

2021 ANNUAL REPORT

**LANDFILL GAS COLLECTION
AND FLARING SYSTEM**

**OXFORD COUNTY WASTE MANAGEMENT FACILITY
SALFORD, ONTARIO**

Prepared for

OXFORD COUNTY

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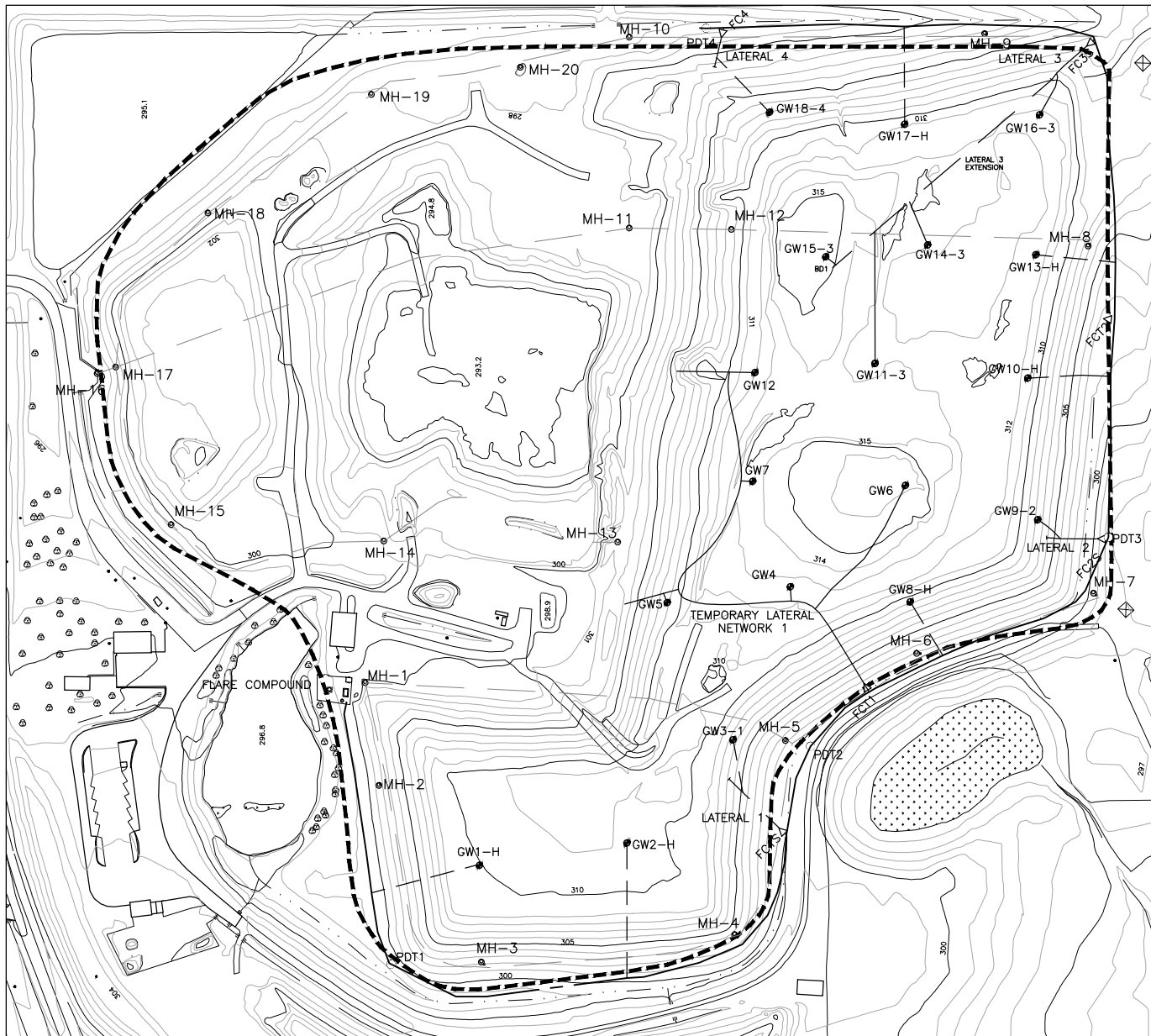
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1.0 INTRODUCTION




Oxford County (County) had Environmental Compliance Approval (ECA) (Waste) No. A070808 amended to allow for the installation of a landfill gas collection and flaring system (LGCFS) at the Oxford County Waste Management Facility (Salford Landfill) in Salford, Ontario. The original ECA amendment was issued by the Ministry of the Environment, Conservation and Parks (MECP) on September 29, 2010. The MECP revoked and replaced all previous ECAs and issued a new ECA to the County on November 7, 2013. This report is being submitted to fulfill Condition 6.0 which requires an Annual Report outlining the maintenance and monitoring activities of the gas collection system.

Construction of Phase 1 of the landfill gas collection system commenced in June 2010. It included the installation of eighteen vertical extraction wells within the waste. All construction on the collection system was substantially completed in August 2010, and the flaring system was commissioned in December 2010. In September 2016, three wells were drilled and connected to the permanent system after the original three wells were decommissioned to allow for filling in the vicinity.

In August 2014, as part of a Waste Management Strategy, County Council approved the change in the name of the landfill site from “Salford Landfill” to “Oxford County Waste Management Facility”. In early March 2015, the County applied for an amendment to ECA No. A070808 to formally change the name of the site on the ECA which was granted approval in July 14, 2015.



LEGEND

-  APPROVED LIMIT OF FILL
-  LANDFILL GAS EXTRACTION WELL
-  LATERAL 3 EXTENSION AND WELLS GW11-3, GW14-3, GW15-3 REPLACED IN SEPTEMBER 2016

2.0 2021 LANDFILL GAS COLLECTION SYSTEM OPERATIONS

2.1 Summary of Plant Operations

The flare ran at an average flow of 119 cfm and 42.6% methane by volume during 2021 as recorded during the monthly monitoring events. The average system vacuum for the year was -27.02 inches of water column. Run times were generally consistent throughout the year, ranging from 41% runtime in December to 78% runtime in February, and an average runtime of 61%.

Table 1: 2021 Flare Runtimes

Month	Runtimes (hrs)	Runtime (%)
January	408.5	54.9%
February	525.4	78.2%
March	477.8	64.2%
April	468.1	65.0%
May	575.9	77.4%
June	532.2	73.9%
July	443	59.5%
August	445.4	59.9%
September	445.6	61.9%
October	350.3	47.1%
November	322.3	44.8%
December	304.4	40.9%
Total	5,298.9	60.5%

2.2 Assessment of Effectiveness of Gas Collection System

The Oxford County Waste Management Facility (OCWMF) has been in operation since 1986, has a maximum approved waste capacity of 5,905,200 m³ (cubic metres), and receives approximately 45,000 tonnes of non-hazardous residential, commercial,

institutional and industrial solid waste annually. Table 2 presents the estimated landfill gas recovery rates for the years 2010 through 2030 using the Scholl Canyon Model with MECF Default inputs for L_o (methane production potential, $m^3 CH_4$ /tonne waste) and k (gas production coefficient, 1/yr).

Table 2: Landfill Gas Recovery Rates

<i>End of Year</i>	<i>Landfill Gas Recovery Estimate</i>			
	<i>Scholl Canyon Model</i>			
	<i>Production k=0.04, L=125 m³/tonne</i>		<i>70% Recovery</i>	
	<i>m³/hr</i>	<i>ft³/min</i>	<i>m³/hr</i>	<i>ft³/min</i>
2010	1,350	794	942	556
2011	1,352	796	946	557
2012	1,356	798	949	559
2013	1,362	802	954	561
2014	1,360	800	952	560
2015	1,359	800	951	560
2016	1,358	799	951	560
2017	1,353	796	947	557
2018	1,346	792	942	554
2019	1,342	790	940	553
2020	1,346	792	942	555
2021	1,362	801	943	561
2022	1,363	803	954	562
2023	1,368	805	958	564
2024	1,372	808	960	565
2025	1,376	810	963	567
2026	1,380	812	966	569
2027	1,384	814	969	570
2028	1,387	817	971	572
2029	1,391	819	974	573
2030	1,394	821	976	574

In 2021, the estimated landfill gas recovery of 943 m^3 /hr (561 cfm) is based on a 70% recovery rate. Since the wellfield does not have full coverage in all areas of waste, with approximately 25-35% of the total mass being covered with active gas collection, an average flow rate of approximately 120 cfm is closer to the predicted flow rates from the

Scholl Canyon Model. This indicates that the system is operating as intended and is controlling emissions from the landfill site, also demonstrated by no landfill gas odour complaints received throughout 2021.

The lower recovery rate at the OCWMF can be attributed to a large area of the landfill being used as the active face, which therefore does not have landfill gas coverage. Tonnages have declined significantly since 2009, which has slowed the process of closing and capping cells. Many of the wells are on side-slopes which typically results in oxygen intrusion through the slope. To reduce the effect of this, the vacuum to the well is reduced, which in turn reduces the flow. As well, much of the waste on the northern portion of the site is currently too shallow to install effective gas collection.

2.3 Summary of Flare Turndown and Investigations

The flare tripped numerous times over the course of 2021, and restarts were completed on 80 days throughout the year. A total of 415 alarms resulting in shutdowns were sent over the course of 2021, however in many instances, several of the alarms were associated with the same issue and were sent out simultaneously or in the same short time period. This contributed greatly to the high number of alarms over the course of the year. The primary causes of alarms in 2021 were those associated with flare flameouts (69.2%), compressed air related issues (11.6%), power failures (5.8%), maintenance related/emergency stops (5.1%), gas analyzer related issues (4.6%), and gas quality/quantity related issues (4.6%).

Historically the system has had frequent shutdowns due to insufficient gas quantity to run the flare. In 2015 notification was given to the MECP that the flare would be run on an on/off basis due to gas quality. The flare is run as frequently as possible but does on occasion stay down to allow gas to build up to have enough gas to run the flare hot enough to meet the destruction efficiency required for proper greenhouse gas destruction.

The underlying cause for most of these trips is the low flow of landfill gas to the flare due to the declining gas from the existing gas collection system. The existing gas collection system has not been expanded due to filling activities at the site. Low tonnages and a large

active face have not been conducive to a gas system expansion. Therefore, the existing gas collection system is in older waste with declining gas production. The flare was design to combust 1,400 cfm, however, as noted above, it only received 120 cfm on average in 2021. As a result, the flare was required to run on the lower end of the turn down ratio which results in increased operational difficulties. Comcor is currently working with the flare manufacturer to improve the operational status of the flare and reduce the number of trips.

On May 7th, 2021, Comcor and Enviro EMD (the flare manufacturer) completed a site visit to inspect the flare. As a result of the site visit, Enviro EMD made recommendations to improve the operation of the flare given the low quantities of landfill gas available for combustion. Recommendations included lowering the bottom thermocouple to account for lower velocities in the flare while still meeting the required retention time of 0.7 seconds at a minimum temperate of 871°C, blanking off burners to only utilize select burners in the attempt to condense the heat within the burner table itself and installation of a heat retention lid to further aid in the attempt to increase flare temperature. The modifications made in 2021 based on the recommendations are further discussed in Section 4.3.

3.0 2021 MONITORING SUMMARY

The Landfill Gas Collection and Flaring System (LGCFS) is monitored to ensure that the system is controlling landfill gas related odours at the site and reducing greenhouse gases. The LGCFS is also monitored to ensure that the system operates in compliance with the ECA (Air).

System monitoring was conducted in 2021 in accordance with the *Maintenance and Monitoring Schedules* attached in Appendix B. The results of the 2021 field monitoring are summarized in Table 3. Note that the February monitoring event was completed in March due to the snow coverage preventing access to the wells.

Up until May 2015, the system had eighteen total wells, with eight extraction wells connected with above ground “Big O” drainage pipe. In May 2015, three wells were decommissioned to allow for the County to place an additional lift of waste in the area of these wells. It was decided at that time that attempting to extend the wells while filling was not beneficial and re-drilling once activities were complete was the best option. The three wells were re-drilled and installed permanently to the collection system in August/September 2016.

As of December 2021, the gas collection system has eighteen operating wells, five of which are operating on a temporary means, by being connected with above ground “Big O” piping. The County has indicated that Stage 3 of the Site, which includes these five wells connected by the above ground piping, is near final contours and still requires a final cap application. The County is planning to finish filling to site contours in this area in summer 2022 and has plans to permanently install piping to these five wells in the fall of 2022 or the spring of 2023 depending on tonnages received at the site.

Based on the average annual flow rate at the plant (119 cfm), the eighteen wells together result in an average flow of 6.6 cfm per well. However, individual flow calculations at each well shows a significant variation from the 6.6 cfm average, with typical flows ranging from non-detectable flows to approximately 53 cfm. This is typical of landfill gas

collection and is a reflection of balancing wells to meet production in an individual area of a landfill. Variations can result due to differences in the local waste including saturation, waste composition, compaction, and pH to name a few. The challenge in balancing a system is to try and maximize gas collection in a localized area without overdrawing.

Table 3: 2021 Field Monitoring Data

		25-Jan-21	3-Mar-21	15-Mar-21	28-Apr-21	26-May-21	17-Jun-21	5-Jul-21	6-Aug-21	17-Sep-21	19-Oct-21	12-Nov-21	14-Dec-21
Plant (Gauge and GEM)	Inlet Vac ("H2O))	-33.60	-21.30	-16.30	-19.91		-29.50	-24.20	-28.30	-29.80	-28.66	-30.20	-35.50
	Outlet Vac ("H2O)	-0.10	0.40	1.10	0.40		0.20	-0.20	0.40	0.30	0.20	1.00	0.30
	CH4 (%)	43.5	41.0	42.6	42.2		36.4	39.8	42.4	36.5	46.5	50.3	47.2
	CO2 (%)	33.9	29.3	29.9	29.5		27.6	24.0	25.6	32.3	33.3	33.2	28.5
	O2 (%)	2.7	3.4	4.0	4.2		4.1	4.7	2.3	2.3	2.4	2.7	1.5
	Flow	118	129	119	118		115	105	108	106	124	110	156
	Comment	some big-o frozen, vac restrictions	February round									Due to landfill activities, well 5 is inaccessible until they fill in around the well	Due to landfill activities, well 5 is inaccessible until they fill in around the well
GW 1-H	Well Vac ("H2O)	-31.46	-17.22	-15.82	-19.06	-31.91	-27.47	-25.20	-26.71	-28.31	-27.03	-27.66	-26.76
	Lat Vac ("H2O)	-32.79	-16.96	-15.62	-18.92	-31.80	-27.50	-25.28	-26.74	-28.34	-27.03	-27.67	-26.93
	CH4 (%)	61.5	58.1	59.7	53.8	45.2	57.1	60.9	59.1	57.8	57.7	60.6	59.8
	CO2 (%)	35.5	33.7	33.2	33.4	26.9	33.9	30.3	34.2	37.0	35.4	29.3	27.9
	O2 (%)	1.2	1.4	1.6	2.4	6.4	1.7	1.2	0.9	1.3	1.7	1.3	1.5
	Max Velocity (m/s)	1.20	0.70	0.40	0.50	0.70	1.50	0.80	1.10	4.30	0.50	1.30	0.90
	Min Velocity (m/s)	1.10	0.60	0.00	0.00	0.50	1.10	0.50	0.80	4.10	0.00	1.00	0.70
	Temp (°C)	14.8	8.1	1.7	-	21.3	30.3	27.2	28.9	22.0	17.1	16.8	13.8
	Flow (cfm)	11.1	6.3	1.9	2.4	5.8	12.6	6.3	9.2	40.6	2.4	11.1	7.7
	Comments	3/4T -> 1T open	1T	1T	1T	1T	1T	1T	1T	1T	1T	1T	1T
GW 2-H	Well Vac ("H2O)	-32.95	-17.24	-15.41		0.89	1.52	11.64	12.60	8.43	21.83	-22.27	-14.45
	Lat Vac ("H2O)	-33.07	-17.01	-15.51		-32.20	-27.35	-25.00	-26.67	-28.34	-26.92	-27.71	-26.78
	CH4 (%)	4.4	2.2	33.4		0.0	0.2	0.4	0.5	0.7	65.1	4.5	36.1
	CO2 (%)	0.2	1.0	19.9		0.0	0.2	0.2	0.0	0.0	34.5	2.6	18.9
	O2 (%)	20.3	19.4	9.9		20.9	20.6	20.3	20.2	19.7	0.0	19.5	9.4
	Max Velocity (m/s)	1.10	0.40	0.00		-	-	-	-	-	-	-	-
	Min Velocity (m/s)	1.00	0.00	0.00		-	-	-	-	-	-	-	-
	Temp (°C)	5.4	7.4	1.5		22.9	-	-	-	-	-	-	-
	Flow (cfm)	10.1	1.9	0.0		-	-	-	-	-	-	-	-
	Comments	cracked	1/2->1/8	1/8->cracked	1/8->closed	closed	closed	closed	closed	closed	closed	closed	closed
GW 3-1	Well Vac ("H2O)	-32.80	-17.38	-15.83	-19.26	-32.41	-27.05	-25.98	-26.35	-28.33	-26.93	-27.75	-26.98
	Lat Vac ("H2O)	-32.82	-16.99	-15.62	-19.13	-32.04	-27.00	-25.95	-26.68	-28.33	-26.86	-27.76	-26.98
	CH4 (%)	59.2	60.3	62.0	60.8	55.0	60.7	62.7	60.4	60.3	59.7	60.8	61.9
	CO2 (%)	40.3	36.3	36.1	36.0	32.9	37.7	32.8	37.0	36.1	34.9	29.7	29.6
	O2 (%)	0.5	0.1	0.3	0.2	0.9	0.3	0.0	0.3	0.1	1.5	0.8	0.7
	Max Velocity (m/s)	1.30	0.90	0.50	0.60	0.80	1.10	1.20	1.20	4.10	0.50	1.20	0.80
	Min Velocity (m/s)	1.20	0.80	0.00	0.60	0.74	0.60	0.60	0.70	3.90	0.40	0.90	0.50
	Temp (°C)	1.5	7.6	3.8	21.2	19.9	30.3	30.1	30.2	21.9	23.7	18.6	13.0
	Flow (cfm)	12.1	8.2	2.4	5.8	7.4	8.2	8.7	9.2	38.6	4.3	10.1	6.3
	Comments	1/2T -> 3/4 T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T	3/4T
GW 4	Well Vac ("H2O)	-2.42	-5.13	-4.37	-4.92	-9.38	-8.45	-7.59	-8.07	-8.77	-7.85	-8.78	-9.11
	Lat Vac ("H2O)	-32.71	-16.97	-15.11	-17.43	-31.95	-25.76	-24.17	-26.06	-27.94	-26.67	-27.73	-26.85
	CH4 (%)	59.3	55.9	58.2	57.0	12.8	38.9	60.3	44.1	32.3	51.8	50.9	56.9
	CO2 (%)	39.5	36.3	36.9	42.3	5.7	32.2	32.0	33.1	29.0	36.3	29.6	28.1
	O2 (%)	0.3	1.0	1.0	0.7	15.4	1.5	0.5	0.9	3.7	0.4	0.1	2.0
	Max Velocity (m/s)	cnm	cnm	cnm	cnm	cnm	1.60	1.60	1.70	-	cnm	-	-
	Min Velocity (m/s)	long	long	long	long	cnm	1.20	1.20	1.20	-	cnm	-	-
	Temp (°C)	port	port	port	port	cnm	29.2	29.8	29.4	-	cnm	-	-
	Flow (cfm)	-	-	-	-	-	-	-	-	-	-	-	-
	Comments	1/4T open	1/4T	1/4T	1/4T		1/4T	1/4T	1/4T	cracked	1/8->1/4	1/4T	1/4T

Table 3: 2021 Field Monitoring Data

		25-Jan-21	3-Mar-21	15-Mar-21	28-Apr-21	26-May-21	17-Jun-21	5-Jul-21	6-Aug-21	17-Sep-21	19-Oct-21	12-Nov-21	14-Dec-21
GW 15	Well Vac ("H2O)	-9.62	-10.23	-7.09	-9.16	-10.33	-9.52	-7.87	-10.82	-10.16	-10.97	-11.44	-12.49
	Lat Vac ("H2O)	-32.40	-17.36	-14.54	-17.50	-31.47	-26.29	-15.09	-26.91	-28.01	-27.59	-28.01	-26.87
	CH4 (%)	34.2	45.1	44.3	41.4	9.5	31.3	56.4	46.0	34.5	47.9	46.4	59.3
	CO2 (%)	33.7	29.4	29.8	30.6	6.2	31.0	33.4	32.3	33.1	36.9	35.1	30.1
	O2 (%)	0.3	3.9	3.0	0.2	15.2	1.6	0.2	2.1	0.8	0.3	0.7	0.7
	Max Velocity (m/s)	2.60	0.50	0.50	0.50	1.44	1.50	1.60	1.40	2.00	0.90	2.20	0.50
	Min Velocity (m/s)	2.50	0.00	0.40	0.40	1.37	0.60	0.80	0.90	1.90	0.80	1.80	0.40
	Temp (°C)	0.8	8.3	3.3	-	19.9	25.6	25.8	27.1	24.9	17.3	20.1	15.0
	Flow (cfm)	24.6	2.4	4.3	4.3	13.6	10.1	11.6	11.1	18.8	8.2	19.3	4.3
	Comments	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked
GW 16-3	Well Vac ("H2O)	-5.74	-1.47	-1.87	-2.35	-4.86	-4.50	-3.19	-5.34	-5.07	-9.66	-7.41	-5.73
	Lat Vac ("H2O)	-32.50	-17.24	-14.98	-17.66	-31.89	-25.92	-15.32	-26.73	-27.93	-28.73	-28.00	-26.98
	CH4 (%)	39.7	23.5	35.6	33.8	19.9	25.5	38.2	32.6	26.1	37.9	44.2	54.2
	CO2 (%)	32.1	26.9	29.2	32.1	20.3	27.1	27.2	29.5	31.1	32.6	33.2	28.5
	O2 (%)	1.0	0.3	1.6	0.1	6.5	0.9	0.3	0.2	0.3	1.6	0.3	0.7
	Max Velocity (m/s)	1.20	0.60	0.80	0.40	1.28	1.20	1.40	1.70	1.80	1.00	1.80	0.70
	Min Velocity (m/s)	1.10	0.40	0.70	0.40	1.22	0.80	0.90	1.10	1.60	0.60	1.50	0.40
	Temp (°C)	1.6	7.5	3.3	-	21.5	26.6	27.1	27.3	22.6	15.3	18.9	10.3
	Flow (cfm)	11.1	4.8	7.2	3.9	12.1	9.7	11.1	13.5	16.4	7.7	15.9	5.3
	Comments	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked	cracked
GW 17-H	Well Vac ("H2O)	-20.37	-13.60	-14.83	-18.28	-30.70	-25.27	-14.97	-26.23	-26.98	-27.99	-27.64	-26.94
	Lat Vac ("H2O)	-32.36	-17.44	-14.79	-18.57	-31.81	-26.22	-15.37	-26.69	-27.65	-28.50	-27.88	-26.97
	CH4 (%)	44.8	54.5	49.8	55.1	26.6	33.9	52.4	48.4	36.5	48.1	53.8	61.6
	CO2 (%)	36.4	33.7	33.4	33.2	25.1	31.0	30.8	34.3	36.6	36.2	34.8	30.0
	O2 (%)	0.0	0.1	0.2	0.6	4.8	0.5	0.1	0.0	0.0	0.0	0.2	0.0
	Max Velocity (m/s)	2.40	1.80	1.30	1.50	1.28	2.00	1.90	2.10	2.40	1.20	2.00	1.70
	Min Velocity (m/s)	2.20	1.40	1.00	1.40	1.22	1.50	1.30	1.20	1.90	0.80	1.80	1.50
	Temp (°C)	0.7	9.2	3.5	22.3	21.5	27.5	27.3	29.1	24.2	15.1	19.6	11.1
	Flow (cfm)	22.2	15.5	11.1	14.0	12.1	16.9	15.5	15.9	20.8	9.7	18.4	15.5
	Comments	1 -> 1.25T open	1/2->1T	1T	1T	1T	1T	1T	1T	1T	1T	1->1.5T	1.5T
GW 18-4	Well Vac ("H2O)	-32.46	-17.77	-14.83	-18.69	30.70	-26.25	-15.29	-27.03	-27.65	-28.01	-28.01	-26.98
	Lat Vac ("H2O)	-32.49	-17.45	-14.68	-18.10	-31.81	-26.31	-15.24	-26.99	-27.95	-27.74	-28.03	-27.07
	CH4 (%)	55.3	57.4	56.6	52.7	26.6	52.7	57.5	57.2	49.0	56.5	59.2	62.1
	CO2 (%)	38.5	36.3	35.1	35.9	25.1	36.9	32.4	35.2	36.8	35.8	35.4	30.3
	O2 (%)	0.3	0.4	1.4	0.4	5.4	0.7	0.9	0.6	0.5	1.1	0.4	0.3
	Max Velocity (m/s)	2.10	0.70	0.80	0.90	2.79	2.30	2.50	2.50	2.80	0.90	2.60	0.70
	Min Velocity (m/s)	2.00	0.60	0.60	0.80	2.79	1.00	1.10	1.20	2.00	0.80	2.00	0.50
	Temp (°C)	3.5	8.9	2.0	23.0	2.8	27.8	28.1	29.1	23.9	17.7	19.8	10.9
	Flow (cfm)	19.8	6.3	6.8	8.2	27.0	15.9	17.4	17.9	23.2	8.2	22.2	5.8
	Comments	5.25->5.75T open	5->full	full	full	full	full	full	full	full	full	full	full
PDT (cycles)	PDT1	32212	33548	34873	37722	39037	39621	40050	40193	41932	159883	159894	159938
	PDT2	57820	57820	57820	57821	57823	57823	64785	67502	67922	68124	68189	68280
	PDT3	18774	21423	22098	24487	25915	26655	27182	28099	28836	29803	30250	31826
	PDT4	74527	80481	81823	86108	88439	89570	91137	93509	97990	102007	103097	107287
	Cond. Chamber	394536	400791	402622	411848	408119	414910	415619	419774	430903	444938	449533	462939
	Total cycles since last round	6785	16194	5173	18750	13147	9246	10194	10304	18506	137172	6208	19307
	Approximate volume (L)	14927	35627	11381	41250	2963	20341	22427	22669	40713	301778	13658	42475

Green highlighted wells - Above ground Big "O" connections

4.0 2021 MAINTENANCE SUMMARY

In 2021, system maintenance was conducted in accordance with the *Maintenance and Monitoring Schedule* attached in Appendix B. The Maintenance Schedule was developed in accordance with the manufacturers' recommendations for preventative maintenance. These schedules outline the work and frequency of the tasks required for all components of the system. Any potential problems observed while conducting the routine maintenance were addressed in a timely manner. This schedule was originally published in the Operating Procedures and Maintenance Program Manual for the LGCFS created during plant construction.

The maintenance program for the LGCFS consists of three major parts; the Landfill Gas Wellfield System, the Mechanical System, and the Flare and Control System. The following sections summarize the maintenance completed on these individual components.

4.1 Wellfield System

All activities outlined in the Operation and Maintenance schedules were carried out as recommended. Various other wellfield system activities occurred throughout 2021 and are further described below.

With the gas collection system having temporary "Big O" piping connections above ground, the system is susceptible to wind and freezing. During high wind conditions, the "Big O" piping is often blown apart and the system shuts down on a high oxygen alarm. In addition to wind being problematic with the temporary piping, cold temperatures can also be a problem. When the moist warm gas comes above ground into this piping, condensate forms and can often block the pipe and freeze solid. The piping has to be drained or replaced depending on temperature conditions.

In order to prevent freezing and excess water, Comcor staff routinely drains the condensate back into the buried piping during cold weather and the condensate is managed by the drain traps in the permanent system. However, in the latter end of January, the lateral and "Big

O” piping to GW12 and GW5 was frozen and with little vacuum. In February, additional “Big O” piping was added to bypass existing “Big O” piping that was frozen. In July, the “Big O” piping in the vicinity of GW8 was repaired after being crushed by a compactor. On two separate occasions in August, one being near the active fill area, the “Big O” piping was found damaged and required repairs and/or replacement. Further “Big O” piping repairs were required in December at GW15 after being found detached from the well. The piping was also sealed at GW5 to allow for other contractors to regrade the area around the well to avoid pooling water. In addition to the “Big O” piping work, some wells were lowered 1-2 ft and pump maintenance was completed as necessary throughout the year. With current filling activities, it is planned to replace most, if not all of the existing “Big O” piping in the Fall of 2022 or Spring of 2023.

The goal of the gas collection system is to maximize gas collection, minimize odours and reduce greenhouse gas emissions. With this in mind, the individual wells are adjusted to maximize flow and maintain a sustainable gas concentration for the flare to operate within the standards outlined in the ECA (Air). Wells with gas below 35% methane are closed or throttled until a sustainable production level is reached. Wells with concentrations higher than 50% are opened over consecutive monitoring events until a sustainable production level is reached. The actions taken during each monitoring round can be seen in Table 3: 2021 Field Monitoring Data.

4.2 Mechanical System

All activities outlined in the Operation and Maintenance schedules were carried out as recommended. There was no major mechanical system maintenance required in 2021, however are expected in 2022 to address settlement issues identified in 2021. Minor mechanical system activities that occurred in 2021, and discussion on the settlement are further described below.

It was noted in late March 2021 that the concrete pads for the blower, flare, and electrical building at the Site appeared to be settling. After the County had been notified of the settlement issues, Comcor and the County began taking survey information and monitoring

for further settlement issues. The effects of the settlement on the landfill gas flaring infrastructure were noted by a Comcor mechanical engineer during a site visit. Comcor observed cracking and misalignment of flex connectors, misalignment of pipe affecting access for maintenance, impact to electrical connections, excess space between flanges and gaskets, and rotation of flanges. It was also noted that the gaskets may be exceeding their load capacity where they are being compressed.

In order to relieve some of the stress on the mechanical portion of the gas collection system and maintain grades of the pipe conveying the gas from the blower skid to the flare, the pipe height was adjusted by Comcor in May. The County engaged a consulting firm to conduct a geotechnical study on the flare compound, and in October the flare was shutdown to allow for locates and borehole drilling to be completed in the flaring compound. The study is on-going and Comcor has continued to monitor the equipment for safe operations until a permanent solution can be determined.

Beginning in October the air compressor that opens the automated valves on startup and the pneumatic pumps in the wellfield for condensate management began to experience operational issues which resulted in frequent system shutdowns. To address these issues, a technician was on site in November to investigate the air compressor which was tripping after only a short period of run time. Comcor was advised that the thermal valve may need to be replaced, as well as the belt to avoid the compressor from running hot and tripping off. As a result, and the requirement to complete service on it, the main air compressor was taken offline and the smaller air compressor was put in to use to run the flare. The smaller air compressor has been in use since November 2021; however, the main air compressor has since been repaired and reinstalled.

4.3 Flare and Control System

Throughout the year, the fan house computer continually logged all control information during flaring operations including gas concentrations, flare temperatures and runtimes with minimal down time. On occasion, there were minor repairs or maintenance required due to blown fuses, sensors (i.e. heat trace, oxygen, carbon dioxide), and various

errors/faults/failures (i.e. chiller, analyzer, pilot flame, purge blower). Other minor maintenance items pertaining to the flare and control system included repairing the Belimo actuator, the igniter, the gas analyzer, components of the burner management system and the control computer. Modifications were also made to the thermocouple heights and the burner tips based on the recommendations provided by the flare manufacturer to increase the ability to operate at the lower flows experienced on site.

To eliminate the requirement to operate the flare louvres manually and avoid unnecessary flameouts, the Belimo actuator was repaired in August. The igniter was pulled out, and reassembled in order to restart the flare and remediate issues that were experienced in the first couple of months in 2021. The H₂S scrubber beads on the analyzer were replaced on multiple occasions throughout 2021 and the service and calibration of the gas analyzer system was completed by Novatech on a quarterly basis. In addition to the quarterly maintenance, Novatech was on site in November to troubleshoot power issues with the gas analyzer that were first noted in mid-October. In December 2021, it was determined that the temperature card in the burner management system was faulty. This was replaced by HS Electric in December, as well as replacing the shutter and bulb in the flame scanner so that the flame was better recognized and nuisance shutdowns were avoided.

In mid-March, the control computer on Site was taken out of service for repair by HS Electric. The computer was reinstalled a few days later; however, the touchscreen required further repairs which were completed in July. Notably, in June, the system experienced power glitches and the UPS was put in to use to run the computer as a result. Various events were completed in the attempt to keep the computer running on the UPS in the case of a power failure, and in mid-July the sensitivity on the UPS was increased which remediated the issue.

As discussed in Section 2.3, following an investigation into the flare operations and the requirement to operate on the lower end of the turn down ratio as a result of the low flows, adjustments were made to the thermocouple heights and burner tips. In August 2021, Enviro EMD, the flare manufacturer, lowered the height of the bottom thermocouple. After

the flare continued to experience trips and shut downs, five of the burners were blanked off in November 2021, leaving two burners open for operation. In December 2021, one additional burner was blanked off. There is currently one burner still operating, which is the burner closest to the flare. Comcor continues to review the flare operation to determine if further adjustments are required. At this time the recommendation of adding a heat retention lid has not been explored

5.0 CONCLUSIONS AND RECOMMENDATIONS

1. The LGCFS operated as intended in 2021.
2. The monitoring and maintenance schedule should be continued in order to maintain a steady level of methane gas production and a safe environment in all of the major component areas of the Landfill Gas Collection and Flaring System. The system also must be monitored and maintained in order to remain in compliance with regulatory agency approvals.
3. The temporary portion of the wellfield should be replaced with permanent buried HDPE to prevent condensate accumulation, freezing, and breakage that all contribute to increased downtime and reduced collection efficiency. Additionally, replacement of this piping will be required to allow for the final cap application in this area once elevations are achieved.
4. The settlement issues in the flaring compound should continue to be monitored until work to remediate the issue can be completed. The County should continue to finalize remediation efforts based on the geotechnical report and recommendations.

All of which is Respectfully Submitted,

COMCOR ENVIRONMENTAL LIMITED



Christine Grant, EIT
Engineering Project Coordinator



Shannan McGarr, B.Sc.
Wellfield Operations Manager

APPENDIX A

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS
ENVIRONMENTAL COMPLIANCE APPROVAL
(Waste) No. A070808



AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A070808

Issue Date: November 7, 2013

County of Oxford
21 Reeve St
Post Office Box, No. 1614
Woodstock, Ontario
N4S 7Y3

Site Location: Salford Landfill
Lot 11 & 12, Concession 2
South-West Oxford Township, Restructured County of Oxford

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

*the use and operation of a **43.7 hectare** (108 acre) Waste Fill Area within a total Site area of **89.44 hectares** (221 acres)*

For the purpose of this environmental compliance approval, the following definitions apply:

DEFINITIONS

"Approval" means this Environmental Compliance Approval No. A070808, including all items, conditions and Schedules attached to and forming part of this Approval, as amended by the Director;

"Director" means any Ministry employee appointed in writing by the Minister pursuant to Section 5 of the EPA as a Director for the purpose of Part II.1 of the EPA;

"District Manager" means the District Manager of the local district office of the Ministry in which the Site is geographically located;

"EPA" means Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended;

"MOE" or "Ministry" means the Ontario Ministry of the Environment;

"Operator " means any person, other than the Owner's employees, authorized by the Owner as having the charge, management or control of any aspect of the Site and includes its successors or assigns;

"Owner" means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and includes the County of Oxford, its successors and assigns;

"OWRA" means the Ontario Water Resources Act, R.S.O. 1990, C. O.40, as amended;

"PA" means the Pesticides Act, R.S.O. 1990, c. P-11, as amended;

"Provincial Officer" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the OWRA or Section 5 of the EPA or section 17 of PA;

"Regional Director" means the Regional Director of the Southwestern Regional Office of the Ontario Ministry of the Environment;

"Regulation 347" or "Reg. 347" means Regulation 347, R.R.O. 1990, made under the EPA, as amended;

"Site" or "Facility" means the entire waste disposal site, including the waste fill Area, the buffer lands/contaminant attenuation zone, and all the operations approved by the Approval, as amended and located at part of Lot 11 & 12, Concession 2, South-West Oxford Township, Restructured County of Oxford, known as Salford and or Oxford Landfill; and

"Trained personnel" means personnel knowledgeable in the following through instruction and/or practice:

- relevant waste management legislation, regulations and guidelines;
- major environmental concerns pertaining to the waste to be handled;
- occupational health and safety concerns pertaining to the processes and wastes to be handled;
- management procedures including the use and operation of equipment for the processes and wastes to be handled;
- emergency response procedures;
- specific written procedures for the control of nuisance conditions;
- specific written procedures for refusal of unacceptable waste loads; and
- the requirements of the Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

1.0 GENERAL

Compliance

1.1 The Owner/Operator shall ensure compliance with all the conditions of this Approval and shall ensure that any person authorized to carry out work on or operate any aspect of the Site/System is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same. Any noncompliance constitutes a violation of the EPA, R.S.O. 1990 and is grounds for enforcement.

In Accordance

1.2 Except as otherwise provided for in this Approval, the Site shall be designed, developed, used, operated and maintained, and all facilities, equipment and fixtures shall be built and installed, in accordance with the documentation listed in the attached Schedule "A" and the terms and conditions of this Approval.

1.3 The requirements specified in this Approval are the requirements under the EPA, R.S.O. 1990. The issuance of this Approval in no way abrogates the Owner's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

Interpretation

1.4 (a) Where there is a conflict between a provision of any document, including the application, referred to in Schedule "A" of this Approval, and the conditions of this Approval, the conditions in this Approval shall take precedence.

(b) Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.

(c). Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

1.5 The conditions of this Approval are severable. If any condition of this Approval, or the application of any condition of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

Adverse Effect

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1.6 The Owner and Operator shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

1.7 Despite the Owner/Operator or any other person fulfilling any obligations imposed by this Approval the person remains responsible for any contravention of any other condition of this Approval or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Notifications

1.8 The Owner shall notify the Director, in writing, and forward a copy of the notification to the District Manager, within 30 days of the occurrence of any changes in the following information:

(a) change of the Ownership and/or Operator of the Site;

(b) change of the address of the Owner or Operator;

(c) the partners, where the Owner or Operator is or at any time becomes a partnership and a copy of the most recent declaration filed under the Business Names Act, R. S. O. 1990, c. B.17, shall be included in the notification;

(d) any change of name of the corporation where the Owner or Operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1 or 2 of Ontario Regulation 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the Corporations Information Act shall be included in the notification to the Director.

1.9 (a) The Owner/Operator shall, forthwith upon request of the Director, District Manager, or Provincial Officer, furnish any information requested by such persons with respect to compliance with this Approval, including but not limited to, any records required to be kept under this Approval; and

(b) In the event the Owner/Operator provides the Ministry with information, records, documentation or notification in accordance with this Approval (for the purposes of this condition referred to as "Information"),

i. the receipt of Information by the Ministry;

ii. the acceptance by the Ministry of the Information's completeness or accuracy; or

iii. the failure of the Ministry to prosecute the Owner, or to require the Owner to take any action, under this Approval or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Owner/Operator relating to the Information, amounting to noncompliance with this Approval or any statute or regulation.

1.10 The Owner/Operator shall allow Ministry personnel, or Ministry authorized representative(s), upon presentation of credentials, to carry out any and all inspections authorized by the Environmental Protection Act, R.S.O. 1990, and the Ontario Water Resources Act, R. S. O. 1990 or the Pesticides Act, R. S. O. 1990, as amended, of any place to which this Approval relates and without restricting the generality of the foregoing to:

(a) enter upon the premises or the location where the records required by the conditions of this Approval are kept;

(b) have access to and copy, at any reasonable time, any records required by the conditions of this Approval;

(c) inspect at reasonable times any facilities (including monitoring and control equipment), equipment, practices or operations required by the conditions of this Approval; and

(d) sample and monitor at reasonable times for the purposes of assessing compliance with the conditions of this Approval.

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1.11 All records and monitoring data required by the conditions of this Approval shall be kept on the Owner's premises for a minimum period of two (2) years from the date of their creation.

1.12 The Owner/Operator shall ensure that all communication made pursuant to this Approval refers to the Approval No. A070808.

1.13 Any information relating to this Approval and contained in Ministry files shall be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, C. F-31.

2.0 SITE DESIGN, DEVELOPMENT AND OPERATION

2.1 (a) The Site shall be designed, operated and maintained at all times, in accordance with the EPA, Regulation 347, the conditions of this Approval, report entitled Oxford County Salford Landfill Site Design and Operations Report, prepared by M.M. Dillon Limited, dated September 12, 1984, and revised on June 17, 1986 and report entitled County of Oxford, Oxford Landfill Site, Amendment to 1986 Design and Operation Report, prepared by R.J. Burnside & Associates Limited, dated April 2013, included in Schedule "A" as Items 6 and 7.

(b) The combined capacity of North Fill Area and South Fill Area, including waste, daily, and final cover, shall not exceed 5,900,000 cubic metres, as represented by final contours in Figure 5, Item 7 of Schedule "A".

(c) Two years prior to North Fill Area reaching final capacity and before South Fill Area is to be utilized, the Owner shall submit to the Director, a complete design and operation plan for utilization of the approved capacity in the South Fill Area.

DAILY, INTERMEDIATE AND FINAL COVER

2.2 Waste shall be deposited in the fill area in an orderly manner. All waste shall be compacted and then covered in accordance with the following schedule:

(a) (i) Soil cover material with a minimum thickness of 150 mm or an equivalent thickness of alternative cover material as approved by the Director shall be placed over the entire working face at the end of each operating day;

(ii) The Owner shall ensure that a minimum cover material supply equal to two days requirements is maintained at the Site to ensure that adequate cover is always available.

(b) Interim cover consisting of a minimum thickness of 300 mm of soil cover or an equivalent thickness of alternative cover material as approved by the Director shall be placed on areas where landfilling has been temporarily discontinued for six months or more.

(c) In areas where landfilling has reached final contours, final cover shall be applied within two years in accordance to details outlined in Item 6 of Schedule "A".

(d) The landfilling area shall be inspected monthly for erosion of the interim and final cover material. Appropriate corrective measures shall be undertaken by the Owner within 5 working days, weather permitting, after an erosion problem is identified.

2.3 The Owner shall ensure that there is no burning of waste at the Site.

2.4 The Owner shall ensure that there is no uncontrolled scavenging of waste at the Site.

WASTE DIVERSION FACILITIES

2.5 (a) Diversion Facilities shall be operated and maintained as outlined in Section 2.1, Item 7 of Schedule "A".

(b) The Owner shall ensure that the Site and the Diversion facilities are operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

(c) The Owner shall ensure that all white goods containing refrigerants are stored in a segregated area in an upright position and in a manner that allows for safe handling and removal of refrigerants as required by O. Reg. 189, until refrigerant has been drained and item has been tagged by a licensed contractor.

SITE INSPECTIONS AND RECORD KEEPING

2.6 (a) An inspection of the working area of the Site and all active equipment shall be conducted each day the Site is in operation to ensure that the Site is being operated in compliance with this Approval. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the Site if needed.

- (b) A record of the inspections shall be kept in a daily log book or a dedicated electronic file that includes:
- a. the name and signature of person that conducted the inspection;
 - b. the date and time of the inspection;
 - c. the list of any deficiencies discovered;
 - d. the recommendations for remedial action; and
 - e. the date, time and description of actions taken.

SITE SECURITY AND ACCESS

2.7 (a) The Owner shall construct adequate fence and gate to secure Site from unauthorized access. During non-operating hours, the Site entrance and exit gates shall be locked and the Site shall be secured against access by unauthorized persons

(b) Access roads and on-Site roads shall be provided and maintained in a manner that vehicles hauling waste to and on the Site may travel readily and safely on any operating day. During winter months, when the Site is in operation, roads must be maintained to ensure safe access to the landfill working face. Access roads must be clear of mud, ice and debris which may create hazardous conditions.

COMPLAINT PROCEDURE

2.8 If at any time, the Owner receives complaints regarding the Site, the Owner shall respond to these complaints according to the following procedure:

- (a) The Owner shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant (if the complainant will provide this information) and the time and date of the complaint;
- (b) The Owner shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint if applicable and forward a formal reply to the complainant; and
- (c) The Owner shall complete and retain on-site a report written within two (2) weeks of the complaint date, listing the actions taken to resolve the complaint if applicable and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

GROUNDWATER AND SURFACE WATER MONITORING

2.9 (a) The Owner shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

(b) Monitoring wells shall be inspected during groundwater monitoring events and any changes in the physical condition of each well shall be documented. Necessary repairs shall be undertaken, as needed. If a monitoring well is greatly damaged and cannot reasonably be repaired, the District Manager shall be notified and the well shall be properly abandoned. The well shall be replaced by a new monitoring well if directed by the District Manager to do so in accordance with O. Reg. 903.

(c) All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been

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approved by the District Manager for abandonment, shall be decommissioned by the Owner, as required, in accordance with O.Reg. 903. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

2.10 The Owner shall conduct groundwater and surface water monitoring at the Site in accordance with the details outlined in Section 3.2, Item 7 of Schedule "A" and as listed in the following table:

Groundwater Monitoring Locations	Frequency	Parameters
00-03, 022R, 023R, 101R, 111, 141R, 191, 231R, 232R, 233R, 263R, 381R, 531R, 541(new well to be drilled in Lower Till), 551R, 552R, 561, 562, 571, 581, 591(new well to be drilled west of 591 with screens in Fractured Till, Upper Till, and Inter-Till Sand), 998, 999 (bedrock well), 03-08 (existing leachate well), and proposed South Fill Area leachate well when it is developed	Twice per year	pH, Conductivity, Hardness, Chloride, DOC, Alkalinity, Carbonate, Bicarbonate, Nitrate, Nitrite, Sulphate, Calcium, Potassium, Magnesium, Sodium, Phenols, Fluoride, colour and turbidity
Private Wells: 902, 904, 906, 907, 908, 909, 911, 912, 913, 916, 917, 918, 920, 921, 922	Once per year	pH, Conductivity, Hardness, Chloride, DOC, Phenols, Fluoride, colour and turbidity
Leachate Sampling: all accessible collection system manholes	Once per year	pH, Conductivity, Hardness, Chloride, DOC, Phenols, Fluoride, colour and turbidity

Surface Water Monitoring Locations	Frequency	Parameters
SW1 (971), Sediment Basin A SW4(974), Wet area at Manicom boundary, 11/12 lot line SW7(977), Sediment Basin B SW8(978), Hooper Drain catchbasin upstream of site SW9(979), Hooper Drain manhole downstream from site	Four times per year	pH, Conductivity, Hardness, Chloride, DOC, Phenols, Fluoride, colour and turbidity
To be added when South Fill Area is developed: SW2(972), Pond at Bartram boundary, 10/11 lot line SW5(975), Culvert at Hwy 19 on Anscombe Drain	Four times per year	pH, Conductivity, Hardness, Chloride, DOC, Phenols, Fluoride, colour and turbidity

2.11 The Owner shall follow trigger mechanisms outlined in Section 3.3.1 Item 7 of Schedule "A".

CHANGES TO THE MONITORING PLAN

2.12 (a) The Owner may request changes to the monitoring program(s) to the District Manager in writing.

(b) Within fourteen (14) days of receiving the written correspondence from the District Manager confirming that the District Manager is in agreement with the proposed changes to the environmental monitoring program, the Owner shall

forward a letter identifying the proposed changes and a copy of the correspondences from the District Manager and all other correspondences and responses related to the changes to the monitoring program, to the Director requesting the Approval be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

3.0 LANDFILL GAS COLLECTION AND FLARING SYSTEM

3.1 A landfill gas collection system, comprising vertical gas extraction wells, a network of sub-laterals, laterals and perimeter header piping, and a flaring facility, shall be constructed and operated, in accordance with the conceptual design and operation described in Section 2.1 in the Design Report, Item 1 in Schedule "A", as amended by Item 3 in Schedule "A", attached to this Approval.

3.2 The landfill gas collection and flaring system, phase 1, shall be constructed and operated in accordance with the detailed design and development, as described in Section 2.2 in Item 1 in Schedule "A", as amended by Item 3 in Schedule "A", attached to this Approval.

3.3 Detailed design in phase 2 and all subsequent phases of the landfill gas collection and flaring system, shall be submitted by the Owner/Operator, for the approval of the Director, with copies to the District Manager, prior to construction. The detailed design, development drawings and specifications, shall reflect the conceptual design of the landfill gas collection and flaring system, as presented in Item 1 in Schedule "A", as amended by Item 3 in Schedule "A", attached to this Approval. Any design optimization or modification shall be clearly identified, along with an explanation of the reasons for the change.

3.4 The detailed Phase 2 design shall, at a minimum include the following:

- (a) full-scale design drawings and specifications, including profiles, site plan showing all engineered facilities associated with the headers, laterals and sub-laterals, and material descriptions and requirements for delivery, storage, installation and sampling;
- (b) detailed quality assurance/quality control (QA/QC) program for construction of the landfill gas collection and flaring system ;
- (c) details of nuisance control programs and necessary precautions to avoid disturbance to the natural environment caused by the operation of the landfill gas collection and flaring system;
- (d) details on the monitoring, maintenance, repair and replacement of components of the landfill gas collection and flaring system, as necessary; and
- (e) contingency plans for environmental controls.

3.5 The Owner shall operate and maintain the landfill gas collection and flaring system in accordance with Operation and Maintenance Manual, Landfill Gas Collection and Flaring System, Oxford County Landfill Site, prepared by Comcor Environmental Limited, dated January 17, 2011, Items No. 5 of Schedule "A".

3.6 During construction of the landfill gas collection system, the Owner/Operator shall implement as a minimum, odour control plan described in Item 3 in Schedule "A", attached to this Approval. The effectiveness of the odour control plan shall be monitored and evaluated regularly, and updated or amended as necessary, based on operational experience and odour complaints received.

3.7 After commissioning the landfill gas collection and flaring system, the Owner/Operator shall prepare and submit to the District Manager, with copies maintained at the Site, a written report covering any significant landfill gas collection system expansion or modification. The report shall detail the construction activities, QA/QC program carried out for the construction, as-built drawings of the landfill gas collection and flaring system to date, including a description and reasons for any changes to the design of the landfill gas collection and flaring system.

4.0 LANDFILL GAS COLLECTION AND FLARING SYSTEM OPERATION

4.1 Prior to implementation of any changes in the landfill gas collection and flaring system operation, that may result in

activities not specified in the Design Report, Item 1, in Schedule "A", as amended in Item 3 in Schedule "A", attached to this Approval, or in this Approval, and that may likely cause the discharge of contaminant to the natural environment, the Owner/Operator shall obtain approval from the Director.

4.2 The Owner/Operator shall maintain records of landfill gas flow. Such records shall be made available for inspection upon request by a Provincial Officer.

4.3 In the event of a discharge of a contaminant, including landfill gas, landfill gas condensate, etc., the Owner/Operator shall immediately notify the District Manager and the Ministry's "Spills Action Centre", and advise of actions being taken to contain, control and ameliorate the situation.

4.4 For any situation when landfill gas is not being collected and incinerated and which cannot be rectified within 48 hours, the Owner/Operator shall notify the District Manager and advise of actions being taken to contain, control and ameliorate the situation.

4.5 Any gas extraction well that needs to be replaced due to damage or the well is deemed to be not functioning properly, the Owner/Operator shall replace the gas extraction well within a reasonable time frame of identifying the need for replacement. Any such changes to the gas extraction system shall be documented in the Annual Report.

4.6 The Owner/Operator shall carry out odour and landfill gas management, as well as the rehabilitation of the Site, in accordance with a report entitled "Landfill Gas and Odour Management Plan", Item 4 in Schedule "A", attached to this Environmental Compliance Approval.

4.7 The Owner/Operator shall document and include in the subsequent Annual Report, the results of the emissions survey completed. The reporting on the emissions survey shall, as a minimum, include tabulated results, drawing showing survey grid nodes, and a site map showing colour-coded concentration levels of landfill gas emissions based on the results of the surface emissions survey.

5.0 LANDFILL GAS ENVIRONMENTAL CONTROL, MONITORING/INSPECTION AND MAINTENANCE

5.1 The Owner/Operator shall carry out monitoring program for landfill gas to monitor the performance of the landfill gas collection and flaring system, as described in Item 1 in Schedule "A", as amended in Item 3 in Schedule "A", attached to this Approval, and as per written recommendations of the District Manager, through the review of Annual Monitoring Reports, and any related EPA requirements.

5.2 Components of the active gas collection system shall be monitored on an as-needed basis, with a routine frequency of once per month for the full collection field. Any observed deficiencies/problems shall be repaired as soon as practicable and a summary of remedial actions carried out, shall be reported in the Annual Monitoring Report.

Subsurface Migration of Combustible Gas

5.4 Buildings and structures existing or to be built on Site shall be situated, constructed and monitored in a manner which minimizes the potential for explosive hazards due to combustible gas. Appropriate methane detection and alarm equipment, shall be installed and maintained for all enclosed unvented buildings and/or structures on Site, which at times are occupied by people.

Note: For the purposes of Condition 5.4, vented building or structure is a building or structure built with its floor sealed and elevated above ground and having adequate air space underneath the floor of the building or structure.

5.5 Subsurface migration of combustible methane gas shall meet the following limits, as required by Ontario Reg. 232/98:

(a) The concentration of methane gas must be less than 2.5 percent by volume at the limits of the property boundary.

(b) The concentration of methane gas must be less than 1.0 percent by volume in any on-site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure that is located on Site, if the building or structure is accessible by people or contains electrical equipment or a potential source

of ignition.

(c) Sub-condition (b) does not apply to a leachate collection, storage or pumping station or a landfill gas collection and/or treatment facility for which specific Occupational Health and Safety measures and procedures relating to the risk of asphyxiation and the risk of explosion, must be followed.

d) The concentration of methane gas from the Site in any off-Site building or enclosed structure, and in the area immediately outside the foundation or basement floor of the building or structure, if the building or structure is accessible by people or contains electrical equipment or a potential source of ignition, must be less than 0.05% by volume.

5.6 If a measured gas concentration at any specific compliance location, reaches the applicable limit identified in Sub-conditions 5.5 (a) and (b) above, or if a notification is given that gas concentration has reached the limit specified in Sub-condition 5.5(d), above, the reading shall be re-measured immediately and daily for a period of up to three (3) consecutive days. If these readings confirm an exceedance of the applicable limit, the District Manager shall be notified immediately, and appropriate control measures shall be implemented as soon as possible thereafter.

6.0 ANNUAL REPORT

6.1 By April 30th following the end of each operating year, the Owner/Operator shall prepare and submit to the District Manager an annual report, covering the previous calendar year. The report shall include, as a minimum, the following information:

- (a) a survey of the Site's waste disposal area, drawings showing areas of fill, buffer areas, current landfilling area contours, percentage of available space utilized, and an estimate of the remaining disposal capacity;
- (b) a summary of the quantities of waste received;
- (c) a drawing(s) indicating all groundwater, surface water and gas monitoring locations;
- (d) tables outlining monitor locations, analytical parameters sampled and frequency of sampling;
- (e) the results and an interpretive analysis of the results of all monitoring at the Site including groundwater, surface water, leachate and landfill gas monitoring, and an assessment of the need to amend the monitoring program or to develop and implement contingency measures;
- (f) review and assessment of any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the Site and during Site inspections and any mitigative actions taken;
- (g) a summary of any public complaints received by the Owner/Operator and the responses made;
- (h) a statement as to compliance with all Conditions of this Approval and all applicable Ministry Acts, Regulations, Guidelines, including Guideline B-7, Incorporation of the Reasonable Use Concept Into MOEE Groundwater Management Activities, (MOEE 1994), and Ontario Provincial Water Quality Objectives;
- (i) any recommendations to minimize environmental impacts from the operation of the Site and to improve Site operations and monitoring programs in this regard; and
- (j) any other information with respect to the Site which the District Manager may require from time to time.

7.0 CLOSURE PLAN

7.1 At least 2 years prior to the anticipated date of closure of this Site or any aspect of the operations at the site, the Owner shall submit to the Director for approval, with copies to the District Manager, a detailed site closure plan pertaining to the termination of landfilling operations and/or any aspect of the operations at this Site, post-closure inspection, maintenance and monitoring, and end use. The plan shall include but not limited to the following:

- (a) a plan showing Site appearance after closure;
- (b) a description of the proposed end use of the Site;
- (c) a description of the procedures for closure of the Site;
- (d) advance notification of the public of the landfill closure;
- (e) posting of a sign at the Site entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
- (f) completion, inspection and maintenance of the final cover and landscaping;
- (g) site security;
- (h) removal of unnecessary landfill-related structures, buildings and facilities; and

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- (i) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
- (j) a schedule indicating the time-period for implementing sub-conditions (a) to (e) above.
- (k) description of the procedures for post-closure care of the Site, including operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
- (l) record keeping and reporting; and
- (m) complaint contact and response procedures;
- (n) an assessment of the adequacy of and need to implement contingency plans for leachate and methane gas; and
- (o) an updated estimate of the contaminating life span of the Site, based on the results of the monitoring programs to date.

7.2 Within ten (10) days after closure of the Site, the Owner shall notify the Director, in writing, that the Site is closed and that the Site Closure Plan has been implemented.

The following documentation hereby forms Schedule "A", and part of Approval No. A070808.

1. Report entitled "Ontario Regulation 347 Design Report, Oxford County Landfill Site, Salford, Ontario", dated June 26, 2009.
2. Application for Provisional Certificate of Approval for a Waste Disposal Site, Installation and Operation of Landfill gas Collection and Flaring System, dated March 29, 2010, signed by Robert Walton, Director of Public Works, County of Oxford.
3. Letter dated April 15, 2010, from Denise Burgess, Comcor Environmental Limited to Dickson Odame-Osafo, Ministry of the Environment, Re: response to MOE comments on the design report.
4. Report entitled "Landfill Gas and Odour Management Plan, Landfill Gas Collection and Flaring System, Oxford County Landfill Site" Salford, Ontario, dated March 15, 2011, prepared by COMCOR Environmental Limited.
5. Report entitled "Operation and Maintenance Manual, Landfill Gas Collection and Flaring System, Oxford County Landfill Site", prepared by Comcor Environmental Limited, dated January 17, 2011.
6. Report entitled "Oxford County Salford Landfill Site Design and Operations Report", prepared by M.M. Dillon Limited, dated September 12, 1984, and revised on June 17, 1986.
7. Report entitled "County of Oxford, Oxford Landfill Site, Amendment to 1986 Design and Operation Report", prepared by R.J. Burnside & Associates Limited, dated April 2013.

The reasons for the imposition of these terms and conditions are as follows:

1. The reasons for **Conditions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.9, 1.11, 1.12, and 1.13** are to clarify the legal rights and responsibilities of the Owner and Operator under this Approval.
2. The reasons for **Conditions 2.1(a), 3.2, 3.3 and 4.2** are to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.
3. The reason for **Condition 1.8** is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.
4. The reason for **Condition 1.10** is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Certificate of Approval. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the EPA and OWRA.
5. The reason for **Condition 2.1(b)** is to specify the site approved capacity.
6. The reason for **Condition 2.1(c)** is to ensure submission of a design and operation plan which will meet the future standards of best practices.
7. The reasons for **Conditions 2.1, 3.1, 3.2, 3.3, 3.4, and 3.5** are to ensure that the Site is designed, constructed and operated in a manner which conforms to current standards of landfill development and operation and as approved..
8. The reason for **Condition 2.2** is to ensure that the waste is covered regularly and that final cover is applied as the site reaches final contours.

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9. The reason for **Condition 2.8** is to ensure that complains are handled properly.
10. The reasons for **Conditions 2.3, 2.4, 2.5, 2.6, and 2.7** are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or to any person.
11. The reasons for **Conditions 3.5, 4.1, 4.2, 4.3, and 4.4** are to ensure site is operated in a controlled manner.
12. The reasons for **Condition 3.7, 4.5 and 4.6** are to ensure optimized performance and capture efficiency of the landfill gas collection and control system design, based on operating experience and monitoring results, and to mitigate possible odour impacts from the site.
13. The reason for **Condition 4.7** is to ensure that landfill gas emission data are documented and mapped clearly to identify and remediate areas deficient of landfill gas collection.
14. The reasons for **Conditions 2.9, 2.10, 2.11, 2.12, 5.1 and 5.2** are to demonstrate that the landfill site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is early warning of potential problems so that any necessary remedial/contingency action can be taken.
15. The reason for **Condition 5.4** is to ensure protection of public health and safety of people against potential for explosion due to accumulation of landfill gas generated at this Site.
16. The reasons for **Conditions 5.5 and 5.6** are to ensure that landfill gas generated at this Site is managed in an environmentally acceptable manner.
17. The reason for **Condition 6.1** is to ensure that regular review of site operations and monitoring data is documented and any possible improvements to site operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site operations and monitoring.
18. The reasons for **Conditions 7.1 and 7.2** are to ensure that final closure of the Site is completed in an environmentally acceptable manner in order to ensure the long-term protection of the natural environment.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A070808 issued on August 16, 1983 and all subsequent amendments.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

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The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at:
Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 7th day of November, 2013

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

NP/
c: District Manager, MOE London - District
Kent Hunter, P.Eng., R.J. Burnside & Associates Limited



AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A070808

Notice No. 1

Issue Date: July 14, 2015

County of Oxford
21 Reeve Street
Post Office Box No. 1614
Woodstock, Ontario
N4S 7Y3

Site Location: Oxford County Waste Management Facility
Lot 11 & 12, Concession 2
South-West Oxford Township, Restructured County of Oxford

*You are hereby notified that I have amended Approval No. A070808 issued on November 7, 2013 for the use and operation of a **43.7 hectare** (108 acre) Waste Fill Area within a total Site area of **89.44 hectares** (221 acres), as follows:*

The name of the landfill site is hereby changed, as follows;

From: Salford Landfill
Lot 11 & 12, Concession 2
South-West Oxford Township, Restructured County of Oxford

To: Oxford County Waste Management Facility
Lot 11 & 12, Concession 2
South-West Oxford Township, Restructured County of Oxford

The reason for this amendment to the Approval is as follows:

all in accordance with the application for approval dated March 4, 2015 and received on March 9, 2015.

This Notice shall constitute part of the approval issued under Approval No. A070808 dated November 7, 2013

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at:
Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of July, 2015

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

KH/
c: District Manager, MOECC London District
Diana Pepall, Comcor Environmental Limited.

APPENDIX B

MAINTENANCE AND MONITORING SCHEDULES



Oxford Landfill
Operation and
Maintenance
Requirements

WEEKLY

Date Completed:	GEM Serial Number _____
Completed by (print):	Anemometer Serial Number _____
Signature:	General Weather _____
	Barometric Pressure _____

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Air compressor	Check oil level	Ensure oil level is within proper range	50	1weekly	5		
Air compressor	Check DD, PD prefilter	Ensure filters are draining, ensure indicator is in green range	50	1weekly	5		
Air compressor	Inspection	Inspect for pressure, noise, temperature, vibration, etc		1weekly	5		
Air compressor	Record pressure, run hours			1weekly	5	Pressure: _____ Run Hours: _____	
Blower skid	Check vibration	Compare vibration to typical		1weekly	5		
Blower skid	Check bearing temperatures	Compare temperatures to typical		1weekly	5	Drive End: _____ Non-drive end: _____	
Blower skid	Drain blower	Open blower drain valves and remove moisture		1weekly	5	Moisture Present?	
Blower skid	Record operational parameters	Record: vacuum, pressure, flow, CH4, O2, temp, blower number and separator differential pressure		1weekly	5	Gauge: Inlet outlet: VLS Diff: CH4: CO2: O2: Blower#: Flow: Temp:	
Control room	Record operational parameters	Record vacuum, pressure, blower number, CH4, O2, flow, and run hours		1weekly	5	Screen On Arrival: Inlet outlet: Blower#: CH4: O2: Flow: Run Hours:	
Gas analyzer	Check operation	Check pressure gauges, flow meters, heat trace, drier temp, condensate drain, exhaust		1weekly	5		
Wellfield	Drain temporary piping	Drain liquid and inspect piping for leaks		1weekly	240		



Oxford Landfill
Operation and
Maintenance
Requirements

MONTHLY

Date Completed:	GEM Serial Number _____
Completed by (print):	Anemometer Serial Number _____
Signature:	General Weather _____
	Barometric Pressure _____

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Air compressor	Check oil level	Ensure oil level is within proper range	50	1weekly	5		
Air compressor	Check DD, PD prefilter	Ensure filters are draining, ensure indicator is in green range	50	1weekly	5		
Air compressor	Inspection	Inspect for pressure, noise, temperature, vibration, etc		1weekly	5		
Air compressor	Record pressure, run hours			1weekly	5	Pressure: _____ Run Hours: _____	
Air compressor	Clean air filter	Remove and inspect filter, replace when needed	500	2monthly	15		
Air compressor	Check condensate drain	Manually open condensate drain valve to ensure drainage	500	2monthly	5	Moisture Present?	
Air compressor	Check belt tension	Inspect belt tension and wear, replace as needed	500	2monthly	30		
Blower skid	Check vibration	Compare vibration to typical		1weekly	5		
Blower skid	Check bearing temperatures	Compare temperatures to typical		1weekly	5	Drive End: _____ Non-drive end: _____	
Blower skid	Drain blower	Open blower drain valves and remove moisture		1weekly	5	Moisture Present?	
Blower skid	Record operational parameters	Record: vacuum, pressure, flow, CH4, O2, temp, blower number and separator differential pressure		1weekly	5	Gauge: Inlet outlet: VLS Diff: CH4: CO2: O2: Blower#: Flow: Temp:	
Blower skid	Inspection	Inspect for wear: vibration pads, rubber couplings, orange blower/motor coupling,		2monthly	15		
Blower skid	Operate valves	Operate all valves to stops		2monthly	15		
Blower skid	Check vapour liquid separator (VLS)	Check differential pressure, heat trace, drainage		2monthly	5		
Control room	Record operational parameters	Record vacuum, pressure, blower number, CH4, O2, flow, and run hours		1weekly	5	Screen On Arrival: Inlet outlet: Blower#: CH4: O2: Flow: Run Hours:	
Control room	Record operational parameters	Record vacuum, CH4, O2, and flow before and after round		2monthly	5	Screen After Round: Inlet outlet: Blower#: CH4: O2: Flow: Run Hours:	
Flare	Inspect flare	Visual inspection from outside the flare while shutdown including, burner tips, insulation, paint, concrete, ladder safety rail		2monthly	5		
Gas analyzer	Check operation	Check pressure gauges, flow meters, heat trace, drier temp, condensate drain, exhaust		1weekly	5		
Wellfield	Drain temporary piping	Drain liquid and inspect piping for leaks		1weekly	240		
Wellfield	Inspect pump drain traps	Check for operation, leaks, record counter, psi		2monthly	60	PSI Chamber: Counter Chamber: PDT1: PDT2: PDT1: PDT2: PDT3: PDT4: PDT3: PDT4:	
Wellfield	Operate valves	Operate all valves to stops		2monthly	60		
Wellfield	Wellfield monitoring	Gas levels, pressure and flow, valve adjustments		2monthly	240		



Oxford Landfill
Operation and
Maintenance
Requirements
QUARTERLY

Date Completed:	GEM Serial Number _____
Completed by (print):	Anemometer Serial Number _____
Signature:	General Weather _____
	Barometric Pressure _____

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Air compressor	Check oil level	Ensure oil level is within proper range	50	1weekly	5		
Air compressor	Check DD, PD prefilter	Ensure filters are draining, ensure indicator is in green range	50	1weekly	5		
Air compressor	Inspection	Inspect for pressure, noise, temperature, vibration, etc		1weekly	5		
Air compressor	Record pressure, run hours			1weekly	5	Pressure: _____ Run Hours: _____	
Air compressor	Clean air filter	Remove and inspect filter, replace when needed	500	2monthly	15		
Air compressor	Check condensate drain	Manually open condensate drain valve to ensure drainage	500	2monthly	5	Moisture Present?	
Air compressor	Check belt tension	Inspect belt tension and wear, replace as needed	500	2monthly	30		
Air compressor	Change air filter	Replace as needed	2000	3quarterly	5		
Air compressor	Change oil	Depressurize compressor, allow to cool, drain oil, fill to specified level	2000	3quarterly	30		
Air compressor	Change oil filter	Change filter when changing oil	2000	3quarterly	15		
Blower skid	Check vibration	Compare vibration to typical		1weekly	5		
Blower skid	Check bearing temperatures	Compare temperatures to typical		1weekly	5	Drive End: _____ Non-drive end: _____	
Blower skid	Drain blower	Open blower drain valves and remove moisture		1weekly	5	Moisture Present?	
Blower skid	Record operational parameters	Record: vacuum, pressure, flow, CH4, O2, temp, blower number and separator differential pressure		1weekly	5	Gauge: Inlet outlet: VLS Diff: CH4: CO2: O2: Blower#: Flow: Temp:	
Blower skid	Inspection	Inspect for wear: vibration pads, rubber couplings, orange blower/motor coupling,		2monthly	15		
Blower skid	Operate valves	Operate all valves to stops		2monthly	15		
Blower skid	Check vapour liquid separator (VLS)	Check differential pressure, heat trace, drainage		2monthly	5		
Blower skid	Change blower grease	Remove old grease and replace	1500	3quarterly	60		
Control room	Record operational parameters	Record vacuum, pressure, blower number, CH4, O2, flow, and run hours		1weekly	5	Screen On Arrival: Inlet outlet: Blower#: CH4: O2: Flow: Run Hours:	
Control room	Record operational parameters	Record vacuum, CH4, O2, and flow before and after round		2monthly	5	Screen After Round: Inlet outlet: Blower#: CH4: O2: Flow: Run Hours:	
Control room	Check operation of ambient gas monitor	Bump test with cal gas		3quarterly	10		
Flare	Inspect flare	Visual inspection from outside the flare while shutdown including, burner tips, insulation, paint, concrete, ladder safety rail		2monthly	5		
Flare	Inspect thermal valve and flame arrestor	Ensure thermal valve is fully Open and remove inspect and clean flame arrestor banks		3quarterly	60		

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Gas analyzer	Check operation	Check pressure gauges, flow meters, heat trace, drier temp, condensate drain, exhaust		1weekly	5		
Gas analyzer	Replace filter media	Change bowl filters and H2S scrubber media as required		3quarterly	120		
Wellfield	Drain temporary piping	Drain liquid and inspect piping for leaks		1weekly	240		
Wellfield	Inspect pump drain traps	Check for operation, leaks, record counter, psi		2monthly	60	PSI Chamber: Counter Chamber: PDT1: PDT2: PDT1: PDT2: PDT3: PDT4: PDT3: PDT4:	
Wellfield	Operate valves	Operate all valves to stops		2monthly	60		
Wellfield	Wellfield monitoring	Gas levels, pressure and flow, valve adjustments		2monthly	240		



Oxford Landfill
Operation and
Maintenance
Requirements
YEARLY

Date Completed:	GEM Serial Number _____
Completed by (print):	Anemometer Serial Number _____
Signature:	General Weather _____
	Barometric Pressure _____

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Air compressor	Check oil level	Ensure oil level is within proper range	50	1weekly	5		
Air compressor	Check DD, PD prefilter	Ensure filters are draining, ensure indicator is in green range	50	1weekly	5		
Air compressor	Inspection	Inspect for pressure, noise, temperature, vibration, etc		1weekly	5		
Air compressor	Record pressure, run hours			1weekly	5	Pressure: _____ Run Hours: _____	
Air compressor	Clean air filter	Remove and inspect filter, replace when needed	500	2monthly	15		
Air compressor	Check condensate drain	Manually open condensate drain valve to ensure drainage	500	2monthly	5	Moisture Present?	
Air compressor	Check belt tension	Inspect belt tension and wear, replace as needed	500	2monthly	30		
Air compressor	Change air filter	Replace as needed	2000	3quarterly	5		
Air compressor	Change oil	Depressurize compressor, allow to cool, drain oil, fill to specified level	2000	3quarterly	30		
Air compressor	Change oil filter	Change filter when changing oil	2000	3quarterly	15		
Air compressor	Clean oil cooler	Use compressed air and/or brush to clean cooler fins	4000	4yearly	30		
Air compressor	Change oil separator	Change air/oil separator during oil change	4000	4yearly	15		
Air compressor	Change DD prefilter	Depressurize system, remove bowl, replace filter	4000	4yearly	15		
Air compressor	Change PD prefilter	Depressurize system, remove bowl, replace filter	4000	4yearly	15		
Air compressor	Service air dryer	Bypass drier, depressurize drier, unplug unit.	12000	4yearly	120		
Blower skid	Check vibration	Compare vibration to typical		1weekly	5		
Blower skid	Check bearing temperatures	Compare temperatures to typical		1weekly	5	Drive End: _____ Non-drive end: _____	
Blower skid	Drain blower	Open blower drain valves and remove moisture		1weekly	5	Moisture Present?	
Blower skid	Record operational parameters	Record: vacuum, pressure, flow, CH4, O2, temp, blower number and separator differential pressure		1weekly	5	Gauge: Inlet outlet: VLS Diff: CH4: O2: CO2: O2: Blower#: Flow: Temp:	
Blower skid	Inspection	Inspect for wear: vibration pads, rubber couplings, orange blower/motor coupling,		2monthly	15		
Blower skid	Operate valves	Operate all valves to stops		2monthly	15		
Blower skid	Check vapour liquid separator (VLS)	Check differential pressure, heat trace, drainage		2monthly	5		
Blower skid	Change blower grease	Remove old grease and replace	1500	3quarterly	60		
blower skid	Inspect moisture separator filter	Disconnect and remove filter, clean/replace as required		4yearly	240		
Control room	Record operational parameters	Record vacuum, pressure, blower number, CH4, O2, flow, and run hours		1weekly	5	Screen On Arrival: Inlet outlet: Blower#: CH4: O2: CO2: O2: Flow: Run Hours:	
Control room	Record operational parameters	Record vacuum, CH4, O2, and flow before and after round		2monthly	5	Screen After Round: Inlet outlet: Blower#: CH4: O2: CO2: O2: Flow: Run Hours:	

Piece of equipment	Maintenance item	Details	frequency (hours)	Scheduled event	Approx. time requirement (min)	Comments	Completed (initial)
Control room	Check operation of ambient gas monitor	Bump test with cal gas		3quarterly	10		
control room	Calibrate ambient gas monitor	Refer to manual		4yearly	60		
Flare	Inspect flare	Visual inspection from outside the flare while shutdown including, burner tips, insulation, paint, concrete, ladder safety rail		2monthly	5		
Flare	Inspect thermal valve and flame arrestor	Ensure thermal valve is fully Open and remove inspect and clean flame arrestor banks		3quarterly	60		
Gas analyzer	Check operation	Check pressure gauges, flow meters, heat trace, drier temp, condensate drain, exhaust		1weekly	5		
Gas analyzer	Replace filter media	Change bowl filters and H2S scrubber media as required		3quarterly	120		
Gas analyzer	Calibrate analyzer	Refer to manual		4yearly	120		
Wellfield	Drain temporary piping	Drain liquid and inspect piping for leaks		1weekly	240		
Wellfield	Inspect pump drain traps	Check for operation, leaks, record counter, psi		2monthly	60	PSI Chamber: PDT1: PDT2: PDT3: PDT4: Counter Chamber: PDT1: PDT2: PDT3: PDT4:	
Wellfield	Operate valves	Operate all valves to stops		2monthly	60		
Wellfield	Wellfield monitoring	Gas levels, pressure and flow, valve adjustments		2monthly	240		
Wellfield	Clean drain trap pumps	Disassemble and clean pumps		4yearly	480		