

3745-76-10

**Compliance provisions.**

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, federal rules, and federal statutory provisions referenced in this rule, see ~~the last~~ paragraph (B)(31) of rule 3745-76-01 of the Administrative Code titled "~~Incorporation by reference~~Referenced materials."]

(A) Except as provided in paragraph (B)(2)(a)(ii) of rule 3745-76-07 of the Administrative Code, the specified methods in paragraphs (A)(1) to (A)(6) of this rule shall be used to determine whether the gas collection system is in compliance with paragraph (B)(2)(b) of rule 3745-76-07 of the Administrative Code.

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with paragraph (B)(2)(b)(i)(a) of rule 3745-76-07 of the Administrative Code, one of the following equations shall be used. The  $k$  and  $l$  kinetic factors should be those published in the most recent "Compilation<sup>o</sup> of Air Pollutant Emission Factors (AP-42)" or other site specific values demonstrated to be appropriate and approved by the director. If  $k$  has been determined as specified in paragraph (A)(4) of rule 3745-76-09 of the Administrative Code, the value of  $k$  determined from the test shall be used. A value of no more than fifteen years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.

(a) For sites with unknown year-to-year solid waste acceptance rate:

$$Q_M = 2L_o R (e^{-kc} - e^{-kt})$$

Where,

$Q_M$  = maximum expected gas generation flow rate, cubic meters per year

$L_o$  = methane generation potential, cubic meters per megagram solid waste

$R$  = average annual acceptance rate, megagrams per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$t$  = age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure,  $t$  is the age of the landfill at installation, years

$c$  = time since closure, years (for an active landfill  $c = 0$  and  $e^{-kc} = 1$ )

(b) For sites with known year-to-year solid waste acceptance rate:

$$Q_M = \sum_{i=1}^n 2kL_0M_i(e^{-kt_i})$$

Where,

$Q_M$  = maximum expected gas generation flow rate, cubic meters per year

$k$  = methane generation rate constant, year<sup>-1</sup>

$L_o$  = methane generation potential, cubic meters per megagram solid waste

$M_i$  = mass of solid waste in the  $i^{\text{th}}$  section, megagrams

$t_i$  = age of the  $i^{\text{th}}$  section, years

(c) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in paragraph (A)(1)(a) and paragraph (A)(1)(b) of this rule. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in paragraph (A)(1)(a) or (A)(1)(b) of this rule or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

- (2) For the purposes of determining sufficient density of gas collectors for compliance with paragraph (B)(2)(b)(i)(b) of rule 3745-76-07 of the Administrative Code, the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the director, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.
- (3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with paragraph (B)(2)(b)(i)(c) of rule

3745-76-07 of the Administrative Code, the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within five calendar days, except for the three conditions allowed under paragraph (B) of rule 3745-76-08 of the Administrative Code. If negative pressure cannot be achieved without excess air infiltration within fifteen calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within one hundred twenty days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Director for approval.

- (4) Owners or operators are not required to expand the system as required in paragraph (A)(3) of this rule during the first one hundred eighty days after gas collection system start-up.
  - (5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in paragraph (C) of rule 3745-76-08 of the Administrative Code. If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within five calendar days. If correction of the exceedance cannot be achieved within fifteen calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within one hundred twenty days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Director for approval.
  - (6) An owner or operator seeking to demonstrate compliance with paragraph (B)(2)(b)(i)(d) of rule 3745-76-07 of the Administrative Code through the use of a collection system not conforming to the specifications provided in rule 3745-76-14 of the Administrative Code shall provide information satisfactory to the director as specified in paragraph (B)(2)(a)(iii) of rule 3745-76-07 of the Administrative Code demonstrating that off-site migration is being controlled.
- (B) For purposes of compliance with paragraph (A) of rule 3745-76-08 of the Administrative Code, each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in paragraph (B)(2)(a) of rule 3745-76-07 of the Administrative Code. Each well shall be installed no later than sixty days after the date on which the initial solid waste has been in place for a period of:

- (1) Five years or more if active; or
- (2) Two years or more if closed or at final grade.

Each well shall be installed as a measure to abate or minimize the migration of explosive gas when the director orders the owner or operator to perform such measures pursuant to paragraph ~~(C)~~ of rule ~~3745-76-12~~ (D) of rule 3745-76-08 of the Administrative Code.

(C) The following procedures shall be used for compliance with the surface methane operational standard as provided in paragraph (D) of rule 3745-76-08 of the Administrative Code.

- (1) After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at thirty meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (D) of this rule.
- (2) The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least thirty meters from the perimeter wells.
- (3) Surface emission monitoring shall be performed in accordance with section 8.3.1 of Method 21 of Appendix A of 40 CFR Part 60, except that the probe inlet shall be placed within five to ten centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.
- (4) Any reading of five hundred parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in paragraphs (C)(4)(a) to (C)(4)(e) of this rule shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of paragraph (D) of rule 3745-76-08 of the Administrative Code.
  - (a) The location of each monitored exceedance shall be marked and the location recorded.
  - (b) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be

made and the location shall be re-monitored within ten calendar days of detecting the exceedance.

- (c) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within ten days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (C)(4)(e) of this rule shall be taken, and no further monitoring of that location is required until the action specified in paragraph (C)(4)(e) of this rule has been taken.
  - (d) Any location that initially showed an exceedance but has a methane concentration less than five hundred parts per million methane above background at the ten-day re-monitoring specified in paragraph (C)(4)(b) or (C)(4)(c) of this rule shall be re-monitored one month from the initial exceedance. If the one-month re-monitoring shows a concentration less than five hundred parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the one-month re-monitoring shows an exceedance, the actions specified in paragraph (C)(4)(c) or (C)(4)(e) of this rule shall be taken.
  - (e) For any location where monitored methane concentration equals or exceeds five hundred parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within one hundred twenty calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the director for approval.
- (5) The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis, and as specified in paragraph (E)(12) of rule 3745-27-19 of the Administrative Code and paragraph (A) of rule 3745-27-14 of the Administrative Code.
- (D) Each owner or operator seeking to comply with the provisions in paragraph (C) of this rule shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:
- (1) The portable analyzer shall meet the instrument specifications provided in section 6 of Method 21 of Appendix A of 40 CFR Part 60, except that "methane" shall replace all references to VOC.

- (2) The calibration gas shall be methane, diluted to a nominal concentration of five hundred parts per million in air.
  - (3) To meet the performance evaluation requirements in section 6 of Method 21 of Appendix A of 40 CFR Part 60, the instrument evaluation procedures of section 8.1 of Method 21 of Appendix A of 40 CFR Part 60 shall be used.
  - (4) The calibration procedures provided in section 8.1.1.1 of Method 21 of Appendix A of 40 CFR Part 60 shall be followed immediately before commencing a surface monitoring survey.
- (E) The provisions of this rule apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed five days for collection systems and shall not exceed one hour for treatment or control devices.

Effective:

Five Year Review (FYR) Dates: 05/27/2016

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Certification

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Date

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