**Section 220.260 Test Methods and Procedures**

a) The landfill owner or operator shall calculate the NMOC emission rate using the equation provided in either subsection (a)(1)(A) or subsection (a)(1)(B) of this Section and make a determination that the emission rate is less than 50 Mg/yr, pursuant to subsection (a)(2), (a)(3), (a)(4), or (e), or install a gas collection and control system pursuant to Sections 220.220 and 220.230 of this Subpart. However, both equations may be used if the actual year-to-year solid waste acceptance rate is known pursuant to subsection (a)(1)(A) of this Section, for part of the life of the landfill and the actual year-to-year solid waste acceptance rate is unknown, pursuant to subsection (a)(1)(B) of this Section, for part of the life of the landfill. If the NMOC emission rate calculated in this subsection is less than 50 Mg/yr, then the landfill owner shall submit an emission rate report as provided in Section 220.280(b) of this Subpart, and shall recalculate the NMOC mass emission rate as required under Section 220.210(c) of this Subpart.

1) The values to be used in both equations are 0.05/yr for k, 170 m3 per Mg for Lo, and 4,000 ppmv as hexane for the CNMOC.

A) The following equation shall be used if the actual year-to-year solid waste acceptance rate is known:

|  |  |  |  |
| --- | --- | --- | --- |
| MNMOC | = | n | 2kLo Mi(e-kti)(CNNMOC)(3.6x10-9) |
| Σ |
| i=1 |

 where:

|  |  |  |
| --- | --- | --- |
| MNMOC | = | Total NMOC emission rate from the landfill, Mg/yr |
| k | = | methane generation rate constant, yr-1 |
| Lo | = | methane generation potential, m3 per Mg solid waste |
| Mi | = | mass of solid waste in the ith section, Mg |
| ti | = | age of solid waste in the ith section, years |
| CNMOC | = | concentration of NMOC, ppmv as hexane |
| 3.6 x 10-9 | = | conversion factor |

 The mass of nondegradable solid waste may be subtracted from the total mass of solid waste in a particular section of the landfill when calculating the value for Mi if documentation of the nature and amount of such wastes is maintained.

B) The following equation shall be used if the actual year-to-year solid waste acceptance rate is unknown:

 MNMOC = 2LoR(e-kc - e(-kt))(CNMOC)(3.6 x 10-9)

 where:

|  |  |  |
| --- | --- | --- |
| MNMOC | = | Total NMOC emission rate from the landfill, Mg/yr |
| Lo | = | methane generation potential, m3 per Mg solid waste |
| R | = | average annual acceptance rate, Mg/yr |
| k | = | methane generation rate constant, year-1 |
| t | = | age of landfill, years |
| CNMOC | = | concentration of NMOC, ppmv as hexane conversion factor |
| c | = | time since closure, years (for active landfill c = 0 and e-kc = 1) |
| 3.6 x 10-9 | = | conversion factor |

 The mass of nondegradable solid waste may be subtracted from the average annual acceptance rate when calculating a value for R, if documentation of the nature and amount of such wastes is maintained.

2) Tier 1. The landfill owner or operator shall calculate the NMOC mass emission rate using the equations provided in subsection (a)(1)(A) or (a)(1)(B) of this Section. The owner or operator shall compare the calculated NMOC mass emission rate to the standard of 50 Mg/yr using the default values for the NMOC mass emission rate and the methane generation rate constant.

3) Tier 2. The landfill owner or operator shall calculate the NMOC mass emission rate using the equations provided in subsection (a)(1)(A) or (a)(1)(B) of this Section using the average NMOC concentration from the collected samples instead of the default value in the equations provided in subsection (a)(1) of this Section. The landfill owner or operator shall determine the NMOC concentration using the following sampling procedure: The landfill owner or operator shall install at least 2 sample probes per hectare of landfill surface that has retained waste for at least 2 years. If the landfill is larger than 25 hectares in area, only 50 samples are required. The sample probes should be located to avoid known areas of nondegradable solid waste. The owner or operator shall collect and analyze one sample of landfill gas from each probe to determine the NMOC concentration using Method 25C or Method 18 of Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part. If using Method 18, the minimum list of compounds to be tested shall be those published in the Compilation of Air Pollutant Emission Factors (AP-42), incorporated by reference in Section 220.130 of this Part. If composite sampling is used, equal volumes shall be taken from each sample probe. If more than the required number of samples are taken, all samples shall be used in the analysis. Divide the NMOC concentration from Method 25C by 6 to convert from CNMOC as carbon to CNMOC as hexane. The owner or operator shall retest the site-specific NMOC concentration every 5 years using the methods specified in this Section.

4) Tier 3. The landfill owner or operator shall estimate the NMOC mass emission rate using equations in subsection (a)(1)(A) or (a)(1)(B) of this Section and using a site-specific methane generation rate constant k, and the site-specific NMOC concentration as determined in subsection (a)(3) of this Section instead of the default values provided in subsection (a)(1) of this Section. The site-specific methane generation rate constant shall be determined using the procedures provided in Method 2E, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part. The calculation of the methane generation rate constant is performed only once, and the value obtained is used in all subsequent annual NMOC emission rate calculations. In addition, pursuant to subsection (a)(3) of this Section, the owner or operator shall retest the site-specific NMOC concentration every 5 years using the methods specified in that subsection.

b) After the installation of a collection and control system in compliance with Sections 220.220 and 220.230 of this Subpart, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in Section 220.250(h) of this Subpart, using the following equation:

 MNMOC = 1.89 x 10-3 QLFG CNMOC

 where:

|  |  |  |
| --- | --- | --- |
| MNMOC | = | mass emission rate of NMOC (Mg/yr) |
| QLFG | = | flow rate of landfill gas (m3/minute) |
| CNMOC | = | NMOC concentration (ppmv as hexane) |

1) The flow rate of landfill gas (QLFG) shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of Section 4 of Method 2E, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part.

2) The average NMOC concentration (CNMOC) shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25C or Method 18, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part. If using Method 18, the minimum list of compounds to be tested shall be those published in the Compilation of Air Pollutant Emission Factors (AP-42), incorporated by reference in Section 220.130 of this Part. The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25C by 6 to convert CNMOC as carbon to CNMOC as hexane.

c) If the gas collection system complies with the provisions in Section 220.220 of this Subpart and is already installed, the owner or operator shall estimate the NMOC emission rate using the procedures provided in subsection (b) of this Section. For areas of the landfill where the owner or operator has not been required to install a well yet, he/she may select an appropriate method from subsection (a) of this Section to estimate emissions.

d) For the performance test required in Section 220.210(d)(2) of this Subpart, Method 25C or Method 18, Appendix A, 40 CFR 60, incorporated by reference in Section 220.130 of this Part, shall be used to determine compliance with 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Agency as provided by Section 220.230(d) of this Subpart. If using Method 18, the minimum list of compounds to be tested shall be those published in the Compilation of Air Pollutant Emission Factors (AP-42), incorporated by reference in Section 220.130 of this Part. The following equation shall be used to calculate efficiency:

 Control efficiency = (NMOCin - NMOCout)/(NMOCin)

 where:

|  |  |  |
| --- | --- | --- |
| NMOCin | = | mass of NMOC entering control device |
| NMOCout | = | mass of NMOC exiting control device |

e) The owner or operator may use other methods to determine the NMOC concentration, site-specific k, or landfill gas flow rate, as an alternate to the methods required in subsection (a)(3) and (a)(4) of this Section, if the method has been approved by the Agency, as provided for in Section 220.220(d) or Section 220.230(d) of this Subpart.

f) The owner or operator may use the procedures described in AP-42, Compilation of Air Pollutant Emission Factors, incorporated by reference in Section 220.130 of this Part, to estimate emissions pursuant to the annual emission report required in 35 Ill. Adm. Code 210.302(a). The most recent values for k, Lo, and NMOC concentration reported in AP-42 shall be used to calculate emissions. To determine applicability of or compliance with the requirements of this Part, the owner or operator must use the tiered emission estimates provided in subsections (a)(1) through (a)(4) of this Section.

g) Testing:

1) Upon a request by the Agency, the owner or operator of an MSW landfill shall at his own expense demonstrate compliance with the applicable requirements of this Subpart using the appropriate test method.

2) An owner or operator planning to conduct a test to demonstrate compliance with this Subpart shall notify the Agency of that intent not less than 30 days before the planned initiation of the tests so that the Agency may observe the test.