**Section 724.321 Design and Operating Requirements**

a) Any surface impoundment that is not covered by subsection (c) or 35 Ill. Adm. Code 725.321 must have a liner for all portions of the impoundment (except for existing portions of such impoundment). The liner must be designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil or groundwater or surface water) during the active life of the facility, provided that the impoundment is closed in accordance with Section 724.328(a)(1). For impoundments that will be closed in accordance with Section 724.328(a)(2), the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility. The liner must be as follows:

1) 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;

2) 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

3) Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

b) The owner or operator will be exempted from the requirements of subsection (a) if the Board grants an adjusted standard pursuant to Section 28.1 of the Act and 35 Ill. Adm. Code 101 and 104. The level of justification is a demonstration by the owner or operator that alternative design or operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see Section 724.193) into the groundwater or surface water at any future time. In deciding whether to grant an adjusted standard, the Board will consider the following:

1) The nature and quantity of the wastes;

2) The proposed alternative design and operation;

3) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and groundwater or surface water; and

4) All other factors that would influence the quality and mobility of the leachate produced and the potential for it to migrate to groundwater or surface water.

c) The owner or operator of each new surface impoundment unit on which construction commences after January 29, 1992, each lateral expansion of a surface impoundment unit on which construction commences after July 29, 1992, and each replacement of an existing surface impoundment unit that is to commence reuse after July 29, 1992, must install two or more liners and a leachate collection and removal system between such liners. "Construction commences" is as defined in 35 Ill. Adm. Code 720.110, under the definition of "existing facility".

1) Liner Requirements

A) The liner system must include the following:

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 (91 cm) of compacted soil material with a hydraulic conductivity of no more than 1 x 10-7 cm/sec.

B) The liners must comply with subsections (a)(1), (a)(2), and (a)(3).

2) 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 (LDS). This LDS 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 LDS in this subsection (c) are satisfied by installation of a system that is, at a minimum, as follows:

A) It is constructed with a bottom slope of one percent or more;

B) It is constructed of granular drainage materials with a hydraulic conductivity of 1 x 10-1 cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3 x 10-4 m2/sec or more;

C) It is constructed of materials that are chemically resistant to the waste managed in the surface impoundment and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes and any waste cover materials or equipment used at the surface impoundment;

D) It is designed and operated to minimize clogging during the active life and post-closure care period; and

E) It is 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 sumps. 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.

3) The owner or operator must collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner.

4) The owner or operator of a LDS that is not located completely above the seasonal high water table must demonstrate that the operation of the LDS will not be adversely affected by the presence of groundwater.

d) Subsection (c) will not apply if the owner or operator demonstrates to the Agency, and the Agency finds for such surface impoundment, that alternative design or operating practices, together with location characteristics, will do the following:

1) It will prevent the migration of any hazardous constituent into the groundwater or surface water at least as effectively as the liners and leachate collection and removal system specified in subsection (c); and

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

e) The double liner requirement set forth in subsection (c) may be waived by the Agency for any monofill, if the following is true of the unit:

1) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents that would render the wastes hazardous for reasons other than the toxicity characteristic in 35 Ill. Adm. Code 721.124; and

2) Design and Location

A) Liner, location, and groundwater monitoring.

i) The monofill has at least one liner for which there is no evidence that such liner is leaking. For the purposes of this subsection (e), the term "liner" means a liner designed, constructed, installed, and operated to prevent hazardous waste from passing into the liner at any time during the active life of the facility, or a liner designed, constructed, installed, and operated to prevent hazardous waste from migrating beyond the liner to adjacent subsurface soil, groundwater, or surface water at any time during the active life of the facility. In the case of any surface impoundment that has been exempted from the requirements of subsection (c) on the basis of a liner designed, constructed, installed, and operated to prevent hazardous waste from passing beyond the liner, at the closure of such impoundment, the owner or operator must remove or decontaminate all waste residues, all contaminated liner material, and contaminated soil to the extent practicable. If all contaminated soil is not removed or decontaminated, the owner or operator of such impoundment will comply with appropriate post-closure requirements, including but not limited to groundwater monitoring and corrective action;

ii) The monofill is located more than one-quarter mile from an "underground source of drinking water" (as that term is defined in 35 Ill. Adm. Code 702.110); and

iii) The monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with permits; or

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

f) The owner or operator of any replacement surface impoundment unit is exempt from subsection (c) if the following is true of the unit:

1) The existing unit was constructed in compliance with the design standards of 35 Ill. Adm. Code 724.321(c), (d), and (e); and

BOARD NOTE: The cited subsections implemented the design standards of sections 3004 (o)(1)(A)(i) and (o)(5) of the Resource Conservation and Recovery Act (42 USC 6924(o)(1)(A)(i) and (o)(5)).

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

g) A surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms, and other equipment; and human error.

h) A surface impoundment must have dikes that are designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.

i) The Agency must specify in the permit all design and operating practices that are necessary to ensure that the requirements of this Section are satisfied.

(Source: Amended at 42 Ill. Reg. 22614, effective November 19, 2018)