1.0 INTRODUCTION

In accordance with the New Source Performance Standards for Municipal Solid Waste Landfills (Landfill NSPS), 40 CFR 60, Subpart WWW, Tier 2 landfill gas sampling and analysis was conducted at the Whitefeather Landfill in Pinconning, Michigan. The facility is owned by Republic Services of Michigan IV (Republic). 40 CFR 60.754(a)(3)(iii) requires the landfill owner to retest the site-specific non-methane organic compound (NMOC) concentration every five years. The purpose of this report is to document the results of the five-year NMOC retest program at the landfill. The tests were performed on August 17, 2020.

Environmental Information Logistics, LLC (EIL) submitted a Tier 2 test plan to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on July 9, 2020. EGLE responded to the test plan on July 22, 2020, stating that the proposed method(s) of calculating NMOC was not approvable by EGLE. EIL submitted a revised test plan July 27, 2020, detailing that per the facility ROP, EULANDFILL<50, VI.3, the annual NMOC emission rates would be calculated using methods outlined in Appendix 7-1, or the most recent version of USEPA's Landfill Gas Emissions Model (LandGEM), using the average NMOC concentration from the collected Tier 2 samples. EGLE approved the test plan on July 28, 2020.

2.0 REGULATORY BACKGROUND

The Whitefeather Landfill began accepting waste in 1991. Approximately 51.5 acres of waste (20.84 hectares) have been in place for at least two years and were suitable for Tier 2 sampling.

To comply with the NSPS the facility submitted an Initial Design Capacity Report and an NSPS Tier 1 calculation report as required by 40 CFR 60.752. Whitefeather Landfill decided to improve the accuracy of the emission calculation by performing Tier 2 landfill gas sampling and analysis to show the facility NMOC emissions may be less than the 50 Mg/year NSPS emission threshold. The Tier 2 NMOC value must be retested every five years in accordance with 40 CFR 60.754(a)(3)(iii).

Based on the sampling results provided in this report, gas collection and control requirements are still not applicable to the facility, since NMOC emissions using the new Tier 2 value do not exceed 50 Mg/yr.

The measured site-specific NMOC concentration was determined to be 285 ppm NMOC as hexane. This value was used in the NSPS equation to calculate NMOC emissions of 25.05 Mg/year in 2020.

NMOC emissions are not estimated to exceed 50 Mg/yr for the next five years, using an assumed MSW waste intake rate of 180,000 tons/year. The five-year projection is provided in Appendix A of this report. Pursuant to 40 CFR 60.757(b)(1)(ii), the landfill owner or operator may submit a five-year report in lieu of annual reports, as long as the actual waste volumes received in subsequent years are less than the estimated projections.

The Tier 2 testing results are valid for five years according to 40 CFR 60.754. A new site-specific NMOC concentration will have to be obtained in 2025.

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 Sample Locations

The NSPS [60.754(a)(3)] requires collection of two samples per hectare of landfill surface area in which waste has been in-place for a minimum of two years. At the Whitefeather Landfill, approximately 51.5 acres met the two-year age criteria. These include Cells 1 – 8.

As shown in Figure 1, the existing gas collection system (GCS), consisting of vertical gas extraction wells, provides coverage for the entire 51.5 acres eligible for Tier 2 sampling. The NSPS further states "For active collection systems, samples may be collected from the common header pipe before the gas moving or condensate removal equipment. For these systems, a minimum of three samples must be collected from the header pipe."

The required three samples from the main header in the Landfill Gas to Energy Plant were collected for Tier 2 sampling.

Actual sampling locations at the header pipe in the gas plant are shown on the map on Figure 1.

3.2 Analysis

The samples were collected from the header at a flow rate of less than 500 ml/min. A six-liter summa canister was utilized for each of the main header samples. Each summa canister was pre-charged with helium so that the samples could be safely shipped as non-hazardous. The methane and oxygen levels recorded from the gas plant analyzer panel. Ambient temperature was measured with a thermocouple and recorded. Barometric pressure was obtained from www.wunderground.com (see Table 1).

Analysis was performed at the AtmAA, Inc. laboratory in Calabasas, California. All three samples were analyzed for oxygen and nitrogen (following Method 3C). The three header samples collected from the active system showed concentrations of oxygen below 5% and nitrogen concentrations below 20%; thus, they were all suitable for Method 25C analysis and were all included in the final average for the landfill. Each sample was also analyzed for methane, carbon dioxide and NMOC (following Method 25C). NMOC results are reported as carbon and must be divided by six to obtain NMOC values as hexane for use in the emissions equation. A schematic of the Method 25C sampling train is found in Figure 2.

4.0 RESULTS

Samples cannot contain oxygen and nitrogen above the acceptable thresholds (i.e. greater than 5% oxygen or greater than 20% nitrogen). All samples were acceptable for use in the calculations. Laboratory analytical data is provided in Appendix B. A summary of laboratory results is shown in Table 2.

The average NMOC value for the site was 285 parts per million (ppm) as hexane for the areas of the landfill older than two years and covered by the active gas collection system. The equation provided in 40 CFR 60.754(a)(1) was used to calculate Tier 2 emissions (Appendix A). Actual values for degradable wastes such as MSW and yard waste were utilized for annual waste receipts. The NSPS allows facilities to exclude non-degradable wastes from Tier 2 calculations, as long as the volume of material is documented.

The NMOC emission rate of 25.05 Mg/yr for the year 2020 is below the 50 Mg/year trigger for installation of gas collection and control systems. The Tier 2 sampling results (Appendix B) are valid for five years (until 2025). At that time, a new Tier 2 value will need to be obtained.

Appendix A also contains the calculations for projected yearly uncontrolled NMOC emissions for the next five years, as permitted by 40 CFR 60.757(b)(1)(ii). Again, based on the projected waste intake rates, emissions of NMOC stay below 50 Mg/year for the next five years at 32.11 Mg/year in 2025. The facility will compare actual MSW waste received each year against the projected volume of 180,000 tons/year to verify that the five-year calculation is still valid.

These emissions are also below the control trigger value of 34 Mg/year NMOC of the Landfill EG rules published on August 29, 2016 (note – Landfill EG sites, per the EG rule, would be those that have not received landfill expansions after July 17, 2014, such as Whitefeather). The Tier 2 test results should therefore remain valid until August 17, 2025.

TABLES

Table 1: Whitefeather Ladnfill
Tier 2 Sampling Field Data Collected August 17, 2020
Pinconning, Michigan

Sample #	Canister #	Barometric Pressure (inches w.c.)	Pre-Test Ambient Temperature (°C)	Weather	Post-TestSample Temperature (°C)	Plant Flow During Sampling	
1	00118	29.25	25.3	Mostly Cloudy	25.1	Time	Plant Flow (scfm)
Gas Quality Check	Time	%CH4		%O2			
	10:56	51.4		1.04			
Leak Check	Vac.	Time	Vac.	Time		10:56	920
	-19.5	10:50	-19.5	10:55		11:01	921
Sample	Sample Date	Sample Time	Initial Vac. (inches w.c.)	Sample End Time	End Vac (inches w.c.)		
	8/17/2020	10:56	-19.5	11:01	<-1	Average	921

Sample #	Canister #	Barometric Pressure (inches w.c.)	Pre-Test Ambient Temperature (°C)	Weather	Post-TestSample Temperature (°C)	Plant Flow During Sampling	
2	00184	29.25	25.7	Mostly Cloudy	26.7	Time	Plant Flow (scfm)
Gas Quality Check	Time	%CH4		%O2			
	11:22	51.4		1.06			
Leak Check	Vac.	Time	Vac.	Time		11:22	918
	-21.5	11:15	-21.4	11:20		11:27	920
Sample	Sample Date	Sample Time	Initial Vac. (inches w.c.)	Sample End Time	End Vac (inches w.c.)		
	8/17/2020	11:22	-21.4	11:27	-4	Average	919

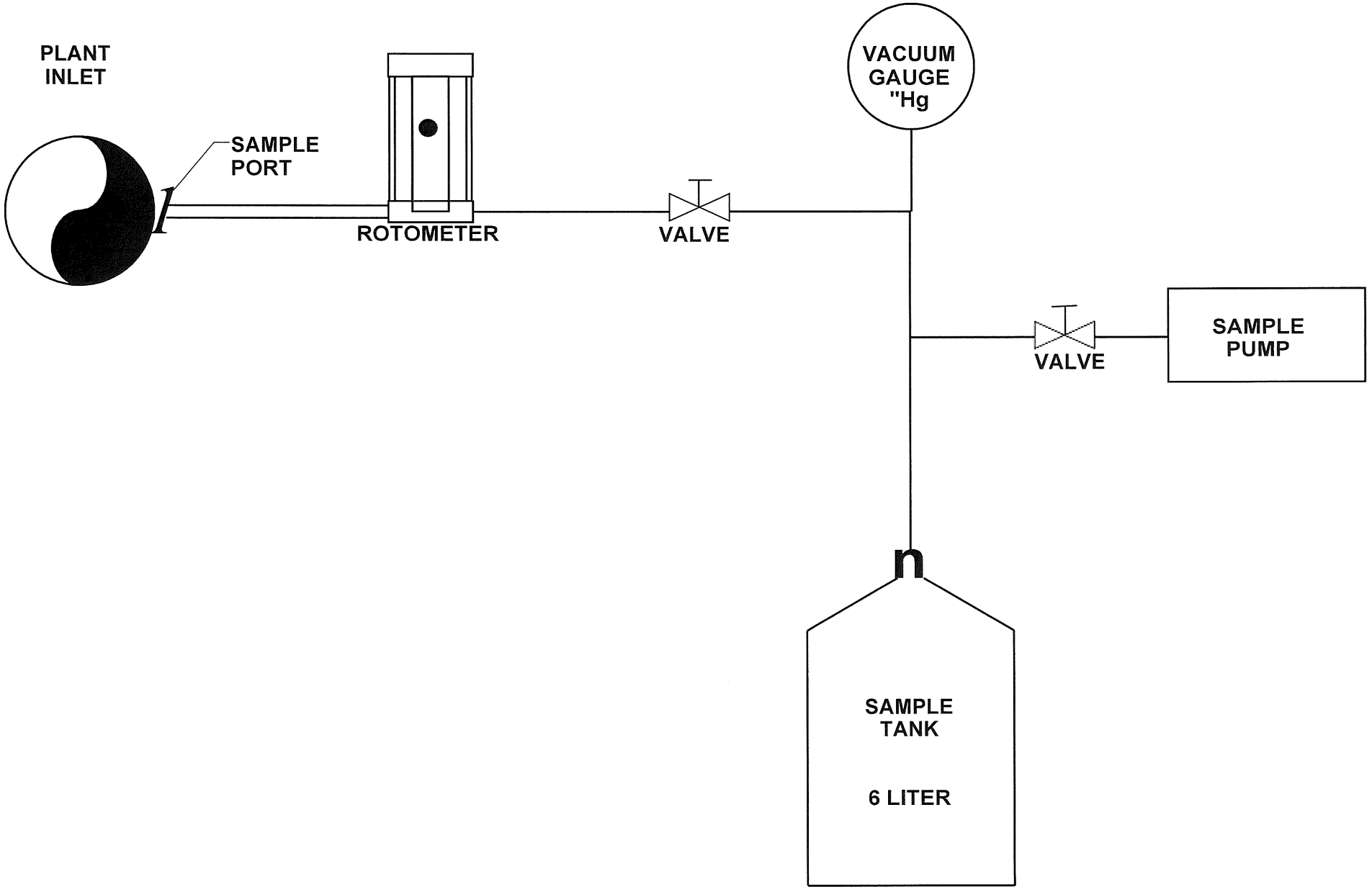
Sample #	Canister #	Barometric Pressure (inches w.c.)	Pre-Test Ambient Temperature (°C)	Weather	Post-TestSample Temperature (°C)	Plant Flow During Sampling	
3	00298	29.25	27.1	Mostly Cloudy	25.7	Time	Plant Flow (scfm)
Gas Quality Check	Time	%CH4		%O2			
	11:33	51.3		1.09			
Leak Check	Vac.	Time	Vac.	Time		11:33	908
	-21.0	11:26	-21.0	11:31		11:38	911
Sample	Sample Date	Sample Time	Initial Vac. (inches w.c.)	Sample End Time	End Vac (inches w.c.)		
	8/17/2020	11:33	-21.0	11:38	-4	Average	910

Table 2: Whitefeather Landfill
Summary of Method 25C and Method 3C Data
August 17, 2020

ID	Sample Location Description	CH4 (%)	CO2 (%)	O2 (%)	N2 (%)	NMOC ppm (As Carbon)	NMOC ppm (As Hexane)	Sample Canister#
WFL Tier 2 #1	Main Header to Plant	46.6%	31.1%	3.5%	18.7%	1459	243	00118
WFL Tier 2 #2		50.7%	34.0%	1.5%	13.1%	1843	307	00184
WFL Tier 2 #3		50.8%	34.1%	1.4%	13.2%	1822	304	00298
Average						1708.0	**285**	

Notes: NMOC Results corrected for the presence of air.

FIGURES



EIL
ENVIRONIIIIENrAL
INFORMATION
LOGISTICS, U.C

FIGURE 2

TOTAL NON-METHANE
ORGANIC COMPOUND SAMPLING TRAIN

REPUBLIC SERVICES OF MICHIGAN IV, LLC
WHITEFEATHER LANDFILL
PINCONNING TOWNSHIP, BAY COUNTY, MICHIGAN AUGUST 2020