



## Ohio Administrative Code

### Rule 3745-57-03 Design and operating requirements.

Effective: September 5, 2010

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(A) Any landfill that is not covered by paragraph (C) of this rule or paragraph (A) of rule 3745-68-05 of the Administrative Code must have a liner system for all portions of the landfill (except for existing portions of such landfill). The liner system must have:

(1) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the landfill. The liner must be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner must be:

(a) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation; and

(b) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(c) Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and

(2) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The director will specify design and operation conditions in the permit to ensure that the leachate depth over the liner does not exceed thirty centimeters (one foot). The leachate collection and removal system must be:

(a) Constructed of materials that are:



- (i) Chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and
  - (ii) Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and
- (b) Designed and operated to function without clogging through the scheduled closure of the landfill.
- (B) The owner or operator will be exempted from the requirements of paragraph (A) of this rule if the director finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see rule 3745-54-93 of the Administrative Code) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the director will consider:
- (1) The nature and quantity of the wastes; and
  - (2) The proposed alternate design and operation; and
  - (3) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and ground water or surface water; and
  - (4) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.
- (C) The owner or operator of each new landfill unit on which construction commences after January 29, 1992, each lateral expansion of a landfill unit on which construction commences after July 29, 1992, and each replacement of an existing landfill unit that commences reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners. "Construction commences" is as defined in rule 3745-50-10 of the Administrative Code under "existing facility".
- (a) The liner system must include:



- (i) A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and
  - (ii) A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet (ninety-one centimeters) of compacted soil material with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  centimeters per second.
- (b) The liners must comply with paragraphs (A)(1)(a), (A)(1)(b), and (A)(1)(c) of this rule.
- (2) The leachate collection and removal system immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post-closure care period. The director will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed thirty centimeters (one foot). The leachate collection and removal system must comply with paragraphs (C)(3)(c) and (C)(3)(d) of this rule.
- (3) The leachate collection and removal system between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a leak detection system. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in paragraphs (C) to (C)(5) of this rule are satisfied by installation of a system that is, at a minimum:
- (a) Constructed with a bottom slope of one per cent or more;
  - (b) Constructed of granular drainage materials with a hydraulic conductivity of  $1 \times 10^{-2}$  centimeters per second or more and a thickness of twelve inches (30.5 centimeters) or more; or constructed of



synthetic or geonet drainage materials with a transmissivity of  $3 \times 10^{-5}$  meters squared per second or more;

(c) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(d) Designed and operated to minimize clogging during the active life and post-closure care period;  
and

(e) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator must collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

(5) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.

(D) The director may approve alternative design or operating practices to those specified in paragraphs (C) to (C)(5) of this rule if the owner or operator demonstrates to the director that such design and operating practices, together with location characteristics:

(1) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems specified in paragraphs (C) to (C)(5) of this rule; and

(2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.



(E) The double liner requirement in paragraphs (C) to (C)(5) of this rule may be waived by the director for any monofill, if:

(1) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than the toxicity characteristics in rule 3745-51-24 of the Administrative Code, with EPA hazardous waste numbers DO04 to DO17; and

(i) The monofill has at least one liner for which there is no evidence that such liner is leaking;

(ii) The monofill is located more than one-quarter mile from an "underground source of drinking water" (as that term is defined in rule 3745-50-10 of the Administrative Code); and

(iii) The monofill is in compliance with generally applicable ground water monitoring requirements for facilities with Ohio hazardous waste permits; or

(b) The owner or operator demonstrates that the monofill is located, designed, and operated so as to assure that there will be no migration of any hazardous constituent into ground water or surface water at any future time.

(F) The owner or operator of any replacement landfill unit is exempt from paragraphs (C) to (C)(5) of this rule if:

(1) The existing unit was constructed in compliance with the design standards of Section 3004(o)(1)(A)(i) and Section (o)(5) of the Resource Conservation and Recovery Act; and

(2) There is no reason to believe that the liner is not functioning as designed.

(G) The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a twenty-five-year storm.

(H) The owner or operator must design, construct, operate, and maintain a run-off management



system to collect and control at least the water volume resulting from a twenty-four-hour, twenty-five-year storm.

(I) Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.

(J) If the landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the landfill to control wind dispersal.

(K) The director will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this rule are satisfied.

(L) Reserved.

[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 rule 3745-50-11 of the Administrative Code titled "Incorporated by reference."]