

1 Pollution Control Agency

2 Hazardous Waste Division

3

4 Adopted Permanent Rules Relating to Hazardous Waste

5

6 Rules as Adopted

7 7001.0150 TERMS AND CONDITIONS OF PERMITS.

8 [For text of subps 1 and 2, see M.R.]

9 Subp. 3. General conditions. Unless specifically exempted  
10 by statute or rule, each draft and final permit must include the  
11 following general conditions and the agency shall incorporate  
12 these conditions into all permits either expressly or by  
13 specific reference to this part:

14 [For text of items A to O, see M.R.]

15 P. Compliance with an RCRA permit during its term  
16 constitutes compliance, for purposes of enforcement, with  
17 subtitle C ~~or~~ of RCRA except for those requirements not included  
18 in the permit which:

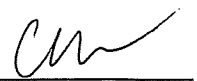
19 (1) become effective by statute;

20 (2) are adopted under parts 7045.1300 to  
21 7045.1380, restricting the placement of hazardous wastes in or  
22 on the land; or

23 (3) are adopted under parts 7045.0450 to  
24 7045.0548 regarding leak detection systems for new and  
25 replacement surface impoundment, waste pile, and landfill units,  
26 and lateral expansions of surface impoundment, waste pile, and  
27 landfill units. The leak detection system requirements include  
28 double liners, construction quality assurance programs,  
29 monitoring, action leakage rates, and response action plans, and  
30 will be implemented through the procedures of part 7001.0730,  
31 minor permit modifications.

32 7001.0590 PART B INFORMATION REQUIREMENTS FOR SURFACE  
33 IMPOUNDMENTS.

34 Except as otherwise provided in part 7045.0532, subpart 1,  
35 if the applicant proposes to store, treat, or dispose of



1 hazardous waste in surface impoundment facilities, the applicant  
2 shall submit detailed plans and specifications accompanied by an  
3 engineering report which collectively includes the following  
4 information in addition to the information required by part  
5 7001.0560:

6 [For text of items A and B, see M.R.]

7 C. Detailed plans and an engineering report  
8 describing how the surface impoundment is designed, and is or  
9 will be constructed, operated, and maintained to meet the  
10 requirements of parts 7045.0461 and 7045.0532, subparts 3, 4a,  
11 and 4b, addressing the following items:

12 (1) The double liner and leak (leachate)  
13 detection, collection, and removal system, if the surface  
14 impoundment must meet the requirements of part 7045.0532,  
15 subpart 3, item C. If an exemption from the requirements for  
16 double liners and a leak detection, collection, and removal  
17 system or alternative design is sought as provided by part  
18 7045.0532, subpart 3, item H-~~or~~ J or K, submit appropriate  
19 information.

20 (2) If the leak detection system is located in a  
21 saturated zone, submit detailed plans and an engineering report  
22 explaining the leak detection system design and operation, and  
23 the location of the saturated zone in relation to the leak  
24 detection system.

25 (3) The construction quality assurance plan if  
26 required under part 7045.0461.

27 (4) Proposed action leakage rate, with rationale,  
28 if required under part 7045.0532, subpart 4a, and response  
29 action plan, if required under part 7045.0532, subpart 4b.

30 (5) Prevention of overtopping.

31 (6) Structural integrity of dikes.

32 D. A description of how each surface impoundment,  
33 including the double liner system, leak detection system,  
34 leachate collection and removal system, cover system, and  
35 appurtenances for control of overtopping, will be inspected in  
36 order to meet the requirements of part 7045.0532, subpart 5,

1 items A, B, and E. This information must be included in the  
2 inspection plan submitted under part 7001.0560, item E.

3 [For text of items E to M, see M.R.]

4 7001.0600 PART B INFORMATION REQUIREMENTS FOR WASTE PILES.

5 Except as otherwise provided by part 7045.0534, subpart 1,  
6 if the applicant proposes to store or treat hazardous waste in  
7 waste piles, the applicant shall furnish the information  
8 required by items A to M in addition to the information required  
9 by part 7001.0560:

10 [For text of items A to C, see M.R.]

11 D. Detailed plans and an engineering report  
12 describing how the waste pile is designed and is or will be  
13 constructed, operated, and maintained to meet the requirements  
14 of parts 7045.0461 and 7045.0534, subparts 3, 4a, and 5a,  
15 addressing the following items:

16 (1)(a) The liner system, except for an existing  
17 portion of a waste pile, if the waste pile must meet the  
18 requirements of part 7045.0534, subpart 3, item A. If an  
19 exemption from the requirement for a liner is sought as provided  
20 by part 7045.0534, subpart 3, item H K, the applicant must  
21 submit detailed plans, and engineering and hydrogeological  
22 reports, as appropriate, describing alternate designs and  
23 operating practices that will, in conjunction with location  
24 aspects, prevent the migration of any hazardous constituents  
25 into the groundwater or surface water at any future time.

26 (b) The double liner and leak (leachate)  
27 detection, collection, and removal system, if the waste pile  
28 must meet the requirements of part 7045.0534, subpart 3, item  
29 C. If an exemption from the requirements for double liners and  
30 a leak detection, collection, and removal system or alternative  
31 design is sought as provided by part 7045.0534, subpart 3, item  
32 D or F E, the applicant must submit appropriate information.

33 (c) If the leak detection system is located  
34 in a saturated zone, the applicant must submit detailed plans  
35 and an engineering report explaining the leak detection system

1 design and operation, and the location of the saturated zone in  
2 relation to the leak detection system.

3 (d) The construction quality assurance plan  
4 if required under part 7045.0461.

5 (e) Proposed action leakage rate, with  
6 rationale, if required under part 7045.0534, subpart 4a, and  
7 response action plan, if required under part 7045.0534, subpart  
8 5a.

9 (2) Control of run-on.

10 (3) Control of runoff.

11 (4) Management of collection and holding units  
12 associated with run-on and runoff control systems.

13 (5) Control of wind dispersal of particulate  
14 matter, if applicable.

15 (6) Treatment and disposal of collected runoff  
16 and leachate.

17 [For text of items E and F, see M.R.]

18 G. A description of how each waste pile, including  
19 the double liner system, leachate collection and removal system,  
20 leak detection system, cover system, and appurtenances for  
21 control of run-on and runoff, will be inspected in order to meet  
22 the requirements of part 7045.0534, subpart 6, items A, B, and  
23 C. This information must be included in the inspection plan  
24 submitted under part 7001.0560, item E. If an exemption is  
25 sought to part 7045.0484 under part 7045.0534, subpart 5,  
26 describe in the inspection plan how the inspection requirements  
27 comply with part 7045.0534, subpart 5, item A, subitem (2).

28 [For text of items H to M, see M.R.]

29 7001.0620 PART B INFORMATION REQUIREMENTS FOR LANDFILLS.

30 Except as otherwise provided by part 7045.0538, subpart 1,  
31 if the applicant proposes to dispose of hazardous waste in a  
32 landfill, the applicant shall furnish the information designated  
33 in items A to L in addition to the information required by part  
34 7001.0560:

35 [For text of items A and B, see M.R.]

1 C. Detailed plans and an engineering report  
2 describing how the landfill is designed and is or will be  
3 constructed, operated, and maintained to meet the requirements  
4 of parts 7045.0461 and 7045.0538, subparts 3, 4a, and 5,  
5 addressing the following items:

6 (1)(a) The liner system, except for an existing  
7 portion of a landfill, if the landfill must meet the  
8 requirements of part 7045.0538, subpart 3, item A. If an  
9 exemption from the requirement for a liner is sought as provided  
10 by part 7045.0538, subpart 3, item B K, submit detailed plans,  
11 and engineering and hydrogeological reports, as appropriate,  
12 describing alternate designs and operating practices that will,  
13 in conjunction with location aspects, prevent the migration of  
14 any hazardous constituents into the groundwater or surface water  
15 at any future time.

16 (b) The double liner and leak (leachate)  
17 detection, collection, and removal system, if the landfill must  
18 meet the requirements of part 7045.0538, subpart 3, item C. If  
19 an exemption from the requirements for double liners and a leak  
20 detection, collection, and removal system or alternative design  
21 is sought as provided by part 7045.0538, subpart 3, items K M  
22 and M N, submit appropriate information.

23 (c) If the leak detection system is located  
24 in a saturated zone, submit detailed plans and an engineering  
25 report explaining the leak detection system design and  
26 operation, and the location of the saturated zone in relation to  
27 the leak detection system.

28 (d) The construction quality assurance plan  
29 if required under part 7045.0461.

30 (e) Proposed action leakage rate, with  
31 rationale, if required under part 7045.0538, subpart 4a, and  
32 response action plan, if required under part 7045.0538, subpart  
33 5.

34 (2) Control of run-on.

35 (3) Control of runoff.

36 (4) Management of collection and holding

1 facilities associated with run-on and runoff control systems.

2 (5) Control of wind dispersal of particulate  
3 matter, where applicable.

4 (6) The phased development plan in accordance  
5 with the requirements of part 7045.0538, subpart 3, item G.

6 (7) Treatment and disposal of collected runoff  
7 and leachate.

8 D. A description of how each landfill, including the  
9 double liner system, leachate collection and removal system,  
10 leak detection system, cover system, and appurtenances for  
11 control of run-on and runoff, will be inspected in order to meet  
12 the requirements of part 7045.0538, subpart 5, items A, B, and  
13 C. This information must be included in the inspection plan  
14 submitted under part 7001.0560, item E.

15 [For text of items E to L, see M.R.]

16 7045.0020 DEFINITIONS.

17 [For text of subps 1 to 10a, see M.R.]

18 Subp. 10b. **Construction commenced.** "Construction  
19 commenced" is related to the definition of "existing facility,"  
20 and has the following meaning. A facility has commenced  
21 construction if the owner or operator has obtained the federal,  
22 state, and local approvals or permits necessary to begin  
23 physical construction and:

24 A. a continuous on-site, physical construction  
25 program has begun; or

26 B. the owner or operator has entered into contractual  
27 obligations, which cannot be canceled or modified without  
28 substantial loss, for physical construction of the facility to  
29 be completed within a reasonable time.

30 [For text of subps 11 to 22a, see M.R.]

31 Subp. 22b. **Existing hazardous waste management facility or**  
32 **existing facility.** "Existing hazardous waste management  
33 facility" or "existing facility" means a facility which was in  
34 operation or for which construction commenced on or before  
35 November 19, 1980. See subpart 10b for definition of

1 "construction commenced."

2 [For text of subps 23 to 73d, see M.R.]

3 Subp. 73e. **Replacement unit.** "Replacement unit" means a  
4 landfill, surface impoundment, or waste pile unit (1) from which  
5 all or substantially all of the waste is removed, and (2) that  
6 is subsequently reused to treat, store, or dispose of hazardous  
7 waste. Replacement unit does not apply to a unit from which  
8 waste is removed during closure, if the subsequent reuse solely  
9 involves the disposal of waste from that unit and other closing  
10 units or corrective action areas at the facility, in accordance  
11 with an approved closure plan or EPA or state-approved  
12 corrective action.

13 [For text of subps 74 to 87, see M.R.]

14 Subp. 87a. **Sump.** "Sump" means any pit or reservoir that  
15 meets the definition of "tank" and those troughs or trenches  
16 connected to it that serve to collect hazardous waste for  
17 transport to hazardous waste storage, treatment, or disposal  
18 facilities; except that as used in the landfill, surface  
19 impoundment, and waste pile rules, sump means any lined pit or  
20 reservoir that serves to collect liquids drained from a leachate  
21 collection and removal system or leak detection system for  
22 subsequent removal from the system.

23 [For text of subps 88 to 109, see M.R.]

24 7045.0125 MANAGEMENT OF WASTE BY USE, REUSE, RECYCLING, AND  
25 RECLAMATION.

26 [For text of subps 1 to 3a, see M.R.]

27 Subp. 4. **Management of specific hazardous wastes.**  
28 Management of the following wastes when recycled, is not subject  
29 to regulation under parts 7045.0205 to 7045.0695 and 7045.1300  
30 to 7045.1380:

31 [For text of items A to H, see M.R.]

32 I. oil that is reclaimed from oil-bearing hazardous  
33 wastes from petroleum refining, production, and transportation  
34 practices, and is burned as a fuel without reintroduction to a  
35 refining process, if the reclaimed oil meets the used oil fuel

1 specification under part 7045.0695, subpart 1, item B, subitem  
2 (1);

3 J. petroleum coke produced from petroleum refinery  
4 hazardous wastes containing oil at the same facility at which  
5 the wastes were generated, unless the resulting coke product  
6 exhibits one or more of the characteristics of hazardous waste  
7 in part 7045.0131; and

8 K. nonwastewater splash condenser dross residue from  
9 the treatment of K061 in high temperature metals recovery units,  
10 provided it is shipped in drums, if shipped, and not land  
11 disposed before recovery.

12 [For text of subps 5 to 12, see M.R.]

13 7045.0135 LISTS OF HAZARDOUS WASTES.

14 [For text of subpart 1, see M.R.]

15 Subp. 2. Hazardous wastes from nonspecific sources.

16 Hazardous wastes from nonspecific sources are listed with the  
17 generic hazardous waste number and hazard code in items A to BB.

18 [For text of items A to X, see M.R.]

19 Y. F035, wastewaters, process residuals, preservative  
20 drippage, and spent formulations from wood preserving processes  
21 generated at plants that use inorganic preservatives containing  
22 arsenic or chromium. This listing does not include K001 bottom  
23 sediment sludge from the treatment of wastewater from wood  
24 preserving processes that use creosote and/or  
25 pentachlorophenol. This listing does not apply to wastewaters  
26 which have not come into contact with process contaminants:  
27 (T);

28 Z. F037, petroleum refinery primary oil/water/solids  
29 separation sludge. Any sludge generated from the gravitational  
30 separation of oil/water/solids during the storage or treatment  
31 of process wastewaters and oily cooling wastewaters from  
32 petroleum refineries. Such sludges include, but are not limited  
33 to, those generated in: oil/water/solids separators; tanks and  
34 impoundments; ditches and other conveyances; sumps; and  
35 stormwater units receiving dry weather flow. Sludges generated



1 in stormwater units that do not receive dry weather flow,  
2 sludges generated from noncontact once-through cooling waters  
3 segregated for treatment from other process or oily cooling  
4 waters, sludges generated in aggressive biological treatment  
5 units as defined in subpart 2a, including sludges generated in  
6 one or more additional units after wastewaters have been treated  
7 in aggressive biological treatment units, and K051 wastes are  
8 not included in this listing: (T);

9 AA. F038, petroleum refinery secondary (emulsified)  
10 oil/water/solids separation sludge. Any sludge and/or float  
11 generated from the physical and/or chemical separation of  
12 oil/water/solids in process wastewaters and oily cooling  
13 wastewaters from petroleum refineries. Such wastes include, but  
14 are not limited to, all sludges and floats generated in:  
15 induced air flotation units, tanks and impoundments, and all  
16 sludges generated in dissolved air flotation units. Sludges  
17 generated in stormwater units that do not receive dry weather  
18 flow, sludges generated from noncontact once-through cooling  
19 waters segregated for treatment from other process or oily  
20 cooling waters, sludges, and floats generated in one or more  
21 additional units as defined in subpart 2a, including sludges and  
22 floats generated in one or more additional units after  
23 wastewaters have been treated in aggressive biological treatment  
24 units, and F037, K048, and K051 wastes are not included in this  
25 listing: (T); and

26 BB. F039, leachate resulting from the treatment,  
27 storage, or disposal of more than one restricted waste  
28 classified as hazardous under part 7045.0131 and this part.  
29 Leachate resulting from the management of one or more of the  
30 following EPA hazardous wastes and no other hazardous wastes  
31 retains its EPA hazardous waste numbers: F020, F021, F022,  
32 F023, F026, F027, or F028: (T).

33 Subp. 2a. Listing-specific definitions.

34 A. For the purposes of the F037 and F038 listings,  
35 "oil/water/solids" is defined as oil and/or water and/or solids.

36 B. (1) For the purposes of the F037 and F038

1 listings, aggressive biological treatment units are defined as  
2 units which employ one of the following four treatment methods:  
3 activated sludge; trickling filter; rotating biological  
4 ~~contractor~~ contactor for the continuous accelerated biological  
5 oxidation of wastewaters; or high-rate aeration. High-rate  
6 aeration is a system of surface impoundments or tanks, in which  
7 intense mechanical aeration is used to completely mix the wastes  
8 and enhance biological activity, the unit employs a minimum of  
9 six horsepower per million gallons of treatment volume, and  
10 either (a) the hydraulic retention time of the unit is no longer  
11 than five days; or (b) the hydraulic retention time is no longer  
12 than 30 days and the unit does not generate a sludge that is a  
13 hazardous waste by the toxicity characteristic.

14 (2) Generators and treatment, storage, and  
15 disposal facilities have the burden of proving that their  
16 sludges are exempt from listing as F037 and F038 wastes under  
17 this definition. Generators and treatment, storage, and  
18 disposal facilities must maintain, in their operating or other  
19 on-site records, documents and data sufficient to prove that (a)  
20 the unit is an aggressive biological treatment unit as defined  
21 in this subpart; and (b) the sludges sought to be exempted from  
22 the definitions of F037 or F038 were actually generated in the  
23 aggressive biological treatment unit.

24 C. (1) For the purposes of the F037 listing, sludges  
25 are considered to be generated at the moment of deposition in  
26 the unit, where deposition is defined as at least a temporary  
27 cessation of lateral particle movement.

28 (2) For the purposes of the F038 listing (a)  
29 sludges are considered to be generated at the moment of  
30 deposition in the unit, where deposition is defined as at least  
31 a temporary cessation of lateral particle movement; and (b)  
32 floats are considered to be generated at the moment they are  
33 formed in the top of the unit.

34 [For text of subps 3 to 5, see M.R.]

35 7045.0139 BASIS FOR LISTING HAZARDOUS WASTES.

1 [For text of subpart 1, see M.R.]

2 Subp. 2. **Constituents.** The constituents which are the  
3 basis for listing the wastes identified in part 7045.0135,  
4 subparts 2 and 3 are listed in items A and B.

5 A. Constituents of wastes identified in part  
6 7045.0135, subpart 2, are listed in subitems (1) to (28).

7 [For text of subitems (1) to (24), see M.R.]

8 (25) F035: Arsenic; chromium; lead;

9 (26) F037: Benzene; benzo(a)pyrene; chrysene;  
10 lead; chromium;

11 (27) F038: Benzene; benzo(a)pyrene; chrysene;  
12 lead; chromium; and

13 (28) F039: Constituents for which treatment  
14 standards are specified for multisource leachate, wastewaters,  
15 and nonwastewaters under part 7045.1358.

16 [For text of item B, see M.R.]

17 7045.0214 EVALUATION OF WASTES.

18 [For text of subps 1 and 2, see M.R.]

19 Subp. 3. **Wastes generated by treatment, storage, or**  
20 **disposal.** Wastes generated by treatment, storage, or disposal  
21 of hazardous waste are as follows:

22 [For text of items A to D, see M.R.]

23 E. Nonwastewater residues, such as slag, resulting  
24 from high temperature metals recovery processing of K061 waste,  
25 in units identified as rotary kilns, flame reactors, electric  
26 furnaces, plasma arc furnaces, slag reactors, rotary hearth  
27 furnace/electric furnace combinations, or industrial furnaces,  
28 as defined in part 7045.0020, subpart 43b, that are disposed of  
29 in solid waste disposal units, provided that these residues meet  
30 the generic exclusion levels identified below for all  
31 constituents, and exhibit no characteristics of hazardous  
32 waste. Testing requirements must be incorporated in a  
33 facility's waste analysis plan or a generator's  
34 self-implementing waste analysis plan. At a minimum, composite  
35 samples of residues must be collected and analyzed quarterly

1 and/or when the process or operation generating the waste  
2 changes. The generic exclusion levels are:

3	Constituent	Maximum for any
4		single composite
5		sample (mg/l)
6		
7	Antimony	0.063
8	Arsenic	0.055
9	Barium	6.3
10	Beryllium	0.0063
11	Cadmium	0.032
12	Chromium (total)	0.33
13	Lead	0.095
14	Mercury	0.009
15	Nickel	0.63
16	Selenium	0.16
17	Silver	0.30
18	Thallium	0.013
19	Vanadium	1.26
20		

21 For each shipment of K061 high temperature metals recovery  
22 residues sent to a solid waste disposal unit that meets the  
23 generic exclusion levels for all constituents, and does not  
24 exhibit any characteristic, a notification and certification  
25 must be sent to the commissioner. The notification must include  
26 the following information:

27 (1) the name and address of the solid waste  
28 disposal unit receiving the waste shipment;

29 (2) the EPA hazardous waste number and  
30 treatability group at the initial point of generation; and

31 (3) the treatment standards applicable to the  
32 waste at the initial point of generation.

33 The certification must be signed by an authorized  
34 representative and must state as follows: "I certify under  
35 penalty of law that the generic exclusion levels for all  
36 constituents have been met without impermissible dilution and  
37 that no characteristic of hazardous waste is exhibited. I am  
38 aware that there are significant penalties for submitting a  
39 false certification, including the possibility of fine and  
40 imprisonment."

41 7045.0452 GENERAL FACILITY STANDARDS.

42 [For text of subs 1 to 4, see M.R.]

43 Subp. 5. General inspection requirements. General  
44 inspection requirements include the following:

1 [For text of items A and B, see M.R.]

2 C. The frequency of inspection may vary for the items  
3 on the schedule. However, it must be based on the rate of  
4 possible deterioration of the equipment and the probability of  
5 an environmental or human health incident if the deterioration  
6 or malfunctions or any operator error goes undetected between  
7 inspections. Areas subject to spills, such as loading and  
8 unloading areas, must be inspected daily when in use. The  
9 inspection schedule must include the terms and frequencies  
10 called for in parts 7045.0526, subpart 5; 7045.0528, subparts 4  
11 and 7; 7045.0532, subpart 5; 7045.0534, subpart 6; 7045.0536,  
12 subpart 6; 7045.0538, subpart 5; 7045.0539, subpart 3; and  
13 7045.0542, subpart 7; and the process vent and equipment leak  
14 standards in Code of Federal Regulations, title 40, sections  
15 264.1033, 264.1052, 264.1053, and 264.1058, as amended, where  
16 applicable. The inspection schedule must be submitted with the  
17 permit application. The commissioner shall evaluate the  
18 schedule along with the rest of the application to ensure that  
19 it adequately protects human health and the environment. As  
20 part of this review, the commissioner may modify or amend the  
21 schedule as necessary.

22 [For text of items D and E, see M.R.]

23 7045.0461 CONSTRUCTION QUALITY ASSURANCE PROGRAM.

24 Subpart 1. Construction quality assurance program. A  
25 construction quality assurance program is required for all  
26 surface impoundment, waste pile, and landfill units that are  
27 required to comply with parts 7045.0532, subpart 3, items C and  
28 H; 7045.0534, subpart 3, items C and D; and 7045.0538, subpart  
29 3, items C and K. The program must ensure that the constructed  
30 unit meets or exceeds all design criteria and specifications in  
31 the permit. The program must be developed and implemented under  
32 the direction of a construction quality assurance officer who is  
33 a registered professional engineer.

34 The construction quality assurance program must address the  
35 following physical components, where applicable:

- 1           ~~(1)~~ A. foundations;
- 2           ~~(2)~~ B. dikes;
- 3           ~~(3)~~ C. low-permeability soil liners;
- 4           ~~(4)~~ D. geomembranes (flexible membrane liners);
- 5           ~~(5)~~ E. leachate collection and removal systems and
- 6 leak detection systems; and
- 7           ~~(6)~~ F. final cover systems.

8           Subp. 2. **Written construction quality assurance plan.** The

9 owner or operator of units subject to the construction quality

10 assurance program under subpart 1 must develop and implement a

11 written construction quality assurance plan. The plan must

12 identify steps that will be used to monitor and document the

13 quality of materials and the condition and manner of their

14 installation. The construction quality assurance plan must

15 include:

16           A. Identification of applicable units, and a

17 description of how they will be constructed.

18           B. Identification of key personnel in the development

19 and implementation of the construction quality assurance plan,

20 and construction quality assurance officer ~~qualification~~

21 qualifications.

22           C. A description of inspection and sampling

23 activities for all unit components identified in subpart 1, ~~item~~

24 ~~B7~~ including observations and tests that will be used before,

25 during, and after construction to ensure that the construction

26 materials and the installed unit components meet the design

27 specifications. The description must cover sampling size and

28 locations, frequency of testing, data evaluation procedures,

29 acceptance and rejection criteria for construction materials,

30 plans for implementing corrective measures, and data or other

31 information to be recorded and retained in the operating record

32 under part 7045.0478.

33           Subp. 3. **Contents of program.**

34           A. The construction quality assurance program must

35 include observations, inspections, tests, and measurements

36 sufficient to ensure:

1 (1) structural stability and integrity of all  
2 components of the unit identified in subpart 17--item-B;

3 (2) proper construction of all components of the  
4 liners, leachate collection and removal system, leak detection  
5 system, and final cover system, according to permit  
6 specifications and good engineering practices, and proper  
7 installation of all components (e.g. pipes) according to design  
8 specifications; and

9 (3) conformity of all materials used with design  
10 and other material specifications under parts 7045.0532,  
11 7045.0534, and 7045.0538.

12 B. The construction quality assurance program shall  
13 include test fills for compacted soil liners, using the same  
14 compaction methods as in the full scale unit, to ensure that the  
15 liners are constructed to meet the hydraulic conductivity  
16 requirements of parts 7045.0532, subpart 3, item C, subitem (1),  
17 unit (a), subunit ii; 7045.0534, subpart 3, item C, subitem (1),  
18 unit (a), subunit ii; and 7045.0538, subpart 3, item C, subitem  
19 (1), unit (a), subunit ii, in the field. Compliance with the  
20 hydraulic conductivity requirements must be verified by using  
21 in-situ testing on the constructed test fill. The commissioner  
22 may accept an alternative demonstration, in lieu of a test fill,  
23 where data are sufficient to show that a constructed soil liner  
24 will meet the hydraulic conductivity requirements of parts  
25 7045.0532, subpart 3, item C, subitem (1), unit (a), subunit ii;  
26 7045.0534, subpart 3, item C, subitem (1), unit (a), subunit ii;  
27 and 7045.0538, subpart 3, item C, subitem (1), unit (a), subunit  
28 ii, in the field.

29 Subp. 4. **Certification.** Waste shall not be received in a  
30 unit subject to part 7045.0461 until the owner or operator has  
31 submitted to the commissioner by certified mail or hand delivery  
32 a certification signed by the construction quality assurance  
33 officer that the approved construction quality assurance plan  
34 has been successfully carried out and that the unit meets the  
35 requirements of parts 7045.0532, subpart 3, items C and H;  
36 7045.0534, subpart 3, items C and D; and 7045.0538, subpart 3,

1 items C and K; and the procedure in part 7001.0150, subpart 3,  
2 item M, has been completed. Documentation supporting the  
3 construction quality assurance officer's certification must be  
4 furnished to the commissioner upon request.

5 7045.0478 OPERATING RECORD.

6 [For text of subps 1 and 2, see M.R.]

7 Subp. 3. **Record information.** The information in items A  
8 to S must be recorded, as it becomes available, and maintained  
9 in the operating record until closure of the facility.

10 [For text of items A to G, see M.R.]

11 H. **Monitoring, testing, or analytical data and**  
12 **corrective action where required by parts 7045.0461; 7045.0484;**  
13 **7045.0528, subparts 2, 4, 5, and 7; 7045.0532, subparts 4a, 4b,**  
14 **and 5; 7045.0534, subparts 4a, 5, 5a, and 6; 7045.0536, subparts**  
15 **5, 6, and 8; 7045.0538, subparts 4a, 5, 5a, and 6; 7045.0539,**  
16 **subpart 3; and 7045.0542, subpart 7; and the process vent and**  
17 **equipment leak test methods and procedures and record keeping**  
18 **requirements in Code of Federal Regulations, title 40, sections**  
19 **264.1034(c) to (f), 264.1035, 264.1063(d) to (i), and 264.1064,**  
20 **as amended.**

21 [For text of items I to S, see M.R.]

22 7045.0532 SURFACE IMPOUNDMENTS.

23 [For text of subps 1 and 2, see M.R.]

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

26 [For text of items A and B, see M.R.]

27 C. The owner or operator of each new surface  
28 impoundment unit on which construction commences after January  
29 29, 1992, each lateral expansion of a surface impoundment unit  
30 on which construction commences after July 29, 1992, and each  
31 replacement of an existing surface impoundment unit that is to  
32 commence reuse after July 29, 1992, must install two or more  
33 liners and a leachate collection and removal system between such  
34 liners. "Construction commences" and "existing facility" are  
35 defined in part 7045.0020.



1 (1)(a) The liner system must include:

2 i. a top liner designed and  
3 constructed of materials (e.g. a geomembrane) to prevent the  
4 migration of hazardous constituents into such liner during the  
5 active life and postclosure care period; and

6 ii. a composite bottom liner,  
7 consisting of at least two components. The upper component must  
8 be designed and constructed of materials (e.g. a geomembrane) to  
9 prevent the migration of hazardous constituents into this  
10 component during the active life and postclosure care period.  
11 The lower component must be designed and constructed of  
12 materials to minimize the migration of hazardous constituents if  
13 a breach in the upper component were to occur. The lower  
14 component must be constructed of at least three feet (91  
15 centimeters) of compacted soil material with a hydraulic  
16 conductivity of no more than  $1 \times 10$  to the negative 7th power  
17 centimeters per second.

18 (b) The liners must comply with item A.

19 (2) The leachate collection and removal system  
20 between the liners, and immediately above the bottom composite  
21 liner in the case of multiple leachate collection and removal  
22 systems, is also a leak detection system. This leak detection  
23 system must be capable of detecting, collecting, and removing  
24 leaks of hazardous constituents at the earliest practicable time  
25 through all areas of the top liner likely to be exposed to waste  
26 or leachate during the active life and postclosure care period.  
27 The requirements for a leak detection system in this subitem are  
28 satisfied by installation of a system that is, at a minimum:

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

31 (b) constructed of granular drainage  
32 materials with a hydraulic conductivity of  $1 \times 10$  to the  
33 negative 1st power centimeters per second or more and a  
34 thickness of 12 inches (30.5 centimeters) or more; or  
35 constructed of synthetic or geonet drainage materials with a  
36 transmissivity of  $3 \times 10$  to the negative 4th power meters

1 squared per second or more;

2 (c) constructed of materials that are  
3 chemically resistant to the waste managed in the surface  
4 impoundment and the leachate expected to be generated, and of  
5 sufficient strength and thickness to prevent collapse under the  
6 pressures exerted by overlying wastes and any waste cover  
7 materials or equipment used at the surface impoundment;

8 (d) designed and operated to minimize  
9 clogging during the active life and postclosure care period; and

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

17 (3) The owner or operator shall collect and  
18 remove pumpable liquids in the sumps to minimize the head on the  
19 bottom liner.

20 (4) The owner or operator of a leak detection  
21 system that is not located completely above the seasonal high  
22 water table must demonstrate that the operation of the leak  
23 detection system will not be adversely affected by the presence  
24 of groundwater.

25 [For text of items D to G, see M.R.]

26 H. ~~The commissioner may approve alternative design or~~  
27 ~~operating practices to those specified in item C if the owner or~~  
28 ~~operator demonstrates to the commissioner that such design and~~  
29 ~~operating practices, together with location characteristics:~~

30 ~~(1) will prevent the migration of any hazardous~~  
31 ~~constituent into the groundwater or surface water at least as~~  
32 ~~effectively as the liners and leachate collection and removal~~  
33 ~~system specified in item C, and~~

34 ~~(2) will allow detection of leaks of hazardous~~  
35 ~~constituents through the top liner at least as effectively. An~~  
36 owner or operator may petition for alternate design and

1 operating practices under part 7045.0075, subpart 12.

2 [For text of item I, see M.R.]

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

7 (1) will prevent the migration of any hazardous  
8 constituent into the groundwater or surface water at least as  
9 effectively as the liners and leachate collection and removal  
10 system specified in item C; and

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

13 K. The owner or operator of any replacement surface  
14 impoundment unit is exempt from item C if:

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

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

21 [For text of subp 4, see M.R.]

22 Subp. 4a. Action leakage rate.

23 A. The commissioner shall approve an action leakage  
24 rate for surface impoundment units subject to subpart 3, item C  
25 or H. The action leakage rate is the maximum design flow rate  
26 that the leak detection system can remove without the fluid head  
27 on the bottom liner exceeding one foot. The action leakage rate  
28 must include an adequate safety margin to allow for  
29 uncertainties in the design (e.g., slope, hydraulic  
30 conductivity, thickness of drainage material), construction,  
31 operation, and location of the leak detection system, waste and  
32 leachate characteristics, likelihood and amounts of other  
33 sources of liquids in the leak detection system, and proposed  
34 response actions (e.g., the action leakage rate must consider  
35 decreases in the flow capacity of the system over time resulting  
36 from siltation and clogging, rib layover and creep of synthetic

1 components of the system, overburden pressures, etc.).

2           B. To determine if the action leakage rate has been  
3 exceeded, the owner or operator must convert the weekly or  
4 monthly flow rate from the monitoring data obtained under  
5 subpart 5, item E, to an average daily flow rate (gallons per  
6 acre per day) for each sump. Unless the commissioner approves a  
7 different calculation, the average daily flow rate for each sump  
8 must be calculated weekly during the active life and closure  
9 period, and if the unit is closed in accordance with subpart 7,  
10 item B, monthly during the postclosure care period when monthly  
11 monitoring is required under subpart 5, item E.

12           Subp. 4b. Response actions.

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

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

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

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

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

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

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

1 and

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

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

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

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

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

21 (2) document why such assessments are not needed.

22 Subp. 5. **Monitoring and inspection.** Monitoring and  
23 inspection requirements are as follows:

24 [For text of items A to D, see M.R.]

25 E. Leak detection system sump monitoring.

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

31 (2) After the final cover is installed, the  
32 amount of liquids removed from each leak detection system sump  
33 must be recorded at least monthly. If the liquid level in the  
34 sump stays below the pump operating level for two consecutive  
35 months, the amount of liquids in the sumps must be recorded at  
36 least quarterly. If the liquid level in the sump stays below

1 the pump operating level for two consecutive quarters, the  
2 amount of liquids in the sumps must be recorded at least  
3 semiannually. If at any time during the postclosure care period  
4 the pump operating level is exceeded at units on quarterly or  
5 semiannual recording schedules, the owner or operator must  
6 return to monthly recording of amounts of liquids removed from  
7 each sump until the liquid level again stays below the pump  
8 operating level for two consecutive months.

9 (3) "Pump operating level" is a liquid level  
10 proposed by the owner or operator and approved by the  
11 commissioner based on pump activation level, sump dimensions,  
12 and level that avoids backup into the drainage layer and  
13 minimizes head in the sump.

14 [For text of subp 6, see M.R.]

15 Subp. 7. **Closure and postclosure care.** The requirements  
16 of closure and postclosure care are as follows:

17 [For text of item A, see M.R.]

18 B. If waste residues or contaminated materials are  
19 left in place at final closure, the owner or operator shall  
20 comply with the postclosure requirements contained in parts  
21 7045.0490 to 7045.0496, including maintenance and monitoring  
22 throughout the postclosure care period specified in the permit  
23 under part 7045.0490. The owner or operator shall:

24 [For text of subitem (1), see M.R.]

25 (2) maintain and monitor the leak detection  
26 system in accordance with subparts 3, item C, subitems (3), unit  
27 (d), and (4); and 5, item E, and comply with all other  
28 applicable leak detection system requirements;

29 (3) maintain and monitor the leak detection  
30 system in accordance with subparts 3 and 4;

31 (4) maintain and monitor the groundwater  
32 monitoring system and comply with all other applicable  
33 requirements of part 7045.0484; and

34 (5) prevent run-on and runoff from eroding or  
35 otherwise damaging the final cover.

36 [For text of items C to E, see M.R.]

1 [For text of subps 8 to 10, see M.R.]

2 7045.0534 WASTE PILES.

3 [For text of subps 1 and 2, see M.R.]

4 Subp. 3. Design and operating requirements. Design and  
5 operating requirements are as follows:

6 [For text of items A and B, see M.R.]

7 C. The owner or operator of each new waste pile unit  
8 on which construction commences after January 29, 1992, each  
9 lateral expansion of a waste pile unit on which construction  
10 commences after July 29, 1992, and each replacement of an  
11 existing waste pile unit that is to commence reuse after July  
12 29, 1992, must install two or more liners and a leachate  
13 collection and removal system above and between such liners.  
14 "Construction commences" and "existing facility" are defined in  
15 part 7045.0020.

16 (1)(a) The liner system must include:

17 i. a top liner designed and  
18 constructed of materials (e.g. a geomembrane) to prevent the  
19 migration of hazardous constituents into such liner during the  
20 active life and postclosure care period; and

21 ii. a composite bottom liner,  
22 consisting of at least two components. The upper component must  
23 be designed and constructed of materials (e.g. a geomembrane) to  
24 prevent the migration of hazardous constituents into this  
25 component during the active life and postclosure care period.  
26 The lower component must be designed and constructed of  
27 materials to minimize the migration of hazardous constituents if  
28 a breach in the upper component were to occur. The lower  
29 component must be constructed of at least three feet (91  
30 centimeters) of compacted soil material with a hydraulic  
31 conductivity of no more than  $1 \times 10$  to the negative 7th power  
32 centimeters per second.

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

35 (2) The leachate collection and removal system

1 immediately above the top liner must be designed, constructed,  
2 operated, and maintained to collect and remove leachate from the  
3 waste pile during the active life and postclosure care period.  
4 The commissioner will specify design and operating conditions in  
5 the permit to ensure that the leachate depth over the liner does  
6 not exceed 30 centimeters (one foot). The leachate collection  
7 and removal system must comply with subitem (3), units (c) and  
8 (d).

9 (3) The leachate collection and removal system  
10 between the liners, and immediately above the bottom composite  
11 liner in the case of multiple leachate collection and removal  
12 systems, is also a leak detection system. This leak detection  
13 system must be capable of detecting, collecting, and removing  
14 leaks of hazardous constituents at the earliest practicable time  
15 through all areas of the top liner likely to be exposed to waste  
16 or leachate during the active life and postclosure care period.  
17 The requirements for a leak detection system in this subitem are  
18 satisfied by installation of a system that is, at a minimum:

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

21 (b) constructed of granular drainage  
22 materials with a hydraulic conductivity of  $1 \times 10$  to the  
23 negative 2nd power centimeters per second or more and a  
24 thickness of 12 inches (30.5 centimeters) or more; or  
25 constructed of synthetic or geonet drainage materials with a  
26 transmissivity of  $3 \times 10$  to the negative 5th meters squared per  
27 second or more;

28 (c) constructed of materials that are  
29 chemically resistant to the waste managed in the waste pile and  
30 the leachate expected to be generated, and of sufficient  
31 strength and thickness to prevent collapse under the pressures  
32 exerted by overlying wastes, waste cover materials, and  
33 equipment used at the waste pile;

34 (d) designed and operated to minimize  
35 clogging during the active life and postclosure care period; and

36 (e) constructed with sumps and liquid



1 removal methods (e.g. pumps) of sufficient size to collect and  
2 remove liquids from the sump and prevent liquids from backing up  
3 into the drainage layer. Each unit must have its own sump. The  
4 design of each sump and removal system must provide a method for  
5 measuring and recording the volume of liquids present in the  
6 sump and of liquids removed.

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

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

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

20 (1) will prevent the migration of any hazardous  
21 constituent into the groundwater or surface water at least as  
22 effectively as the liners and leachate collection and removal  
23 systems specified in item C; and

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

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

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

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

34 F. The owner or operator shall design, construct,  
35 operate, and maintain a run-on control system capable of  
36 preventing flow onto the active portion of the pile during peak

1 discharge from at least a 100-year storm.

2 G. The owner or operator shall design, construct,  
3 operate, and maintain a runoff management system to collect and  
4 control at least the water volume resulting from a 24-hour,  
5 100-year storm.

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

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

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

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

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

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

25 A. The commissioner shall approve an action leakage  
26 rate for waste pile units subject to subpart 3, item C or D.  
27 The action leakage rate is the maximum design flow rate that the  
28 leak detection system can remove without the fluid head on the  
29 bottom liner exceeding one foot. The action leakage rate must  
30 include an adequate safety margin to allow for uncertainties in  
31 the design (e.g., slope, hydraulic conductivity, thickness of  
32 drainage material), construction, operation, and location of the  
33 leak detection system, waste and leachate characteristics,  
34 likelihood and amounts of other sources of liquids in the leak  
35 detection system, and proposed response actions (e.g., the  
36 action leakage rate must consider decreases in the flow capacity

1 of the system over time resulting from siltation and clogging,  
2 rib layover and creep of synthetic components of the system,  
3 overburden pressures, etc.).

4           B. To determine if the action leakage rate has been  
5 exceeded, the owner or operator must convert the weekly flow  
6 rate from the monitoring data obtained under subpart 6, item C,  
7 to an average daily flow rate (gallons per acre per day) for  
8 each sump. Unless the commissioner approves a different  
9 calculation, the average daily flow rate for each sump must be  
10 calculated weekly during the active life and closure period.

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

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

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

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

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

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

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

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

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

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

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

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

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

20 (2) document why such assessments are not needed.

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

23 [For text of items A and B, see M.R.]

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

28 [For text of subps 7 to 10, see M.R.]

29 7045.0538 LANDFILLS.

30 [For text of subps 1 and 2, see M.R.]

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

33 [For text of items A and B, see M.R.]

34 C. The owner or operator of each new landfill unit on  
35 which construction commences after January 29, 1992, each

1 lateral expansion of a landfill unit on which construction  
2 commences after July 29, 1992, and each replacement of an  
3 existing landfill unit that is to commence reuse after July 29,  
4 1992, must install two or more liners and a leachate collection  
5 and removal system above and between such liners. "Construction  
6 commences" and "existing facility" are defined in part 7045.0020.

7 (1)(a) The liner system must include:

- 8 i. a top liner designed and  
9 constructed of materials (e.g. a geomembrane) to prevent the  
10 migration of hazardous constituents into such liner during the  
11 active life and postclosure care period; and  
12 ii. a composite bottom liner,  
13 consisting of at least two components. The upper component must  
14 be designed and constructed of materials (e.g. a geomembrane) to  
15 prevent the migration of hazardous constituents into this  
16 component during the active life and postclosure care period.  
17 The lower component must be designed and constructed of  
18 materials to minimize the migration of hazardous constituents if  
19 a breach in the upper component were to occur. The lower  
20 component must be constructed of at least three feet (91  
21 centimeters) of compacted soil material with a hydraulic  
22 conductivity of no more than  $1 \times 10^{-7}$  to the negative 7th  
23 centimeters per second.

24 (b) The liners must comply with item A.

25 (2) The leachate collection and removal system  
26 immediately above the top liner must be designed, constructed,  
27 operated, and maintained to collect and remove leachate from the  
28 landfill during the active life and postclosure care period.  
29 The commissioner will specify design and operating conditions in  
30 the permit to ensure that the leachate depth over the liner does  
31 not exceed 30 centimeters (one foot). The leachate collection  
32 and removal system must comply with subitem (3), units (c) and  
33 (d).

34 (3) The leachate collection and removal system  
35 between the liners, and immediately above the bottom composite  
36 liner in the case of multiple leachate collection and removal

1 systems, is also a leak detection system. This leak detection  
2 system must be capable of detecting, collecting, and removing  
3 leaks of hazardous constituents at the earliest practicable time  
4 through all areas of the top liner likely to be exposed to waste  
5 or leachate during the active life and postclosure care period.  
6 The requirements for a leak detection system in this subitem are  
7 satisfied by installation of a system that is, at a minimum:

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

10 (b) constructed of granular drainage  
11 materials with a hydraulic conductivity of  $1 \times 10$  to the  
12 negative 2nd centimeters per second or more and a thickness of  
13 12 inches (30.5 centimeters) or more; or constructed of  
14 synthetic or geonet drainage materials with a transmissivity of  
15  $3 \times 10$  to the negative 5th meters squared per second or more;

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

22 (d) designed and operated to minimize  
23 clogging during the active life and postclosure care period; and

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

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

34 (5) The owner or operator of a leak detection  
35 system that is not located completely above the seasonal high  
36 water table must demonstrate that the operation of the leak

1 detection system will not be adversely affected by the presence  
2 of groundwater.

3 [For text of items D to J, see M.R.]

4 ~~K. The commissioner may approve alternative design or~~  
5 ~~operating practices to those specified in item C if the owner or~~  
6 ~~operator demonstrates to the commissioner that such design and~~  
7 ~~operating practices, together with location characteristics:~~

8 ~~(1) will prevent the migration of any hazardous~~  
9 ~~constituent into the groundwater or surface water at least as~~  
10 ~~effectively as the liners and leachate collection and removal~~  
11 ~~systems specified in item C; and~~

12 ~~(2) will allow detection of leaks of hazardous~~  
13 ~~constituents through the top liner at least as effectively. An~~  
14 ~~owner or operator may petition for alternate design or operating~~  
15 ~~practices under part 7045.0075, subpart 12.~~

16 [For text of item L, see M.R.]

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

21 (1) will prevent the migration of any hazardous  
22 constituent into the groundwater or surface water at least as  
23 effectively as the liners and leachate collection and removal  
24 systems specified in item C; and

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

27 N. The owner or operator of any replacement landfill  
28 unit is exempt from item C if:

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

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

35 [For text of subp 4, see M.R.]

36 Subp. 4a. Action leakage rate.

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

16           B. To determine if the action leakage rate has been  
17 exceeded, the owner or operator must convert the weekly or  
18 monthly flow rate from the monitoring data obtained under  
19 subpart 5, item C, to an average daily flow rate (gallons per  
20 acre per day) for each sump. Unless the commissioner approves a  
21 different calculation, the average daily flow rate for each sump  
22 must be calculated weekly during the active life and closure  
23 period, and monthly during the postclosure care period when  
24 monthly monitoring is required under subpart 5, item C.

25           **Subp. 5. Monitoring and inspection.** Monitoring and  
26 inspection requirements are as follows:

27                     [For text of items A and B, see M.R.]

28           C. (1) An owner or operator required to have a leak  
29 detection system under subpart 3, item C or K, must record the  
30 amount of liquids removed from each leak detection system sump  
31 at least once each week during the active life and closure  
32 period.

33                     (2) After the final cover is installed, the  
34 amount of liquids removed from each leak detection system sump  
35 must be recorded at least monthly. If the liquid level in the  
36 sump stays below the pump operating level for two consecutive



1 months, the amount of liquids in the sumps must be recorded at  
2 least quarterly. If the liquid level in the sump stays below  
3 the pump operating level for two consecutive quarters, the  
4 amount of liquids in the sumps must be recorded at least  
5 semiannually. If at any time during the postclosure care period  
6 the pump operating level is exceeded at units on quarterly or  
7 semiannual recording schedules, the owner or operator must  
8 return to monthly recording of amounts of liquids removed from  
9 each sump until the liquid level again stays below the pump  
10 operating level for two consecutive months.

11 (3) "Pump operating level" is a liquid level  
12 proposed by the owner or operator and approved by the  
13 commissioner based on pump activation level, sump dimensions,  
14 and level that avoids backup into the drainage layer and  
15 minimizes head in the sump.

16 Subp. 5a. Response actions.

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

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

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

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

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

35 (4) determine whether waste receipt should cease  
36 or be curtailed, whether any waste should be removed from the

1 unit for inspection, repairs, or controls, and whether or not  
2 the unit should be closed;

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

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

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

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

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

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

25 (2) document why such assessments are not needed.

26 [For text of subp 6, see M.R.]

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

29 [For text of item A, see M.R.]

30 B. After final closure, the owner or operator shall  
31 comply with all postclosure requirements contained in parts  
32 7045.0488 to 7045.0494 including maintenance and monitoring  
33 throughout the postclosure care period specified in the permit  
34 under part 7045.0488. The owner or operator shall:

35 [For text of subitems (1) to (3), see M.R.]

36 (4) maintain and monitor the leak detection

1 system in accordance with subparts 3, item C, subitems (3), unit  
2 (d), and (4); and 5, item C, and comply with all other  
3 applicable leak detection system requirements of this part;

4 (5) maintain and monitor the groundwater  
5 monitoring systems and comply with all other applicable  
6 requirements of part 7045.0484;

7 (6) prevent run-on and runoff from eroding or  
8 otherwise damaging the final cover;

9 (7) protect and maintain surveyed benchmarks used  
10 in complying with subpart 6; and

11 (8) survey the landfill at least annually to  
12 determine any effects from settling, subsidence, erosion, or  
13 other events.

14 [For text of item C, see M.R.]

15 [For text of subps 8 to 13, see M.R.]

16 7045.0556 GENERAL FACILITY STANDARDS.

17 [For text of subps 1 to 4, see M.R.]

18 Subp. 5. **General inspection requirements.** General  
19 inspection requirements are listed in items A to E.

20 [For text of items A and B, see M.R.]

21 C. The frequency of inspection may vary for the items  
22 on the schedule. However, it must be based on the rate of  
23 possible deterioration of the equipment and the probability of  
24 an environmental or human health incident if the deterioration  
25 or malfunction or any operator error goes undetected between  
26 inspections. Areas subject to spills, such as loading and  
27 unloading areas, must be inspected daily when in use. The  
28 inspection schedule must include the terms and frequencies  
29 called for in parts 7045.0626, subpart 5; 7045.0628, subparts 4,  
30 5, and 7; 7045.0630, subpart 5; 7045.0632, subpart 9; 7045.0634,  
31 subpart 4; 7045.0638, subpart 2c; 7045.0640, subpart 4; and  
32 7045.0642, subpart 4; and the process vent and equipment leak  
33 standards in Code of Federal Regulations, title 40, sections  
34 264.1033, 264.1052, 264.1053, and 264.1058, as amended.

35 [For text of items D and E, see M.R.]

1 [For text of subps 6 and 7, see M.R.]

2 Subp. 8. Construction quality assurance program.

3 A. Construction quality assurance program.

4 (1) A construction quality assurance program is  
5 required for all surface impoundment, waste pile, and landfill  
6 units that are required to comply with parts 7045.0630, subpart  
7 1a, item A; 7045.0632, subpart 4a; and 7045.0638, subpart 2,  
8 item A. The program must ensure that the constructed unit meets  
9 or exceeds all design criteria and specifications in the  
10 permit. The program must be developed and implemented under the  
11 direction of a construction quality assurance officer who is a  
12 registered professional engineer.

13 (2) The construction quality assurance program  
14 must address the following physical components, where applicable:

- 15 (a) foundations;  
16 (b) dikes;  
17 (c) low-permeability soil liners;  
18 (d) geomembranes (flexible membrane liners);  
19 (e) leachate collection and removal systems  
20 and leak detection systems; and  
21 (f) final cover systems.

22 B. Written construction quality assurance plan.

23 Before construction begins on a unit subject to the construction  
24 quality assurance program under item A, the owner or operator  
25 must develop a written construction quality assurance plan. The  
26 plan must identify steps that will be used to monitor and  
27 document the quality of materials and the condition and manner  
28 of their installation. The construction quality assurance plan  
29 must include:

30 (1) identification of applicable units, and a  
31 description of how they will be constructed;

32 (2) identification of key personnel in the  
33 development and implementation of the construction quality  
34 assurance plan, and construction quality assurance officer  
35 qualifications; and

36 (3) a description of inspection and sampling

1 activities for all unit components identified in item A, subitem  
2 (2), including observations and tests that will be used before,  
3 during, and after construction to ensure that the construction  
4 materials and the installed unit components meet the design  
5 specifications. The description must cover sampling size and  
6 locations, frequency of testing, data evaluation procedures,  
7 acceptance and rejection criteria for construction materials,  
8 plans for implementing corrective measures, and data or other  
9 information to be recorded and retained in the operating record  
10 under part 7045.0584.

11 C. Contents of program.

12 (1) The construction quality assurance program  
13 must include observations, inspections, tests, and measurements  
14 sufficient to ensure:

15 (a) structural stability and integrity of  
16 all components of the unit identified in item A, subitem (2);

17 (b) proper construction of all components of  
18 the liners, leachate collection and removal system, leak  
19 detection system, and final cover system, according to permit  
20 specifications and good engineering practices, and proper  
21 installation of all components (e.g. pipes) according to design  
22 specifications; and

23 (c) conformity of all materials used with  
24 design and other material specifications under parts 7045.0532,  
25 subpart 3; 7045.0534, subpart 3; and 7045.0538, subpart 3.

26 (2) The construction quality assurance program  
27 shall include test fills for compacted soil liners, using the  
28 same compaction methods as in the full-scale unit, to ensure  
29 that the liners are constructed to meet the hydraulic  
30 conductivity requirements of parts 7045.0532, subpart 3, item C,  
31 subitem (1); 7045.0534, subpart 3, item C, subitem (1); and  
32 7045.0538, subpart 3, item C, subitem (1), in the field.  
33 Compliance with the hydraulic conductivity requirements must be  
34 verified by using in-situ testing on the constructed test fill.  
35 The test fill requirement is waived where data are sufficient to  
36 show that a constructed soil liner meets the hydraulic

1 conductivity requirements of parts 7045.0532, subpart 3, item C,  
2 subitem (1); 7045.0534, subpart 3, item C, subitem (1); and  
3 7045.0538, subpart 3, item C, subitem (1), in the field.

4 D. Certification. The owner or operator of units  
5 subject to this subpart must submit to the commissioner by  
6 certified mail or hand delivery, at least 30 days prior to  
7 receiving waste, a certification signed by the construction  
8 quality assurance officer that the construction quality  
9 assurance plan has been successfully carried out and that the  
10 unit meets the requirements of parts 7045.0630, subparts 1a and  
11 2; 7045.0632, subpart 4a; and 7045.0638, subpart 2. The owner  
12 or operator may receive waste in the unit after 30 days from the  
13 commissioner's receipt of the construction quality assurance  
14 certification unless the commissioner determines in writing that  
15 the construction is not acceptable, or extends the review period  
16 for a maximum of 30 more days, or seeks additional information  
17 from the owner or operator during this period. Documentation  
18 supporting the construction quality assurance officer's  
19 certification must be furnished to the commissioner upon request.

20 7045.0584 OPERATING RECORD.

21 [For text of subps 1 and 2, see M.R.]

22 Subp. 3. Record information. The following information  
23 must be recorded, as it becomes available, and maintained in the  
24 operating record until closure of the facility:

25 [For text of items A to G, see M.R.]

26 H. Monitoring, testing, or analytical data, and  
27 corrective action where required by parts 7045.0556, subpart 8;  
28 7045.0590, subparts 1, 6, 7, and 8; 7045.0592, subparts 1 and 7;  
29 7045.0628, subparts 2, 4, 5, and 7; 7045.0630, subparts 2a, 3,  
30 and 5; 7045.0632, subparts 4b, 8, and 9; 7045.0634, subparts 4  
31 and 6, item D, subitem (1); 7045.0636; 7045.0638, subparts 2a,  
32 2b, and 2c; and 7045.0640, subpart 4, and the process vent and  
33 equipment leak test methods and procedures and record keeping  
34 requirements in Code of Federal Regulations, title 40, sections  
35 264.1034(c) to (f), 264.1035, 264.1063(d) to (i), and 264.1064,

1 as amended. As required by parts 7045.0590, subparts 6 and 7;  
2 and 7045.0592, subpart 7, monitoring data at disposal facilities  
3 must be kept throughout the postclosure period.

4 [For text of items I to P, see M.R.]

5 7045.0630 SURFACE IMPOUNDMENTS.

6 [For text of subpart 1, see M.R.]

7 Subp. 1a. **Design and operating requirements.** Design and  
8 operating requirements are as follows:

9 A. The owner or operator of each new surface  
10 impoundment unit on which construction commences after January  
11 29, 1992, each lateral expansion of a surface impoundment unit  
12 on which construction commences after July 29, 1992, and each  
13 replacement of an existing surface impoundment unit that is to  
14 commence reuse after July 29, 1992, must install two or more  
15 liners and a leachate collection and removal system between such  
16 liners, and operate the leachate collection and removal system,  
17 in accordance with part 7045.0532, subpart 3, item C, unless  
18 exempted under part 7045.0532, subpart 3, item ~~H7-F7-or~~ J or K.  
19 "Construction commences" and "existing facility" are defined in  
20 part 7045.0020.

21 [For text of item B, see M.R.]

22 [For text of subp 2, see M.R.]

23 Subp. 2a. **Action leakage rate.**

24 A. The owner or operator of surface impoundment units  
25 subject to subpart 1a, item A, must submit a proposed action  
26 leakage rate to the commissioner when submitting the notice  
27 required under subpart 1a, item B. Within 60 days of receipt of  
28 the notification, the commissioner will establish an action  
29 leakage rate, either as proposed by the owner or operator or  
30 modified using the criteria in this subpart, or extend the  
31 review period for up to 30 days. If no action is taken by the  
32 commissioner before the original 60-day or extended 90-day  
33 review periods, the action leakage rate will be approved as  
34 proposed by the owner or operator.

35 B. The commissioner shall approve an action leakage

1 rate for surface impoundment units subject to subpart 1a, item  
2 A. The action leakage rate is the maximum design flow rate that  
3 the leak detection system can remove without the fluid head on  
4 the bottom liner exceeding one foot. The action leakage rate  
5 must include an adequate safety margin to allow for  
6 uncertainties in the design (e.g., slope, hydraulic  
7 conductivity, thickness of drainage material), construction,  
8 operation, and location of the leak detection system, waste and  
9 leachate characteristics, likelihood and amounts of other  
10 sources of liquids in the leak detection system, and proposed  
11 response actions (e.g., the action leakage rate must consider  
12 decreases in the flow capacity of the system over time resulting  
13 from siltation and clogging, rib layover and creep of synthetic  
14 components of the system, overburden pressures, etc.).

15 C. To determine if the action leakage rate has been  
16 exceeded, the owner or operator must convert the weekly or  
17 monthly flow rate from the monitoring data obtained under  
18 subpart 5, item B, to an average daily flow rate (gallons per  
19 acre per day) for each sump. Unless the commissioner approves a  
20 different calculation, the average daily flow rate for each sump  
21 must be calculated weekly during the active life and closure  
22 period, and if the unit closes in accordance with subpart 6,  
23 item C, monthly during the postclosure care period when monthly  
24 monitoring is required under subpart 5, item B.

25 Subp. 2b. **Response actions.**

26 A. The owner or operator of surface impoundment units  
27 subject to subpart 1a, item A, must submit a response action  
28 plan to the commissioner when submitting the proposed action  
29 leakage rate under subpart 2a. The response action plan must  
30 set forth the actions to be taken if the action leakage rate has  
31 been exceeded. At a minimum, the response action plan must  
32 describe the actions specified in item B.

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

36 (1) notify the commissioner in writing of the



1 exceedance within seven days of the determination;

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

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

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

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

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

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

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

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

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

35 (2) document why such assessments are not needed.

36 [For text of subps 3 and 4, see M.R.]

1 Subp. 5. Monitoring and inspection.

2 A. The owner or operator shall inspect:

3 (1) the freeboard level at least once each  
4 operating day to ensure compliance with subpart 2; and

5 (2) the surface impoundment, including dikes and  
6 vegetation surrounding the dike, at least once a week to detect  
7 any leaks, deterioration, or failures in the impoundment. As  
8 required by part 7045.0556, subpart 5, the owner or operator  
9 shall remedy any deterioration or malfunction found.

10 B. The owner or operator shall determine leaks as  
11 follows:

12 (1) An owner or operator required to have a leak  
13 detection system under subpart 1a, item A, must record the  
14 amount of liquids removed from each leak detection system sump  
15 at least once each week during the active life and closure  
16 period.

17 (2) After the final cover is installed, the  
18 amount of liquids removed from each leak detection system sump  
19 must be recorded at least monthly. If the liquid level in the  
20 sump stays below the pump operating level for two consecutive  
21 months, the amount of liquids in the sumps must be recorded at  
22 least quarterly. If the liquid level in the sump stays below  
23 the pump operating level for two consecutive quarters, the  
24 amount of liquids in the sumps must be recorded at least  
25 semiannually. If at any time during the postclosure care period  
26 the pump operating level is exceeded at units on quarterly or  
27 semiannual recording schedules, the owner or operator must  
28 return to monthly recording of amounts of liquids removed from  
29 each sump until the liquid level again stays below the pump  
30 operating level for two consecutive months.

31 (3) "Pump operating level" is a liquid level  
32 proposed by the owner or operator and approved by the  
33 commissioner based on pump activation level, sump dimensions,  
34 and level that avoids backup into the drainage layer and  
35 minimizes head in the sump. The timing for submission and  
36 approval of the proposed pump operating level will be in

1 accordance with subpart 2a, item A.

2 Subp. 6. **Closure and postclosure care.** The requirements  
3 of closure and postclosure care are as follows:

4 [For text of items A to C, see M.R.]

5 D. In addition to the requirements of parts 7045.0594  
6 to 7045.0606 and 7045.0638, subpart 4, during the postclosure  
7 care period, the owner or operator of a surface impoundment in  
8 which wastes, waste residues, or contaminated materials remain  
9 after closure in accordance with item C shall:

10 [For text of subitem (1), see M.R.]

11 (2) maintain and monitor the leak detection  
12 system in accordance with subpart 5, item B, and comply with all  
13 other applicable leak detection system requirements;

14 (3) maintain and monitor the groundwater  
15 monitoring system and comply with all other applicable  
16 requirements of part 7045.0590; and

17 (4) prevent run-on and runoff from eroding or  
18 otherwise damaging the final cover.

19 The closure requirements under part 7045.0638, subpart 4,  
20 will vary with the amount and nature of the residues remaining,  
21 if any, and the degree of contamination of the underlying and  
22 surrounding soil. The commissioner may vary postclosure  
23 requirements, according to part 7045.0602, subpart 1.

24 [For text of subps 7 and 8, see M.R.]

25 7045.0632 WASTE PILES.

26 [For text of subps 1 to 4, see M.R.]

27 Subp. 4a. **Design and operating requirements.** The owner or  
28 operator of each new waste pile on which construction commences  
29 after January 29, 1992, each lateral expansion of a waste pile  
30 unit on which construction commences after July 29, 1992, and  
31 each such replacement of an existing waste pile unit that is to  
32 commence reuse after July 29, 1992, must install two or more  
33 liners and a leachate collection and removal system above and  
34 between such liners, and operate the leachate collection and  
35 removal systems, in accordance with part 7045.0534, subpart 3,

1 item C, unless exempted under part 7045.0534, subpart 3, item D<sub>7</sub>  
2 E<sub>7</sub> or F E; and must comply with the procedures of part  
3 7045.0630, subpart 1a, item B. "Construction commences" and  
4 "existing facility" are defined in part 7045.0020.

5 Subp. 4b. Action leakage rates.

6 A. The owner or operator of waste pile units subject  
7 to subpart 4a must submit a proposed action leakage rate to the  
8 commissioner when submitting the notice required under subpart  
9 4a. Within 60 days of receipt of the notification, the  
10 commissioner will establish an action leakage rate, either as  
11 proposed by the owner or operator or modified using the criteria  
12 in this subpart, or extend the review period for up to 30 days.  
13 If no action is taken by the commissioner before the original  
14 60-day or extended 90-day review periods, the action leakage  
15 rate will be approved as proposed by the owner or operator.

16 B. The commissioner shall approve an action leakage  
17 rate for ~~surface-impoundment~~ waste pile units subject to subpart  
18 4a. The action leakage rate is the maximum design flow rate  
19 that the leak detection system can remove without the fluid head  
20 on the bottom liner exceeding one foot. The action leakage rate  
21 must include an adequate safety margin to allow for  
22 uncertainties in the design (e.g., slope, hydraulic  
23 conductivity, thickness of drainage material), construction,  
24 operation, and location of the leak detection system, waste and  
25 leachate characteristics, likelihood and amounts of other  
26 sources of liquids in the leak detection system, and proposed  
27 response actions (e.g., the action leakage rate must consider  
28 decreases in the flow capacity of the system over time resulting  
29 from siltation and clogging, rib layover and creep of synthetic  
30 components of the system, overburden pressures, etc.).

31 C. To determine if the action leakage rate has been  
32 exceeded, the owner or operator must convert the weekly flow  
33 rate from the monitoring data obtained under subpart 9, to an  
34 average daily flow rate (gallons per acre per day) for each  
35 sump. Unless the commissioner approves a different calculation,  
36 the average daily flow rate for each sump must be calculated

1 weekly during the active life and closure period.

2 [For text of subps 5 to 7, see M.R.]

3 Subp. 8. Response actions.

4 A. The owner or operator of waste pile units subject  
5 to subpart 4a must submit a response action plan to the  
6 commissioner when submitting the proposed action leakage rate  
7 under subpart 4b. The response action plan must set forth the  
8 actions to be taken if the action leakage rate has been  
9 exceeded. At a minimum, the response action plan must describe  
10 the actions specified in item B.

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

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

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

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

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

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

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

1 the results of any remedial actions taken and actions planned.

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

4 (1) document the following assessments:

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

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

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

14 (2) document why such assessments are not needed.

15 Subp. 9. **Monitoring and inspection.** An owner or operator  
16 required to have a leak detection system under subpart 4a must  
17 record the amount of liquids removed from each leak detection  
18 system sump at least once each week during the active life and  
19 closure period.

20 7045.0638 LANDFILLS.

21 [For text of subpart 1, see M.R.]

22 Subp. 1a. [See repealer.]

23 Subp. 2. **Design and operating requirements.** Design and  
24 operating requirements are as follows:

25 A. The owner or operator of each new landfill unit on  
26 which construction commences after January 29, 1992, each  
27 lateral expansion of a landfill unit on which construction  
28 commences after July 29, 1992, and each replacement of an  
29 existing landfill unit that is to commence reuse after July 29,  
30 1992, must install two or more liners and a leachate collection  
31 and removal system above and between such liners, and operate  
32 the leachate collection and removal systems, in accordance with  
33 part 7045.0538, subpart 3, item ~~K7-B7-or-M~~ C, unless exempted  
34 under part 7045.0538, subpart 3, item M or N. "Construction  
35 commences" and "existing facility" are defined in part 7045.0020.

1           B. The owner or operator of each unit referred to in  
2 item A must notify the commissioner at least 60 days before  
3 receiving waste. The owner or operator of each facility  
4 submitting notice must file a part B application within six  
5 months of the commissioner's receipt of the notice.

6           C. The owner or operator of any replacement landfill  
7 unit is exempt from item A if:

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

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

14           D. The owner or operator shall design, construct,  
15 operate, and maintain a run-on control system capable of  
16 preventing flow onto the active portion of the landfill during  
17 peak discharge from at least a 25-year storm.

18           E. The owner or operator shall design, construct,  
19 operate, and maintain a runoff management system to collect and  
20 control at least the water volume resulting from a 24-hour,  
21 25-year storm.

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

26           G. The owner or operator of a landfill containing  
27 hazardous waste which is subject to dispersal by wind shall  
28 cover or otherwise manage the landfill so that wind dispersal of  
29 the hazardous waste is controlled. As required by part  
30 7045.0564, the waste analysis plan must include analyses needed  
31 to comply with subparts 5, 6, and 7. As required by part  
32 7045.0584, the owner or operator shall place the results of  
33 these analyses in the operating record of the facility.

34           **Subp. 2a. Action leakage rate.**

35           A. The owner or operator of landfill units subject to  
36 subpart 2, item A, must submit a proposed action leakage rate to

1 the commissioner when submitting the notice required under  
2 subpart 2, item B. Within 60 days of receipt of the  
3 notification, the commissioner will establish an action leakage  
4 rate, either as proposed by the owner or operator or modified  
5 using the criteria in this subpart, or extend the review period  
6 for up to 30 days. If no action is taken by the commissioner  
7 before the original 60-day or extended 90-day review periods,  
8 the action leakage rate will be approved as proposed by the  
9 owner or operator.

10 B. The commissioner shall approve an action leakage  
11 rate for landfill units subject to subpart 2, item A. The  
12 action leakage rate is the maximum design flow rate that the  
13 leak detection system can remove without the fluid head on the  
14 bottom liner exceeding one foot. The action leakage rate must  
15 include an adequate safety margin to allow for uncertainties in  
16 the design (e.g., slope, hydraulic conductivity, thickness of  
17 drainage material), construction, operation, and location of the  
18 leak detection system, waste and leachate characteristics,  
19 likelihood and amounts of other sources of liquids in the leak  
20 detection system, and proposed response actions (e.g., the  
21 action leakage rate must consider decreases in the flow capacity  
22 of the system over time resulting from siltation and clogging,  
23 rib layover and creep of synthetic components of the system,  
24 overburden pressures, etc.).

25 C. To determine if the action leakage rate has been  
26 exceeded, the owner or operator must convert the weekly or  
27 monthly flow rate from the monitoring data obtained under  
28 subpart 2c to an average daily flow rate (gallons per acre per  
29 day) for each sump. Unless the commissioner approves a  
30 different calculation, the average daily flow rate for each sump  
31 must be calculated weekly during the active life and closure  
32 period, and monthly during the postclosure care period when  
33 monthly monitoring is required under subpart 2c, item B.

34 Subp. 2b. **Response actions.**

35 A. The owner or operator of landfill units subject to  
36 subpart 2, item A, must submit a response action plan to the



1 commissioner when submitting the proposed action leakage rate  
2 under subpart 2a. The response action plan must set forth the  
3 actions to be taken if the action leakage rate has been  
4 exceeded. At a minimum, the response action plan must describe  
5 the actions specified in item B.

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

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

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

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

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

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

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

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

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

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

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

8 (2) document why such assessments are not needed.

9 **Subp. 2c. Monitoring and inspection.**

10 A. An owner or operator required to have a leak  
11 detection system under subpart 2, item A, must record the amount  
12 of liquids removed from each leak detection system sump at least  
13 once each week during the active life and closure period.

14 B. After the final cover is installed, the amount of  
15 liquids removed from each leak detection system sump must be  
16 recorded at least monthly. If the liquid level in the sump  
17 stays below the pump operating level for two consecutive months,  
18 the amount of liquids in the sumps must be recorded at least  
19 quarterly. If the liquid level in the sump stays below the pump  
20 operating level for two consecutive quarters, the amount of  
21 liquids in the sumps must be recorded at least semiannually. If  
22 at any time during the postclosure care period the pump  
23 operating level is exceeded at units on quarterly or semiannual  
24 recording schedules, the owner or operator must return to  
25 monthly recording of amounts of liquids removed from each sump  
26 until the liquid level again stays below the pump operating  
27 level for two consecutive months.

28 C. "Pump operating level" is a liquid level proposed  
29 by the owner or operator and approved by the commissioner based  
30 on pump activation level, sump dimensions, and level that avoids  
31 backup into the drainage layer and minimizes head in the sump.  
32 The timing for submission and approval of the proposed pump  
33 operating level will be in accordance with subpart 2a, item A.

34 [For text of subp 3, see M.R.]

35 **Subp. 4. Closure and postclosure.** Closure and postclosure  
36 requirements are as follows:

1 [For text of item A, see M.R.]

2 B. After final closure, the owner or operator shall  
3 comply with all postclosure requirements contained in parts  
4 7045.0600 to 7045.0606 including maintenance and monitoring  
5 throughout the postclosure care period. The owner or operator  
6 must:

7 [For text of subitem (1), see M.R.]

8 (2) maintain and monitor the leak detection  
9 system in accordance with part 7045.0538, subparts 3, item C,  
10 subitems (3), unit (d), and (4); and 2c, item B, and comply with  
11 all other applicable leak detection system requirements of this  
12 part;

13 (3) maintain and monitor the groundwater  
14 monitoring system and comply with all other applicable  
15 requirements of parts 7045.0590 and 7045.0592;

16 (4) prevent run-on and runoff from eroding or  
17 otherwise damaging the final cover; and

18 (5) protect and maintain surveyed bench marks  
19 used in complying with part 7045.0638, subpart 3.

20 [For text of subps 5 to 9, see M.R.]

21 7045.1305 DILUTION PROHIBITED AS A SUBSTITUTE FOR TREATMENT.

22 [For text of item A, see M.R.]

23 B. Dilution of wastes that are hazardous only because  
24 they exhibit a characteristic in a treatment system that treats  
25 wastes subsequently discharged to a water of the United States  
26 pursuant to a permit issued under section 402 of the Clean Water  
27 Act (CWA), or that treats wastes for purposes of pretreatment  
28 requirements under section 307 of the CWA is not impermissible  
29 dilution for purposes of this part unless a method has been  
30 specified as the treatment standard in part 7045.1360, or unless  
31 the waste is a D003 reactive cyanide wastewater or nonwastewater.

32 7045.1335 WASTE SPECIFIC PROHIBITIONS; THIRD ONE-THIRD OF  
33 REGULATED WASTES.

34 [For text of subps 1 and 2, see M.R.]

35 Subp. 3. Applicability as of May 8, 1992. Effective May

1 8, 1992, the following wastes are prohibited from land disposal:

2 [For text of items A to D, see M.R.]

3 E. the following wastes identified as hazardous based  
4 on a characteristic alone: D004 (nonwastewaters); D009  
5 (nonwastewaters); inorganic solids debris as defined in part  
6 7045.0020, subpart 45a (which also applies to chromium  
7 refractory bricks carrying the EPA Hazardous Waste Nos.  
8 K048-K052); and RCRA hazardous wastes that contain naturally  
9 occurring radioactive materials.

10 [For text of subp 4, see M.R.]

11 Subp. 5. **Contaminated soil or debris.** Effective May 8,  
12 1993, debris that is contaminated with wastes listed in Code of  
13 Federal Regulations, title 40, part 268.10, 268.11, or 268.12,  
14 and debris that is contaminated with any characteristic waste  
15 for which treatment standards are established in parts 7045.1350  
16 to 7045.1360 are prohibited from land disposal.

17 [For text of subps 6 to 10, see M.R.]

18 Subp. 11. **Applicability as of May 8, 1993.** Effective May  
19 8, 1993, D006 lead materials stored before secondary smelting  
20 are prohibited from land disposal. On or before March 1, 1993,  
21 the owner or operator of each secondary lead smelting facility  
22 shall submit to the commissioner the following, a binding  
23 contractual commitment to construct or otherwise provide  
24 capacity for storing such D008 wastes prior to smelting which  
25 complies with all applicable storage standards, documentation  
26 that the capacity to be provided will be sufficient to manage  
27 the entire quantity of such D008 wastes, and a detailed schedule  
28 for providing such capacity. Failure by a facility to submit  
29 such documentation shall render such D008 managed by that  
30 facility prohibited from land disposal effective March 1, 1993.  
31 In addition, no later than July 27, 1992, the owner or operator  
32 of each facility must place in the facility record documentation  
33 of the manner and location in which such wastes will be managed  
34 pending completion of such capacity, demonstrating that such  
35 management capacity will be adequate and complies with all  
36 applicable hazardous waste requirements.

1 7045.1355 TREATMENT STANDARDS EXPRESSED AS CONCENTRATIONS IN  
2 WASTE EXTRACT.

3 Subpart 1. **Applicability.** Code of Federal Regulations,  
4 title 40, part 268.41, Table CCWE, identifies the restricted  
5 wastes and the concentrations of their associated constituents  
6 that may not be exceeded by the extract of a waste or waste  
7 treatment residual developed using the test method in Code of  
8 Federal Regulations, title 40, part 261, Appendix II, for the  
9 allowable land disposal of such wastes, with the exception of  
10 EPA Hazardous Waste Nos. D004, D008, ~~D031~~ K031, K084, K101,  
11 K102, P010, P011, P012, P036, and U136, and the concentrations  
12 of their associated constituents which may not be exceeded by  
13 the extract of a waste or waste treatment residual developed  
14 using the test method in Code of Federal Regulations, title 40,  
15 part 261, Appendix II, for the allowable land disposal of such  
16 wastes. Code of Federal Regulations, title 40, part 268,  
17 Appendix II, provides agency guidance on treatment methods that  
18 have been shown to achieve the Table CCWE levels for the  
19 respective wastes. This guidance is provided to assist  
20 generators and owners or operators in their selection of  
21 appropriate treatment methods. Compliance with these  
22 concentrations is required based on grab samples unless  
23 otherwise noted in Code of Federal Regulations, title 40, part  
24 268.43, Table CCW.

25 Subp. 2. **Combined wastes.** When wastes with differing  
26 treatment standards for a constituent of concern are combined  
27 for purposes of treatment, the treatment residue must meet the  
28 lowest treatment standard for the constituent of concern, except  
29 that mixtures of high and low zinc nonwastewater K061 are  
30 subject to the treatment standard for high zinc K061.

31 [For text of subp 3, see M.R.]

32 7045.1360 TREATMENT STANDARDS EXPRESSED AS SPECIFIED  
33 TECHNOLOGIES.

34 [For text of subps 1 to 10, see M.R.]

35 Subp. 11. **Recommended technologies to achieve deactivation**

1 of characteristics. The treatment standard for many  
 2 subcategories of the EPA Hazardous Waste Nos. D001, D002, D003,  
 3 K044, K045, and K047 wastes is listed simply as "Deactivation to  
 4 remove the characteristics of ignitability, corrosivity, and  
 5 reactivity." EPA has determined that many technologies, when  
 6 used alone or in combination, can achieve this standard. The  
 7 following appendix presents a partial list of these  
 8 technologies, using the five-letter technology codes established  
 9 in subpart 3. Use of these specific technologies is not  
 10 mandatory and does not preclude direct reuse, recovery, or the  
 11 use of other pretreatment technologies, provided deactivation is  
 12 achieved and these alternative methods are not performed in  
 13 units designated as land disposal.

14 Waste Code/Subcategory	Nonwastewaters	Wastewaters
15 D001 Ignitable Liquids based on	RORGS	Not
16 261.21(a)(1) - Low TOC Non-	INCIN	applicable
17 wastewater Subcategory	WETOX	
18 (containing 1% to <10% TOC)	CHOXD	
19	BIODG	
20		
21		
22 D001 Ignitable Liquids based on	Not	RORGS
23 261.21(a)(1) - Ignitable Waste-	applicable	INCIN
24 water Subcategory (containing		WETOX
25 <1% TOC)		CHOXD
26		BIODG
27		
28 D001 Compressed Gases based on	RCGAS	Not
29 261.21(a)(3)	INCIN	applicable
30	FSUBS	
31	ADGAS fol-	
32	lowed by	
33	INCIN	
34	ADGAS fol-	
35	lowed by	
36	(CHOXD; or	
37	CHRED)	
38		
39 D001 Ignitable Reactives based	WTRRX	Not
40 on 261.21(a)(2)	CHOXD	applicable
41	CHRED	
42	STABL	
43	INCIN	
44		
45 D001 Ignitable Oxidizers based	CHRED	CHRED
46 on 261.21(a)(4)	INCIN	INCIN
47		
48 D002 Acid Subcategory based	RCORR	NEUTR
49 on 261.22(a)(1) with pH less	NEUTR	INCIN
50 than or equal to 2	INCIN	
51		
52 D002 Alkaline Subcategory based	NEUTR	NEUTR
53 on 261.22(a)(1) with pH	INCIN	INCIN
54 greater than or equal to 12.5		
55		
56 D002 Other Corrosives based on	CHOXD	CHOXD
57 261.22(a)(2)	CHRED	CHRED
58	INCIN	INCIN

1		STABL	
2			
3	D003 Water Reactives based	INCIN	Not
4	on 261.23(a)(2), (3), and (4)	WTRRX	applicable
5		CHOXD	
6		CHRED	
7			
8	D003 Reactive Sulfides based	CHOXD	CHOXD
9	on 261.23(a)(5)	CHRED	CHRED
10		INCIN	BIODG
11		STABL	INCIN
12			
13	D003 Explosives based on	INCIN	INCIN
14	261.23(a)(6), (7), and (8)	CHOXD	CHOXD
15		CHRED	CHRED
16			BIODG
17			CARBN
18			
19	D003 Other Reactives based	INCIN	INCIN
20	on 261.23(a)(1)	CHOXD	CHOXD
21		CHRED	CHRED
22			BIODG
23			CARBN
24			
25	K044 Wastewater treatment sludges	CHOXD	CHOXD
26	from the manufacturing and	CHRED	CHRED
27	processing of explosives	INCIN	BIODG
28			CARBN
29			INCIN
30			
31	K045 Spent carbon from the	CHOXD	CHOXD
32	treatment of wastewaters	CHRED	CHRED
33	containing explosives	INCIN	BIODG
34			CARBN
35			INCIN
36			
37	K047 Pink/red water from	CHOXD	CHOXD
38	TNT operations	CHRED	CHRED
39		INCIN	BIODG
40			CARBN
41			INCIN
42			
43	REPEALER. Minnesota Rules, part 7045.0638, subpart 1a, is		
44	repealed.		