1,000,000 200	(FAV) ID 1,600 1,800 6,400	12/5/2018 <1 <1 <1 <1	12/5/2018 <1 <1 <1 <1	12/5/2018 <1 <1	12/5/2018	12/5/2018
Analyte Uni 1,1,1,2-Tetrachloroethane ug/ 1,1,1-Trichloroethane ug/ 1,1,2,2-Tetrachloroethane ug/ 1,1,2,2-Tetrachloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethane ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2,4-Trimethylbenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 2,2,4-Trimethylbenzene ug/ 1,4-Dichlorobenzene ug/ 2-Methylnaphthalene ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Garbon tetrachloride ug/ Carbon tetrachloride ug/ Chloroethane ug/		od   0	77 200 9 5 880 7 NA 42 NA 70	Organics-Vola ID 89 78 330 740 130 NA NA	15,000 660,000 12,000 17,000 1,000,000 200	ID 1,600 1,800 6,400	<1 <1 <1	<1 <1 <1	<1 <1	<1	<1
1.1.1.2-Tetrachloroethane         ug/           1.1.1-Trichloroethane         ug/           1.1.2-Tetrachloroethane         ug/           1.1.2-Trichloroethane         ug/           1.1-Dichloroethane         ug/           1.1-Dichloroethylene         ug/           1.2-Dichloroethylene         ug/           1.2.3-Trichlorobenzene         ug/           1.2.3-Trimethylbenzene         ug/           1.2.4-Trimethylbenzene         ug/           1.2-Trichlorobenzene         ug/           1.2-Dichlorobenzene         ug/           1.2-Dichlorobenzene         ug/           1.2-Dichloropenzene         ug/           1.3-Dichlorobenzene         ug/           1.4-Dichlorobenzene         ug/           2.2-4-Trimethylpentane         ug/           2.2-4-Trimethylpentane         ug/           2.2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoofloromethane         ug/           Bromooform         ug/           Bromoofloroethane         ug/           Car		0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 NA 0 NA 0 5 0 1	200 9 5 880 7 NA 42 NA 70	1D 89 78 330 740 130 NA NA	15,000 660,000 12,000 17,000 1,000,000 200	1,600 1,800 6,400	<1 <1	<1 <1	<1		
1,1,1-Trichloroethane         ug/           1,1,2-Trichloroethane         ug/           1,1,2-Trichloroethane         ug/           1,1-Dichloroethane         ug/           1,1-Dichloroethylene         ug/           1,2,3-Trichlorobenzene         ug/           1,2,3-Trichloroptopane         ug/           1,2,3-Trimethylbenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2-Trichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,3-Trimethylbenzene         ug/           1,3-Trimethylbenzene         ug/           1,2-Dichlorobenzene         ug/           2,2-4-Trimethylpentane         ug/           2,2-4-Trimethylpentane         ug/           2,2-4-Trimethylpentane         ug/           2,2-4-Trimethylpentane         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone         ug/           Bernzene         ug/ <tr< td=""><td>1/L 82/1/L 82/1/</td><td>0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 NA 0 1 0 NA 0 5 0 1</td><td>200 9 5 880 7 NA 42 NA 70</td><td>89 78 330 740 130 NA NA</td><td>660,000 12,000 17,000 1,000,000 200</td><td>1,600 1,800 6,400</td><td>&lt;1 &lt;1</td><td>&lt;1 &lt;1</td><td>&lt;1</td><td></td><td></td></tr<>	1/L 82/1/L 82/1/	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 NA 0 1 0 NA 0 5 0 1	200 9 5 880 7 NA 42 NA 70	89 78 330 740 130 NA NA	660,000 12,000 17,000 1,000,000 200	1,600 1,800 6,400	<1 <1	<1 <1	<1		
1,1,2,2-Tetrachloroethane ug/ 1,1,2-Trichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethylene ug/ 1,1-Dichloroethylene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trimethylbenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 2,4-Trimethylbenzene ug/ 2,4-Trimethylpentane ug/ 2-Propanone (MEK) ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chloroethane ug/ Chloroethane ug/ Chloroform ug/ Chloroform	1/L   82   82   82   82   83   84   84   84   84   84   84   84	0 1 0 1 0 1 0 1 0 1 0 NA 0 1 0 NA 0 5 0 1	9 5 880 7 NA 42 NA 70	78 330 740 130 NA NA	12,000 17,000 1,000,000 200	1,800 6,400	<1	<1		<1	
1,1,2-Trichloroethane ug/ 1,1-Dichloroethane ug/ 1,1-Dichloroethylene ug/ 1,2,3-Trichloropenzene ug/ 1,2,3-Trichloropenzene ug/ 1,2,3-Trichloropenzene ug/ 1,2,3-Trimethylbenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloropenzene ug/ 1,2-Dichloropenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Trimethylbenzene ug/ 1,3-Dichlorobenzene ug/ 2,4-Trimethylpentane ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Benzene ug/ Bromochloromethane ug/ Bromochloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/	7/L 82	0 1 0 1 0 1 0 NA 0 1 0 NA 0 5 0 1	5 880 7 NA 42 NA 70	330 740 130 NA NA	17,000 1,000,000 200	6,400					<1
1,1-Dichloroethane ug/ 1,1-Dichloroethylene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,2-Dichloroethane ug/ 1,3-Dichloroethane ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,4-Dichlorobenzene ug/ 2,4-Trimethylpentane ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Benzene ug/ Bromochloromethane ug/ Bromochloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon tetrachloride ug/ Carbon tetrachloride ug/ Chloroethane ug/	1/1 82 1/1 82	0 1 0 1 0 NA 0 1 0 NA 0 5 0 5	880 7 NA 42 NA 70	740 130 NA NA	1,000,000		<1		<1	<1	<1
1,1-Dichloroethylene ug/ 1,2,3-Trichlorobenzene ug/ 1,2,3-Trichloropopane ug/ 1,2,3-Trichlorobenzene ug/ 1,2,4-Trimethylbenzene ug/ 1,2,4-Trimethylbenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,4-Dichlorobenzene ug/ 2,2,4-Trimethylbentane ug/ 2-Rethylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromodichloromethane ug/ Bromomethane ug/ Carbon tetrachloride ug/ Carbon tetrachloride ug/ Chloroethane ug/ Chloroethane ug/ Chloroethane ug/ Chloroform ug/ Chloroform ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/ Cis-1,2-Dichloroethylene	1/L 82 1/L 82 1/	0 1 0 NA 0 1 0 NA 0 5 0 1 0 0	7 NA 42 NA 70	130 NA NA	200	13,000		<1	<1	<1	<1
1,2,3-Trichlorobenzene         ug/           1,2,3-Trichloropropane         ug/           1,2,3-Trimethylbenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2-Dibromoethane         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichloropenpane         ug/           1,3-Trimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2,2-Hathylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoformethane         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroethane         ug/           Chloromethane         ug/           Chloroform         Chloroforhylene	1/L   82   1/L   82	0 NA 0 1 0 NA 0 5 0 1	NA 42 NA 70	NA NA		10,000	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene         ug/           1,2,3-Trichloropropane         ug/           1,2,3-Trimethylbenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2,4-Trichlorobenzene         ug/           1,2-Dibromoethane         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichloropenpane         ug/           1,3-Trimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2,2-Hathylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoformethane         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroethane         ug/           Chloromethane         ug/           Chloroform         Chloroforhylene	1/L   82   1/L   82	0 NA 0 1 0 NA 0 5 0 1	42 NA 70	NA NA		2,300	<1	<1	<1	<1	<1
1,2,3-Trichloropropane ug/ 1,2,3-Trimethylbenzene ug/ 1,2,4-Trichlorobenzene ug/ 1,2-4-Trichlorobenzene ug/ 1,2-4-Trichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichloropropane ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 2,2-4-Trimethylbenzene ug/ 2,2-4-Trimethylpentane ug/ 2-Butanone (MEK) ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chlorobenzene ug/ Chlorotentane ug/	1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82	0 1 0 NA 0 5 0 1	42 NA 70	NA		NA	<5	<5	<5	<5	<5
1.2,3-Trimethylbenzene ug/ 1.2,4-Trinchlorobenzene ug/ 1.2,4-Trimethylbenzene ug/ 1.2-Dibromoethane ug/ 1,2-Dibromoethane ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,2-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 1,3-Dichlorobenzene ug/ 2,2-4-Trimethylbenzene ug/ 2-Butanone (MEK) ug/ 2-Methylnaphthalene ug/ 2-Propanone (aetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chlorobenzene ug/ Chlorotethane ug/	1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82	0 NA 0 5 0 1 0 0	NA 70		8,300	NA	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene         ug/           1,2,4-Trimethylbenzene         ug/           1,2-Dibromoethane         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichloroethane         ug/           1,2-Dichloropenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           A-Crylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoform         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           Chloroform         ug/	1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82	0 5 0 1 0 0	70	NA	NA	NA	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene         ug/           1,2-Dibromoethane         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichloropropane         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromomethane         ug/           Carbon (disulfide         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroethane         ug/           Chloromethane         ug/           Chloromethane         ug/           Chloromethane         ug/           Chloromethane         ug/	9/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82	0 1		99	300,000	850	<5	<5	<5	<5	<5
1,2-Dibromoethane         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,2-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Butanone (MEK)         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoforhane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroform         Chloroform           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	1/L 82 1/L 82 1/L 82 1/L 82 1/L 82 1/L 82	0 0	63	17	56,000	310	<1	<1	<1	<1	<1
1,2-Dichlorobenzene         ug/           1,2-Dichloroethane         ug/           1,2-Dichloropropane         ug/           1,3-5-Trimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2-4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromodichloromethane         ug/           Bromoform         ug/           Bromomethane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloromethane         ug/           Chloromethane         ug/           chloromethane         ug/           chloromethane         ug/	1/L 82 1/L 82 1/L 82 1/L 82 1/L 82		0	6	2,400	280	<1	<1	<1	<1	<1
1,2-Dichloroethane         ug/           1,2-Dichloropropane         ug/           1,3-Frimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Butanone (MEK)         ug/           2-Propanone (acetone)         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoform         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	g/L 82 g/L 82 g/L 82 g/L 82	U I	600	13	160,000	240	<1	<1	<1	<1	<1
1,2-Dichloropropane         ug/           1,3-Frimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoform         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	1/L 82 1/L 82 1/L 82		5	360	9,600	16,000	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene         ug/           1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2,Butanone (MEK)         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromoform         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	/L 82		5	230	16,000	4,000	<1	<1	<1	<1	<1
1,3-Dichlorobenzene         ug/           1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2,-Butanone (MEK)         ug/           2Butanone (MEK)         ug/           2Propanone (acetone)         ug/           4Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromoform         ug/           Bromomethane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	/L 82						<1			<1	<1
1,4-Dichlorobenzene         ug/           2,2,4-Trimethylpentane         ug/           2-Butanone (MEK)         ug/           2-Methylnaphthalene         ug/           2-Propanone (acetone)         ug/           4-Methyl-2-pentanone (MIBK)         ug/           Acrylonitrile         ug/           Benzene         ug/           Bromochloromethane         ug/           Bromodichloromethane         ug/           Bromoform         ug/           Bromomethane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/			72	45	61,000	810	<1	<1	<1	<1	
2,2,4-Trimethylpentane ug/ 2-Butanone (MEK) ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloroform ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/	//L   83			28	18,000	200			<1		<1
2-Butanone (MEK) ug/ 2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloroform ug/ Chloromethane ug/	-		75	17	16,000	210	<1 >E	<1	<1	<1	<1
2-Methylnaphthalene ug/ 2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromothale ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chloroethane ug/ Chloroethane ug/ Chloroethane ug/ Chloroform ug/ Chloroform ug/ Chloromethane ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/			ID	NA	2,300	NA	<5	<5	<5	<5	<5
2-Propanone (acetone) ug/ 4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromodichloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromodithane ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/			13,000	2,200	240,000,000	40,000	<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK) ug/ Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromofichloromethane ug/ Bromofichloromethane ug/ Bromoform ug/ Bromoform ug/ Bromoform ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chlorothane ug/ Chlorothane ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/	-		260	19	25,000	340	<5	<5	<5	<5	<5
Acrylonitrile ug/ Benzene ug/ Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromoform ug/ Bromomethane ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ Chloromethane ug/ Chloromethane ug/ Chloromethane ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/			730	1,700	1,000,000,000	30,000	<20	<20	<20	<20	<20
Benzene         ug/           Bromochloromethane         ug/           Bromodichloromethane         ug/           Bromoform         ug/           Bromomethane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/			1,800	ID	20,000,000	ID	<5	<5	<5	<5	<5
Bromochloromethane ug/ Bromodichloromethane ug/ Bromoform ug/ Bromomethane ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ chloroform ug/ cis-1,2-Dichloroethylene ug/			3	2	34,000	1,200	<5	<5	<5	<5	<5
Bromodichloromethane ug/ Bromoform ug/ Bromomethane ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/			5	200	5,600	1,900	<1	<1	<1	<1	<1
Bromoform         ug/           Bromomethane         ug/           Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	/L 82	0 NA	NA	NA	NA	NA	<1	<1	<1	<1	<1
Bromomethane ug/ Carbon disulfide ug/ Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ Cis-1,2-Dichloroethylene ug/	/L 82	0 1	80	ID.	4,800	ID	<1	<1	<1	<1	<1
Carbon disulfide         ug/           Carbon tetrachloride         ug/           Chlorobenzene         ug/           Chloroethane         ug/           Chloroform         ug/           Chloromethane         ug/           cis-1,2-Dichloroethylene         ug/	/L 82	0 1	80	ID	470,000	ID	<1	<1	· <1	<1 ×	<1
Carbon tetrachloride ug/ Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ cis-1,2-Dichloroethylene ug/	/L 82	0 5	10	35	4,000	640	<5	<5	<5	<5	<5
Chlorobenzene ug/ Chloroethane ug/ Chloroform ug/ Chloromethane ug/ cis-1,2-Dichloroethylene ug/	/L 82	0 5	800	ID	250,000	ID	<1	<1	<1	<1	<1
Chloroethane ug/ Chloroform ug/ Chloromethane ug/ cis-1,2-Dichloroethylene ug/	/L 82	0 1	5	45	370	1,400	<1	<1	<1	<1	<1
Chloroethane ug/ Chloroform ug/ Chloromethane ug/ cis-1,2-Dichloroethylene ug/	/L 82	0 1	100	25	210,000	450	<1	<1	<1	<1	<1
Chloromethane ug/ cis-1,2-Dichloroethylene ug/		0 5	430	1,100	5,700,000	20,000	<5	<5	<5	<5	<5
Chloromethane ug/ cis-1,2-Dichloroethylene ug/			80	350	28,000	11,000	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene ug/		0 5	260	ID	8,600	ID	<5	<5	<5	<5 `	<5
	-		70	620	93,000	11,000	<1	<1	<1	<1	<1
cis-1,3-Dichloropropylene ug/			NA	NA	NA	NA	<1	<1	<1	<1	<1
Cyclohexane ug/			NA	NA	NA	NA	<5	<5	<5	<5	<5
Dibromochloromethane ug/	_	Andrew Commencer	80	ID	14,000	1D	<1	<1	<1	<1	<1
Dibromomethane ug/	-		80	NA NA	ID	NA	<1	<1	<1	<1	<1
Dichlorodifluoromethane ug/	-		1,700	ID	220,000	ID	<5	<5	<5	<5	<5
Diethyl ether ug/		-	10	ID	61,000,000	ID.	<5	<5	<5	<5	<5
			30	ID	8,000	ID	<5	<5	<5	<5	<5
	-	-	74	18	110,000	320	<1	<1	<1	<1	<1
Ethylbenzene ug/			49	ID ID		320 ID	<1 <5	<1 <5	<5	<5	<1 <5
Ethyltertiarybutylether ug/					2,900,000						
Hexachloroethane ug/			7	7	27,000	210	<5	<5	<5	<5	<5
Hexane ug/		2	3,000	NA	12,000	NA	<1	<1	<1	<1	<1
Isopropylbenzene ug/	-		800	28	56,000	500	<1	<1	<1	<1	<1
m & p - Xylene ug/			NA	NA	NA	NA	<2	<2	<2	<2	<2
Methylene chloride ug/			5	1,500	220,000	17,000	<5	<5	<5	<5	<5
Methyltertiarybutylether ug/	-		40	7,100	47,000,000	420,000	<1	<1	<1	<1	<1
Naphthalene ug/			520	11	31,000	200	<5	<5	<5	<5	<5
n-Butylbenzene ug/	/L 82	0 1	80	ID.	ID	ID	<1	<1	<1	<1	<1
n-Propylbenzene ug/	J/L 82	0 1	80	ID	ID	ID	<1	<1	<1	<1	<1
o-Xylene ug/	/L 82	0 NA	NA	NA	NA	NA	<1	<1	<1	<1	<1
sec-Butylbenzene ug/	-	0 1	80	ID	ID	ID	<1	<1	<1	<1	<1
Styrene ug/		0 1	100	80	170,000	2,900	<1	<1	<1	<1	<1
tert-Butylbenzene ug/		0 1	80	ID	ID	ID	<1	<1	<1	<1	<1
tertiary Butyl Alcohol ug/			3,900	NA	1,000,000,000	NA	<50	<50	<50	<50	<50
tertiaryAmylmethylether ug/			190	NA	260,000	NA	<5	<5	<5	<5	<5
Tetrachloroethylene ug/			5	60	25,000	2,900	<1	<1	<1	<1	<1
Tetrahydrofuran ug/		-	95	11,000	6,900,000	150,000	<5	<5	<5	<5	<5
Toluene ug/	_		790	270	530,000	2,600	<1	2.4	<1	<1	1.6
trans-1,2-Dichloroethylene ug/			100	1,500	85,000	28,000	<1	<1	<1	<1	<1
	-	The second second	The second second				<1	<1	<1	<1	<1
trans-1,3-Dichloropropylene ug/	/L 82		NA .	NA 200	NA 2.200	NA 9.500					
Trichloroethylene ug/			5	200	2,200	3,500	<1	<1	<1	<1	<1
Trichlorofluoromethane ug/ Vinyl chloride ug/	/L 82	0 1	2,600	NA 13	1,100,000	NA 17,000	<1	<1 <1	<1	<1	<1 <1

Grey indicates contaminant was detected,

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background, not applicable.

"NLV" means hazardous substance is not likely to volatilize under most conditions.

Work Order: 1812039

Report Date: 1/2/2019 8:59

Client: MDEQ-RRD-SAGINAW BAY

Attention: Mike Jury

Project Name: OSCODA TOWNSHIP DUMP

Project Number: 3501000

r roject rumber.	00010	00														
Sample Number	. 1					Groundwater	Rule 57	1812039-01	1812039-02	1812039-03	1812039-04	1812039-05	1812039-06	1812039-07	1812039-08	1812039-09
Sample ID			Target	Drinking	Groundwater	Volatilization to	Final	WELL-1	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8
Sample Depth			Detection	Water	Surface Water	Indoor Air	Acute		27-31 feet	26-30 feet	22-26 feet	22-26 feet	22-26 feet	23-27 feet	23-27 feet	19-23 feet
Date Collected			Limit	Criteria	Interface	Inhalation	Value	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
Date Received			(TDL)	(DWC)	Criteria (GSIC)	Criteria (GVIIC)	(FAV)	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018
Analyte	Units	Method			Inorganics-Me	tals						-			1	1 = 1
Arsenic	ug/L	200.8	5	10	10	NLV	680	<1	7	13	2.7	1.3	6.6	2.2	5.2	3.5
Barium	ug/L	200.8	100	2,000	G	NLV	Calc	<5	130	120	62	34	130	68	130	64
Cadmium	ug/L	200.8	1	5	G,X	NLV	Calc	1.4	0.3	0.4	0.3	<0.2	1.2	0.3	0.3	0.3
Chromium	ug/L	200.8	10	100	11	NLV	32	<1	94	76	110	53	140	42	190	65
Copper	ug/L	200.8	4	1,000	G	NLV	Calc	2.3	34	54	66	18	120	24	70	24
Lead	ug/L	200.8	3	4	G,X	NLV	Calc	17	9.6	19	4.2	1.5	7.1	3	8	6.1
Mercury	ug/L	245.1	0	2	0	56	3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	ug/L	200.8	- 5	50	5	NLV	120	<1	<1	<1	<1	<1	<2	<1	<1	<1
Silver	ug/L	200.8	0	34	0	NLV	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	ug/L	200.8	50	2,400	G	NLV	Calc	36,000	140	110	220	29	410	35	360	20

Grey indicates contaminant was detected.

Yellow indicates contaminant exceeds DWC.

Blue indicates contaminant exceeds GSIC.

Steen indicates contaminant exceeds both DWC and GSIC

Orange indicates contaminant exceeds one or more criteria; GVIIC and/or FAV.

"Calc" means the FAV must be calculated, see Rule 57 Table.

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background, not applicable.

"NLV" means hazardous substance is not likely to volatilize under most conditions.

"G" refers to Footnote G of the Criteria/RBSLs tables. The GSI criteria must be calculated.

Work Order:

1812039

Report Date:

1/2/2019 8:59

Client:

MDEQ-RRD-SAGINAW BAY

Attention:

Mike Jury

Project Name:

OSCODA TOWNSHIP DUMP

Project Number: 3501000

1 Toject Hullibel	. 00010	00													
Sample Numbe	er					Groundwater	Rule 57	1812039-10	1812039-11	1812039-12	1812039-13	1812039-14	1812039-15	1812039-16	1812039-17
Sample ID			Target	Drinking	Groundwater	Volatilization to	Final	SB-8 DUP	SB-9	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15
Sample Depth			Detection	Water	Surface Water	Indoor Air	Acute	19-23 feet	15-19 feet	11-15 feet	11-15 feet	15-19 feet	27-31 feet	27-31 feet	31-35 feet
Date Collected			Limit	Criteria	Interface	Inhalation	Value	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
Date Received			(TDL)	(DWC)	Criteria (GSIC)	Criteria (GVIIC)	(FAV)	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018	12/5/2018
Analyte	Units	Method			Inorganics-Me	etals							11		
Arsenic	ug/L	200.8	5	10	10	NLV	680	3.6	7.1	5.4	<1	<1	5.3	<1	<1
Barium	ug/L	200.8	100	2,000	G	NLV	Calc	57	150	120	23	21	100	17	25
Cadmium	ug/L	200.8	1	5	G,X	NLV	Calc	0.2	0.7	1.4	<0.2	<0.2	0.4	<0.2	<0.2
Chromium	ug/L	200.8	10	100	11	NLV	32	52	480	280	25	13	69	3.7	<1
Copper	ug/L	200.8	4	1,000	G	NLV	Calc	19	110	70	7.2	6.9	56	1.4	<1
Lead	ug/L	200.8	3	4	G,X	NLV	Calc	5.3	8.8	7.2	<1	<1	6.5	<1	<1
Mercury	ug/L	245.1	0	2	0	56	3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	ug/L	200.8	5	50	5	NLV	120	<1	<2	<1	<1	<1	<1	<1	<1
Silver	ug/L	200.8	0	34	0	NLV	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	ug/L	200.8	50	2,400	G	NLV	Calc	19	260	270	7.5	15	730	<5	<5

Grey indicates contaminant was detected.

Yellow indicates contaminant exceeds DWC.

Blue indicates contaminant exceeds GSIC.

Breen indicates, contaminant exceeds both DVVC and GSIC

Orange indicates contaminant exceeds one or more criteria; GVIIC and/or FAV.

"Calc" means the FAV must be calculated, see Rule 57 Table.

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background, not applicable.

"NLV" means hazardous substance is not likely to volatilize under most conditions.

"G" refers to Footnote G of the Criteria/RBSLs tables. The GSI criteria must be calculated.

VISTA Analytical Laboratory Report

VISTA Work Order:

1803948

Table #4 (Page 1 of 1)

Report Date:

1/2/2019

Client:

MDEQ-RRD-SAGINAW BAY

Attention:

Mike Jury

Project Name: Project Number:

OSCODA TOWNSHIP DUMP

3501000

Project Number:	3501000						
Location:		Well-1	SB-1	SB-2	SB-3	SB-4	SB-5
Depth:			27-31 ft	26-30 ft	22-26 ft	22-26 ft	22-26 ft
Date:		12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/3/2018	12/4/2018
	Action Level						
Perfluorooctanoic Acid (PFOA)	70 ng/l	32.1	23.4	22.8	359	273	245
Perfluorooctane Sulfonate (PFOS)	70 ng/l	ND	4.11	2.4	4.2	2.84	10.6
Total PFOA and PFOS	70 ng/l	32.1	27.51	25.2	363.2	275.84	255.6
Total PFAS		203.33	80.9	68.53	618.83	464.58	351.61

Location:		SB-6	SB-7	SB-8	SB-8 DUP	SB-9	SB-10
Depth:		23-27 ft	23-27 ft	19-23 ft	19-23 ft	152-419 ft	10-15 ft
Date:		12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
	Action Level						
Perfluorooctanoic Acid (PFOA)	70 ng/l	3.62	1.89	22.3	22.4	12	ND
Perfluorooctane Sulfonate (PFOS)	70 ng/l	ND	ND	8.22	10.2	26	1.57
Total PFOA and PFOS	70 ng/l	3.62	1.89	30.52	32.6	38	1.57
Total PFAS		12.25	1.89	60.09	62.13	49.43	4.88

Location:		SB-11	SB-12	SB-13	SB-14	SB-15
Depth:		11-15 ft	15-19 ft	27.31	27-31 ft	31-35 ft
Date:		12/4/2018	12/4/2018	12/4/2018	12/4/2018	12/4/2018
	Action Level					
Perfluorooctanoic Acid (PFOA)	70 ng/l	ND	21.5	ND	8.4	11.2
Perfluorooctane Sulfonate (PFOS)	70 ng/l	ND	ND	ND	ND	3.82
Total PFOA and PFOS	70 ng/l	ND	21.5	ND	8.4	15.02
Total PFAS		ND	69.94	2.53	8.4	23.04

ND = Not Detected

# **APPENDIX A**

Otsego Township Dump, Iosco County Site ID #35010000

DEQ Soil Boring Logs



BORING/WELL: SB/GW-1

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

SECTION: 6

LOCATION DESCRIPTION: SW corner of site

**DATE: 10-3-18** 

DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe
DRILL METHOD: Geoprobe

TOTAL DEPTH: 31 feet

ERNIE#: 35010000

WELL CONSTRUCTION	LITHOLOGIC	DESCRIPTION	DEPTH	SAMPLEID	SAMPLE TYPE	FIELD SCREENING RESULTS	PID ppm
		Grd.  SAND  Medium to coarse with gravel, light brown	0   5 				
		SAND Fine to medium, light brown  SAND Fine to medium, light brown  Probe to 31 feet with 1.25 inch rods and drop out screen. Collected groundwater sample from 27-31 feet	-10 -15 -15 20				
		E.O.B.	- -25 - - - -30 - - - - -35				

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.504557078

LONGITUDE: -83.380744977

DATUM: MichGeoRef

NORTHING: 442556.973

EASTING: 708031.724



#### **BOREHOLE LOG**

SITE: Oscoda Township Dump

BORING/WELL: SB/GW-2

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N

RANGE: 9E **SECTION:** 6 **DATE: 10-3-18** 

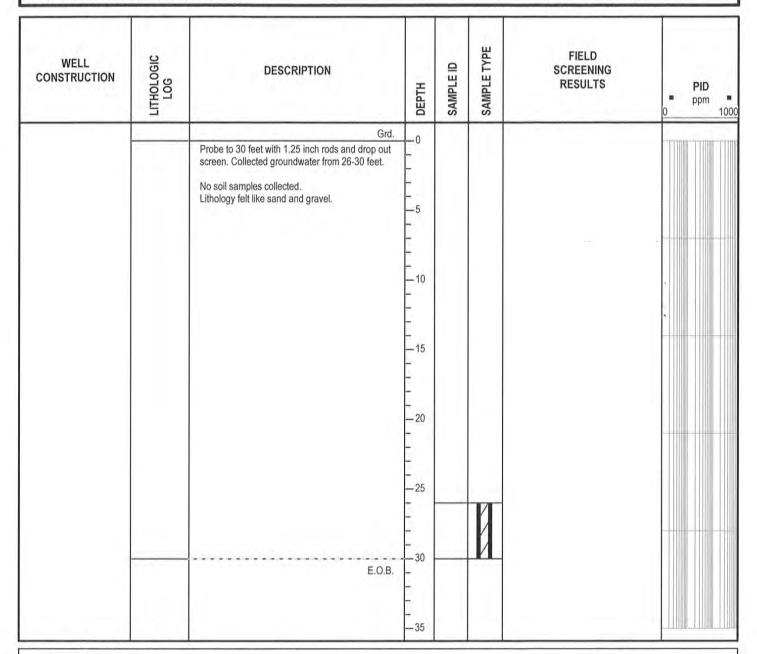
**DRILLER:** Scott Densteadt **GEOLOGIST:** Jeff Pincumbe

DRILL METHOD: Geoprobe

TOTAL DEPTH: 30 feet

LOCATION DESCRIPTION: Midpoint of south side

ERNIE#: 35010000



VERTICAL DATUM: NA GRD. ELEVATION: NA

> T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA WELL DEPTH: NA

**COMPLETION NOTES:** backfilled with bentonite

LATITUDE: 44.504538832

LONGITUDE: -83.380076746

DATUM: MichGeoRef NORTHING: 442556.645

EASTING: 708084.897





COUNTY: losco

TOWNSHIP: Oscoda

RANGE: 9E **SECTION:** 6

TOWN: 24N

LOCATION DESCRIPTION: SE corner of site

**DATE: 10-3-18** 

**DRILLER:** Scott Densteadt **GEOLOGIST:** Jeff Pincumbe **DRILL METHOD:** Geoprobe

TOTAL DEPTH: 26 feet

ERNIE#: 35010000

WELL CONSTRUCTION	LITHOLOGIC LOG	DESCRIPTION	DEPTH	SAMPLE ID	SAMPLE TYPE	FIELD SCREENING RESULTS	PID ppm 0 10
		Grd.  Probe to 26 feet with 1.25 inch rods and drop out screen. Collected groundwater sample from 22 - 26 feet.  No soil samples collected. Lithology felt like sand and gravel.  E.O.B.	-0 5 10 15 20 25 30 35				

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.504599492

LONGITUDE: -83.378961648

DATUM: MichGeoRef

NORTHING: 442566.217

EASTING: 708173.304





COUNTY: losco

**DATE: 10-3-18** 

TOWNSHIP: Oscoda

DRILLER: Scott Densteadt

TOWN: 24N

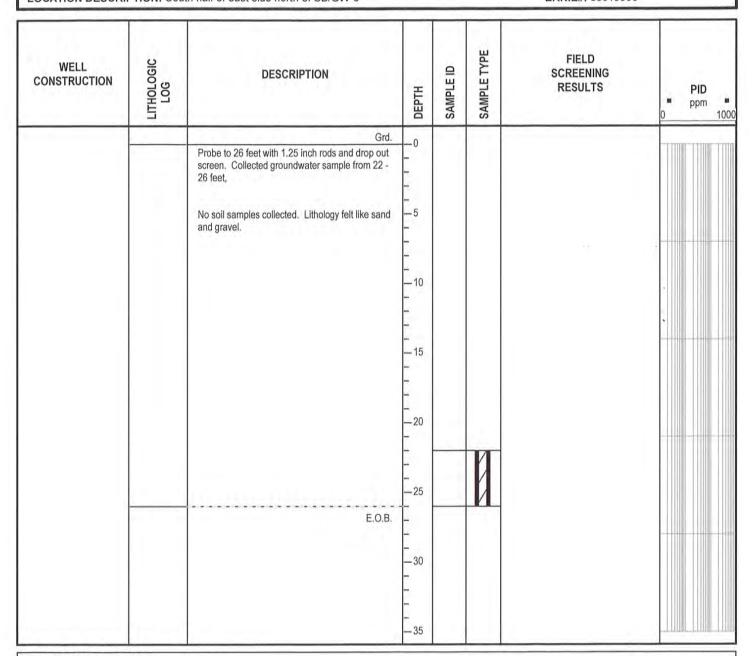
GEOLOGIST: Jeff Pincumbe
DRILL METHOD: Geoprobe

RANGE: 9E SECTION: 6

TOTAL DEPTH: 30 feet

LOCATION DESCRIPTION: South half of east side north of SB/GW-3

ERNIE#: 35010000



VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.505728190

LONGITUDE: -83.379206423

DATUM: MichGeoRef

NORTHING: 442690.943

EASTING: 708149.840



BORING/WELL: SB/GW-5

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

SECTION: 6

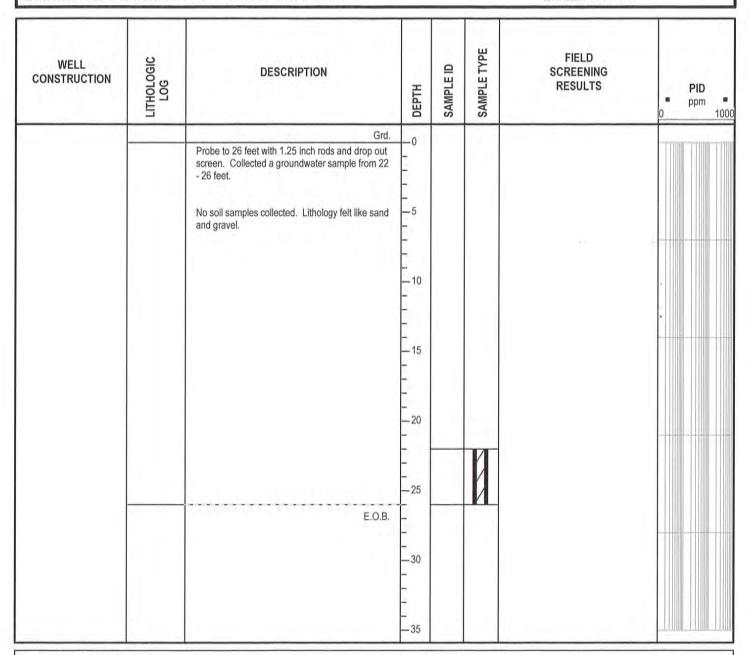
DATE: 10-4-18

DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe
DRILL METHOD: Geoprobe

TOTAL DEPTH: 26 feet

LOCATION DESCRIPTION: South half of east side north of SB/GW-4

ERNIE#: 35010000



VERTICAL DATUM: NA
GRD. ELEVATION: NA
T.O.C.: NA
S.W.L.: NA
CASING: NA
SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.506326934

LONGITUDE: -83.379541704

DATUM: MichGeoRef NORTHING: 442756.584

EASTING: 708121.067



BORING/WELL: SB/GW-6

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

**SECTION:** 6

**DATE: 10-4-18** 

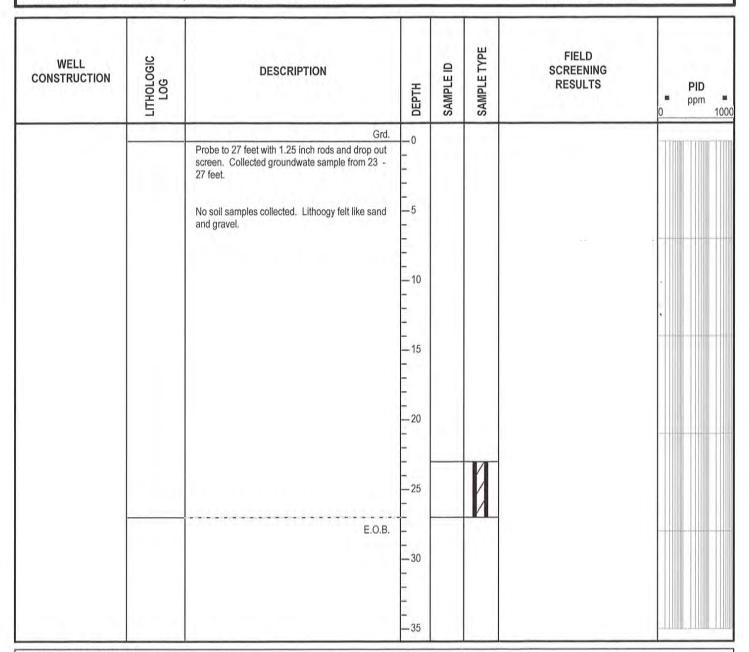
DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe

DRILL METHOD: Geoprobe

TOTAL DEPTH: 27 feet

LOCATION DESCRIPTION: Mid point of east side north of SB/GW-5

ERNIE#: 35010000



VERTICAL DATUM: NA GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.507042602

LONGITUDE: -83.38038138

DATUM: MichGeoRef

NORTHING: 442834.801

EASTING: 708079.072



BORING/WELL: SB/GW-7

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

**SECTION:** 6

**DATE: 10-4-18** 

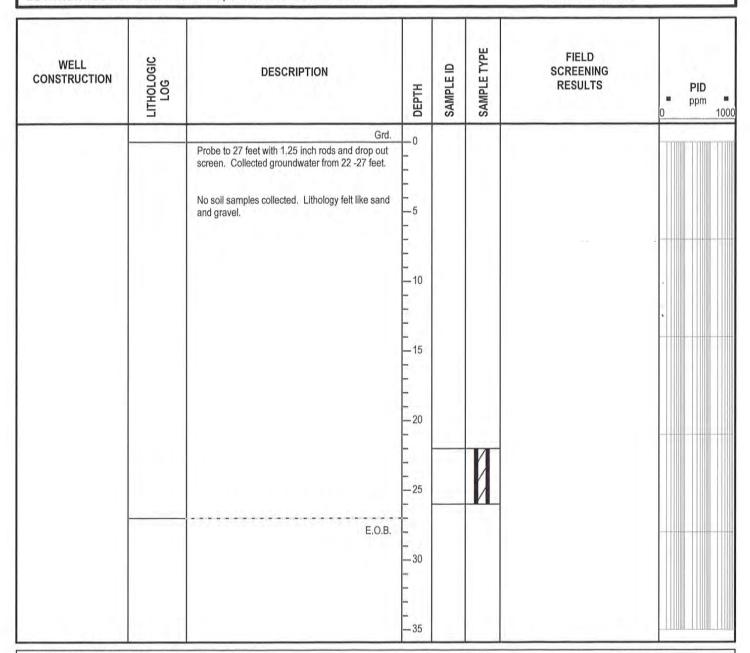
DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe

DRILL METHOD: Geoprobe

TOTAL DEPTH: 27 feet

LOCATION DESCRIPTION: North of midpoint on east side north of SB/GW-6

ERNIE#: 35010000



VERTICAL DATUM: NA GRD. ELEVATION: NA T.O.C.: NA

> S.W.L.: NA CASING: NA

SCREEN: NA WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.507574717

LONGITUDE: -83.379504286

DATUM: MichGeoRef

NORTHING: 442895.252

EASTING: 708119.608



BORING/WELL: SB/GW-8

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

SECTION: 6

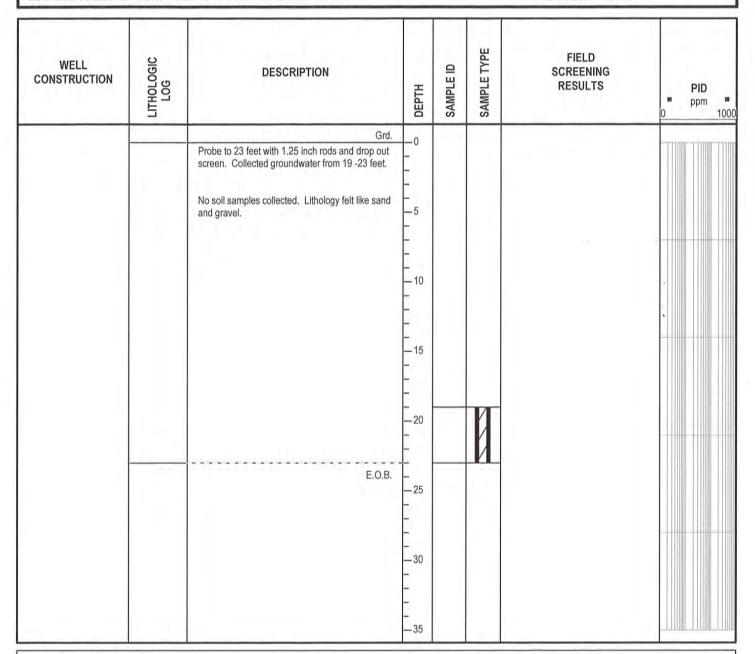
**DATE: 10-4-18** 

**DRILLER:** Scott Densteadt **GEOLOGIST:** Jeff Pincumbe

**DRILL METHOD:** Geoprobe TOTAL DEPTH: 23 feet

LOCATION DESCRIPTION: North half of east side north of SB/GW-7

ERNIE#: 35010000



**VERTICAL DATUM: NA** 

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

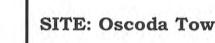
LATITUDE: 44.508342135

LONGITUDE: -83.379512752

DATUM: MichGeoRef

NORTHING: 442980.457

EASTING: 708116.208



BORING/WELL: SB/GW-9

# SITE: Oscoda Township Dump

COUNTY: losco

**DATE: 10-4-18** 

TOWNSHIP: Oscoda

**BOREHOLE LOG** 

**DRILLER:** Scott Densteadt

TOWN: 24N

**GEOLOGIST:** Jeff Pincumbe

RANGE: 9E

DRILL METHOD: Geoprobe

SECTION: 6

TOTAL DEPTH: 19 feet

LOCATION DESCRIPTION: North half of east side north of SB/GW-8

ERNIE#: 35010000

WELL CONSTRUCTION	LITHOLOGIC LOG	DESCRIPTION	DEPTH	SAMPLE ID	SAMPLE TYPE	FIELD SCREENING RESULTS	<b>PID</b> ■ ppm 0 1
		Grd.  Probe to 19 feet with 1.25 inch rods and drop out screen. Collected groundwater sample from 15 - 19 feet.  No soil samples collected. Lithology felt like sand and gravel.	0  5  10  15				,
		E.O.B.	20 				

**VERTICAL DATUM: NA** 

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.509226107

LONGITUDE: -83.380155174

DATUM: MichGeoRef

NORTHING: 443076.993

EASTING: 708062.015



BORING/WELL: SB/GW-10

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

SECTION: 6

**DATE: 10-4-18** 

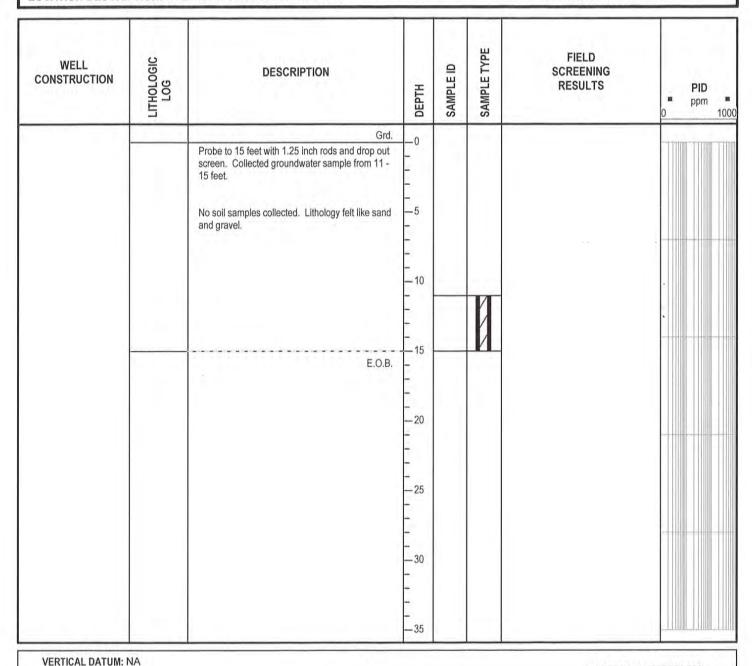
DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe

DRILL METHOD: Geoprobe

TOTAL DEPTH: 15 feet

LOCATION DESCRIPTION: North half of east side near north end

ERNIE#: 35010000



GRD. ELEVATION: NA
T.O.C.: NA
S.W.L.: NA
CASING: NA
SCREEN: NA

WELL DEPTH: NA
COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.510093529

LONGITUDE: -83.380641558

DATUM: MichGeoRef NORTHING: 443172.089

EASTING: 708020.282





#### **BOREHOLE LOG**

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E **SECTION:** 6

LOCATION DESCRIPTION: North end of site

SITE: Oscoda Township Dump

**DATE: 10-4-18** 

**DRILLER:** Scott Densteadt **GEOLOGIST:** Jeff Pincumbe DRILL METHOD: Geoprobe

TOTAL DEPTH: 15 feet

ERNIE#: 35010000

LITHOLOGIC LOG		DEPTH	SAMPLEID	SAMPLE TYPE	SCREENING RESULTS	PID ppm = 0 100
	Grd.  Probe to 15 feet with 1.25 inch rods and drop outr screen. Collected groundwater from 11 -15 feet.  No soil samples collected. Lithology felt like sand and gravel.	0 				
	E.O.B.	- - - - - - - - - - - - - - - - - - -				
		- - - -25 - - - - -30				
		No soil samples collected. Lithology felt like sand and gravel.	No soil samples collected. Lithology felt like sand and gravel.  -5 -10 -10 -15 E.O.B20 -25 -	No soil samples collected. Lithology felt like sand and gravel.  -5 -10 -10 -15 E.O.B20 -25 -	No soil samples collected. Lithology felt like sand and gravel.	No soil samples collected. Lithology felt like sand and gravel.  E.O.B.  E.O.B.

VERTICAL DATUM: NA GRD. ELEVATION: NA

> T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA WELL DEPTH: NA

**COMPLETION NOTES:** backfilled with bentonite

LATITUDE: 44.510982461

LONGITUDE: -83.381155468

DATUM: MichGeoRef NORTHING: 443269.504

EASTING: 707976.286



BORING/WELL: SB/GW-12

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

RANGE: 9E SECTION: 6

LOCATION DESCRIPTION: West side of north half

**DATE: 10-4-18** 

DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe
DRILL METHOD: Geoprobe

TOTAL DEPTH: 19 feet

ERNIE#: 35010000

WELL CONSTRUCTION	LITHOLOGIC LOG	DESCRIPTION	рертн	SAMPLEID	SAMPLE TYPE	FIELD SCREENING RESULTS	PID ppm 0 1
		Grd.  Probe to 19 feet with 1.25 inch rods and drop out screen. Collected groundwater from 15 - 19 feet.  No soil samples collected. Lithology felt like sand and gravel.	0 				
		E.O.B.	15   20   25 				
			- -30 - - - - - - - -35				

VERTICAL DATUM: NA GRD. ELEVATION: NA T.O.C.: NA

S.W.L.: NA CASING: NA

SCREEN: NA WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.508985458

LONGITUDE: -83,380853800

DATUM: MichGeoRef

NORTHING: 443048.492

EASTING: 708007.350





COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

**SECTION:** 6

SITE: Oscoda Township Dump

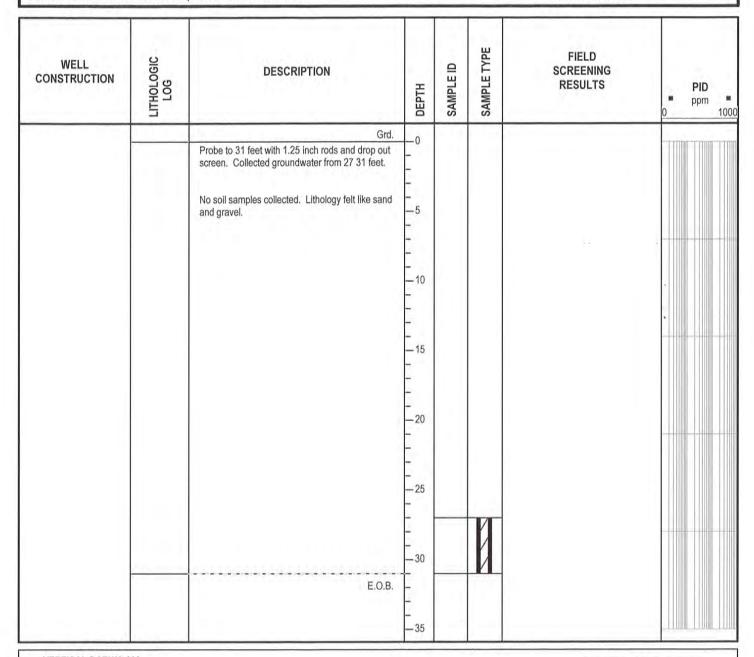
**DATE: 10-4-18** 

**DRILLER:** Scott Densteadt **GEOLOGIST:** Jeff Pincumbe DRILL METHOD: Geoprobe

TOTAL DEPTH: 31 feet

LOCATION DESCRIPTION: Mid point of west side of site

ERNIE#: 35010000



VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.508207528

LONGITUDE: -83.380861678

DATUM: MichGeoRef

NORTHING: 442942.089

EASTING: 708010.126



BORING/WELL: SB/GW-14

# SITE: Oscoda Township Dump

COUNTY: losco

TOWNSHIP: Oscoda

TOWN: 24N RANGE: 9E

**SECTION: 6** 

**DATE: 10-4-18** 

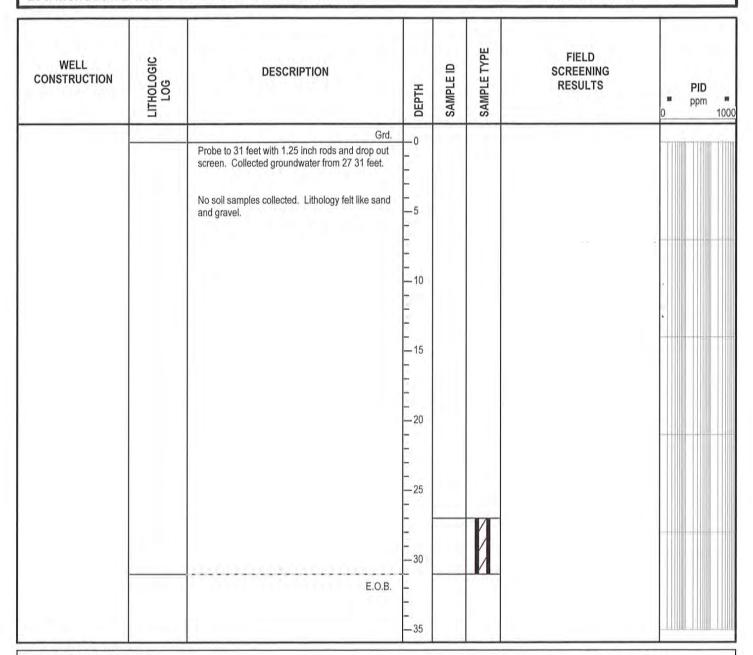
DRILLER: Scott Densteadt
GEOLOGIST: Jeff Pincumbe

DRILL METHOD: Geoprobe

TOTAL DEPTH: 31 feet

LOCATION DESCRIPTION: South half of west side south SB/GW-13

ERNIE#: 35010000



VERTICAL DATUM: NA GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA CASING: NA

SCREEN: NA WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.506902544

LONGITUDE: -83.380987627

DATUM: MichGeoRef

NORTHING: 442816.833

EASTING: 708004.111





COUNTY: losco

DATE: 10-4-18

TOWNSHIP: Oscoda

**DRILLER:** Scott Densteadt

TOWN: 24N

GEOLOGIST: Jeff Pincumbe

RANGE: 9E

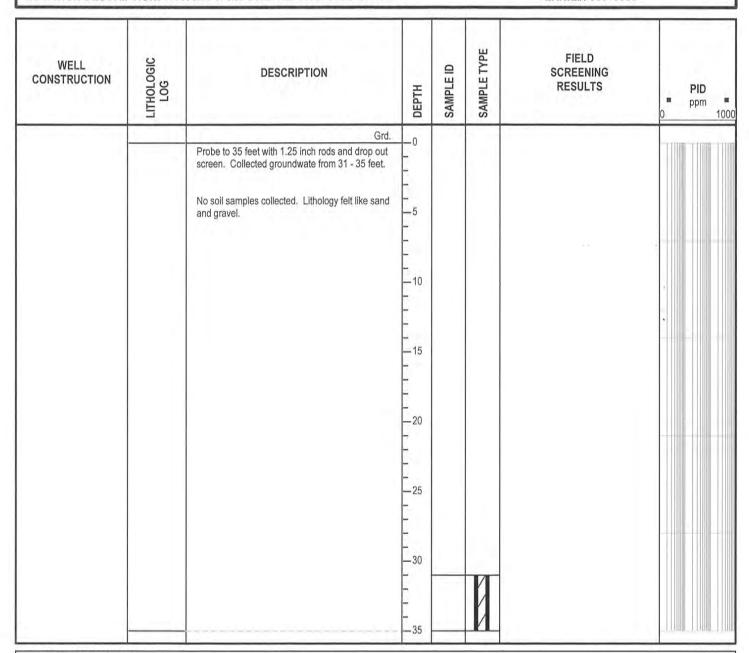
DRILL METHOD: Geoprobe

SECTION: 6

TOTAL DEPTH: 35 feet

LOCATION DESCRIPTION: West side of site South half south of SB/GW-14

ERNIE#: 35010000



VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA S.W.L.: NA

CASING: NA SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: backfilled with bentonite

LATITUDE: 44.505941726

LONGITUDE: -83.380907985

DATUM: MichGeoRef

NORTHING: 442710.332

EASTING: 708013.852