7045.0534 WASTE PILES.

Subpart 1. **Scope.** This part applies to owners and operators of facilities that store or treat hazardous waste in piles, except as part 7045.0450 provides or as otherwise provided in this subpart.

The requirements of this part do not apply to owners or operators of waste piles that are closed with wastes left in place. Such waste piles are subject to regulation under part 7045.0538.

The owner or operator of a waste pile that is inside or under a structure that provides protection from precipitation so that neither run-off nor leachate is generated is not subject to subparts 2, items A and B; 3; or part 7045.0484 if:

A. liquids or materials containing free liquids are not placed in the pile;

B. the pile is protected from surface water run-on by the structure or in some other manner;

C. the pile is designed and operated to control dispersal of the waste by wind, where necessary, by means other than wetting; and

D. the pile will not generate leachate through decomposition or other reactions.

Subp. 2. **Locational requirements.** Locational requirements are as follows:

A. A waste pile must not be located in an area characterized by surficial karst features.

B. The owner or operator of a proposed or existing waste pile shall submit to the agency with the permit application a hydrogeologic report which provides sufficient information and detail on the site's topography, soils, geology, surface hydrology, and ground water hydrology to evaluate the facility's actual and potential effects on subsoils, surface water, and ground water. This report must include:

(1) a geologic history of the area;

(2) the stratigraphy of the area;

(3) the composition of the site's soil and rock formations;

(4) the hydraulic characteristics of the site's soil and rock formations;

(5) the occurrence of ground water in the area;

(6) directions and rates of ground water and surface water movements;

(7) ground water and surface water interactions;

(8) existing and future uses of ground water and surface water;

(9) existing quality of ground water and surface water;

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(10) if a ground water monitoring system which complies with part 7045.0484, subpart 11, item A can be installed at the site;

(11) climatological information; and

(12) all other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to subsoils, ground water, or surface water.

C. A waste pile, including its underlying liners, must be located entirely above the seasonal high water table.

Subp. 3. **Design and operating requirements.** Design and operating requirements are as follows:

A. A waste pile must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the pile into the adjacent subsurface soil or ground water or surface water at any time during the active life, including the closure period, of the waste pile. The liner may be constructed of materials that may allow waste to migrate into the liner itself, but not into the adjacent subsurface soil or ground water or surface water, during the active life, including the closure period, of the facility. The liner must be:

(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. A waste pile must have a leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile. The agency shall specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 centimeters (one foot) at any point. The leachate collection and removal system must be:

(1) constructed of materials that are chemically resistant to the waste managed in the pile and the leachate expected to be generated; and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying wastes, waste cover materials, and by any equipment used at the pile; and

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(2) designed and operated to function without clogging through the scheduled closure of the waste pile.

C. The owner or operator of each new waste pile unit on which construction commences after January 29, 1992, each lateral expansion of a waste pile unit on which construction commences after July 29, 1992, and each replacement of an existing waste pile unit that is to commence 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" and "existing facility" are defined in part 7045.0020.

(1) (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 postclosure 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 postclosure 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 centimeters) of compacted soil material with a hydraulic conductivity of no more than 1 x 10 to the negative 7th power centimeters per second.

(b) The liners must comply with item A, subitems (1) to (3).

(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 waste pile during the active life and postclosure care period. The commissioner will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 centimeters (one foot). The leachate collection and removal system must comply with subitem (3), units (c) and (d).

(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 postclosure care period. The requirements for a leak detection system in this subitem are satisfied by installation of a system that is, at a minimum:

(a) constructed with a bottom slope of one percent or more;

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(b) constructed of granular drainage materials with a hydraulic conductivity of 1 x 10 to the negative 2nd power centimeters per second or more and a thickness of 12 inches (30.5 centimeters) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3 x 10 to the negative 5th meters squared per second or more;

(c) constructed of materials that are chemically resistant to the waste managed in the waste pile 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 waste pile;

(d) designed and operated to minimize clogging during the active life and postclosure 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. 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 shall 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 groundwater.

D. The commissioner shall approve alternative design or operating practices to those specified in item C if the owner or operator demonstrates to the commissioner that such design and operating practices, together with location characteristics:

(1) 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 systems specified in item C; and

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

E. The owner or operator of any replacement waste pile unit is exempt from item C if:

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

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

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F. The owner or operator shall design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the pile during peak discharge from at least a 100-year storm.

G. The owner or operator shall design, construct, operate, and maintain a runoff management system to collect and control at least the water volume resulting from a 24-hour, 100-year storm.

H. Collection and holding facilities, such as tanks or basins, associated with run-on and runoff control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.

I. If the pile contains any particulate matter which may be subject to wind dispersal, the owner or operator shall cover or otherwise manage the pile to control wind dispersal of hazardous waste.

J. The owner or operator of a waste pile shall submit to the agency with the permit application a plan for the treatment and disposal of runoff contained in the runoff management system and leachate which is removed from the waste pile.

K. An owner or operator may petition for alternate design or operating practices under part 7045.0075, subpart 12.

L. The agency shall specify in the permit all design and operating practices that are necessary to ensure that the requirements of items A to H are satisfied.

Subp. 4. [Repealed, 11 SR 1832]

Subp. 4a. **Action leakage rate.**

A. The commissioner shall approve an action leakage rate for waste pile units subject to subpart 3, item C or D. The action leakage rate is the maximum design flow rate that the leak detection system can remove without the fluid head on the bottom liner exceeding one foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the leak detection system, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the leak detection system, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

B. To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly flow rate from the monitoring data obtained under subpart 6, item C, to an average daily flow rate (gallons per acre per day) for each sump.

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Unless the commissioner approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period.

Subp. 5. [Repealed, 11 SR 1832]

Subp. 5a. **Response actions.**

A. The owner or operator of waste pile units subject to subpart 3, item C or D, must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in item B.

B. If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:

(1) notify the commissioner in writing of the exceedence within seven days of the determination;

(2) submit a preliminary written assessment to the commissioner within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;

(3) determine to the extent practicable the location, size, and cause of any leak;

(4) determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;

(5) determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and

(6) within 30 days after the notification that the action leakage rate has been exceeded, submit to the commissioner the results of the analyses specified in subitems (3) to (5), the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the commissioner a report summarizing the results of any remedial actions taken and actions planned.

C. To make the leak and/or remediation determinations in item B, subitems (3) to (5), the owner or operator must:

(1) (a) assess the source of liquids and amounts of liquids by source;

(b) conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and

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(c) assess the seriousness of any leaks in terms of potential for escaping into the environment; or

(2) document why such assessments are not needed.

Subp. 6. **Monitoring and inspection.** Monitoring and inspection requirements are as follows:

A. During construction or installation, liners and cover systems, such as membranes, sheets, or coatings, must be inspected for uniformity, damage, and imperfections such as holes, cracks, thin spots, or foreign materials. Immediately after construction or installation:

(1) synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters;

(2) soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural nonuniformities that may cause an increase in the permeability of the liner or cover; and

(3) the construction of the liners must be certified by a qualified engineer to comply with the approved plans and specifications.

B. While a waste pile is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:

(1) deterioration, malfunctions, or improper operation of run-on and run-off control systems;

(2) the presence of liquids in leak detection, collection, and removal systems;

(3) improper functioning of wind dispersal control systems, where present; or

(4) the presence of leachate in and proper functioning of leachate collection and removal systems.

If any evidence of a condition described in subitems (1) to (3) is detected, the owner or operator shall notify the commissioner of the condition and remedies to correct this condition.

C. An owner or operator required to have a leak detection system under subpart 3, item C, must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

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Subp. 7. **Closure and postclosure care.** Closure and postclosure requirements are as follows:

A. At closure, the owner or operator shall remove or decontaminate all waste residues, contaminated containment system components including liners, contaminated subsoils, and structures and equipment contaminated with waste and leachate; and manage them as hazardous waste unless they are shown to not be hazardous in accordance with parts 7045.0102 to 7045.0155.

B. If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in item A, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he or she must close the facility and perform postclosure care in accordance with the closure and postclosure care requirements that apply to landfills, part 7045.0538, subpart 7.

C. The owner or operator of a waste pile that does not comply with the liner requirements of subpart 3, item A and is not exempt from them in accordance with subpart 1 shall:

(1) include in the closure plan for the pile under part 7045.0486 both a plan for complying with item A and a contingent plan for complying with item B in case not all contaminated subsoils can be practicably removed at closure; and

(2) prepare a contingent postclosure plan under part 7045.0490 for complying with item B in case not all contaminated subsoils can be practicably removed at closure.

D. The cost estimates calculated under parts 7045.0502 and 7045.0506 for closure and postclosure care of a pile subject to item C must include the cost of complying with the contingent closure plan and the contingent postclosure plan, as well as the cost of expected closure under item A.

Subp. 8. **Special requirements for ignitable or reactive waste.** Ignitable or reactive waste must not be placed in a waste pile unless the waste and waste pile satisfy all applicable requirements of part 7045.1390, and:

A. the waste is treated, rendered, or mixed before or immediately after placement in the pile so that the resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under part 7045.0131, subpart 2 or 5, and compliance with part 7045.0456, subpart 2 is maintained; or

B. the waste is managed to protect it from material or conditions which may cause it to ignite or react.

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Subp. 9. **Special requirements for incompatible wastes.** Incompatible wastes, or incompatible wastes and materials, must not be placed in the same pile unless compliance with part 7045.0456, subpart 2, is maintained.

A pile of hazardous waste that is incompatible with waste or other material located nearby must be adequately separated from the other materials, or protected from them by means of a dike, berm, wall, or other device.

Hazardous waste must not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to ensure compliance with part 7045.0456, subpart 2.

Subp. 10. **Special requirements for hazardous wastes F020, F021, F022, F023, F026, F027, and F028.** The following requirements apply to the hazardous wastes indicated:

A. Hazardous waste F020, F021, F022, F023, F026, and F027 listed under part 7045.0135, subpart 1a, item B, must not be placed in a surface impoundment.

B. Hazardous waste F028 and treatment residues and soils contaminated with hazardous wastes F020, F021, F022, F023, F026, F027, and F028 listed under part 7045.0135, subpart 1a, item B, must not be placed in surface impoundments unless the owner or operator operates the surface impoundment in accordance with all applicable requirements of this part and in accordance with a management plan that is approved by the commissioner considering the following factors:

(1) the volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) the attenuative properties of underlying and surrounding soils or other materials;

(3) the mobilizing properties of other materials codisposed with these wastes; and

(4) the effectiveness of additional treatment, design, or monitoring techniques.

C. The commissioner shall impose additional design, operating, and monitoring requirements if the commissioner finds that additional requirements are necessary for surface impoundments used to treat, store, or dispose of hazardous waste F028 and treatment residues and soils contaminated with hazardous wastes F020, F021, F022, F023, F026, F027, and F028 listed under part 7045.0135, subpart 1a, item B, in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

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Statutory Authority: *MS s 116.07; 116.37*

History: *9 SR 115; 10 SR 1212; L 1987 c 186 s 15; 15 SR 1877; 16 SR 2102; 16 SR 2239; 18 SR 1565; 18 SR 1886; 33 SR 2042*

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