Reference Number: 2023/977

16 June 2023

[redacted]

Email: [redacted]

Tēnā koe [redacted]

Response - Official Information Request

I refer to your request for information received on 1 June 2023. Your request has been considered under the Local Government Official Information and Meetings Act 1987 (LGOIMA) and I provide the following information.

"The quantity of landfill gas capture Hokio Beach Landfill (CLOSED) (eg. CH4 Nm3/hour)"
"The average proportion of methane in the landfill gas collected (% vol/vol)"
"The composition of waste disposed to landfill, dating back at least five years (and longer if available)"
"If possible, methane emissions measurements using emissions detection technologies"
"Methods, formula, or calculations you use to apply the above information to determine efficiency rates (including any additional data you use to calculate these rates, if not requested above)"

Please find attached the documents requested. We will also look at the tonnage reporting we receive from the Ministry for the Environment via the Online Water Levy System for the purpose of analyzing the data received.

Also attached are the last spreadsheets for the Levin UEF. One is the gas model (Landgem) and the other the calculation of the UEF and carbon unit obligation.

The gas model is a 'decay model'. Even though the input tonnes stop, there is still LFG produced for a long time. The gas generation impact is shown in the year after the final tonnes are in place. You will see this effect in the Methane tab, cell J41 where the methane volume increase in 2022 even though there were no tonnes placed in the landfill

You are entitled to seek an investigation and review by the Office of the Ombudsman. Information about how to make a complaint is available at www.ombudsman.parliament.nz or free phone 0800 802 602.

Horowhenua District Council publishes responses to Local Government Official Information and Meetings Act 1987 (LGOIMA) requests that we consider to be of wider public interest, or which relate to a subject that has been widely requested. To protect your privacy, we will not generally publish personal information about you, or information that identifies you. We will publish the LGOIMA response along with a summary of the request on our website. Requests and responses may be paraphrased.

If you have any queries regarding this information, please contact the LGOIMA Officer on LGOIMAOfficer@horowhenua.govt.nz

Ngā mihi

Monique Davidson
Chief Executive

New Zealand Emissions Trading Register
For managing our units and climate change response activities

New UEF

Account Holder details

The Account Holder details in this section are for information only.

Account Holder type:	Other Body Corporate

Account Holder details

Entity name (Account Holder name):	Horowhenua District Council

Address

Floor / Level:	
Building / Property name:	
Street number and name:	126-148 Oxford Street
Suburb / RD:	
Town / City:	Levin
Postcode:	5510
Country:	New Zealand

Postal address

Floor / Level:	
Building / Property name:	
Street number and name / PO box:	Private Bag 4002
Suburb / RD:	
Town / City:	Levin
Postcode:	5540
Country:	New Zealand

UEFs

To add a UEF, select Apply for UEF.

New Zealand Emissions Trading Register
For managing our units and climate change response activities

New UEFs

Member	Activity	Category	Location	UEF name	UEF value	UEF start date	Supporting document
	Operating a disposal facility	Operating a disposal facility	Levin Landfill	Levin Landfill UEF	0.7891	01 Jan 2018	

Current UEFs

Member	Activity	Category	Location	UEF name	UEF value	UEF start date

Ceased UEFs

Member	Activity	Category	Location	UEF name	UEF value	UEF start date	UEF end date

Supporting information

As part of this application, you must provide a verification statement and a sampling and testing plan for your new UEFs. You may also provide information about your calculation methodologies and any other attachments as required.

If all your supporting information is in one document then only attach it once and leave a note in the comments field.

Verification statement

UEF name(s)	File name	Attachment

Sampling and testing plan

UEF name(s)	File name	Attachment
Levin Landfill UEF		Waste Management - Solid Waste - Levin Landfill - UEF Unique Emmisions Factor Ongoing Sampling and Testing Plan - 24 January 2018.docx

Calculation methodologies

UEF name(s)	File name	Attachment
Levin Landfill UEF		ETS Obligations Levin 2018 (PM4).xls

Other attachments

UEF name(s)	File name	Attachment

Submission

Validate to ensure you have provided all required information.

Click the button below if you are ready to submit.

Independent auditors' report

To Horowhenua District Council

Assurance Report Pursuant to regulation 4(3) of the Climate Change (Unique Emissions Factors) Regulations 2009

We have completed the assurance engagement in respect of the compliance of Horowhenua District Council (the "Council") in calculating a unique emissions factor in relation to the landfill gas collection and destruction system at Levin landfill under the Climate Change (Unique Emissions Factors) Regulations 2009 ("the Regulations") for the year ended 31 December 2018, in respect of the Council's application for a unique emissions factor in relation to the emissions reporting period which began on 1 January 2018 and ended on 31 December 2018.

The unique emissions factor calculated in relation to the landfill gas collection and destruction system at Levin landfill is 0.7891.

Council management's responsibilities

The management of the Council is responsible on behalf of the Council for the completion and submission of the application under regulation 23C for a unique emissions factor in compliance with the requirements of the Regulations.

Our independence and quality control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 (Revised) issued by the New Zealand Auditing and Assurance Standards Board, which is founded on the fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies Professional and Ethical Standard 3 (Amended) and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Verifier's responsibilities

Our responsibility is to express an opinion on whether the Council has complied, in all material respects, with regulation 24(1)(b) to (d) of the Climate Change (Unique Emissions Factors) Regulations 2009 in relation to the establishment and calculation of a unique emissions factor for Levin landfill for the year ended 31 December 2018, in respect of the Council's application for a unique emissions factor in relation to the emissions reporting period which began on 1 January 2018 and ended on 31 December 2018, and report our opinion to you.

Our engagement has been conducted in accordance with ISAE (NZ) 3000 (Revised), *Assurance Engagements Other than Audits or Reviews of Historical Financial Information (ISAE (NZ) 3000 Revised))* and SAE 3100 (Revised) *Assurance Engagements* on *Compliance (SAE 3100(Revised))* to obtain reasonable assurance that the Council has complied with regulation 24(1)(b) to (d) of the Climate Change (Unique Emissions Factors) Regulations 2009 in the establishment and calculation of a unique emissions factor for Levin landfill for the year ended 31 December 2018, in respect to the Council's application for a unique emissions factor in relation to the emissions reporting period which began on 1 January 2018 and ended on 31 December 2018.

We certify that we meet the requirements of regulation 24(1)(a) of the Climate Change (Unique Emissions Factors) Regulations 2009.

Use of report

This report has been prepared for the Management of the Council in accordance with regulation 4(2)(d)(i) and regulation 4(3), of the Climate Change (Unique Emissions Factors) Regulations 2009 and is provided solely to assist the Council in establishing that compliance requirements have been met. Our report should not be used for any other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility for any reliance on this report to anyone other than the management of the Council, or for any purpose other than that for which it was prepared.

Under the terms of our engagement with the Council, this report may be disclosed on a confidential basis to the Environmental Protection Authority as part of the Council's application to use a unique emissions factor in relation to the landfill gas collection and destruction system at Levin landfill under the Regulations for the year ended
31 December 2018, in respect of the Council's application for a unique emissions factor in relation to the emissions reporting period which began on 1 January 2018 and ended on
31 December 2018. In accordance with our agreed terms of engagement with the Council this report should not be distributed to any other parties.

Inherent limitations

Because of the inherent limitations of evidence gathering procedures and limitations in the Council's compliance system, it is possible that fraud, error or non-compliance may occur and not be detected. As the procedures performed for this engagement were not performed continuously throughout the period and were undertaken on a test basis, our assurance engagement cannot be relied on to detect all instances where the Council may not have complied with the Regulations. The opinion expressed in this report has been formed on the above basis.

We are independent of the Council. Our firm carries out other services for the Council in the area of taxation services. The provision of these other services has not impaired our independence.

Opinion

In our opinion, Horowhenua District Council has complied, in all material respects, with the matters in regulation 24(1)(b) to (d) of the Climate Change (Unique Emissions Factors) Regulations 2009 in relation to the establishment and calculation of a unique emissions factor for the Levin landfill for the year ended 31 December 2018, in respect of the Council's application for a unique emissions factor in relation to the emissions reporting period which began on 1 January 2018 and ended on 31 December 2018.

Chris Ussher

PricewaterhouseCoopers

Chris Ussher
Wellington, New Zealand
31 January 2019

2016 Tonnes 115,000 Budget

UEF CALCULATIONS

All other waste class Tonnes Average WOL Composition	Total			Emission factor 2016 from regs	UEF		UEF
Garden waste	9,545	9,545	8.3%	1 500	0.12		
Nappy and sanitary	3,450	3,450	3.0%	1 800	0.05		
Other putrescible	19,320	19,320	16.8%	1.125	0.19		
Paper waste	12,305	12,305	10.7%	3 000	0.32		
Sewage sludge	4,485	4,485	3.9%	0 375	0.01		
Timber waste	13,685	13,685	11.9%	3 225	0.38		
Textile waste	6,440	6,440	5.6%	1 800	0.10		
Other	45,770	45,770	39.8%	0 000	0.00		
TOTAL	**115,000**	**115,000**	**100.0%**		**1.19**		

This should equal 1.19, using default Composition and Emission factors

Lo & k for landgem

Both classes combined

			Methane Generatic	Decay rate	Calculated	Calculated
			Lo	k	Lo	k
Garden waste	9,545	8%	100	0.100	8.300	0.008
Nappy and sanitary	3,450	3%	120	0.100	3.600	0.003
Other putrescible	19,320	17%	75	0.185	12.600	0.031
Paper waste	12,305	11%	200	0.060	21.400	0.006
Sewage sludge	4,485	4%	25	0.185	0.975	0.007
Timber waste	13,685	12%	215	0.030	25.585	0.004
Textile waste	6,440	6%	120	0.060	6.720	0.003
Other	45,770	40%	0	0.000	0.000	0.000
TOTAL	**115,000**	**100%**			**79.180**	**0.063**

Use these figures in Landgem for 2015 Methane Generation

PwC calc 2014

	As per Schedule 3 default composition	As per Schedule 3 IPCC Lo	As per Schedule 3 decay const k	PwC Recalculation Lo methane generatic	PwC Recalculation decay rate k
Food	0.0%	75	0.185	0	0
Garden	23.3%	100	0.1	23.3	0.0233
paper	14.9%	200	0.06	29.8	0.00894
wood	13.9%	215	0.03	29.885	0.00417
textile	3.9%	120	0.06	4.68	0.00234
nappies	2.7%	120	0.1	3.24	0.0027
sewage	0.0%	25	0.185	0	0
other	41.3%	0	0	0	0
PwC calculated value				**90.905**	**0.04145**

Gas Capture

m3 per Hour	121.92	CH4 tonnes per m3	0.000668	0.041592715	8217	94% up time 2021	
Methane Percentage	51.07%	Hours per Year	8217 00		7459	87% up time 2020	
					7485	85% up time 2019	
Collected Tonnes	**341.7673424**						

Gas Generation

		Landgem Methane m3/yr	10% Oxidation	Corrected 90% Landgem Me hane m3/yr		2020	2021 ann CH4	Monthly CH4	increase
		1.623E+06		1,460,784.12		1529886	1,623,093		
						1376898	1,460,784	121732	6.1%
Generated Tonnes	0%	**1084.226436**		**975.80**					

UEF Calculation

Gas Capture	**341.7673424**	Q	
Base Year Gas Generation	975 80	G	10% oxidation allowed for at this stage as per discussion with Jolly PwC
Destruction Efficiency	0.99	D	Default as per schedule 2, Flare and Engines

Efficiency of Collection and Destruc ion

C = D × Q/G

Where: C is the efficiency of the collection and destruction system

D is the destruction factor for the flare or other equipment used to destroy the captured CH4, ie, oxidise it to CO2

Q is the amount of me hane collected and conveyed to the destruction equipment in the base year (tonnes)

G is the estimated gross generation of methane in the base year (tonnes).

		OR	
C= lower of	**0.3467**	**0.9**	Default as per 23C(g)

UEF Calculation		UEFwc= 1.19
UEF = 1.19 × (1 – C)	0.7774	
UEF=1.19x(1-0 9)	0.1190	
Unique Emissions Factor	**0.7774**	

Obligations

UEF	**0.7774**	34.55%	destruction benefit
Annual Gross Tonnes	32,124		From OWLs Levy Tonnes 1 Jan 2021 to 31 Dec 2021
Annual Nett Tonnes	25,084		From OWLs Levy Tonnes 1 Jan 2021 to 31 Dec 2021
Carbon Credit Obligations	19,500		UEF x Nett Tonnes (refer Reg 5.1)
			Qty of carbon units to be surrendered

NZ ETS Levin 2020
REFUSE TONNES

Table 10b: ETS Tonnes by year

Month	E	L	R	X	Gross tonnage. Item A in CCWR5(1). A = E+L+R+X. GROSS	Diverted tonnage. Item B in CCWR5(1). B = E+R. DIVERTED	Residual tonnage. Use for FOD calculation. = A - B LANDFILL	
2004	-	-	-	-		-	6,993	
2005	-	-	-	-		-	17,994	
2006	-	-	-	-		-	15,550	
2007	-	-	-	-		-	16,411	
2008	-	-	-	-		-	16,636	
2009	-	-	-	-		-	30,590	
2010	-	-	-	-		-	32,979	
2011	-	-	-	-		-	33,495	
2012	-	-	-	-		-	32,308	
2013	-	-	-	-		-	37,650	
2014	-	-	-	-		-	36,186	
2015	-	-	-	-		-	34,565	
2016	-	-	-	-		-	35,285	
2017							33,073	
2018							36,428	
2019							34,751	
2020							38,480	
2021					32124	7,040	25,084	Provisional
Note								

Row Labels	Methane m³	Average LFG Flow Rate (m³/hr)	Average Methane %
2017	**63,305.79**	**64.88**	**46.28**
Sep	7,698.48	115.64	50 91
Oct	18,802.48	54 29	52 57
Nov	3,707.47	14.17	43 91
Dec	33,097.37	107 35	41 53
2018	**400,697.76**	**96.52**	**49.52**
Jan	24,046.40	81 07	44 35
Feb	22,554.26	80.47	47 24
Mar	26,158.75	79.42	46 54
Apr	26,320.22	70 96	51.64
May	24,831.32	60.45	57.15
Jun	25,693.89	72 01	55.14
Jul	39,744.16	108 20	50.70
Aug	46,140.21	118 51	52.61
Sep	37,718.00	110.15	49.11
Oct	47,857.72	134.10	48 00
Nov	42,780.19	128 23	46 93
Dec	36,852.64	110 50	44 96
2019	**316,696.82**	**82.54**	**45.79**
Jan	27,885.59	91 96	42.17
Feb	26,906.56	93 80	42.72
Mar	31,495.55	96 22	44 07
Apr	18,067.24	75.18	47.68
May	32,629.95	91.64	48 04
Jun	33,089.82	87.74	52 54
Jul	22,038.65	58 05	53.70
Aug	26,772.55	76.48	49 27
Sep	25,506.32	86 01	41 24
Oct	20,334.88	70 39	38 51
Nov	24,508.14	80 90	43.76
Dec	27,461.59	80.60	46 30
2020	**426,855.26**	**99.38**	**50.69**
Jan	29,442.19	94.71	44 07
Feb	20,988.81	74.76	47.42
Mar	12,252.51	32 96	56.49
Apr	32,764.08	97 90	47.77
May	25,098.71	75 52	45 31
Jun	26,153.27	75 95	50.16
Jul	40,864.03	104.46	54.65
Aug	59,469.61	155 29	51 53
Sep	44,940.03	119 38	53 90
Oct	58,928.72	157 59	50 51
Nov	31,332.51	83 50	54 24
Dec	44,620.80	116 29	51 81
2021	**504,736.87**	**114.39**	**51.07**
Jan	44,452.38	115 07	51 96
Feb	48,997.85	149 22	48 97
Mar	54,924.77	145 99	51.17
Apr	51,900.58	140.48	52.18
May	45,558.68	123.71	50 33
Jun	44,760.48	122 20	51 51
Jul	37,385.26	94 24	55 35
Aug	51,374.03	142 80	49.16
Sep	41,812.23	115.66	51 21
Oct	42,156.15	111.13	51.10
Nov	27,186.40	76 86	49 24
Dec	14,228.06	38 53	50 50
2022	**240,807.29**	**52.69**	**43.86**
Jan	10,516.03	34.17	43 29
Feb	17,680.45	55.19	47 80
Mar	29,866.44	82 51	48 32
Apr	21,244.76	52.11	53.75
May	31,608.62	73.71	49.14
Jun	4,680.84	11 35	56.12
Jul	8,816.61	21 04	57 21
Aug	34,507.91	82.45	49 24
Sep	-	-	0 06
Oct	32,110.23	81 91	48 80
Nov	21,753.39	58.16	33 30
Dec	28,022.03	77 06	38.48
2023	**37,448.27**	**21.17**	**45.84**
Jan	13,262.13	38 86	45 00
Feb	9,957.26	30 35	47 24
Mar	8,967.62	24 85	32.72
Apr	545.83	1 53	51 80
May	3,507.57	8 56	52 35
Jun	1,207.86	63 88	54 87
Grand Total	**1,990,548.07**	**82.99**	**47.93**

2016		July	August	September	October	November	December	January	February	March	April	May	June	Yearly Tonnes	
HDC Levin	HDC Contr	106.57	109.65	116.67	119.53	120.9	122.91	122.51	116.00	119.03	119.34	126.00	115.11	1414.26	
HDC Green	HDC contr	3.80	1.96	3.52	82.94	5.6	2.03	3.08	6.20	2.04	1.03	15.77	6.30	134.23	
HDC	Specials - S	60.71	65.43	75.75	107.15	108.8	115.43	107.52	85.13	90.35	73.57	110.43	91.79	**1,092**	Sludge
HDC	Loads from	148.10	102.11	83.12	164.78	139.2	169.93	154.16	158.70	172.04	169.49	184.52	108.96	1755.11	
Kapiti to	Levin LF (K	1766.83	1856.15	1585.54	1726.37	1418.0	2106.04	1976.20	2071.58	2377.32	1825.66	2267.48	2067.24	23044.43	
MW	Levin LF/M	859.97	848.18	867.97	1018.92	1155.4	1149.54	1078.89	1009.78	943.01	864.74	881.97	773.05	11451.40	
MW	Special/Spe	22.36	24.27	37.65	40.73	41.3	35.18	27.09	32.17	59.23	43.57	56.37	51.71	471.67	
Clean fill	MDL Clean	9.90		19.83		20.6	17.82	9.07		14.75		11.87		103.80	
Horowhen	Disposed t	1091.14	1039.99	1064.49	1331.58	1444.7	1470.08	1367.66		1264.63	1151.37	1233.29	1025.51	13,484	Total less Kapiti
Green was	to Landfill/	45.97	41.08	80.2	78.10	68.4	100.02	79.75	73.33	82.40	93.63	67.29	66.05	**876.23**	Greenwaste not included in totals
MW Total to Landfill		2857.97	2896.14	2650.03	3057.95	2862.7	3576.1	3343.9	2071.6	3642.0	2977.0	3500.8	3092.8	**36,529**	Total waste

2017		July	August	September	October	November	December	January	February	March	April	May	June	Yearly Tonnes	
HDC Levin	HDC Contr	101.85	115.06	108.30	113.23	123.6	111.98	115.62	109.21	113.32	109.99	112.47	176.14	1410.78	
HDC Green	HDC contr	1.21	3.09	4.88	2.50	19.0	3.83	7.01	21.76	12.10	7.57	5.32	5.85	94.07	
HDC	Specials - S	94.63	67.34	83.37	82.86	99.7	106.31	91.45	94.38	100.86	58.70	90.92	86.95	**1,057**	Sludge
HDC	Loads from	61.15	119.03	134.82	146.63	92.5	191.31	144.08	166.77	187.79	228.31	179.30	188.93	1840.61	
Kapiti to	Levin LF (K	1859.40	861.52	690.31	933.77	874.3	1550.41	1859.81	1882.08	1845.19	906.83	1976.19	1722.00	16961.81	
MW	Levin LF/M	693.65	790.55	838.08	898.11	774.3	790.60	894.78	764.56	842.37	465.70	850.64	736.14	9339.48	
MW	Special/Spe	47.26	58.98	51.17	52.62	60.7	42.10	45.56	56.18	59.01	59.57	79.26	56.40	668.79	
Clean fill	MDL Clean	10.51	0	8.84	10.38	0.0	10.54	0.00	100.32	105.73	227.47	0.00	0.00	473.79	
Horowhen	Disposed to	896.69	1035.9	1,107.44	1180.22	1027.2	1130.32	1175.87	1081.89	1190.03	812.28	1200.12	1068.42	12906.37	
Kapiti Wast	Disposed to	1859.40	861.52	690.31	933.77	874.30	1550.41	1859.81	1882.08	1845.19	906.83	1976.19	1722.00	16961.81	
Total Wast	Disposed to	2756.09	1897.42	1797.75	2113.99	1901.49	2680.73	3035.68	2963.97	3035.22	1719.11	3176.31	2790.42	29,868	
Green wast	to Landfill/	43.47	31.15		118.34	120.0	60.96	66.04	65.93	93.87	70.96	48.88	47.71	**767**	Extra item to add
MW Total to Landfill		2756.09	1897.42	1797.75	2113.99	1901.5	2680.7	3035.7	2964.0	3035.2	1719.1	3176.3	2790.4	**29,868**	Not including greenwaste

2017		July	August	September	October	November	December	January	February	March	April	May	June	early Tonnes	
HDC Levin	HDC Contr	101.88	99.15	100.85	144.14	106.3	187.25	240.54	214.06	74.33	152.98	236.59	151.44	1809.47	
HDC Green	HDC contr	0.71	83	11.47	68.06	9.9	15.78	86.57	9.25	10.23	32.48	105.87	5.52	438.79	
HDC	Specials - S	96.42	46.48	111.96	120.99	119.9	154.91	104.62	106.85	255.68	110.88	110.64	78.08	1,417	Sludge
HDC	Loads from	119.08	110.29	141.43	146.02	184.5	162.91	163.01	142.80	147.44	147.68	147.06	126.98	1739.21	
Kapiti to	Levin LF (K	1778.55	1744.91	1691.83	2061.48	1536.9	812.51	1592.75	1736.52	1462.44	1539.75	1487.25	1441.23	18886.15	
MW	Levin LF/M	808.25	628.1	747.12	940.61	825.0	963.97	1063.95	847.39	943.32	974.15	967.89	842.45	10552.18	
MW	Special/Spe	65.37	54.17	67.50	145.20	81.6	66.79	61.78	64.17	59.86	46.49	58.90	65.61	837.41	
Clean fill	MDL Clean	0.00	79.09	17.83	0.00	0.0	0.00	17.22	0.00	22.18	11.05	18.94	7.93	174.24	
Horowhen	Disposed t	1089.12	839.04	1,068.01	1352.82	1210.9	1348.58	1393.36	1161.21	1406.3	1279.2	1284.49	1113.12	14546.17	
Kapiti Was	Disposed t	1778.55	1744.91	1691.83	2061.48	1536.93	812.51	1592.75	1736.52	1462.44	1539.75	1487.25	1441.23	18886.15	
Total Wast	Disposed t	2867.67	2583.95	2759.84	3414.30	2747.85	2161.09	2986.11	2897.73	2868.74	2818.95	2771.74	2554.35	33432.32	
Green was	to Landfill/	33.82	31.47	55.58	54.99	77.7	81.57	85.16	70.43	70.16	61.24	63.61	46.26	**732**	GW to landfill
MW Total to Landfill		2867.67	2583.95	2759.84	3414.3	2747.9	2161.1	2986.1	2897.7	2868.7	2819.0	2771.7	2554.4	**33,432**	Not including GW

2019	Type	July	August	September	October	November	December	January	February	March	April	May	June		
HDC Levin	HDC Contr	82.34	79.8	77.15	153.79	83.68	84.32	82.41	148.06	82.39	62.25	75.12	215		
HDC Green Waste	HDC contr	1.67	65.54	7.41	11.98	16.22	7.86	8.89	6.85	4.96	2.52	11.8	6.91		
HDC	Specials - S	73.96	64.63	61.33	123.55	112.58	153.65	61.89	58.06	51.72	60.7	87.28	111.26	**1,020.61**	Sludge
HDC	Loads from	150.86	154.06	161.42	157.93	156.29	162.25	121.59	126.26	112.64	12.45	157.97	159		
Kapiti to	Levin LF (K	1800.7	1449.56	1087.72	1443.03	1746.00	1829.02	1846.28	1559.12	1548.58	1118.24	1853.80	1832.69		
MW	Levin LF/M	886.51	895.94	977.4	1055.25	1117.07	1185.72	990.89	824.49	900.31	587.33	972.53	1117.4		
MW	Special/Spe	92.36	142.61	125.88	126.09	77.94	130.07	77.69	101.25	109.89	52.77	78.42	107.09		
Clean fill	MDL Clean	35.33	9.99	28.76	7.82	19.15	19.88	20.89	26.59	47.46	0	0	20.63		
Green waste	to Landfill/	40.81	30.95	40.59	51.52	77.02	90.31	71.28	72.49	58.78	4.77	75.73	**45.17**	**659.42**	Greeenwaste (GW) LandFill
Landfill															
Horowhenua Wast	Disposed t	1286.03	1337.04	1403.18	1616.61	1547.56	1716.01	1334.47	1258.12	1256.95	775.5	1371.32	1709.75		
Kapiti Waste	Disposed t	1800.7	1449.56	1087.72	1443.03	1746	1829.02	1846.28	1559.12	1548.58	1118.24	1853.80	1832.69	19,115	
Total Waste	Disposed t	3086.73	2786.6	2490.9	3059.64	3293.56	3545.03	3180.75	2817.24	2805.53	1893.74	3225.12	**3542.44**	**35,727**	Total waste less GW

2020 - 2021	Type	July	August	September	October	November	December	January	February	March	April	May	June	early Tonne	
HDC Levin	HDC Contro	105.31	77.66	88.34	89.43	172.255	80.17	76.7	150.1	80.54	73.72	154.43	73.29	1,221.95	
HDC Green Wast	HDC contro	14.95	3.4	6.23	11.71	25.33	16.51	11.98	4.8	4.84	8.09	7.25	2.95	118	
HDC	Specials - S	91.93	75.03	86.26	106.31	100.35	124.13	93.85	119.58	130.65	117.76	120.91	121.64	**1,288**	Sludge
HDC	Loads from	157.1	156.32	149.06	170.35	196.16	212.63	171.00	164.89	173.14	206.94	171.04	276.79	2,205.42	
HDC	Loads from	139.1	135.32	137.06	146.35	158.16	190.63	171.00	143.41	149.01	176.87	137.88	258.46		
HDC	Loads from	18	21	12	24	38	22	22.14	21.48	24.13	30.07	33.16	18.33	284.31	
Kapiti to	Levin LF (Ka	1766.48	1805.32	1751.64	1844.77	1,925.94	1912.66	1743.59	603.16	681.16	602.87	592.8	585.39	15,815.78	
MW	Levin LF/M	1319.82	1166.86	1254.28	1208.23	1341.1	1713.12	1510.86	1433.49	1839.39	1754.12	1650.83	1507.31	17,699.41	
MW	Special/Spe	106.36	82.46	70.42	48.39	65	37.89	50.24	61.58	85.54	63.69	51.62	101.46	824.65	
Clean fill	MDL Clean	27.14	9.15	26.17	19.24	10.67	18.65	19.32	40.35	9.93	72.93	10.89	26.96	291.40	
Green waste	to Landfill/	37.03	42.65	43.77	74.46	93.24	89.93	133.66	73.86	62.76	80.22	55.95	39.89	**827**	GW
Landfill															
Horowhenua Wa	Disposed to	1780.52	1558.33	1648.36	1622.71	1874.865	2167.94	1902.65	1929.64	2309.26	2216.23	2148.83	2080.49	23,240	
Kapiti Waste	Disposed to	1766.48	1805.32	1751.64	1844.77	1925.94	1912.66	1743.59	603.16	681.16	602.87	592.8	585.39	15,816	
Total Waste	Disposed to	3547	3363.65	3400	3467.48	3800.805	4080.6	3646.24	2532.8	2990.42	2819.1	2741.63	2665.88	**39,056**	Total waste less GW

Category	Type	Source	July	August	September	October	November	December	January	February	March	April	May	June	early Tonne	
eral Waste to Landfill																
HDC Levin	HDC Controlled tonnes		74.5	65.42	149.77	79.04	83.44	80.71	82.73	76.23	87.26	83.47	33.45	35.39	931.41	
HDC Green Was	HDC controlled tonnes		4.1	0.76	7.86	12.7	22.6	22.99	7	7.04	7.81	4.65	3.11	3.93	104.55	
HDC	Specials - S	2022 these records	96.99	133.61	134.96	100.45	157.3	134.8	128.7	70.35	120.9	116.78	No records		**1,195**	Sludge
HDC	Sludge to Levin Landfil		96.99	125.81	94.24	27.25	**From November 2021 no sludge went to Levin Landfill.**								344.29	
HDC	Sludge to Bonny Glen		0	7.80	40.72	73.2	157.3	134.8	128.7	70.35	120.9	116.78	**No records**		850.55	
HDC	Loads from	Foxton + S	184.93	132.86	193.19	192.8	209.24	145.27	198.62	201.2	258.8	177.46	152.66	96.98	2,144.01	
HDC	Loads from	From Midw	164.28	117.33	167.68	173.64	**From November 2021 these values are no longer separated**								622.93	
HDC	Loads from	From Midw	20.65	15.53	25.51	19.16									80.85	
Kapiti to	Levin LF (Kapiti ORRF +		588.71	360.67	437.5	347.44	653.16	817.36	574.38	509.8	519.5	511.18			5,319.70	
MW	Levin LF/MDL Refuse lo		1096.62	802.51	1115.9	1523.92	1163.42	1438.8	1105.88	1169.87	1203.64	933.82			11,554.38	
MW	Special/Special Waste		72.75	73.82	67.88	41.83	27.27	42.91							326.46	
Clean fill	MDL Clean fill to landf		14.57	18.21	25.04	65.61									123.43	
Green waste	to Landfill/MDL Green		45.43	26.71	48.38	77.32	113.06	117.92	97.91	70.35	92.28	98.5			**788**	GW to landfill
Horowhenua Wa	Disposed to Landfill		1451.3	1142.8	1511.9	1859.0	1557.2	1761.8	1433.2	1441.4	1583.3	1228.1	1497.005	1497.005	17,964	
Kapiti Waste	Disposed to Landfill		588.7	360.7	437.5	347.44	653.16	817.36	574.38	509.8	519.5	511.18	0	0	5,320	
Total Waste	Disposed to Landfill		2040.0	1503.5	1949.4	2206.44	2210.39	2579.14	2007.58	1951.22	2102.84	1739.24	1497.005	1497.005	**23,284**	Total waste to LF excluding GW

INTRODUCTION

LandGEM - Landfill Gas Emissions Model, Version 3.02

U.S. Environmental Protection Agency

Model Design:

Worksheet Name	Function
INTRO	Contains an overview of the model and important notes about using LandGEM
USER INPUTS	Allows users to provide landfill characteristics, determine model parameters, select up to four gases/pollutants (total landfill gas, methane, carbon dioxide, NMOC, and 46 air pollutants), and enter waste acceptance rates
POLLUTANTS	Allows users to edit air pollutant concentrations and molecular weights for existing pollutants and add up to 10 new pollutants
INPUT REVIEW	Allows users to review and print model inputs
METHANE	Calculates methane emission estimates using the first-order decomposition rate equation
RESULTS	Shows tabular emission estimates for up to four gases/pollutants (selected in the USER INPUTS worksheet) in megagrams per year, cubic meters per year, and user's choice of a third unit of measure (average cubic feet per minute, cubic feet per year, or short tons per year)
GRAPHS	Shows graphical emission estimates for up to four gases/pollutants (selected in the USER INPUTS worksheet) in megagrams per year, cubic meters per year, and user's choice of a third unit of measure (selected in the RESULTS worksheet)
INVENTORY	Displays tabular emission estimates for all gases/pollutants for a single year specified by users
REPORT	Allows users to review and print model inputs and outputs in a summary report

IMPORTANT NOTES!

The following user inputs MUST be completed in the USER INPUTS worksheet:

- Landfill open year
- Landfill closure year or Waste design capacity
- Annual waste acceptance rates from open year to current year or closure year

Other Important Notes:

- LandGEM is based on the gas generated from anaerobic decomposition of landfilled waste which has a methane content between 40 and 60 percent.
- When using LandGEM to comply with the CAA, the methane content of the landfill gas must remain fixed at 50% by volume (the model default value).
- Default pollutant concentrations used by LandGEM have already been corrected for air infiltration, as stated in AP-42. If a user-specified value for NMOC concentration is used based on site-specific data, then it must be corrected for air infiltration.
- When comparing results from LandGEM with measurements of extracted gas collected at a site, the landfill owner/operator must adjust for air infiltration prior to any comparisons.
- One megagram is equivalent to one metric ton.

About LandGEM:

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html .

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

USER INPUTS

Landfill Name or Identifier: Levin Landfill

Clear ALL Non-Parameter Inputs/Selections

1: PROVIDE LANDFILL CHARACTERISTICS

Landfill Open Year	2004	
Landfill Closure Year	2021	
Have Model Calculate Closure Year?	○ Yes ◉ No	
Waste Design Capacity		megagrams

Restore Default Model Parameters

2: DETERMINE MODEL PARAMETERS

Methane Generation Rate, k (*year*$^{-1}$)

User-specified

User-specified k value should be based on site-specific data and determined by EPA Method 2E.

User-specified value: 0.063

Potential Methane Generation Capacity, L_o (*m^3/Mg*)

User-specified

User-specified Lo value should be based on site-specific data and determined by waste type and composition.

User-specified value: 79

NMOC Concentration (*ppmv as hexane*)

CAA - 4,000

Methane Content (*% by volume*)

CAA - 50% by volume

3: SELECT GASES/POLLUTANTS

Default pollutant parameters are currently being used by model.

Gas / Pollutant #1

Total landfill gas

Gas / Pollutant #2

Methane

Gas / Pollutant #3

Carbon dioxide

Gas / Pollutant #4

NMOC

Edit Existing or Add New Pollutant Parameters

Restore Default Pollutant Parameters

Description/Comments:

4: ENTER WASTE ACCEPTANCE RATES

Input Units: *Mg/year*

Year	Input Units *(Mg/year)*	Calculated Units *(short tons/year)*
2004	6,993	7,692
2005	17,994	19,793
2006	15,550	17,105
2007	16,411	18,052
2008	16,636	18,300
2009	30,590	33,648
2010	32,979	36,277
2011	33,495	36,845
2012	32,308	35,539
2013	37,650	41,415
2014	36,186	39,805
2015	34,565	38,022
2016	35,285	38,814
2017	33,073	36,380
2018	36,428	40,071
2019	34,751	38,226
2020	38,480	42,328
2021	25,084	27,592
2022	0	
2023		
2024		
2025		
2026		
2027		
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035		
2036		
2037		
2038		
2039		
2040		
2041		
2042		
2043		

4: ENTER WASTE ACCEPTANCE RATES

Input Units: *Mg/year*

Year	Input Units *(Mg/year)*	Calculated Units *(short tons/year)*
2044		
2045		
2046		
2047		
2048		
2049		
2050		
2051		
2052		
2053		
2054		
2055		
2056		
2057		
2058		
2059		
2060		
2061		
2062		
2063		
2064		
2065		
2066		
2067		
2068		
2069		
2070		
2071		
2072		
2073		
2074		
2075		
2076		
2077		
2078		
2079		
2080		
2081		
2082		
2083		

POLLUTANTS

Landfill Name or Identifier: Levin Landfill

Enter New Pollutant Parameters | **Edit Existing Pollutant Parameters**

Default parameters will be used by model unless alternate parameters are entered.

Gas / Pollutant Default Parameters:

Enter User-specified Pollutant Parameters for Existing Pollutants:

	Compound	Concentration (*ppmv*)	Molecular Weight	Notes	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		30.03			
	Methane		16.04			
	Carbon dioxide		44.01			
	NMOC	4,000	86.18			
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41	A		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85	A, B		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97	A, B		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94	A, B		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96	A, B		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99	A, B		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11	B		
	Acetone	7.0	58.08			
	Acrylonitrile - HAP/VOC	6.3	53.06	A, B		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11	A, B		
	Benzene - Co-disposal - HAP/VOC	11	78.11	A, B		
	Bromodichloromethane - VOC	3.1	163.83	B		
	Butane - VOC	5.0	58.12	B		
	Carbon disulfide - HAP/VOC	0.58	76.13	A, B		
	Carbon monoxide	140	28.01			
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84	A, B		
	Carbonyl sulfide - HAP/VOC	0.49	60.07	A, B		
	Chlorobenzene - HAP/VOC	0.25	112.56	A, B		
	Chlorodifluoromethane	1.3	86.47			
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52	A, B		
	Chloroform - HAP/VOC	0.03	119.39	A, B		
	Chloromethane - VOC	1.2	50.49	B		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147	B, C		
	Dichlorodifluoromethane	16	120.91			
	Dichlorofluoromethane - VOC	2.6	102.92	B		
	Dichloromethane (methylene chloride) - HAP	14	84.94	A		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13	B		
	Ethane	890	30.07			
	Ethanol - VOC	27	46.08	B		
	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13	B		
	Ethylbenzene - HAP/VOC	4.6	106.16	A, B		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88	A, B		
	Fluorotrichloromethane - VOC	0.76	137.38	B		
	Hexane - HAP/VOC	6.6	86.18	A, B		
	Hydrogen sulfide	36	34.08			
	Mercury (total) - HAP	2.9E-04	200.61	A		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11	A, B		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16	A, B		
	Methyl mercaptan - VOC	2.5	48.11	B		
	Pentane - VOC	3.3	72.15	B		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83	A		
	Propane - VOC	11	44.09	B		
	t-1,2-Dichloroethene - VOC	2.8	96.94	B		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13	A, B		
	Toluene - Co-disposal - HAP/VOC	170	92.13	A, B		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40	A, B		
	Vinyl chloride - HAP/VOC	7.3	62.50	A, B		
	Xylenes - HAP/VOC	12	106.16	A, B		

Enter New Compound	Enter Concentration (*ppmv*)	Enter Molecular Weight

Return to USER INPUTS

A. Hazardous air pollutants (HAP) listed in Title III of the 1990 Clean Air Act Amendments.
B. Considered volatile organic compounds (VOC), as defined by U.S. EPA in 40 CFR 51.100(s).
C. Source tests did not indicate whether this compound was the para- or ortho- isomer. The para- isomer is a Title III-listed HAP.

Source: Tables 2.4-1 and 2.4-2 of *Compilation of Air Pollutant Emission Factors, AP-42, Volume 1: Stationary Point and Area Sources*, 5th ed., Chapter 2.4 Municipal Solid Waste Landfills. U.S. EPA, Office of Air Quality Planning and Standards. Research Triangle Park, NC. November 1998. http://www.epa.gov/ttn/chief/ap42/ch02/final/c02s04.pdf

INPUT REVIEW

Landfill Name or Identifier: Levin Landfill

LANDFILL CHARACTERISTICS

Landfill Open Year	**2004**	
Landfill Closure Year (with 80-year limit)	**2021**	
Actual Closure Year (without limit)	***2021***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity		*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.063**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**79**	*m^3/Mg*
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1: **Total landfill gas**
Gas / Pollutant #2: **Methane**
Gas / Pollutant #3: **Carbon dioxide**
Gas / Pollutant #4: **NMOC**

Description/Comments:

WASTE ACCEPTANCE RATES

Year	*(Mg/year)*	*(short tons/year)*
2004	6,993	7,692
2005	17,994	19,793
2006	15,550	17,105
2007	16,411	18,052
2008	16,636	18,300
2009	30,590	33,648
2010	32,979	36,277
2011	33,495	36,845
2012	32,308	35,539
2013	37,650	41,415
2014	36,186	39,805
2015	34,565	38,022
2016	35,285	38,814
2017	33,073	36,380
2018	36,428	40,071
2019	34,751	38,226
2020	38,480	42,328
2021	25,084	27,592
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	0	0
2028	0	0
2029	0	0
2030	0	0
2031	0	0
2032	0	0
2033	0	0
2034	0	0
2035	0	0
2036	0	0
2037	0	0
2038	0	0
2039	0	0
2040	0	0
2041	0	0
2042	0	0
2043	0	0
2044	0	0
2045	0	0
2046	0	0
2047	0	0
2048	0	0
2049	0	0

WASTE ACCEPTANCE RATES

Year	*(Mg/year)*	*(short tons/year)*
2050	0	0
2051	0	0
2052	0	0
2053	0	0
2054	0	0
2055	0	0
2056	0	0
2057	0	0
2058	0	0
2059	0	0
2060	0	0
2061	0	0
2062	0	0
2063	0	0
2064	0	0
2065	0	0
2066	0	0
2067	0	0
2068	0	0
2069	0	0
2070	0	0
2071	0	0
2072	0	0
2073	0	0
2074	0	0
2075	0	0
2076	0	0
2077	0	0
2078	0	0
2079	0	0
2080	0	0
2081	0	0
2082	0	0
2083	0	0

METHANE

Landfill Name or Identifier: Levin Landfill

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation (*m^3/year*)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate (*$year^{-1}$*)

L_o = potential methane generation capacity (m^3/*Mg*)

M_i = mass of waste accepted in the i^{th} year (*Mg*)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

Model Parameters from User Inputs:

k = 0.063 *$year^{-1}$*

L_o = 79 *m^3/Mg*

When Model Calculates Closure Year…

Final Non-Zero Acceptance Entered =	25,084	*megagrams* in	2021
Waste Design Capacity =		*megagrams*	
Closure Year (with 80-year limit) =	2021		
Actual Closure Year (without limit) =	2021		
Model Waste Acceptance Limit =	80	*years*	

Year	User Waste Acceptance Inputs *(Mg/year)*	User Waste-In-Place *(Mg)*	Waste Acceptance *(Mg/year)*	Waste-In-Place *(Mg)*
2004	6,993	0	6,993	0
2005	17,994	6,993	17,994	6,993
2006	15,550	24,987	15,550	24,987
2007	16,411	40,537	16,411	40,537
2008	16,636	56,948	16,636	56,948
2009	30,590	73,584	30,590	73,584
2010	32,979	104,173	32,979	104,173
2011	33,495	137,152	33,495	137,152
2012	32,308	170,647	32,308	170,647
2013	37,650	202,955	37,650	202,955
2014	36,186	240,605	36,186	240,605
2015	34,565	276,791	34,565	276,791
2016	35,285	311,356	35,285	311,356
2017	33,073	346,641	33,073	346,641
2018	36,428	379,714	36,428	379,714
2019	34,751	416,142	34,751	416,142
2020	38,480	450,893	38,480	450,893
2021	25,084	489,373	25,084	489,373
2022	0	514,457	0	514,457
2023	0	514,457	0	514,457
2024	0	514,457	0	514,457
2025	0	514,457	0	514,457
2026	0	514,457	0	514,457
2027	0	514,457	0	514,457
2028	0	514,457	0	514,457
2029	0	514,457	0	514,457
2030	0	514,457	0	514,457
2031	0	514,457	0	514,457
2032	0	514,457	0	514,457
2033	0	514,457	0	514,457
2034	0	514,457	0	514,457
2035	0	514,457	0	514,457
2036	0	514,457	0	514,457
2037	0	514,457	0	514,457
2038	0	514,457	0	514,457
2039	0	514,457	0	514,457
2040	0	514,457	0	514,457
2041	0	514,457	0	514,457
2042	0	514,457	0	514,457
2043	0	514,457	0	514,457
2044	0	514,457	0	514,457
2045	0	514,457	0	514,457
2046	0	514,457	0	514,457
2047	0	514,457	0	514,457
2048	0	514,457	0	514,457
2049	0	514,457	0	514,457
2050	0	514,457	0	514,457
2051	0	514,457	0	514,457
2052	0	514,457	0	514,457
2053	0	514,457	0	514,457
2054	0	514,457	0	514,457
2055	0	514,457	0	514,457
2056	0	514,457	0	514,457
2057	0	514,457	0	514,457
2058	0	514,457	0	514,457

Year	User Waste Acceptance Inputs *(Mg/year)*	User Waste-In-Place *(Mg)*	Waste Acceptance *(Mg/year)*	Waste-In-Place *(Mg)*
2059	0	514,457	0	514,457
2060	0	514,457	0	514,457
2061	0	514,457	0	514,457
2062	0	514,457	0	514,457
2063	0	514,457	0	514,457

Year	User Waste Acceptance Inputs *(Mg/year)*	User Waste-In-Place *(Mg)*	Waste Acceptance *(Mg/year)*	Waste-In-Place *(Mg)*
2064	0	514,457	0	514,457
2065	0	514,457	0	514,457
2066	0	514,457	0	514,457
2067	0	514,457	0	514,457
2068	0	514,457	0	514,457
2069	0	514,457	0	514,457
2070	0	514,457	0	514,457
2071	0	514,457	0	514,457
2072	0	514,457	0	514,457
2073	0	514,457	0	514,457
2074	0	514,457	0	514,457
2075	0	514,457	0	514,457
2076	0	514,457	0	514,457
2077	0	514,457	0	514,457
2078	0	514,457	0	514,457
2079	0	514,457	0	514,457
2080	0	514,457	0	514,457
2081	0	514,457	0	514,457
2082	0	514,457	0	514,457
2083	0	514,457	0	514,457

RESULTS

Landfill Name or Identifier: Levin Landfill

Closure Year (with 80-year limit) = 2021

Methane = 50 *% by volume*

Please choose a third unit of measure to represent all of the emission rates below.

User-specified Unit: *av ft^3/min*

Year	Waste Accepted		Waste-In-Place		Total landfill gas			Methane			Carbon dioxide			NMOC		
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2004	6,993	7,692	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	17,994	19,793	6,993	7,692	8.470E+01	6.782E+04	4.557E+00	2.262E+01	3.391E+04	2.279E+00	6.208E+01	3.391E+04	2.279E+00	9.724E-01	2.713E+02	1.823E-02
2006	15,550	17,105	24,987	27,485	2.975E+02	2.382E+05	1.601E+01	7.946E+01	1.191E+05	8.003E+00	2.180E+02	1.191E+05	8.003E+00	3.415E+00	9.529E+02	6.402E-02
2007	16,411	18,052	40,537	44,590	4.677E+02	3.745E+05	2.516E+01	1.249E+02	1.872E+05	1.258E+01	3.428E+02	1.872E+05	1.258E+01	5.369E+00	1.498E+03	1.006E-01
2008	16,636	18,300	56,948	62,642	6.379E+02	5.108E+05	3.432E+01	1.704E+02	2.554E+05	1.716E+01	4.675E+02	2.554E+05	1.716E+01	7.324E+00	2.043E+03	1.373E-01
2009	30,590	33,648	73,584	80,942	8.005E+02	6.410E+05	4.307E+01	2.138E+02	3.205E+05	2.153E+01	5.867E+02	3.205E+05	2.153E+01	9.190E+00	2.564E+03	1.723E-01
2010	32,979	36,277	104,173	114,591	1.122E+03	8.985E+05	6.037E+01	2.997E+02	4.493E+05	3.019E+01	8.224E+02	4.493E+05	3.019E+01	1.288E+01	3.594E+03	2.415E-01
2011	33,495	36,845	137,152	150,867	1.453E+03	1.164E+06	7.818E+01	3.881E+02	5.818E+05	3.909E+01	1.065E+03	5.818E+05	3.909E+01	1.668E+01	4.654E+03	3.127E-01
2012	32,308	35,539	170,647	187,712	1.770E+03	1.417E+06	9.523E+01	4.728E+02	7.087E+05	4.762E+01	1.297E+03	7.087E+05	4.762E+01	2.032E+01	5.670E+03	3.809E-01
2013	37,650	41,415	202,955	223,250	2.053E+03	1.644E+06	1.105E+02	5.485E+02	8.221E+05	5.524E+01	1.505E+03	8.221E+05	5.524E+01	2.357E+01	6.577E+03	4.419E-01
2014	36,186	39,805	240,605	264,665	2.384E+03	1.909E+06	1.283E+02	6.368E+02	9.545E+05	6.413E+01	1.747E+03	9.545E+05	6.413E+01	2.737E+01	7.636E+03	5.131E-01
2015	34,565	38,022	276,791	304,470	2.677E+03	2.143E+06	1.440E+02	7.150E+02	1.072E+06	7.201E+01	1.962E+03	1.072E+06	7.201E+01	3.073E+01	8.574E+03	5.761E-01
2016	35,285	38,814	311,356	342,492	2.932E+03	2.348E+06	1.578E+02	7.832E+02	1.174E+06	7.888E+01	2.149E+03	1.174E+06	7.888E+01	3.366E+01	9.391E+03	6.310E-01
2017	33,073	36,380	346,641	381,305	3.180E+03	2.547E+06	1.711E+02	8.495E+02	1.273E+06	8.556E+01	2.331E+03	1.273E+06	8.556E+01	3.651E+01	1.019E+04	6.845E-01
2018	36,428	40,071	379,714	417,685	3.387E+03	2.712E+06	1.822E+02	9.047E+02	1.356E+06	9.111E+01	2.482E+03	1.356E+06	9.111E+01	3.888E+01	1.085E+04	7.289E-01
2019	34,751	38,226	416,142	457,756	3.621E+03	2.900E+06	1.948E+02	9.673E+02	1.450E+06	9.742E+01	2.654E+03	1.450E+06	9.742E+01	4.158E+01	1.160E+04	7.793E-01
2020	38,480	42,328	450,893	495,982	3.821E+03	3.060E+06	2.056E+02	1.021E+03	1.530E+06	1.028E+02	2.800E+03	1.530E+06	1.028E+02	4.387E+01	1.224E+04	8.223E-01
2021	25,084	27,592	489,373	538,310	4.054E+03	3.246E+06	2.181E+02	1.083E+03	1.623E+06	1.091E+02	2.971E+03	1.623E+06	1.091E+02	4.654E+01	1.298E+04	8.724E-01
2022	0	0	514,457	565,903	4.110E+03	3.291E+06	2.211E+02	1.098E+03	1.646E+06	1.106E+02	3.012E+03	1.646E+06	1.106E+02	4.719E+01	1.317E+04	8.846E-01
2023	0	0	514,457	565,903	3.859E+03	3.090E+06	2.076E+02	1.031E+03	1.545E+06	1.038E+02	2.828E+03	1.545E+06	1.038E+02	4.431E+01	1.236E+04	8.306E-01
2024	0	0	514,457	565,903	3.624E+03	2.902E+06	1.950E+02	9.679E+02	1.451E+06	9.748E+01	2.656E+03	1.451E+06	9.748E+01	4.160E+01	1.161E+04	7.798E-01
2025	0	0	514,457	565,903	3.402E+03	2.724E+06	1.831E+02	9.088E+02	1.362E+06	9.153E+01	2.494E+03	1.362E+06	9.153E+01	3.906E+01	1.090E+04	7.322E-01
2026	0	0	514,457	565,903	3.195E+03	2.558E+06	1.719E+02	8.533E+02	1.279E+06	8.594E+01	2.341E+03	1.279E+06	8.594E+01	3.668E+01	1.023E+04	6.875E-01
2027	0	0	514,457	565,903	3.000E+03	2.402E+06	1.614E+02	8.012E+02	1.201E+06	8.069E+01	2.198E+03	1.201E+06	8.069E+01	3.444E+01	9.608E+03	6.455E-01
2028	0	0	514,457	565,903	2.816E+03	2.255E+06	1.515E+02	7.523E+02	1.128E+06	7.577E+01	2.064E+03	1.128E+06	7.577E+01	3.234E+01	9.021E+03	6.061E-01
2029	0	0	514,457	565,903	2.644E+03	2.118E+06	1.423E+02	7.064E+02	1.059E+06	7.114E+01	1.938E+03	1.059E+06	7.114E+01	3.036E+01	8.470E+03	5.691E-01
2030	0	0	514,457	565,903	2.483E+03	1.988E+06	1.336E+02	6.632E+02	9.941E+05	6.680E+01	1.820E+03	9.941E+05	6.680E+01	2.851E+01	7.953E+03	5.344E-01
2031	0	0	514,457	565,903	2.331E+03	1.867E+06	1.254E+02	6.227E+02	9.334E+05	6.272E+01	1.709E+03	9.334E+05	6.272E+01	2.677E+01	7.468E+03	5.017E-01
2032	0	0	514,457	565,903	2.189E+03	1.753E+06	1.178E+02	5.847E+02	8.765E+05	5.889E+01	1.604E+03	8.765E+05	5.889E+01	2.513E+01	7.012E+03	4.711E-01
2033	0	0	514,457	565,903	2.055E+03	1.646E+06	1.106E+02	5.490E+02	8.229E+05	5.529E+01	1.506E+03	8.229E+05	5.529E+01	2.360E+01	6.584E+03	4.423E-01
2034	0	0	514,457	565,903	1.930E+03	1.545E+06	1.038E+02	5.155E+02	7.727E+05	5.192E+01	1.414E+03	7.727E+05	5.192E+01	2.216E+01	6.182E+03	4.153E-01
2035	0	0	514,457	565,903	1.812E+03	1.451E+06	9.749E+01	4.840E+02	7.255E+05	4.875E+01	1.328E+03	7.255E+05	4.875E+01	2.080E+01	5.804E+03	3.900E-01
2036	0	0	514,457	565,903	1.701E+03	1.362E+06	9.154E+01	4.545E+02	6.812E+05	4.577E+01	1.247E+03	6.812E+05	4.577E+01	1.953E+01	5.450E+03	3.662E-01
2037	0	0	514,457	565,903	1.598E+03	1.279E+06	8.595E+01	4.267E+02	6.396E+05	4.298E+01	1.171E+03	6.396E+05	4.298E+01	1.834E+01	5.117E+03	3.438E-01
2038	0	0	514,457	565,903	1.500E+03	1.201E+06	8.071E+01	4.007E+02	6.006E+05	4.035E+01	1.099E+03	6.006E+05	4.035E+01	1.722E+01	4.805E+03	3.228E-01
2039	0	0	514,457	565,903	1.408E+03	1.128E+06	7.578E+01	3.762E+02	5.639E+05	3.789E+01	1.032E+03	5.639E+05	3.789E+01	1.617E+01	4.511E+03	3.031E-01
2040	0	0	514,457	565,903	1.322E+03	1.059E+06	7.115E+01	3.532E+02	5.295E+05	3.558E+01	9.692E+02	5.295E+05	3.558E+01	1.518E+01	4.236E+03	2.846E-01
2041	0	0	514,457	565,903	1.242E+03	9.943E+05	6.681E+01	3.317E+02	4.971E+05	3.340E+01	9.100E+02	4.971E+05	3.340E+01	1.426E+01	3.977E+03	2.672E-01
2042	0	0	514,457	565,903	1.166E+03	9.336E+05	6.273E+01	3.114E+02	4.668E+05	3.136E+01	8.545E+02	4.668E+05	3.136E+01	1.339E+01	3.734E+03	2.509E-01
2043	0	0	514,457	565,903	1.095E+03	8.766E+05	5.890E+01	2.924E+02	4.383E+05	2.945E+01	8.023E+02	4.383E+05	2.945E+01	1.257E+01	3.506E+03	2.356E-01
2044	0	0	514,457	565,903	1.028E+03	8.231E+05	5.530E+01	2.746E+02	4.115E+05	2.765E+01	7.533E+02	4.115E+05	2.765E+01	1.180E+01	3.292E+03	2.212E-01
2045	0	0	514,457	565,903	9.651E+02	7.728E+05	5.193E+01	2.578E+02	3.864E+05	2.596E+01	7.073E+02	3.864E+05	2.596E+01	1.108E+01	3.091E+03	2.077E-01
2046	0	0	514,457	565,903	9.062E+02	7.256E+05	4.875E+01	2.420E+02	3.628E+05	2.438E+01	6.641E+02	3.628E+05	2.438E+01	1.040E+01	2.903E+03	1.950E-01
2047	0	0	514,457	565,903	8.508E+02	6.813E+05	4.578E+01	2.273E+02	3.407E+05	2.289E+01	6.236E+02	3.407E+05	2.289E+01	9.769E+00	2.725E+03	1.831E-01
2048	0	0	514,457	565,903	7.989E+02	6.397E+05	4.298E+01	2.134E+02	3.199E+05	2.149E+01	5.855E+02	3.199E+05	2.149E+01	9.172E+00	2.559E+03	1.719E-01
2049	0	0	514,457	565,903	7.501E+02	6.007E+05	4.036E+01	2.004E+02	3.003E+05	2.018E+01	5.498E+02	3.003E+05	2.018E+01	8.612E+00	2.403E+03	1.614E-01
2050	0	0	514,457	565,903	7.043E+02	5.640E+05	3.789E+01	1.881E+02	2.820E+05	1.895E+01	5.162E+02	2.820E+05	1.895E+01	8.086E+00	2.256E+03	1.516E-01
2051	0	0	514,457	565,903	6.613E+02	5.296E+05	3.558E+01	1.766E+02	2.648E+05	1.779E+01	4.847E+02	2.648E+05	1.779E+01	7.593E+00	2.118E+03	1.423E-01
2052	0	0	514,457	565,903	6.209E+02	4.972E+05	3.341E+01	1.659E+02	2.486E+05	1.670E+01	4.551E+02	2.486E+05	1.670E+01	7.129E+00	1.989E+03	1.336E-01
2053	0	0	514,457	565,903	5.830E+02	4.669E+05	3.137E+01	1.557E+02	2.334E+05	1.568E+01	4.273E+02	2.334E+05	1.568E+01	6.694E+00	1.867E+03	1.255E-01
2054	0	0	514,457	565,903	5.474E+02	4.384E+05	2.945E+01	1.462E+02	2.192E+05	1.473E+01	4.012E+02	2.192E+05	1.473E+01	6.285E+00	1.753E+03	1.178E-01
2055	0	0	514,457	565,903	5.140E+02	4.116E+05	2.765E+01	1.373E+02	2.058E+05	1.383E+01	3.767E+02	2.058E+05	1.383E+01	5.901E+00	1.646E+03	1.106E-01
2056	0	0	514,457	565,903	4.826E+02	3.865E+05	2.597E+01	1.289E+02	1.932E+05	1.298E+01	3.537E+02	1.932E+05	1.298E+01	5.541E+00	1.546E+03	1.039E-01
2057	0	0	514,457	565,903	4.532E+02	3.629E+05	2.438E+01	1.210E+02	1.814E+05	1.219E+01	3.321E+02	1.814E+05	1.219E+01	5.203E+00	1.451E+03	9.752E-02
2058	0	0	514,457	565,903	4.255E+02	3.407E+05	2.289E+01	1.137E+02	1.704E+05	1.145E+01	3.118E+02	1.704E+05	1.145E+01	4.885E+00	1.363E+03	9.157E-02
2059	0	0	514,457	565,903	3.995E+02	3.199E+05	2.149E+01	1.067E+02	1.600E+05	1.075E+01	2.928E+02	1.600E+05	1.075E+01	4.587E+00	1.280E+03	8.598E-02
2060	0	0	514,457	565,903	3.751E+02	3.004E+05	2.018E+01	1.002E+02	1.502E+05	1.009E+01	2.749E+02	1.502E+05	1.009E+01	4.307E+00	1.202E+03	8.073E-02
2061	0	0	514,457	565,903	3.522E+02	2.820E+05	1.895E+01	9.408E+01	1.410E+05	9.475E+00	2.581E+02	1.410E+05	9.475E+00	4.044E+00	1.128E+03	7.580E-02
2062	0	0	514,457	565,903	3.307E+02	2.648E+05	1.779E+01	8.834E+01	1.324E+05	8.896E+00	2.424E+02	1.324E+05	8.896E+00	3.797E+00	1.059E+03	7.117E-02
2063	0	0	514,457	565,903	3.105E+02	2.486E+05	1.671E+01	8.294E+01	1.243E+05	8.353E+00	2.276E+02	1.243E+05	8.353E+00	3.565E+00	9.946E+02	6.683E-02
2064	0	0	514,457	565,903	2.916E+02	2.335E+05	1.569E+01	7.788E+01	1.167E+05	7.843E+00	2.137E+02	1.167E+05	7.843E+00	3.347E+00	9.339E+02	6.275E-02
2065	0	0	514,457	565,903	2.738E+02	2.192E+05	1.473E+01	7.312E+01	1.096E+05	7.364E+00	2.006E+02	1.096E+05	7.364E+00	3.143E+00	8.768E+02	5.891E-02
2066	0	0	514,457	565,903	2.570E+02	2.058E+05	1.383E+01	6.866E+01	1.029E+05	6.915E+00	1.884E+02	1.029E+05	6.915E+00	2.951E+00	8.233E+02	5.532E-02
2067	0	0	514,457	565,903	2.413E+02	1.933E+05	1.299E+01	6.447E+01	9.663E+04	6.493E+00	1.769E+02	9.663E+04	6.493E+00	2.771E+00	7.730E+02	5.194E-02
2068	0	0	514,457	565,903	2.266E+02	1.815E+05	1.219E+01	6.053E+01	9.073E+04	6.096E+00	1.661E+02	9.073E+04	6.096E+00	2.602E+00	7.258E+02	4.877E-02
2069	0	0	514,457	565,903	2.128E+02	1.704E+05	1.145E+01	5.683E+01	8.519E+04	5.724E+00	1.559E+02	8.519E+04	5.724E+00	2.443E+00	6.815E+02	4.579E-02
2070	0	0	514,457	565,903	1.998E+02	1.600E+05	1.075E+01	5.336E+01	7.999E+04	5.374E+00	1.464E+02	7.999E+04	5.374E+00	2.294E+00	6.399E+02	4.300E-02
2071	0	0	514,457	565,903	1.876E+02	1.502E+05	1.009E+01	5.011E+01	7.510E+04	5.046E+00	1.375E+02	7.510E+04	5.046E+00	2.154E+00	6.008E+02	4.037E-02
2072	0	0	514,457	565,903	1.761E+02	1.410E+05	9.476E+00	4.705E+01	7.052E+04	4.738E+00	1.291E+02	7.052E+04	4.738E+00	2.022E+00	5.642E+02	3.791E-02
2073	0	0	514,457	565,903	1.654E+02	1.324E+05	8.898E+00	4.417E+01	6.621E+04	4.449E+00	1.212E+02	6.621E+04	4.449E+00	1.899E+00	5.297E+02	3.559E-02
2074	0	0	514,457	565,903	1.553E+02	1.243E+05	8.355E+00	4.148E+01	6.217E+04	4.177E+00	1.138E+02	6.217E+04	4.177E+00	1.783E+00	4.974E+02	3.342E-02
2075	0	0	514,457	565,903	1.458E+02	1.167E+05	7.844E+00	3.894E+01	5.837E+04	3.922E+00	1.069E+02	5.837E+04	3.922E+00	1.674E+00	4.670E+02	3.138E-02
2076	0	0	514,457	565,903	1.369E+02	1.096E+05	7.365E+00	3.657E+01	5.481E+04	3.683E+00	1.003E+02	5.481E+04	3.683E+00	1.572E+00	4.385E+02	2.946E-02
2077	0	0	514,457	565,903	1.285E+02	1.029E+05	6.916E+00	3.433E+01	5.146E+04	3.458E+00	9.421E+01	5.146E+04	3.458E+00	1.476E+00	4.117E+02	2.766E-02
2078	0	0	514,457	565,903	1.207E+02	9.664E+04	6.493E+00	3.224E+01	4.832E+04	3.247E+00	8.845E+01	4.832E+04	3.247E+00	1.386E+00	3.866E+02	2.597E-02
2079	0	0	514,457	565,903	1.133E+02	9.074E+04	6.097E+00	3.027E+01	4.537E+04	3.049E+00	8.305E+01	4.537E+04	3.049E+00	1.301E+00	3.630E+02	2.439E-02

RESULTS **Landfill Name or Identifier:** Levin Landfill

Closure Year (with 80-year limit) = 2021

Methane = 50 *% by volume*

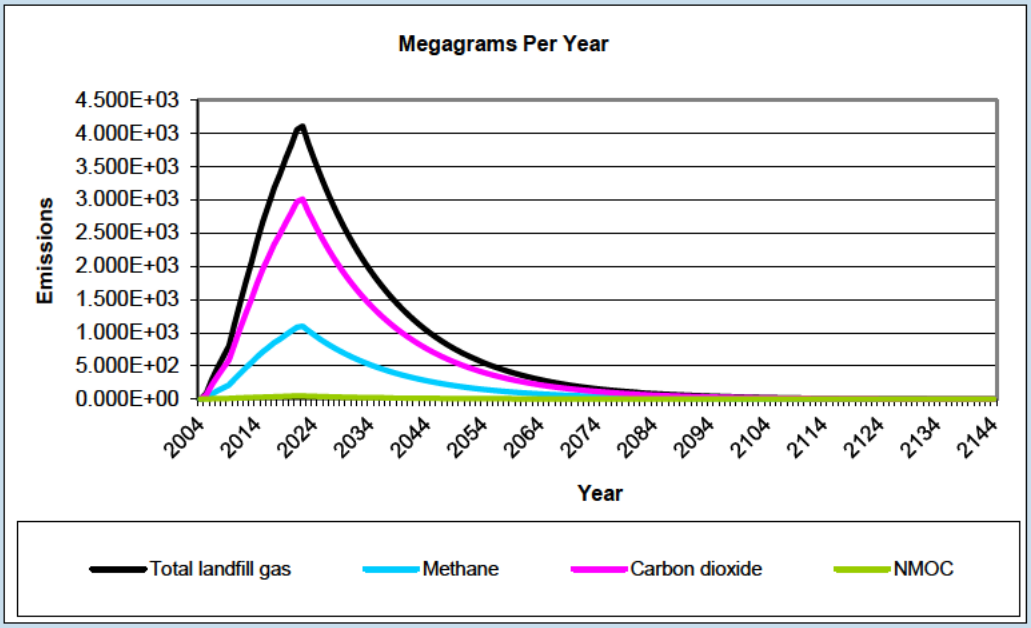
Please choose a third unit of measure to represent all of the emission rates below.

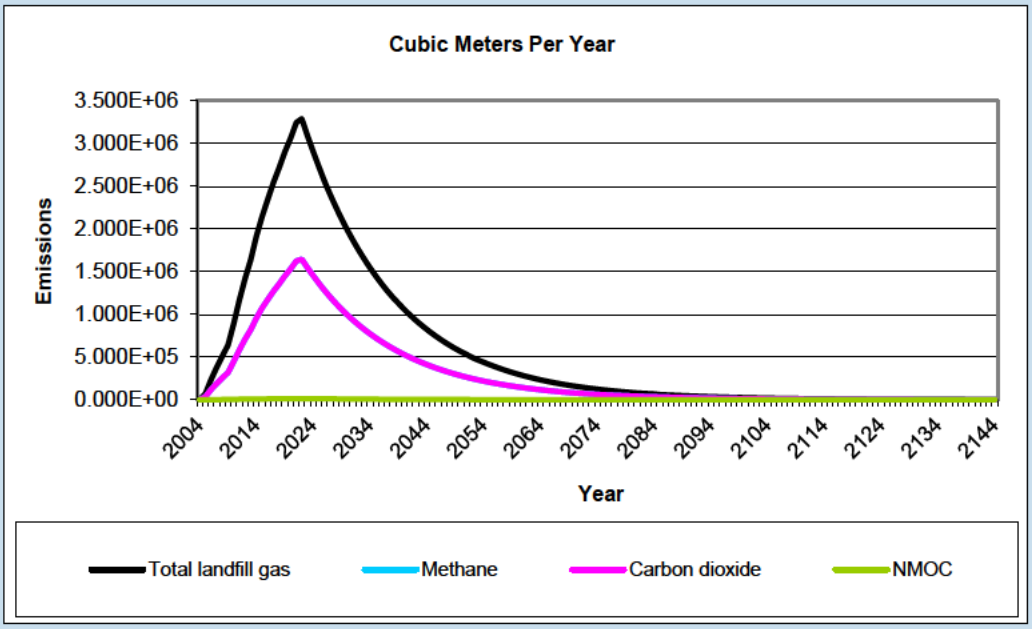
User-specified Unit: *av ft^3/min*

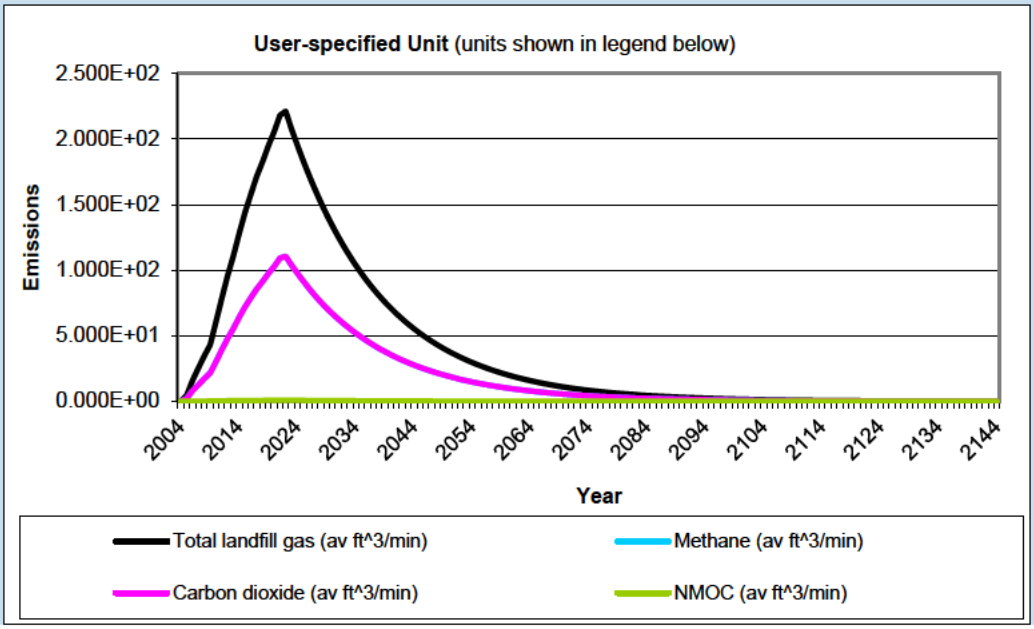
Year	Waste Accepted		Waste-In-Place		Total landfill gas			Methane			Carbon dioxide			NMOC		
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2080	0	0	514,457	565,903	1.064E+02	8.520E+04	5.725E+00	2.842E+01	4.260E+04	2.862E+00	7.798E+01	4.260E+04	2.862E+00	1.222E+00	3.408E+02	2.290E-02
2081	0	0	514,457	565,903	9.991E+01	8.000E+04	5.375E+00	2.669E+01	4.000E+04	2.688E+00	7.322E+01	4.000E+04	2.688E+00	1.147E+00	3.200E+02	2.150E-02
2082	0	0	514,457	565,903	9.381E+01	7.512E+04	5.047E+00	2.506E+01	3.756E+04	2.524E+00	6.875E+01	3.756E+04	2.524E+00	1.077E+00	3.005E+02	2.019E-02
2083	0	0	514,457	565,903	8.808E+01	7.053E+04	4.739E+00	2.353E+01	3.526E+04	2.369E+00	6.455E+01	3.526E+04	2.369E+00	1.011E+00	2.821E+02	1.896E-02
2084	0	0	514,457	565,903	8.270E+01	6.622E+04	4.450E+00	2.209E+01	3.311E+04	2.225E+00	6.061E+01	3.311E+04	2.225E+00	9.495E-01	2.649E+02	1.780E-02
2085	0	0	514,457	565,903	7.765E+01	6.218E+04	4.178E+00	2.074E+01	3.109E+04	2.089E+00	5.691E+01	3.109E+04	2.089E+00	8.915E-01	2.487E+02	1.671E-02
2086	0	0	514,457	565,903	7.291E+01	5.838E+04	3.923E+00	1.948E+01	2.919E+04	1.961E+00	5.344E+01	2.919E+04	1.961E+00	8.371E-01	2.335E+02	1.569E-02
2087	0	0	514,457	565,903	6.846E+01	5.482E+04	3.683E+00	1.829E+01	2.741E+04	1.842E+00	5.017E+01	2.741E+04	1.842E+00	7.860E-01	2.193E+02	1.473E-02
2088	0	0	514,457	565,903	6.428E+01	5.147E+04	3.458E+00	1.717E+01	2.574E+04	1.729E+00	4.711E+01	2.574E+04	1.729E+00	7.380E-01	2.059E+02	1.383E-02
2089	0	0	514,457	565,903	6.035E+01	4.833E+04	3.247E+00	1.612E+01	2.416E+04	1.624E+00	4.423E+01	2.416E+04	1.624E+00	6.929E-01	1.933E+02	1.299E-02
2090	0	0	514,457	565,903	5.667E+01	4.538E+04	3.049E+00	1.514E+01	2.269E+04	1.524E+00	4.153E+01	2.269E+04	1.524E+00	6.506E-01	1.815E+02	1.220E-02
2091	0	0	514,457	565,903	5.321E+01	4.261E+04	2.863E+00	1.421E+01	2.130E+04	1.431E+00	3.900E+01	2.130E+04	1.431E+00	6.109E-01	1.704E+02	1.145E-02
2092	0	0	514,457	565,903	4.996E+01	4.001E+04	2.688E+00	1.335E+01	2.000E+04	1.344E+00	3.662E+01	2.000E+04	1.344E+00	5.736E-01	1.600E+02	1.075E-02
2093	0	0	514,457	565,903	4.691E+01	3.756E+04	2.524E+00	1.253E+01	1.878E+04	1.262E+00	3.438E+01	1.878E+04	1.262E+00	5.386E-01	1.503E+02	1.010E-02
2094	0	0	514,457	565,903	4.405E+01	3.527E+04	2.370E+00	1.177E+01	1.764E+04	1.185E+00	3.228E+01	1.764E+04	1.185E+00	5.057E-01	1.411E+02	9.479E-03
2095	0	0	514,457	565,903	4.136E+01	3.312E+04	2.225E+00	1.105E+01	1.656E+04	1.113E+00	3.031E+01	1.656E+04	1.113E+00	4.748E-01	1.325E+02	8.900E-03
2096	0	0	514,457	565,903	3.883E+01	3.109E+04	2.089E+00	1.037E+01	1.555E+04	1.045E+00	2.846E+01	1.555E+04	1.045E+00	4.458E-01	1.244E+02	8.357E-03
2097	0	0	514,457	565,903	3.646E+01	2.920E+04	1.962E+00	9.739E+00	1.460E+04	9.808E-01	2.672E+01	1.460E+04	9.808E-01	4.186E-01	1.168E+02	7.847E-03
2098	0	0	514,457	565,903	3.423E+01	2.741E+04	1.842E+00	9.144E+00	1.371E+04	9.210E-01	2.509E+01	1.371E+04	9.210E-01	3.931E-01	1.097E+02	7.368E-03
2099	0	0	514,457	565,903	3.214E+01	2.574E+04	1.729E+00	8.586E+00	1.287E+04	8.647E-01	2.356E+01	1.287E+04	8.647E-01	3.691E-01	1.030E+02	6.918E-03
2100	0	0	514,457	565,903	3.018E+01	2.417E+04	1.624E+00	8.062E+00	1.208E+04	8.119E-01	2.212E+01	1.208E+04	8.119E-01	3.465E-01	9.667E+01	6.495E-03
2101	0	0	514,457	565,903	2.834E+01	2.269E+04	1.525E+00	7.570E+00	1.135E+04	7.624E-01	2.077E+01	1.135E+04	7.624E-01	3.254E-01	9.077E+01	6.099E-03
2102	0	0	514,457	565,903	2.661E+01	2.131E+04	1.432E+00	7.107E+00	1.065E+04	7.158E-01	1.950E+01	1.065E+04	7.158E-01	3.055E-01	8.523E+01	5.726E-03
2103	0	0	514,457	565,903	2.498E+01	2.001E+04	1.344E+00	6.673E+00	1.000E+04	6.721E-01	1.831E+01	1.000E+04	6.721E-01	2.868E-01	8.002E+01	5.377E-03
2104	0	0	514,457	565,903	2.346E+01	1.878E+04	1.262E+00	6.266E+00	9.392E+03	6.311E-01	1.719E+01	9.392E+03	6.311E-01	2.693E-01	7.514E+01	5.049E-03
2105	0	0	514,457	565,903	2.203E+01	1.764E+04	1.185E+00	5.883E+00	8.819E+03	5.925E-01	1.614E+01	8.819E+03	5.925E-01	2.529E-01	7.055E+01	4.740E-03
2106	0	0	514,457	565,903	2.068E+01	1.656E+04	1.113E+00	5.524E+00	8.280E+03	5.564E-01	1.516E+01	8.280E+03	5.564E-01	2.374E-01	6.624E+01	4.451E-03
2107	0	0	514,457	565,903	1.942E+01	1.555E+04	1.045E+00	5.187E+00	7.775E+03	5.224E-01	1.423E+01	7.775E+03	5.224E-01	2.229E-01	6.220E+01	4.179E-03
2108	0	0	514,457	565,903	1.823E+01	1.460E+04	9.810E-01	4.870E+00	7.300E+03	4.905E-01	1.336E+01	7.300E+03	4.905E-01	2.093E-01	5.840E+01	3.924E-03
2109	0	0	514,457	565,903	1.712E+01	1.371E+04	9.211E-01	4.573E+00	6.854E+03	4.605E-01	1.255E+01	6.854E+03	4.605E-01	1.966E-01	5.483E+01	3.684E-03
2110	0	0	514,457	565,903	1.607E+01	1.287E+04	8.649E-01	4.294E+00	6.436E+03	4.324E-01	1.178E+01	6.436E+03	4.324E-01	1.846E-01	5.149E+01	3.459E-03
2111	0	0	514,457	565,903	1.509E+01	1.209E+04	8.120E-01	4.032E+00	6.043E+03	4.060E-01	1.106E+01	6.043E+03	4.060E-01	1.733E-01	4.834E+01	3.248E-03
2112	0	0	514,457	565,903	1.417E+01	1.135E+04	7.625E-01	3.785E+00	5.674E+03	3.812E-01	1.039E+01	5.674E+03	3.812E-01	1.627E-01	4.539E+01	3.050E-03
2113	0	0	514,457	565,903	1.331E+01	1.066E+04	7.159E-01	3.554E+00	5.328E+03	3.580E-01	9.752E+00	5.328E+03	3.580E-01	1.528E-01	4.262E+01	2.864E-03
2114	0	0	514,457	565,903	1.249E+01	1.000E+04	6.722E-01	3.337E+00	5.002E+03	3.361E-01	9.157E+00	5.002E+03	3.361E-01	1.434E-01	4.002E+01	2.689E-03
2115	0	0	514,457	565,903	1.173E+01	9.394E+03	6.312E-01	3.133E+00	4.697E+03	3.156E-01	8.598E+00	4.697E+03	3.156E-01	1.347E-01	3.757E+01	2.525E-03
2116	0	0	514,457	565,903	1.101E+01	8.820E+03	5.926E-01	2.942E+00	4.410E+03	2.963E-01	8.073E+00	4.410E+03	2.963E-01	1.265E-01	3.528E+01	2.370E-03
2117	0	0	514,457	565,903	1.034E+01	8.282E+03	5.564E-01	2.763E+00	4.141E+03	2.782E-01	7.580E+00	4.141E+03	2.782E-01	1.187E-01	3.313E+01	2.226E-03
2118	0	0	514,457	565,903	9.711E+00	7.776E+03	5.225E-01	2.594E+00	3.888E+03	2.612E-01	7.117E+00	3.888E+03	2.612E-01	1.115E-01	3.110E+01	2.090E-03
2119	0	0	514,457	565,903	9.118E+00	7.301E+03	4.906E-01	2.435E+00	3.651E+03	2.453E-01	6.682E+00	3.651E+03	2.453E-01	1.047E-01	2.920E+01	1.962E-03
2120	0	0	514,457	565,903	8.561E+00	6.855E+03	4.606E-01	2.287E+00	3.428E+03	2.303E-01	6.274E+00	3.428E+03	2.303E-01	9.829E-02	2.742E+01	1.842E-03
2121	0	0	514,457	565,903	8.038E+00	6.437E+03	4.325E-01	2.147E+00	3.218E+03	2.162E-01	5.891E+00	3.218E+03	2.162E-01	9.229E-02	2.575E+01	1.730E-03
2122	0	0	514,457	565,903	7.548E+00	6.044E+03	4.061E-01	2.016E+00	3.022E+03	2.030E-01	5.532E+00	3.022E+03	2.030E-01	8.666E-02	2.418E+01	1.624E-03
2123	0	0	514,457	565,903	7.087E+00	5.675E+03	3.813E-01	1.893E+00	2.837E+03	1.906E-01	5.194E+00	2.837E+03	1.906E-01	8.136E-02	2.270E+01	1.525E-03
2124	0	0	514,457	565,903	6.654E+00	5.328E+03	3.580E-01	1.777E+00	2.664E+03	1.790E-01	4.877E+00	2.664E+03	1.790E-01	7.640E-02	2.131E+01	1.432E-03
2125	0	0	514,457	565,903	6.248E+00	5.003E+03	3.361E-01	1.669E+00	2.501E+03	1.681E-01	4.579E+00	2.501E+03	1.681E-01	7.173E-02	2.001E+01	1.345E-03
2126	0	0	514,457	565,903	5.866E+00	4.698E+03	3.156E-01	1.567E+00	2.349E+03	1.578E-01	4.299E+00	2.349E+03	1.578E-01	6.735E-02	1.879E+01	1.263E-03
2127	0	0	514,457	565,903	5.508E+00	4.411E+03	2.964E-01	1.471E+00	2.205E+03	1.482E-01	4.037E+00	2.205E+03	1.482E-01	6.324E-02	1.764E+01	1.185E-03
2128	0	0	514,457	565,903	5.172E+00	4.141E+03	2.783E-01	1.381E+00	2.071E+03	1.391E-01	3.790E+00	2.071E+03	1.391E-01	5.938E-02	1.657E+01	1.113E-03
2129	0	0	514,457	565,903	4.856E+00	3.889E+03	2.613E-01	1.297E+00	1.944E+03	1.306E-01	3.559E+00	1.944E+03	1.306E-01	5.575E-02	1.555E+01	1.045E-03
2130	0	0	514,457	565,903	4.560E+00	3.651E+03	2.453E-01	1.218E+00	1.826E+03	1.227E-01	3.342E+00	1.826E+03	1.227E-01	5.235E-02	1.460E+01	9.813E-04
2131	0	0	514,457	565,903	4.281E+00	3.428E+03	2.303E-01	1.144E+00	1.714E+03	1.152E-01	3.138E+00	1.714E+03	1.152E-01	4.915E-02	1.371E+01	9.214E-04
2132	0	0	514,457	565,903	4.020E+00	3.219E+03	2.163E-01	1.074E+00	1.609E+03	1.081E-01	2.946E+00	1.609E+03	1.081E-01	4.615E-02	1.288E+01	8.651E-04
2133	0	0	514,457	565,903	3.774E+00	3.022E+03	2.031E-01	1.008E+00	1.511E+03	1.015E-01	2.766E+00	1.511E+03	1.015E-01	4.333E-02	1.209E+01	8.123E-04
2134	0	0	514,457	565,903	3.544E+00	2.838E+03	1.907E-01	9.466E-01	1.419E+03	9.534E-02	2.597E+00	1.419E+03	9.534E-02	4.069E-02	1.135E+01	7.627E-04
2135	0	0	514,457	565,903	3.328E+00	2.665E+03	1.790E-01	8.888E-01	1.332E+03	8.952E-02	2.439E+00	1.332E+03	8.952E-02	3.820E-02	1.066E+01	7.161E-04
2136	0	0	514,457	565,903	3.124E+00	2.502E+03	1.681E-01	8.346E-01	1.251E+03	8.405E-02	2.290E+00	1.251E+03	8.405E-02	3.587E-02	1.001E+01	6.724E-04
2137	0	0	514,457	565,903	2.934E+00	2.349E+03	1.578E-01	7.836E-01	1.175E+03	7.892E-02	2.150E+00	1.175E+03	7.892E-02	3.368E-02	9.396E+00	6.313E-04
2138	0	0	514,457	565,903	2.754E+00	2.206E+03	1.482E-01	7.358E-01	1.103E+03	7.410E-02	2.019E+00	1.103E+03	7.410E-02	3.162E-02	8.823E+00	5.928E-04
2139	0	0	514,457	565,903	2.586E+00	2.071E+03	1.392E-01	6.908E-01	1.036E+03	6.958E-02	1.895E+00	1.036E+03	6.958E-02	2.969E-02	8.284E+00	5.566E-04
2140	0	0	514,457	565,903	2.428E+00	1.945E+03	1.307E-01	6.487E-01	9.723E+02	6.533E-02	1.780E+00	9.723E+02	6.533E-02	2.788E-02	7.778E+00	5.226E-04
2141	0	0	514,457	565,903	2.280E+00	1.826E+03	1.227E-01	6.090E-01	9.129E+02	6.134E-02	1.671E+00	9.129E+02	6.134E-02	2.618E-02	7.303E+00	4.907E-04
2142	0	0	514,457	565,903	2.141E+00	1.714E+03	1.152E-01	5.719E-01	8.572E+02	5.759E-02	1.569E+00	8.572E+02	5.759E-02	2.458E-02	6.857E+00	4.607E-04
2143	0	0	514,457	565,903	2.010E+00	1.610E+03	1.082E-01	5.369E-01	8.048E+02	5.408E-02	1.473E+00	8.048E+02	5.408E-02	2.308E-02	6.439E+00	4.326E-04
2144	0	0	514,457	565,903	1.887E+00	1.511E+03	1.016E-01	5.042E-01	7.557E+02	5.078E-02	1.383E+00	7.557E+02	5.078E-02	2.167E-02	6.046E+00	4.062E-04

GRAPHS

Landfill Name or Identifier: Levin Landfill







INVENTORY

Landfill Name or Identifier: Levin Landfill

Enter year of emissions inventory: 2011

Gas / Pollutant	Emission Rate				
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(ft^3/year)*	*(short tons/year)*
Total landfill gas	1.453E+03	1.164E+06	7.818E+01	4.109E+07	1.598E+03
Methane	3.881E+02	5.818E+05	3.909E+01	2.055E+07	4.269E+02
Carbon dioxide	1.065E+03	5.818E+05	3.909E+01	2.055E+07	1.171E+03
NMOC	1.668E+01	4.654E+03	3.127E-01	1.644E+05	1.835E+01
1,1,1-Trichloroethane (methyl chloroform) - HAP	3.099E-03	5.585E-01	3.753E-05	1.972E+01	3.409E-03
1,1,2,2-Tetrachloroethane - HAP/VOC	8.936E-03	1.280E+00	8.600E-05	4.520E+01	9.829E-03
1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	1.150E-02	2.793E+00	1.876E-04	9.862E+01	1.264E-02
1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	9.383E-04	2.327E-01	1.564E-05	8.218E+00	1.032E-03
1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	1.964E-03	4.771E-01	3.205E-05	1.685E+01	2.160E-03
1,2-Dichloropropane (propylene dichloride) - HAP/VOC	9.843E-04	2.094E-01	1.407E-05	7.396E+00	1.083E-03
2-Propanol (isopropyl alcohol) - VOC	1.455E-01	5.818E+01	3.909E-03	2.055E+03	1.600E-01
Acetone	1.968E-02	8.145E+00	5.473E-04	2.876E+02	2.164E-02
Acrylonitrile - HAP/VOC	1.618E-02	7.330E+00	4.925E-04	2.589E+02	1.780E-02
Benzene - No or Unknown Co-disposal - HAP/VOC	7.182E-03	2.211E+00	1.485E-04	7.807E+01	7.901E-03
Benzene - Co-disposal - HAP/VOC	4.158E-02	1.280E+01	8.600E-04	4.520E+02	4.574E-02
Bromodichloromethane - VOC	2.458E-02	3.607E+00	2.424E-04	1.274E+02	2.704E-02
Butane - VOC	1.406E-02	5.818E+00	3.909E-04	2.055E+02	1.547E-02
Carbon disulfide - HAP/VOC	2.137E-03	6.749E-01	4.534E-05	2.383E+01	2.351E-03
Carbon monoxide	1.898E-01	1.629E+02	1.095E-02	5.753E+03	2.088E-01
Carbon tetrachloride - HAP/VOC	2.978E-05	4.654E-03	3.127E-07	1.644E-01	3.276E-05
Carbonyl sulfide - HAP/VOC	1.424E-03	5.701E-01	3.831E-05	2.013E+01	1.567E-03
Chlorobenzene - HAP/VOC	1.362E-03	2.909E-01	1.954E-05	1.027E+01	1.498E-03
Chlorodifluoromethane	5.440E-03	1.513E+00	1.016E-04	5.342E+01	5.984E-03
Chloroethane (ethyl chloride) - HAP/VOC	4.059E-03	1.513E+00	1.016E-04	5.342E+01	4.465E-03
Chloroform - HAP/VOC	1.733E-04	3.491E-02	2.345E-06	1.233E+00	1.907E-04
Chloromethane - VOC	2.932E-03	1.396E+00	9.381E-05	4.931E+01	3.225E-03
Dichlorobenzene - (HAP for para isomer/VOC)	1.494E-03	2.443E-01	1.642E-05	8.629E+00	1.643E-03
Dichlorodifluoromethane	9.362E-02	1.862E+01	1.251E-03	6.575E+02	1.030E-01
Dichlorofluoromethane - VOC	1.295E-02	3.025E+00	2.033E-04	1.068E+02	1.425E-02
Dichloromethane (methylene chloride) - HAP	5.755E-02	1.629E+01	1.095E-03	5.753E+02	6.331E-02
Dimethyl sulfide (methyl sulfide) - VOC	2.345E-02	9.076E+00	6.098E-04	3.205E+02	2.580E-02
Ethane	1.295E+00	1.036E+03	6.958E-02	3.657E+04	1.425E+00
Ethanol - VOC	6.021E-02	3.142E+01	2.111E-03	1.109E+03	6.623E-02
Ethyl mercaptan (ethanethiol) - VOC	6.916E-03	2.676E+00	1.798E-04	9.451E+01	7.607E-03
Ethylbenzene - HAP/VOC	2.363E-02	5.352E+00	3.596E-04	1.890E+02	2.600E-02
Ethylene dibromide - HAP/VOC	9.093E-06	1.164E-03	7.818E-08	4.109E-02	1.000E-05
Fluorotrichloromethane - VOC	5.053E-03	8.843E-01	5.942E-05	3.123E+01	5.558E-03
Hexane - HAP/VOC	2.753E-02	7.679E+00	5.160E-04	2.712E+02	3.028E-02
Hydrogen sulfide	5.938E-02	4.189E+01	2.814E-03	1.479E+03	6.531E-02
Mercury (total) - HAP	2.816E-06	3.374E-04	2.267E-08	1.192E-02	3.097E-06
Methyl ethyl ketone - HAP/VOC	2.478E-02	8.261E+00	5.551E-04	2.917E+02	2.726E-02
Methyl isobutyl ketone - HAP/VOC	9.210E-03	2.211E+00	1.485E-04	7.807E+01	1.013E-02
Methyl mercaptan - VOC	5.821E-03	2.909E+00	1.954E-04	1.027E+02	6.403E-03
Pentane - VOC	1.152E-02	3.840E+00	2.580E-04	1.356E+02	1.268E-02
Perchloroethylene (tetrachloroethylene) - HAP	2.969E-02	4.305E+00	2.893E-04	1.520E+02	3.266E-02
Propane - VOC	2.347E-02	1.280E+01	8.600E-04	4.520E+02	2.582E-02
t-1,2-Dichloroethene - VOC	1.314E-02	3.258E+00	2.189E-04	1.151E+02	1.445E-02
Toluene - No or Unknown Co-disposal - HAP/VOC	1.739E-01	4.538E+01	3.049E-03	1.603E+03	1.913E-01
Toluene - Co-disposal - HAP/VOC	7.580E-01	1.978E+02	1.329E-02	6.985E+03	8.338E-01
Trichloroethylene (trichloroethene) - HAP/VOC	1.781E-02	3.258E+00	2.189E-04	1.151E+02	1.959E-02
Vinyl chloride - HAP/VOC	2.208E-02	8.494E+00	5.707E-04	3.000E+02	2.429E-02
Xylenes - HAP/VOC	6.165E-02	1.396E+01	9.381E-04	4.931E+02	6.782E-02

Summary Report

Landfill Name or Identifier: Levin Landfill

Date: Tuesday, 21 November 2023

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate ($year^{-1}$)
L_o = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**2004**	
Landfill Closure Year (with 80-year limit)	**2021**	
Actual Closure Year (without limit)	***2021***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity		*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.063**	$year^{-1}$
Potential Methane Generation Capacity, L_o	**79**	m^3/Mg
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2004	6,993	7,692	0	0
2005	17,994	19,793	6,993	7,692
2006	15,550	17,105	24,987	27,485
2007	16,411	18,052	40,537	44,590
2008	16,636	18,300	56,948	62,642
2009	30,590	33,648	73,584	80,942
2010	32,979	36,277	104,173	114,591
2011	33,495	36,845	137,152	150,867
2012	32,308	35,539	170,647	187,712
2013	37,650	41,415	202,955	223,250
2014	36,186	39,805	240,605	264,665
2015	34,565	38,022	276,791	304,470
2016	35,285	38,814	311,356	342,492
2017	33,073	36,380	346,641	381,305
2018	36,428	40,071	379,714	417,685
2019	34,751	38,226	416,142	457,756
2020	38,480	42,328	450,893	495,982
2021	25,084	27,592	489,373	538,310
2022	0	0	514,457	565,903
2023	0	0	514,457	565,903
2024	0	0	514,457	565,903
2025	0	0	514,457	565,903
2026	0	0	514,457	565,903
2027	0	0	514,457	565,903
2028	0	0	514,457	565,903
2029	0	0	514,457	565,903
2030	0	0	514,457	565,903
2031	0	0	514,457	565,903
2032	0	0	514,457	565,903
2033	0	0	514,457	565,903
2034	0	0	514,457	565,903
2035	0	0	514,457	565,903
2036	0	0	514,457	565,903
2037	0	0	514,457	565,903
2038	0	0	514,457	565,903
2039	0	0	514,457	565,903
2040	0	0	514,457	565,903
2041	0	0	514,457	565,903
2042	0	0	514,457	565,903
2043	0	0	514,457	565,903

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2044	0	0	514,457	565,903
2045	0	0	514,457	565,903
2046	0	0	514,457	565,903
2047	0	0	514,457	565,903
2048	0	0	514,457	565,903
2049	0	0	514,457	565,903
2050	0	0	514,457	565,903
2051	0	0	514,457	565,903
2052	0	0	514,457	565,903
2053	0	0	514,457	565,903
2054	0	0	514,457	565,903
2055	0	0	514,457	565,903
2056	0	0	514,457	565,903
2057	0	0	514,457	565,903
2058	0	0	514,457	565,903
2059	0	0	514,457	565,903
2060	0	0	514,457	565,903
2061	0	0	514,457	565,903
2062	0	0	514,457	565,903
2063	0	0	514,457	565,903
2064	0	0	514,457	565,903
2065	0	0	514,457	565,903
2066	0	0	514,457	565,903
2067	0	0	514,457	565,903
2068	0	0	514,457	565,903
2069	0	0	514,457	565,903
2070	0	0	514,457	565,903
2071	0	0	514,457	565,903
2072	0	0	514,457	565,903
2073	0	0	514,457	565,903
2074	0	0	514,457	565,903
2075	0	0	514,457	565,903
2076	0	0	514,457	565,903
2077	0	0	514,457	565,903
2078	0	0	514,457	565,903
2079	0	0	514,457	565,903
2080	0	0	514,457	565,903
2081	0	0	514,457	565,903
2082	0	0	514,457	565,903
2083	0	0	514,457	565,903

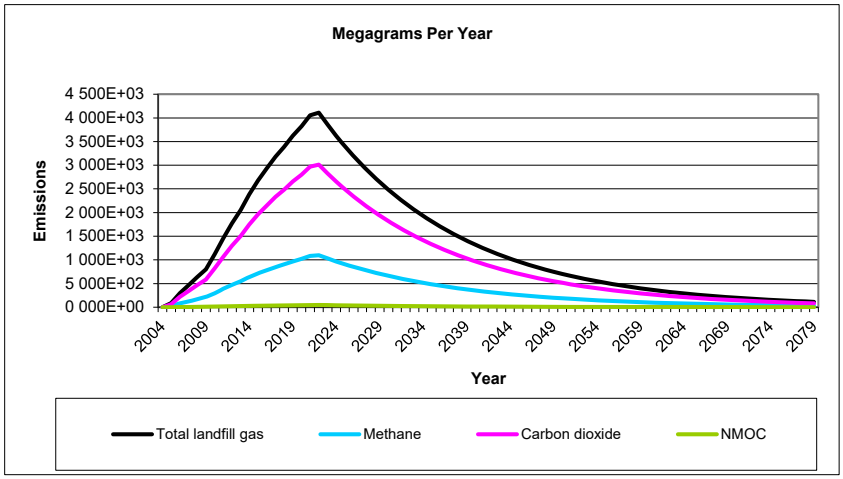
Pollutant Parameters

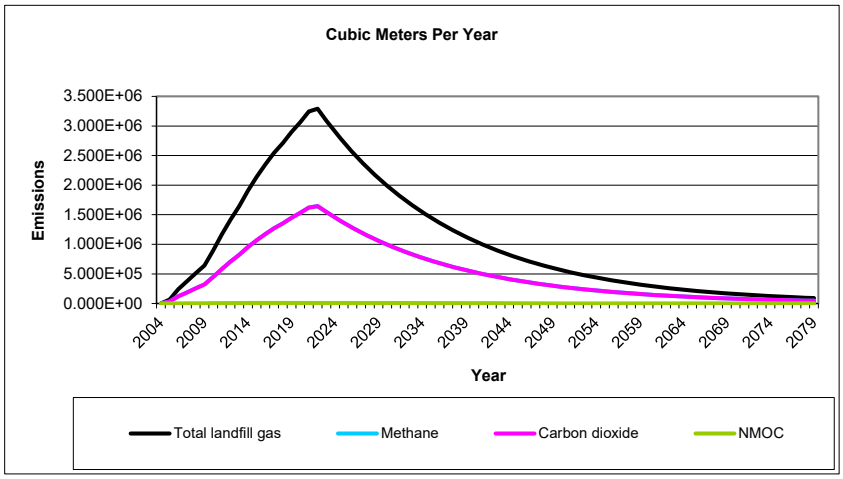
		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

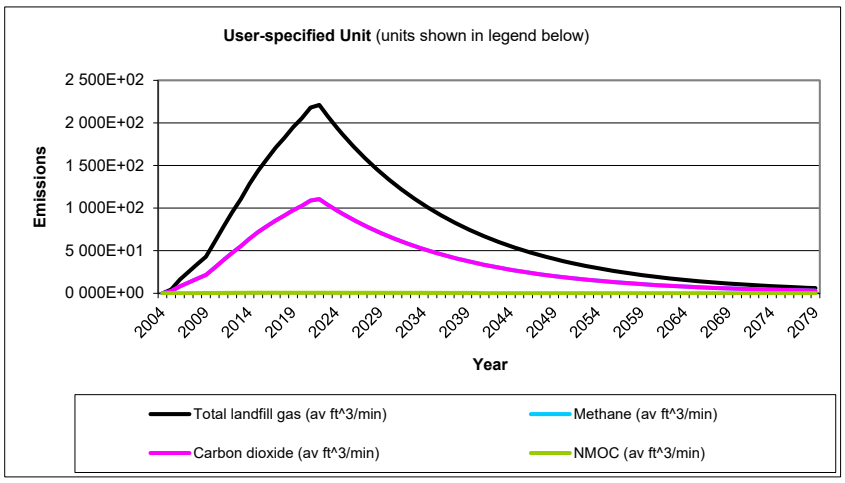
Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethy benzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
4 500E+03
4 000E+03
3 500E+03
3 000E+03
2 500E+03
2 000E+03
1 500E+03
1 000E+03
5 000E+02
0 000E+00
2004
2009
2014
2019
2024
2029
2034
2039
2044
2049
2054
2059
2064
2069
2074
2079
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
3.500E+06
3.000E+06
2.500E+06
2.000E+06
1.500E+06
1.000E+06
5.000E+05
0.000E+00
2004
2009
2014
2019
2024
2029
2034
2039
2044
2049
2054
2059
2064
2069
2074
2079
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
2 500E+02
2 000E+02
1 500E+02
1 000E+02
5 000E+01
0 000E+00
2004
2009
2014
2019
2024
2029
2034
2039
2044
2049
2054
2059
2064
2069
2074
2079
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2004	0	0	0	0	0	0
2005	8.470E+01	6.782E+04	4.557E+00	2.262E+01	3.391E+04	2.279E+00
2006	2.975E+02	2.382E+05	1.601E+01	7.946E+01	1.191E+05	8.003E+00
2007	4.677E+02	3.745E+05	2.516E+01	1.249E+02	1.872E+05	1.258E+01
2008	6.379E+02	5.108E+05	3.432E+01	1.704E+02	2.554E+05	1.716E+01
2009	8.005E+02	6.410E+05	4.307E+01	2.138E+02	3.205E+05	2.153E+01
2010	1.122E+03	8.985E+05	6.037E+01	2.997E+02	4.493E+05	3.019E+01
2011	1.453E+03	1.164E+06	7.818E+01	3.881E+02	5.818E+05	3.909E+01
2012	1.770E+03	1.417E+06	9.523E+01	4.728E+02	7.087E+05	4.762E+01
2013	2.053E+03	1.644E+06	1.105E+02	5.485E+02	8.221E+05	5.524E+01
2014	2.384E+03	1.909E+06	1.283E+02	6.368E+02	9.545E+05	6.413E+01
2015	2.677E+03	2.143E+06	1.440E+02	7.150E+02	1.072E+06	7.201E+01
2016	2.932E+03	2.348E+06	1.578E+02	7.832E+02	1.174E+06	7.888E+01
2017	3.180E+03	2.547E+06	1.711E+02	8.495E+02	1.273E+06	8.556E+01
2018	3.387E+03	2.712E+06	1.822E+02	9.047E+02	1.356E+06	9.111E+01
2019	3.621E+03	2.900E+06	1.948E+02	9.673E+02	1.450E+06	9.742E+01
2020	3.821E+03	3.060E+06	2.056E+02	1.021E+03	1.530E+06	1.028E+02
2021	4.054E+03	3.246E+06	2.181E+02	1.083E+03	1.623E+06	1.091E+02
2022	4.110E+03	3.291E+06	2.211E+02	1.098E+03	1.646E+06	1.106E+02
2023	3.859E+03	3.090E+06	2.076E+02	1.031E+03	1.545E+06	1.038E+02
2024	3.624E+03	2.902E+06	1.950E+02	9.679E+02	1.451E+06	9.748E+01
2025	3.402E+03	2.724E+06	1.831E+02	9.088E+02	1.362E+06	9.153E+01
2026	3.195E+03	2.558E+06	1.719E+02	8.533E+02	1.279E+06	8.594E+01
2027	3.000E+03	2.402E+06	1.614E+02	8.012E+02	1.201E+06	8.069E+01
2028	2.816E+03	2.255E+06	1.515E+02	7.523E+02	1.128E+06	7.577E+01
2029	2.644E+03	2.118E+06	1.423E+02	7.064E+02	1.059E+06	7.114E+01
2030	2.483E+03	1.988E+06	1.336E+02	6.632E+02	9.941E+05	6.680E+01
2031	2.331E+03	1.867E+06	1.254E+02	6.227E+02	9.334E+05	6.272E+01
2032	2.189E+03	1.753E+06	1.178E+02	5.847E+02	8.765E+05	5.889E+01
2033	2.055E+03	1.646E+06	1.106E+02	5.490E+02	8.229E+05	5.529E+01
2034	1.930E+03	1.545E+06	1.038E+02	5.155E+02	7.727E+05	5.192E+01
2035	1.812E+03	1.451E+06	9.749E+01	4.840E+02	7.255E+05	4.875E+01
2036	1.701E+03	1.362E+06	9.154E+01	4.545E+02	6.812E+05	4.577E+01
2037	1.598E+03	1.279E+06	8.595E+01	4.267E+02	6.396E+05	4.298E+01
2038	1.500E+03	1.201E+06	8.071E+01	4.007E+02	6.006E+05	4.035E+01
2039	1.408E+03	1.128E+06	7.578E+01	3.762E+02	5.639E+05	3.789E+01
2040	1.322E+03	1.059E+06	7.115E+01	3.532E+02	5.295E+05	3.558E+01
2041	1.242E+03	9.943E+05	6.681E+01	3.317E+02	4.971E+05	3.340E+01
2042	1.166E+03	9.336E+05	6.273E+01	3.114E+02	4.668E+05	3.136E+01
2043	1.095E+03	8.766E+05	5.890E+01	2.924E+02	4.383E+05	2.945E+01
2044	1.028E+03	8.231E+05	5.530E+01	2.746E+02	4.115E+05	2.765E+01
2045	9.651E+02	7.728E+05	5.193E+01	2.578E+02	3.864E+05	2.596E+01
2046	9.062E+02	7.256E+05	4.875E+01	2.420E+02	3.628E+05	2.438E+01
2047	8.508E+02	6.813E+05	4.578E+01	2.273E+02	3.407E+05	2.289E+01
2048	7.989E+02	6.397E+05	4.298E+01	2.134E+02	3.199E+05	2.149E+01
2049	7.501E+02	6.007E+05	4.036E+01	2.004E+02	3.003E+05	2.018E+01
2050	7.043E+02	5.640E+05	3.789E+01	1.881E+02	2.820E+05	1.895E+01
2051	6.613E+02	5.296E+05	3.558E+01	1.766E+02	2.648E+05	1.779E+01
2052	6.209E+02	4.972E+05	3.341E+01	1.659E+02	2.486E+05	1.670E+01
2053	5.830E+02	4.669E+05	3.137E+01	1.557E+02	2.334E+05	1.568E+01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2054	5.474E+02	4.384E+05	2.945E+01	1.462E+02	2.192E+05	1.473E+01
2055	5.140E+02	4.116E+05	2.765E+01	1.373E+02	2.058E+05	1.383E+01
2056	4.826E+02	3.865E+05	2.597E+01	1.289E+02	1.932E+05	1.298E+01
2057	4.532E+02	3.629E+05	2.438E+01	1.210E+02	1.814E+05	1.219E+01
2058	4.255E+02	3.407E+05	2.289E+01	1.137E+02	1.704E+05	1.145E+01
2059	3.995E+02	3.199E+05	2.149E+01	1.067E+02	1.600E+05	1.075E+01
2060	3.751E+02	3.004E+05	2.018E+01	1.002E+02	1.502E+05	1.009E+01
2061	3.522E+02	2.820E+05	1.895E+01	9.408E+01	1.410E+05	9.475E+00
2062	3.307E+02	2.648E+05	1.779E+01	8.834E+01	1.324E+05	8.896E+00
2063	3.105E+02	2.486E+05	1.671E+01	8.294E+01	1.243E+05	8.353E+00
2064	2.916E+02	2.335E+05	1.569E+01	7.788E+01	1.167E+05	7.843E+00
2065	2.738E+02	2.192E+05	1.473E+01	7.312E+01	1.096E+05	7.364E+00
2066	2.570E+02	2.058E+05	1.383E+01	6.866E+01	1.029E+05	6.915E+00
2067	2.413E+02	1.933E+05	1.299E+01	6.447E+01	9.663E+04	6.493E+00
2068	2.266E+02	1.815E+05	1.219E+01	6.053E+01	9.073E+04	6.096E+00
2069	2.128E+02	1.704E+05	1.145E+01	5.683E+01	8.519E+04	5.724E+00
2070	1.998E+02	1.600E+05	1.075E+01	5.336E+01	7.999E+04	5.374E+00
2071	1.876E+02	1.502E+05	1.009E+01	5.011E+01	7.510E+04	5.046E+00
2072	1.761E+02	1.410E+05	9.476E+00	4.705E+01	7.052E+04	4.738E+00
2073	1.654E+02	1.324E+05	8.898E+00	4.417E+01	6.621E+04	4.449E+00
2074	1.553E+02	1.243E+05	8.355E+00	4.148E+01	6.217E+04	4.177E+00
2075	1.458E+02	1.167E+05	7.844E+00	3.894E+01	5.837E+04	3.922E+00
2076	1.369E+02	1.096E+05	7.365E+00	3.657E+01	5.481E+04	3.683E+00
2077	1.285E+02	1.029E+05	6.916E+00	3.433E+01	5.146E+04	3.458E+00
2078	1.207E+02	9.664E+04	6.493E+00	3.224E+01	4.832E+04	3.247E+00
2079	1.133E+02	9.074E+04	6.097E+00	3.027E+01	4.537E+04	3.049E+00
2080	1.064E+02	8.520E+04	5.725E+00	2.842E+01	4.260E+04	2.862E+00
2081	9.991E+01	8.000E+04	5.375E+00	2.669E+01	4.000E+04	2.688E+00
2082	9.381E+01	7.512E+04	5.047E+00	2.506E+01	3.756E+04	2.524E+00
2083	8.808E+01	7.053E+04	4.739E+00	2.353E+01	3.526E+04	2.369E+00
2084	8.270E+01	6.622E+04	4.450E+00	2.209E+01	3.311E+04	2.225E+00
2085	7.765E+01	6.218E+04	4.178E+00	2.074E+01	3.109E+04	2.089E+00
2086	7.291E+01	5.838E+04	3.923E+00	1.948E+01	2.919E+04	1.961E+00
2087	6.846E+01	5.482E+04	3.683E+00	1.829E+01	2.741E+04	1.842E+00
2088	6.428E+01	5.147E+04	3.458E+00	1.717E+01	2.574E+04	1.729E+00
2089	6.035E+01	4.833E+04	3.247E+00	1.612E+01	2.416E+04	1.624E+00
2090	5.667E+01	4.538E+04	3.049E+00	1.514E+01	2.269E+04	1.524E+00
2091	5.321E+01	4.261E+04	2.863E+00	1.421E+01	2.130E+04	1.431E+00
2092	4.996E+01	4.001E+04	2.688E+00	1.335E+01	2.000E+04	1.344E+00
2093	4.691E+01	3.756E+04	2.524E+00	1.253E+01	1.878E+04	1.262E+00
2094	4.405E+01	3.527E+04	2.370E+00	1.177E+01	1.764E+04	1.185E+00
2095	4.136E+01	3.312E+04	2.225E+00	1.105E+01	1.656E+04	1.113E+00
2096	3.883E+01	3.109E+04	2.089E+00	1.037E+01	1.555E+04	1.045E+00
2097	3.646E+01	2.920E+04	1.962E+00	9.739E+00	1.460E+04	9.808E-01
2098	3.423E+01	2.741E+04	1.842E+00	9.144E+00	1.371E+04	9.210E-01
2099	3.214E+01	2.574E+04	1.729E+00	8.586E+00	1.287E+04	8.647E-01
2100	3.018E+01	2.417E+04	1.624E+00	8.062E+00	1.208E+04	8.119E-01
2101	2.834E+01	2.269E+04	1.525E+00	7.570E+00	1.135E+04	7.624E-01
2102	2.661E+01	2.131E+04	1.432E+00	7.107E+00	1.065E+04	7.158E-01
2103	2.498E+01	2.001E+04	1.344E+00	6.673E+00	1.000E+04	6.721E-01
2104	2.346E+01	1.878E+04	1.262E+00	6.266E+00	9.392E+03	6.311E-01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2105	2.203E+01	1.764E+04	1.185E+00	5.883E+00	8.819E+03	5.925E-01
2106	2.068E+01	1.656E+04	1.113E+00	5.524E+00	8.280E+03	5.564E-01
2107	1.942E+01	1.555E+04	1.045E+00	5.187E+00	7.775E+03	5.224E-01
2108	1.823E+01	1.460E+04	9.810E-01	4.870E+00	7.300E+03	4.905E-01
2109	1.712E+01	1.371E+04	9.211E-01	4.573E+00	6.854E+03	4.605E-01
2110	1.607E+01	1.287E+04	8.649E-01	4.294E+00	6.436E+03	4.324E-01
2111	1.509E+01	1.209E+04	8.120E-01	4.032E+00	6.043E+03	4.060E-01
2112	1.417E+01	1.135E+04	7.625E-01	3.785E+00	5.674E+03	3.812E-01
2113	1.331E+01	1.066E+04	7.159E-01	3.554E+00	5.328E+03	3.580E-01
2114	1.249E+01	1.000E+04	6.722E-01	3.337E+00	5.002E+03	3.361E-01
2115	1.173E+01	9.394E+03	6.312E-01	3.133E+00	4.697E+03	3.156E-01
2116	1.101E+01	8.820E+03	5.926E-01	2.942E+00	4.410E+03	2.963E-01
2117	1.034E+01	8.282E+03	5.564E-01	2.763E+00	4.141E+03	2.782E-01
2118	9.711E+00	7.776E+03	5.225E-01	2.594E+00	3.888E+03	2.612E-01
2119	9.118E+00	7.301E+03	4.906E-01	2.435E+00	3.651E+03	2.453E-01
2120	8.561E+00	6.855E+03	4.606E-01	2.287E+00	3.428E+03	2.303E-01
2121	8.038E+00	6.437E+03	4.325E-01	2.147E+00	3.218E+03	2.162E-01
2122	7.548E+00	6.044E+03	4.061E-01	2.016E+00	3.022E+03	2.030E-01
2123	7.087E+00	5.675E+03	3.813E-01	1.893E+00	2.837E+03	1.906E-01
2124	6.654E+00	5.328E+03	3.580E-01	1.777E+00	2.664E+03	1.790E-01
2125	6.248E+00	5.003E+03	3.361E-01	1.669E+00	2.501E+03	1.681E-01
2126	5.866E+00	4.698E+03	3.156E-01	1.567E+00	2.349E+03	1.578E-01
2127	5.508E+00	4.411E+03	2.964E-01	1.471E+00	2.205E+03	1.482E-01
2128	5.172E+00	4.141E+03	2.783E-01	1.381E+00	2.071E+03	1.391E-01
2129	4.856E+00	3.889E+03	2.613E-01	1.297E+00	1.944E+03	1.306E-01
2130	4.560E+00	3.651E+03	2.453E-01	1.218E+00	1.826E+03	1.227E-01
2131	4.281E+00	3.428E+03	2.303E-01	1.144E+00	1.714E+03	1.152E-01
2132	4.020E+00	3.219E+03	2.163E-01	1.074E+00	1.609E+03	1.081E-01
2133	3.774E+00	3.022E+03	2.031E-01	1.008E+00	1.511E+03	1.015E-01
2134	3.544E+00	2.838E+03	1.907E-01	9.466E-01	1.419E+03	9.534E-02
2135	3.328E+00	2.665E+03	1.790E-01	8.888E-01	1.332E+03	8.952E-02
2136	3.124E+00	2.502E+03	1.681E-01	8.346E-01	1.251E+03	8.405E-02
2137	2.934E+00	2.349E+03	1.578E-01	7.836E-01	1.175E+03	7.892E-02
2138	2.754E+00	2.206E+03	1.482E-01	7.358E-01	1.103E+03	7.410E-02
2139	2.586E+00	2.071E+03	1.392E-01	6.908E-01	1.036E+03	6.958E-02
2140	2.428E+00	1.945E+03	1.307E-01	6.487E-01	9.723E+02	6.533E-02
2141	2.280E+00	1.826E+03	1.227E-01	6.090E-01	9.129E+02	6.134E-02
2142	2.141E+00	1.714E+03	1.152E-01	5.719E-01	8.572E+02	5.759E-02
2143	2.010E+00	1.610E+03	1.082E-01	5.369E-01	8.048E+02	5.408E-02
2144	1.887E+00	1.511E+03	1.016E-01	5.042E-01	7.557E+02	5.078E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2004	0	0	0	0	0	0
2005	6.208E+01	3.391E+04	2.279E+00	9.724E-01	2.713E+02	1.823E-02
2006	2.180E+02	1.191E+05	8.003E+00	3.415E+00	9.529E+02	6.402E-02
2007	3.428E+02	1.872E+05	1.258E+01	5.369E+00	1.498E+03	1.006E-01
2008	4.675E+02	2.554E+05	1.716E+01	7.324E+00	2.043E+03	1.373E-01
2009	5.867E+02	3.205E+05	2.153E+01	9.190E+00	2.564E+03	1.723E-01
2010	8.224E+02	4.493E+05	3.019E+01	1.288E+01	3.594E+03	2.415E-01
2011	1.065E+03	5.818E+05	3.909E+01	1.668E+01	4.654E+03	3.127E-01
2012	1.297E+03	7.087E+05	4.762E+01	2.032E+01	5.670E+03	3.809E-01
2013	1.505E+03	8.221E+05	5.524E+01	2.357E+01	6.577E+03	4.419E-01
2014	1.747E+03	9.545E+05	6.413E+01	2.737E+01	7.636E+03	5.131E-01
2015	1.962E+03	1.072E+06	7.201E+01	3.073E+01	8.574E+03	5.761E-01
2016	2.149E+03	1.174E+06	7.888E+01	3.366E+01	9.391E+03	6.310E-01
2017	2.331E+03	1.273E+06	8.556E+01	3.651E+01	1.019E+04	6.845E-01
2018	2.482E+03	1.356E+06	9.111E+01	3.888E+01	1.085E+04	7.289E-01
2019	2.654E+03	1.450E+06	9.742E+01	4.158E+01	1.160E+04	7.793E-01
2020	2.800E+03	1.530E+06	1.028E+02	4.387E+01	1.224E+04	8.223E-01
2021	2.971E+03	1.623E+06	1.091E+02	4.654E+01	1.298E+04	8.724E-01
2022	3.012E+03	1.646E+06	1.106E+02	4.719E+01	1.317E+04	8.846E-01
2023	2.828E+03	1.545E+06	1.038E+02	4.431E+01	1.236E+04	8.306E-01
2024	2.656E+03	1.451E+06	9.748E+01	4.160E+01	1.161E+04	7.798E-01
2025	2.494E+03	1.362E+06	9.153E+01	3.906E+01	1.090E+04	7.322E-01
2026	2.341E+03	1.279E+06	8.594E+01	3.668E+01	1.023E+04	6.875E-01
2027	2.198E+03	1.201E+06	8.069E+01	3.444E+01	9.608E+03	6.455E-01
2028	2.064E+03	1.128E+06	7.577E+01	3.234E+01	9.021E+03	6.061E-01
2029	1.938E+03	1.059E+06	7.114E+01	3.036E+01	8.470E+03	5.691E-01
2030	1.820E+03	9.941E+05	6.680E+01	2.851E+01	7.953E+03	5.344E-01
2031	1.709E+03	9.334E+05	6.272E+01	2.677E+01	7.468E+03	5.017E-01
2032	1.604E+03	8.765E+05	5.889E+01	2.513E+01	7.012E+03	4.711E-01
2033	1.506E+03	8.229E+05	5.529E+01	2.360E+01	6.584E+03	4.423E-01
2034	1.414E+03	7.727E+05	5.192E+01	2.216E+01	6.182E+03	4.153E-01
2035	1.328E+03	7.255E+05	4.875E+01	2.080E+01	5.804E+03	3.900E-01
2036	1.247E+03	6.812E+05	4.577E+01	1.953E+01	5.450E+03	3.662E-01
2037	1.171E+03	6.396E+05	4.298E+01	1.834E+01	5.117E+03	3.438E-01
2038	1.099E+03	6.006E+05	4.035E+01	1.722E+01	4.805E+03	3.228E-01
2039	1.032E+03	5.639E+05	3.789E+01	1.617E+01	4.511E+03	3.031E-01
2040	9.692E+02	5.295E+05	3.558E+01	1.518E+01	4.236E+03	2.846E-01
2041	9.100E+02	4.971E+05	3.340E+01	1.426E+01	3.977E+03	2.672E-01
2042	8.545E+02	4.668E+05	3.136E+01	1.339E+01	3.734E+03	2.509E-01
2043	8.023E+02	4.383E+05	2.945E+01	1.257E+01	3.506E+03	2.356E-01
2044	7.533E+02	4.115E+05	2.765E+01	1.180E+01	3.292E+03	2.212E-01
2045	7.073E+02	3.864E+05	2.596E+01	1.108E+01	3.091E+03	2.077E-01
2046	6.641E+02	3.628E+05	2.438E+01	1.040E+01	2.903E+03	1.950E-01
2047	6.236E+02	3.407E+05	2.289E+01	9.769E+00	2.725E+03	1.831E-01
2048	5.855E+02	3.199E+05	2.149E+01	9.172E+00	2.559E+03	1.719E-01
2049	5.498E+02	3.003E+05	2.018E+01	8.612E+00	2.403E+03	1.614E-01
2050	5.162E+02	2.820E+05	1.895E+01	8.086E+00	2.256E+03	1.516E-01
2051	4.847E+02	2.648E+05	1.779E+01	7.593E+00	2.118E+03	1.423E-01
2052	4.551E+02	2.486E+05	1.670E+01	7.129E+00	1.989E+03	1.336E-01
2053	4.273E+02	2.334E+05	1.568E+01	6.694E+00	1.867E+03	1.255E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2054	4.012E+02	2.192E+05	1.473E+01	6.285E+00	1.753E+03	1.178E-01
2055	3.767E+02	2.058E+05	1.383E+01	5.901E+00	1.646E+03	1.106E-01
2056	3.537E+02	1.932E+05	1.298E+01	5.541E+00	1.546E+03	1.039E-01
2057	3.321E+02	1.814E+05	1.219E+01	5.203E+00	1.451E+03	9.752E-02
2058	3.118E+02	1.704E+05	1.145E+01	4.885E+00	1.363E+03	9.157E-02
2059	2.928E+02	1.600E+05	1.075E+01	4.587E+00	1.280E+03	8.598E-02
2060	2.749E+02	1.502E+05	1.009E+01	4.307E+00	1.202E+03	8.073E-02
2061	2.581E+02	1.410E+05	9.475E+00	4.044E+00	1.128E+03	7.580E-02
2062	2.424E+02	1.324E+05	8.896E+00	3.797E+00	1.059E+03	7.117E-02
2063	2.276E+02	1.243E+05	8.353E+00	3.565E+00	9.946E+02	6.683E-02
2064	2.137E+02	1.167E+05	7.843E+00	3.347E+00	9.339E+02	6.275E-02
2065	2.006E+02	1.096E+05	7.364E+00	3.143E+00	8.768E+02	5.891E-02
2066	1.884E+02	1.029E+05	6.915E+00	2.951E+00	8.233E+02	5.532E-02
2067	1.769E+02	9.663E+04	6.493E+00	2.771E+00	7.730E+02	5.194E-02
2068	1.661E+02	9.073E+04	6.096E+00	2.602E+00	7.258E+02	4.877E-02
2069	1.559E+02	8.519E+04	5.724E+00	2.443E+00	6.815E+02	4.579E-02
2070	1.464E+02	7.999E+04	5.374E+00	2.294E+00	6.399E+02	4.300E-02
2071	1.375E+02	7.510E+04	5.046E+00	2.154E+00	6.008E+02	4.037E-02
2072	1.291E+02	7.052E+04	4.738E+00	2.022E+00	5.642E+02	3.791E-02
2073	1.212E+02	6.621E+04	4.449E+00	1.899E+00	5.297E+02	3.559E-02
2074	1.138E+02	6.217E+04	4.177E+00	1.783E+00	4.974E+02	3.342E-02
2075	1.069E+02	5.837E+04	3.922E+00	1.674E+00	4.670E+02	3.138E-02
2076	1.003E+02	5.481E+04	3.683E+00	1.572E+00	4.385E+02	2.946E-02
2077	9.421E+01	5.146E+04	3.458E+00	1.476E+00	4.117E+02	2.766E-02
2078	8.845E+01	4.832E+04	3.247E+00	1.386E+00	3.866E+02	2.597E-02
2079	8.305E+01	4.537E+04	3.049E+00	1.301E+00	3.630E+02	2.439E-02
2080	7.798E+01	4.260E+04	2.862E+00	1.222E+00	3.408E+02	2.290E-02
2081	7.322E+01	4.000E+04	2.688E+00	1.147E+00	3.200E+02	2.150E-02
2082	6.875E+01	3.756E+04	2.524E+00	1.077E+00	3.005E+02	2.019E-02
2083	6.455E+01	3.526E+04	2.369E+00	1.011E+00	2.821E+02	1.896E-02
2084	6.061E+01	3.311E+04	2.225E+00	9.495E-01	2.649E+02	1.780E-02
2085	5.691E+01	3.109E+04	2.089E+00	8.915E-01	2.487E+02	1.671E-02
2086	5.344E+01	2.919E+04	1.961E+00	8.371E-01	2.335E+02	1.569E-02
2087	5.017E+01	2.741E+04	1.842E+00	7.860E-01	2.193E+02	1.473E-02
2088	4.711E+01	2.574E+04	1.729E+00	7.380E-01	2.059E+02	1.383E-02
2089	4.423E+01	2.416E+04	1.624E+00	6.929E-01	1.933E+02	1.299E-02
2090	4.153E+01	2.269E+04	1.524E+00	6.506E-01	1.815E+02	1.220E-02
2091	3.900E+01	2.130E+04	1.431E+00	6.109E-01	1.704E+02	1.145E-02
2092	3.662E+01	2.000E+04	1.344E+00	5.736E-01	1.600E+02	1.075E-02
2093	3.438E+01	1.878E+04	1.262E+00	5.386E-01	1.503E+02	1.010E-02
2094	3.228E+01	1.764E+04	1.185E+00	5.057E-01	1.411E+02	9.479E-03
2095	3.031E+01	1.656E+04	1.113E+00	4.748E-01	1.325E+02	8.900E-03
2096	2.846E+01	1.555E+04	1.045E+00	4.458E-01	1.244E+02	8.357E-03
2097	2.672E+01	1.460E+04	9.808E-01	4.186E-01	1.168E+02	7.847E-03
2098	2.509E+01	1.371E+04	9.210E-01	3.931E-01	1.097E+02	7.368E-03
2099	2.356E+01	1.287E+04	8.647E-01	3.691E-01	1.030E+02	6.918E-03
2100	2.212E+01	1.208E+04	8.119E-01	3.465E-01	9.667E+01	6.495E-03
2101	2.077E+01	1.135E+04	7.624E-01	3.254E-01	9.077E+01	6.099E-03
2102	1.950E+01	1.065E+04	7.158E-01	3.055E-01	8.523E+01	5.726E-03
2103	1.831E+01	1.000E+04	6.721E-01	2.868E-01	8.002E+01	5.377E-03
2104	1.719E+01	9.392E+03	6.311E-01	2.693E-01	7.514E+01	5.049E-03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2105	1.614E+01	8.819E+03	5.925E-01	2.529E-01	7.055E+01	4.740E-03
2106	1.516E+01	8.280E+03	5.564E-01	2.374E-01	6.624E+01	4.451E-03
2107	1.423E+01	7.775E+03	5.224E-01	2.229E-01	6.220E+01	4.179E-03
2108	1.336E+01	7.300E+03	4.905E-01	2.093E-01	5.840E+01	3.924E-03
2109	1.255E+01	6.854E+03	4.605E-01	1.966E-01	5.483E+01	3.684E-03
2110	1.178E+01	6.436E+03	4.324E-01	1.846E-01	5.149E+01	3.459E-03
2111	1.106E+01	6.043E+03	4.060E-01	1.733E-01	4.834E+01	3.248E-03
2112	1.039E+01	5.674E+03	3.812E-01	1.627E-01	4.539E+01	3.050E-03
2113	9.752E+00	5.328E+03	3.580E-01	1.528E-01	4.262E+01	2.864E-03
2114	9.157E+00	5.002E+03	3.361E-01	1.434E-01	4.002E+01	2.689E-03
2115	8.598E+00	4.697E+03	3.156E-01	1.347E-01	3.757E+01	2.525E-03
2116	8.073E+00	4.410E+03	2.963E-01	1.265E-01	3.528E+01	2.370E-03
2117	7.580E+00	4.141E+03	2.782E-01	1.187E-01	3.313E+01	2.226E-03
2118	7.117E+00	3.888E+03	2.612E-01	1.115E-01	3.110E+01	2.090E-03
2119	6.682E+00	3.651E+03	2.453E-01	1.047E-01	2.920E+01	1.962E-03
2120	6.274E+00	3.428E+03	2.303E-01	9.829E-02	2.742E+01	1.842E-03
2121	5.891E+00	3.218E+03	2.162E-01	9.229E-02	2.575E+01	1.730E-03
2122	5.532E+00	3.022E+03	2.030E-01	8.666E-02	2.418E+01	1.624E-03
2123	5.194E+00	2.837E+03	1.906E-01	8.136E-02	2.270E+01	1.525E-03
2124	4.877E+00	2.664E+03	1.790E-01	7.640E-02	2.131E+01	1.432E-03
2125	4.579E+00	2.501E+03	1.681E-01	7.173E-02	2.001E+01	1.345E-03
2126	4.299E+00	2.349E+03	1.578E-01	6.735E-02	1.879E+01	1.263E-03
2127	4.037E+00	2.205E+03	1.482E-01	6.324E-02	1.764E+01	1.185E-03
2128	3.790E+00	2.071E+03	1.391E-01	5.938E-02	1.657E+01	1.113E-03
2129	3.559E+00	1.944E+03	1.306E-01	5.575E-02	1.555E+01	1.045E-03
2130	3.342E+00	1.826E+03	1.227E-01	5.235E-02	1.460E+01	9.813E-04
2131	3.138E+00	1.714E+03	1.152E-01	4.915E-02	1.371E+01	9.214E-04
2132	2.946E+00	1.609E+03	1.081E-01	4.615E-02	1.288E+01	8.651E-04
2133	2.766E+00	1.511E+03	1.015E-01	4.333E-02	1.209E+01	8.123E-04
2134	2.597E+00	1.419E+03	9.534E-02	4.069E-02	1.135E+01	7.627E-04
2135	2.439E+00	1.332E+03	8.952E-02	3.820E-02	1.066E+01	7.161E-04
2136	2.290E+00	1.251E+03	8.405E-02	3.587E-02	1.001E+01	6.724E-04
2137	2.150E+00	1.175E+03	7.892E-02	3.368E-02	9.396E+00	6.313E-04
2138	2.019E+00	1.103E+03	7.410E-02	3.162E-02	8.823E+00	5.928E-04
2139	1.895E+00	1.036E+03	6.958E-02	2.969E-02	8.284E+00	5.566E-04
2140	1.780E+00	9.723E+02	6.533E-02	2.788E-02	7.778E+00	5.226E-04
2141	1.671E+00	9.129E+02	6.134E-02	2.618E-02	7.303E+00	4.907E-04
2142	1.569E+00	8.572E+02	5.759E-02	2.458E-02	6.857E+00	4.607E-04
2143	1.473E+00	8.048E+02	5.408E-02	2.308E-02	6.439E+00	4.326E-04
2144	1.383E+00	7.557E+02	5.078E-02	2.167E-02	6.046E+00	4.062E-04