

**3745-27-89 Gas management system design.**

- (A) The gas collection and conveyance system at the designated area for bulk liquid addition shall be designed to meet the following:
- (1) To consist of the following:
    - (a) A gas collection layer. Landfill gas collected in the gas collection layer shall be directed to a gas vent or gas well or other gas collection device.
    - (b) Gas wells or elements of the leachate collection system used as gas collection devices. A gas well is a device within a landfill that relies on a gas mover to move gas out of the landfill. A gas well can be vertical or horizontal.
    - (c) A gas mover system. A gas mover system includes the gas mover and associated equipment such as the power source. A gas mover is the equipment used to cause transport of landfill gas (such as fans, blowers, and compressors).
    - (d) A gas conveyance system. A gas conveyance system includes the devices used to convey landfill gas from a gas collection device and may consist of headers and laterals.
    - (e) A gas control device. Examples of gas control devices are open flares, enclosed combustors (such as enclosed flares, boilers, or process heaters), and gas treatment systems.
  - (2) To not compromise the integrity of the cap system, the leachate management system, the liner system, or the separatory leachate barrier and collection system. At a minimum, the design of the gas collection and conveyance system shall meet the following criteria:
    - (a) Gas wells that are installed through waste shall not be installed within ten feet of the top of the liner system or separatory leachate barrier and collection system.
    - (b) Any penetrations through the cap system at the designated area for bulk liquid addition shall account for settlement of the waste relative to the gas wells.
  - (3) To not cause fires within the disposal limits. At a minimum, perforations in the gas wells shall not occur within twenty feet of the surface.
  - (4) To prevent landfill gas flow from being restricted due to accumulation of leachate or of landfill gas condensate.
  - (5) To be capable of isolating individual gas wells and portions of the gas conveyance system for maintenance and repair.
- [Comment: Certain municipal solid waste landfills are required to control landfill gas emissions. Permits for gas collection and control systems are obtained through Ohio EPA, division of air pollution control.]
- (B) The gas collection layer at the designated area for bulk liquid addition shall be designed to meet the following:
- (1) As a component of a cap system, be located as close as possible to the disposal limits.
  - (2) Either remain dry or be oversized to accommodate leachate and landfill gas condensate. If oversized to accommodate leachate and landfill gas condensate, the gas collection layer shall direct the leachate and landfill gas condensate to the waste mass or to the leachate collection system.

- (3) If the gas collection layer is below a flexible membrane liner or geosynthetic clay liner, meet the following criteria:
- (a) Provide sufficient flow capacity to reduce the landfill gas pressure sufficiently to not result in loss of intimate contact between the flexible membrane liner or geosynthetic clay liner and the underlying recompacted soil barrier layer or subbase.
  - (b) The surface of the gas collection layer shall have no abrupt changes in grade that may result in damage to the flexible membrane liner or geosynthetic clay liner.
- (C) Gas wells at the designated area for bulk liquid addition shall be designed to obtain landfill gas samples, control landfill gas flow, and measure the following:
- (1) Temperature at different locations down the gas well.
  - (2) The water level in the gas well and withdrawing leachate from the gas well.
  - (3) Landfill gas pressure.
  - (4) Landfill gas composition.
  - (5) Landfill gas flow.
- (D) The gas mover system shall be designed to have the capacity to manage the maximum gas generation flow rate expected over the intended use period of the gas mover system.
- (E) Landfill gas condensate collected in the gas collection and conveyance system designed in accordance with paragraph (A) of this rule shall be directed to one or more of the following:
- (1) The leachate collection and management system.
  - (2) A condensate storage tank that conforms to paragraph (E) of this rule.
  - (3) A public sewerage system.
  - (4) A wastewater treatment works permitted in accordance with Chapter 6111. of the Revised Code.
  - (5) If collected from within or above the disposal limits and the waste mass is above a leachate collection system, the waste mass.
- (F) Condensate holding tanks shall be designed to meet the following:
- (1) Have a minimum storage capacity of ten times the anticipated daily amount of condensate generated from continuous operation of the gas extraction system.
  - (2) For a condensate holding tank comprised of metal, incorporate cathodic protection.
  - (3) For an above ground holding tank, have a foundation capable of supporting the holding tank when the tank is full of condensate without compromising the integrity of any engineered components.
- [Comment: Pursuant to rule 3745-42-11 of the Administrative Code, industrial waste holding tanks are required to obtain a permit through Ohio EPA, division of surface water.]
- (G) Condensate holding tank load-out facilities shall be designed to meet the following criteria:

- (1) Be protected from damage caused by freezing and facility operations.
- (2) Prevent releases of leachate from load-out operations.
- (3) Contain spills and facilitate spill cleanup.

Five Year Review (FYR) Dates: 11/03/2016 and 11/01/2021

CERTIFIED ELECTRONICALLY

---

Certification

11/03/2016

---

Date

Promulgated Under:	119.03
Statutory Authority:	3734.02
Rule Amplifies:	3734.02
Prior Effective Dates:	6/6/2011