

# Appendix 8

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*U.S. EPA, 40 CFR, part 258 Criteria for Municipal Solid Waste Landfills*

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## ***PART 258—CRITERIA FOR MUNICIPAL SOLID WASTE LANDFILLS***

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AUTHORITY: 33 U.S.C. 1345(d) and (e); 42 U.S.C. 6902(a), 6907, 6912(a), 6944, 6945(c) and 6949a(c), 6981(a).

SOURCE: 56 FR 51016, Oct. 9, 1991, unless otherwise noted.

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### ***Subpart A—General***

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#### ***§258.1 Purpose, scope, and applicability.***

(a) The purpose of this part is to establish minimum national criteria under the Resource Conservation and Recovery Act (RCRA or the Act), as amended, for all municipal solid waste landfill (MSWLF) units and under the Clean Water Act, as amended, for municipal solid waste landfills that are used to dispose of sewage sludge. These minimum national criteria ensure the protection of human health and the environment.

(b) These Criteria apply to owners and operators of new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this part; all other solid waste disposal facilities and practices that are not regulated under subtitle C of RCRA are subject to the criteria contained in part 257 of this chapter.

(c) These Criteria do not apply to municipal solid waste landfill units that do not receive waste after October 9, 1991.

(d)(1) MSWLF units that meet the conditions of §258.1(e)(2) and receive waste after October 9, 1991 but stop receiving waste before April 9, 1994, are exempt from all the requirements of this part 258, except the final cover requirement specified in §258.60(a). The final cover must be installed by October 9, 1994. Owners or operators of MSWLF units described in this paragraph that fail to complete cover installation by October 9, 1994 will be subject to all the requirements of this part 258, unless otherwise specified.

(2) MSWLF units that meet the conditions of §258.1(e)(3) and receive waste after October 9, 1991 but stop receiving waste before the date designated by the state pursuant to §258.1(e)(3), are exempt from all the requirements of this part 258, except the final cover requirement specified in §258.60(a). The final cover must be installed within one year after the date designated by the state pursuant to §258.1(e)(3). Owners or operators of MSWLF units described in this paragraph that fail to complete cover installation within one year after the date designated by the state pursuant to §258.1(e)(3) will be subject to all the requirements of this part 258, unless otherwise specified.

(3) MSWLF units that meet the conditions of paragraph (f)(1) of this section and receive waste after October 9, 1991 but stop receiving waste before October 9, 1997, are exempt from all the requirements of this part 258, except the final cover requirement specified in §258.60(a). The final cover must be installed by October 9, 1998. Owners or operators of MSWLF units described in this paragraph that fail to complete cover installation by October 9, 1998 will be subject to all the requirements of this part 258, unless otherwise specified.

(4) MSWLF units that do not meet the conditions of §258.1 (e)(2), (e)(3), or (f) and receive waste after October 9, 1991 but stop receiving waste before October 9, 1993, are exempt from all the requirements this part 258, except the final cover requirement specified in §258.60(a). The final cover must be installed by October 9, 1994. Owners or operators of MSWLF units described in this paragraph that fail to complete cover installation by October 9, 1994 will be subject to all the requirements of this part 258, unless otherwise specified.

(e)(1) The compliance date for all requirements of this part 258, unless otherwise specified, is October 9, 1993 for all MSWLF units that receive waste on or after October 9, 1993, except those units that qualify for an extension under (e)(2), (3), or (4) of this section.

(2) The compliance date for all requirements of this part 258, unless otherwise specified, is April 9, 1994 for an existing MSWLF unit or a lateral expansion of an existing MSWLF unit that meets the following conditions:

(i) The MSWLF unit disposed of 100 tons per day or less of solid waste during a representative period prior to October 9, 1993;

(ii) The unit does not dispose of more than an average of 100 TPD of solid waste each month between October 9, 1993 and April 9, 1994;

(iii) The MSWLF unit is located in a state that has submitted an application for permit program approval to EPA by October 9, 1993, is located in the state of Iowa, or is located on Indian Lands or Indian Country; and

(iv) The MSWLF unit is not on the National Priorities List (NPL) as found in appendix B to 40 CFR part 300.

(3) The compliance date for all requirements of this part 258, unless otherwise specified, for an existing MSWLF unit or lateral expansion of an existing MSWLF unit receiving flood-related waste from federally-designated areas within the major disasters declared for the states of Iowa, Illinois, Minnesota, Wisconsin, Missouri, Nebraska, Kansas, North Dakota, and South Dakota by the President during the summer of 1993 pursuant to 42 U.S.C. 5121 *et seq.*, shall be designated by the state in which the MSWLF unit is located in accordance with the following:

(i) The MSWLF unit may continue to accept waste up to April 9, 1994 without being subject to part 258, if the state in which the MSWLF unit is located determines that the MSWLF unit is needed to receive flood-related waste from a federally-designated disaster area as specified in (e)(3) of this section.

(ii) The MSWLF unit that receives an extension under paragraph (e)(3)(i) of this section may continue to accept waste up to an additional six months beyond April 9, 1994 without being subject to part 258, if the state in which the MSWLF unit is located determines that the MSWLF unit is needed to receive flood-related waste from a federally-designated disaster area specified in (e)(3) of this section.

(iii) In no case shall a MSWLF unit receiving an extension under paragraph (e)(3) (i) or (ii) of this section accept waste beyond October 9, 1994 without being subject to part 258.

(4) For a MSWLF unit that meets the conditions for the exemption in paragraph (f)(1) of this section, the compliance date for all applicable requirements of part 258, unless otherwise specified, is October 9, 1997.

(f)(1) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that dispose of less than twenty (20) tons of municipal solid waste daily, based on an annual average, are exempt from subparts D and E of this part, so long as there is no evidence of ground-water contamination from the MSWLF unit, and the MSWLF unit serves:

(i) A community that experiences an annual interruption of at least three consecutive months of surface transportation that prevents access to a regional waste management facility, or

(ii) A community that has no practicable waste management alternative and the landfill unit is located in an area that annually receives less than or equal to 25 inches of precipitation.

(2) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that meet the criteria in paragraph (f)(1)(i) or (f)(1)(ii) of this section must place in the operating record information demonstrating this.

(3) If the owner or operator of a new MSWLF unit, existing MSWLF unit, or lateral expansion has knowledge of ground-water contamination resulting from the unit that has asserted the exemption in paragraph (f)(1)(i) or (f)(1)(ii) of this section, the owner or operator must notify the state Director of such contamination and, thereafter, comply with subparts D and E of this part.

(g) Municipal solid waste landfill units failing to satisfy these criteria are considered open dumps for purposes of State solid waste management planning under RCRA.

(h) Municipal solid waste landfill units failing to satisfy these criteria constitute open dumps, which are prohibited under section 4005 of RCRA.

(i) Municipal solid waste landfill units containing sewage sludge and failing to satisfy these Criteria violate sections 309 and 405(e) of the Clean Water Act.

(j) Subpart G of this part is effective April 9, 1995, except for MSWLF units meeting the requirements of paragraph (f)(1) of this section, in which case the effective date of subpart G is October 9, 1995.

[56 FR 51016, Oct. 9, 1991, as amended at 58 FR 51546, Oct. 1, 1993; 60 FR 52342, Oct. 6, 1995; 61 FR 50413, Sept. 25, 1996]

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## **§258.2 Definitions.**

Unless otherwise noted, all terms contained in this part are defined by their plain meaning. This section contains definitions for terms that appear throughout this part; additional definitions appear in the specific sections to which they apply.

*Active life* means the period of operation beginning with the initial receipt of solid waste and ending at completion of closure activities in accordance with §258.60 of this part.

*Active portion* means that part of a facility or unit that has received or is receiving wastes and that has not been closed in accordance with §258.60 of this part.

*Aquifer* means a geological formation, group of formations, or portion of a formation capable of yielding significant quantities of ground water to wells or springs.

*Commercial solid waste* means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

*Construction and demolition (C&D) landfill* means a solid waste disposal facility subject to the requirements in part 257, subparts A or B of this chapter that receives construction and demolition waste and does not receive hazardous waste (defined in §261.3 of this chapter) or industrial solid waste (defined in this section). Only a C&D landfill that meets the requirements of 40 CFR part 257, subpart B may receive very small quantity generator waste (defined in §260.10 of this chapter). A C&D landfill typically receives any one or more of the

following types of solid wastes: Roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste.

*Director of an Approved State* means the chief administrative officer of a state agency responsible for implementing the state permit program that is deemed to be adequate by EPA under regulations published pursuant to sections 2002 and 4005 of RCRA.

*Existing MSWLF unit* means any municipal solid waste landfill unit that is receiving solid waste as of the appropriate dates specified in §258.1(e). Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management.

*Facility* means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.

*Ground water* means water below the land surface in a zone of saturation.

*Household waste* means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

*Indian lands or Indian country* means:

- (1) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running throughout the reservation;
- (2) All dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of the State; and
- (3) All Indian allotments, the Indian titles to which have not been extinguished, including rights of way running through the same.

*Indian Tribe or Tribe* means any Indian tribe, band, nation, or community recognized by the Secretary of the Interior and exercising substantial governmental duties and powers on Indian lands.

*Industrial solid waste* means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under subtitle C of RCRA. Such waste may include, but is not limited to, waste resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

*Lateral expansion* means a horizontal expansion of the waste boundaries of an existing MSWLF unit.

*Leachate* means a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

*Municipal solid waste landfill (MSWLF) unit* means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under §257.2 of this chapter. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, very small quantity generator waste and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit.

*New MSWLF unit* means any municipal solid waste landfill unit that has not received waste prior to October 9, 1993, or prior to October 9, 1997 if the MSWLF unit meets the conditions of §258.1(f)(1).

*Open burning* means the combustion of solid waste without:

- (1) Control of combustion air to maintain adequate temperature for efficient combustion,
- (2) Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and
- (3) Control of the emission of the combustion products.

*Operator* means the person(s) responsible for the overall operation of a facility or part of a facility.

*Owner* means the person(s) who owns a facility or part of a facility.

*Residential lead-based paint waste* means waste containing lead-based paint, which is generated as a result of activities such as abatement, rehabilitation, renovation and remodeling in homes and other residences. The term residential lead-based paint waste includes, but is not limited to, lead-based paint debris, chips, dust, and sludges.

*Run-off* means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

*Run-on* means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

*Saturated zone* means that part of the earth's crust in which all voids are filled with water.

*Sludge* means any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

*Solid waste* means any garbage, or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit under 33 U.S.C. 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

*State* means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

*State Director* means the chief administrative officer of the lead state agency responsible for implementing the state permit program for 40 CFR part 257, subpart B and 40 CFR part 258 regulated facilities.

*Uppermost aquifer* means the geologic formation nearest the natural ground surface that is an aquifer, as well as, lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

*Waste management unit boundary* means a vertical surface located at the hydraulically downgradient limit of the unit. This vertical surface extends down into the uppermost aquifer.

[56 FR 51016, Oct. 9, 1991; 57 FR 28627, June 26, 1992, as amended at 58 FR 51547, Oct. 1, 1993; 60 FR 52342, Oct. 6, 1995; 63 FR 57044, Oct. 23, 1998; 68 FR 36495, June 18, 2003; 81 FR 85805, Nov. 28, 2016]

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### **§258.3 Consideration of other Federal laws.**

The owner or operator of a municipal solid waste landfill unit must comply with any other applicable Federal rules, laws, regulations, or other requirements.

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#### **§258.4 Research, development, and demonstration permits.**

(a) Except as provided in paragraph (f) of this section, the Director of an approved State may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative and new methods which vary from either or both of the following criteria provided that the MSWLF unit has a leachate collection system designed and constructed to maintain less than a 30-cm depth of leachate on the liner:

(1) The run-on control systems in §258.26(a)(1); and

(2) The liquids restrictions in §258.28(a).

(b) The Director of an approved State may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, for which the owner or operator proposes to utilize innovative and new methods which vary from the final cover criteria of §258.60(a)(1), (a)(2) and (b)(1), provided the MSWLF unit owner/operator demonstrates that the infiltration of liquid through the alternative cover system will not cause contamination of groundwater or surface water, or cause leachate depth on the liner to exceed 30-cm.

(c) Any permit issued under this section must include such terms and conditions at least as protective as the criteria for municipal solid waste landfills to assure protection of human health and the environment. Such permits shall:

(1) Provide for the construction and operation of such facilities as necessary, for not longer than three years, unless renewed as provided in paragraph (e) of this section;

(2) Provide that the MSWLF unit must receive only those types and quantities of municipal solid waste and non-hazardous wastes which the State Director deems appropriate for the purposes of determining the efficacy and performance capabilities of the technology or process;

(3) Include such requirements as necessary to protect human health and the environment, including such requirements as necessary for testing and providing information to the State Director with respect to the operation of the facility;

(4) Require the owner or operator of a MSWLF unit permitted under this section to submit an annual report to the State Director showing whether and to what extent the site is progressing in attaining project goals. The report will also include a summary of all monitoring and testing results, as well as any other operating information specified by the State Director in the permit; and

(5) Require compliance with all criteria in this part, except as permitted under this section.

(d) The Director of an approved State may order an immediate termination of all operations at the facility allowed under this section or other corrective measures at any time the State Director determines that the overall goals of the project are not being attained, including protection of human health or the environment.

(e) Any permit issued under this section shall not exceed three years and each renewal of a permit may not exceed three years.

(1) The total term for a permit for a project including renewals may not exceed twenty-one (21) years; and

(2) During permit renewal, the applicant shall provide a detailed assessment of the project showing the status with respect to achieving project goals, a list of problems and status with respect to problem resolutions, and other any other requirements that the Director determines necessary for permit renewal.

(f) *Small MSWLF units.* (1) An owner or operator of a MSWLF unit operating under an exemption set forth in §258.1(f)(1) is not eligible for any variance from §§258.26(a)(1) and 258.28(a) of the operating criteria in subpart C of this part.

(2) An owner or operator of a MSWLF unit that disposes of 20 tons of municipal solid waste per day or less, based on an annual average, is not eligible for a variance from §258.60 (b)(1), except in accordance with §258.60(b)(3).

[69 FR 13255, Mar. 22, 2004, as amended at 81 FR 28724, May 10, 2016]

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## **§§258.5-258.9 [Reserved]**

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### **Subpart B—Location Restrictions**

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#### **§258.10 Airport safety.**

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions that are located within 10,000 feet (3,048 meters) of any airport runway end used by turbojet aircraft or within 5,000 feet (1,524 meters) of any airport runway end used by only piston-type aircraft must demonstrate that the units are designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft.

(b) Owners or operators proposing to site new MSWLF units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the Federal Aviation Administration (FAA).

(c) The owner or operator must place the demonstration in paragraph (a) of this section in the operating record and notify the State Director that it has been placed in the operating record.

(d) For purposes of this section:

(1) *Airport* means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.

(2) *Bird hazard* means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

NOTE TO §258.10: A prohibition on locating a new MSWLF near certain airports was enacted in Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Ford Act), Pub. L. 106-181 (49 U.S.C. 44718 note). Section 503 prohibits the "construction or establishment" of new MSWLFs after April 5, 2000 within six miles of certain smaller public airports. The Federal Aviation Administration (FAA) administers the Ford Act and has issued guidance in FAA Advisory Circular 150/5200-34, dated August 26, 2000. For further information, please contact the FAA.

[56 FR 51016, Oct. 9, 1991, as amended at 68 FR 59335, Oct. 15, 2003]

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#### **§258.11 Floodplains.**

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year floodplains must demonstrate that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment. The owner or operator must place the demonstration in the operating record and notify the State Director that it has been placed in the operating record.

(b) For purposes of this section:

(1) *Floodplain* means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(2) *100-year flood* means a flood that has a 1-percent or greater chance of recurring in any given year or a flood of a magnitude equalled or exceeded once in 100 years on the average over a significantly long period.

(3) *Washout* means the carrying away of solid waste by waters of the base flood.

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## **§258.12 Wetlands.**

(a) New MSWLF units and lateral expansions shall not be located in wetlands, unless the owner or operator can make the following demonstrations to the Director of an approved State:

(1) Where applicable under section 404 of the Clean Water Act or applicable State wetlands laws, the presumption that practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;

(2) The construction and operation of the MSWLF unit will not:

(i) Cause or contribute to violations of any applicable State water quality standard,

(ii) Violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act,

(iii) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, and

(iv) Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary;

(3) The MSWLF unit will not cause or contribute to significant degradation of wetlands. The owner or operator must demonstrate the integrity of the MSWLF unit and its ability to protect ecological resources by addressing the following factors:

(i) Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the MSWLF unit;

(ii) Erosion, stability, and migration potential of dredged and fill materials used to support the MSWLF unit;

(iii) The volume and chemical nature of the waste managed in the MSWLF unit;

(iv) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;

(v) The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and

(vi) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

(4) To the extent required under section 404 of the Clean Water Act or applicable State wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent practicable as required by paragraph (a)(1) of this section, then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

(5) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

(b) For purposes of this section, *wetlands* means those areas that are defined in 40 CFR 232.2(r).

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### **§258.13 *Fault areas.***

(a) New MSWLF units and lateral expansions shall not be located within 200 feet (60 meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates to the Director of an approved State that an alternative setback distance of less than 200 feet (60 meters) will prevent damage to the structural integrity of the MSWLF unit and will be protective of human health and the environment.

(b) For the purposes of this section:

(1) *Fault* means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

(2) *Displacement* means the relative movement of any two sides of a fault measured in any direction.

(3) *Holocene* means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

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### **§258.14 *Seismic impact zones.***

(a) New MSWLF units and lateral expansions shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Director of an approved State/Tribe that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The owner or operator must place the demonstration in the operating record and notify the State Director that it has been placed in the operating record.

(b) For the purposes of this section:

(1) *Seismic impact zone* means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 250 years.

(2) *Maximum horizontal acceleration in lithified earth material* means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

(3) *Lithified earth material* means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface.

[56 FR 51016, Oct. 9, 1991; 57 FR 28627, June 26, 1992]

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### **§258.15 *Unstable areas.***

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in an unstable area must demonstrate that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. The owner or operator must place the demonstration in the operating record and notify the State Director that it has

been placed in the operating record. The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable:

- (1) On-site or local soil conditions that may result in significant differential settling;
- (2) On-site or local geologic or geomorphologic features; and
- (3) On-site or local human-made features or events (both surface and subsurface).

(b) For purposes of this section:

(1) *Unstable area* means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and Karst terranes.

(2) *Structural components* means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the MSWLF that is necessary for protection of human health and the environment.

(3) *Poor foundation conditions* means those areas where features exist which indicate that a natural or man-induced event may result in inadequate foundation support for the structural components of an MSWLF unit.

(4) *Areas susceptible to mass movement* means those areas of influence (*i.e.*, areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the MSWLF unit, because of natural or man-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.

(5) *Karst terranes* means areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terranes include, but are not limited to, sinkholes, sinking streams, caves, large springs, and blind valleys.

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## **§258.16 Closure of existing municipal solid waste landfill units.**

(a) Existing MSWLF units that cannot make the demonstration specified in §258.10(a), pertaining to airports, §258.11(a), pertaining to floodplains, or §258.15(a), pertaining to unstable areas, must close by October 9, 1996, in accordance with §258.60 of this part and conduct post-closure activities in accordance with §258.61 of this part.

(b) The deadline for closure required by paragraph (a) of this section may be extended up to two years if the owner or operator demonstrates to the Director of an approved State that:

- (1) There is no available alternative disposal capacity;
- (2) There is no immediate threat to human health and the environment.

NOTE TO SUBPART B: Owners or operators of MSWLFs should be aware that a State in which their landfill is located or is to be located, may have adopted a state wellhead protection program in accordance with section 1428 of the Safe Drinking Water Act. Such state wellhead protection programs may impose additional requirements on owners or operators of MSWLFs than those set forth in this part.

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## **§§258.17-258.19 [Reserved]**

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### **Subpart C—Operating Criteria**

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#### **§258.20 Procedures for excluding the receipt of hazardous waste.**

(a) Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes as defined in part 261 of this chapter and polychlorinated biphenyls (PCB) wastes as defined in part 761 of this chapter. This program must include, at a minimum:

(1) Random inspections of incoming loads unless the owner or operator takes other steps to ensure that incoming loads do not contain regulated hazardous wastes or PCB wastes;

(2) Records of any inspections;

(3) Training of facility personnel to recognize regulated hazardous waste and PCB wastes; and

(4) Notification of State Director of authorized States under Subtitle C of RCRA or the EPA Regional Administrator if in an unauthorized State if a regulated hazardous waste or PCB waste is discovered at the facility.

(b) For purposes of this section, *regulated hazardous waste* means a solid waste that is a hazardous waste, as defined in 40 CFR 261.3, that is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) or was not generated by a very small quantity generator as defined in §260.10 of this chapter.

[56 FR 51016, Oct. 9, 1991, as amended at 81 FR 85805, Nov. 28, 2016]

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#### **§258.21 Cover material requirements.**

(a) Except as provided in paragraph (b) of this section, the owners or operators of all MSWLF units must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.

(b) Alternative materials of an alternative thickness (other than at least six inches of earthen material) may be approved by the Director of an approved State if the owner or operator demonstrates that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

(c) The Director of an approved State may grant a temporary waiver from the requirement of paragraph (a) and (b) of this section if the owner or operator demonstrates that there are extreme seasonal climatic conditions that make meeting such requirements impractical.

(d) The Director of an Approved State may establish alternative frequencies for cover requirements in paragraphs (a) and (b) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative requirements established under this paragraph must:

(1) Consider the unique characteristics of small communities;

(2) Take into account climatic and hydrogeologic conditions; and

(3) Be protective of human health and the environment.

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### **§258.22 Disease vector control.**

(a) Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.

(b) For purposes of this section, *disease vectors* means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

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### **§258.23 Explosive gases control.**

(a) Owners or operators of all MSWLF units must ensure that:

(1) The concentration of methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and

(2) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.

(b) Owners or operators of all MSWLF units must implement a routine methane monitoring program to ensure that the standards of paragraph (a) of this section are met.

(1) The type and frequency of monitoring must be determined based on the following factors:

(i) Soil conditions;

(ii) The hydrogeologic conditions surrounding the facility;

(iii) The hydraulic conditions surrounding the facility; and

(iv) The location of facility structures and property boundaries.

(2) The minimum frequency of monitoring shall be quarterly.

(c) If methane gas levels exceeding the limits specified in paragraph (a) of this section are detected, the owner or operator must:

(1) Immediately take all necessary steps to ensure protection of human health and notify the State Director;

(2) Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and

(3) Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the State Director that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

(4) The Director of an approved State may establish alternative schedules for demonstrating compliance with paragraphs (c) (2) and (3) of this section.

(d) For purposes of this section, *lower explosive limit* means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 °C and atmospheric pressure.

(e) The Director of an approved State may establish alternative frequencies for the monitoring requirement of paragraph (b)(2) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative monitoring frequencies established under this paragraph must:

- (1) Consider the unique characteristics of small communities;
- (2) Take into account climatic and hydrogeologic conditions; and
- (3) Be protective of human health and the environment.

[56 FR 51016, Oct. 9, 1991, as amended at 62 FR 40713, July 29, 1997]

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### **§258.24 *Air criteria.***

(a) Owners or operators of all MSWLFs must ensure that the units not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to section 110 of the Clean Air Act, as amended.

(b) Open burning of solid waste, except for the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees, or debris from emergency cleanup operations, is prohibited at all MSWLF units.

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### **§258.25 *Access requirements.***

Owners or operators of all MSWLF units must control public access and prevent unauthorized vehicular traffic and illegal dumping of wastes by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment.

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### **§258.26 *Run-on/run-off control systems.***

(a) Owners or operators of all MSWLF units must design, construct, and maintain:

- (1) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 25-year storm;
- (2) A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

(b) Run-off from the active portion of the landfill unit must be handled in accordance with §258.27(a) of this part.

[56 FR 51016, Oct. 9, 1991; 57 FR 28627, June 26, 1992]

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### **§258.27 *Surface water requirements.***

MSWLF units shall not:



(a) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to section 402.

(b) Cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area-wide or State-wide water quality management plan that has been approved under section 208 or 319 of the Clean Water Act, as amended.

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## **§258.28 Liquids restrictions.**

(a) Bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:

(1) The waste is household waste other than septic waste;

(2) The waste is leachate or gas condensate derived from the MSWLF unit and the MSWLF unit, whether it is a new or existing MSWLF, or lateral expansion, is designed with a composite liner and leachate collection system as described in §258.40(a)(2) of this part. The owner or operator must place the demonstration in the operating record and notify the State Director that it has been placed in the operating record; or

(3) The MSWLF unit is a Project XL MSWLF and meets the applicable requirements of §258.41. The owner or operator must place documentation of the landfill design in the operating record and notify the State Director that it has been placed in the operating record.

(b) Containers holding liquid waste may not be placed in a MSWLF unit unless:

(1) The container is a small container similar in size to that normally found in household waste;

(2) The container is designed to hold liquids for use other than storage; or

(3) The waste is household waste.

(c) For purposes of this section:

(1) *Liquid waste* means any waste material that is determined to contain “free liquids” as defined by Method 9095B (Paint Filter Liquids Test), included in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (EPA Publication SW-846) which is incorporated by reference. A suffix of “B” in the method number indicates revision two (the method has been revised twice). Method 9095B is dated November 2004. This incorporation by reference was approved by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. This material is incorporated as it exists on the date of approval and a notice of any change in this material will be published in the FEDERAL REGISTER. A copy may be inspected at the Library, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW. (3403T), Washington, DC 20460, [libraryhq@epa.gov](mailto:libraryhq@epa.gov); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(2) *Gas condensate* means the liquid generated as a result of gas recovery process(es) at the MSWLF unit.

[56 FR 51016, Oct. 9, 1991, as amended at 66 FR 42449, Aug. 13, 2001; 70 FR 34555, June 14, 2005]

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## **§258.29 Recordkeeping requirements.**

(a) The owner or operator of a MSWLF unit must record and retain near the facility in an operating record or in an alternative location approved by the Director of an approved State the following information as it becomes available:

- (1) Any location restriction demonstration required under subpart B of this part;
  - (2) Inspection records, training procedures, and notification procedures required in §258.20 of this part;
  - (3) Gas monitoring results from monitoring and any remediation plans required by §258.23 of this part;
  - (4) Any MSWLF unit design documentation for placement of leachate or gas condensate in a MSWLF unit as required under §258.28(a)(2) of this part;
  - (5) Any demonstration, certification, finding, monitoring, testing, or analytical data required by subpart E of this part;
  - (6) Closure and post-closure care plans and any monitoring, testing, or analytical data as required by §§258.60 and 258.61 of this part; and
  - (7) Any cost estimates and financial assurance documentation required by subpart G of this part.
  - (8) Any information demonstrating compliance with small community exemption as required by §258.1(f)(2).
- (b) The owner/operator must notify the State Director when the documents from paragraph (a) of this section have been placed or added to the operating record, and all information contained in the operating record must be furnished upon request to the State Director or be made available at all reasonable times for inspection by the State Director.
- (c) The Director of an approved State can set alternative schedules for recordkeeping and notification requirements as specified in paragraphs (a) and (b) of this section, except for the notification requirements in §258.10(b) and §258.55(g)(1)(iii).
- (d) The Director of an approved state program may receive electronic documents only if the state program includes the requirements of 40 CFR Part 3—(Electronic reporting).

[56 FR 51016, Oct. 9, 1991, as amended at 70 FR 59888, Oct. 13, 2005]

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## **§§258.30-258.39 [Reserved]**

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### **Subpart D—Design Criteria**

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#### **§258.40 Design criteria.**

- (a) New MSWLF units and lateral expansions shall be constructed:
- (1) In accordance with a design approved by the Director of an approved State or as specified in §258.40(e) for unapproved States. The design must ensure that the concentration values listed in Table 1 of this section will not be exceeded in the uppermost aquifer at the relevant point of compliance, as specified by the Director of an approved State under paragraph (d) of this section, or
  - (2) With a composite liner, as defined in paragraph (b) of this section and a leachate collection system that is designed and constructed to maintain less than a 30-cm depth of leachate over the liner.
- (b) For purposes of this section, *composite liner* means a system consisting of two components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$

cm/sec. FML components consisting of high density polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component.

(c) When approving a design that complies with paragraph (a)(1) of this section, the Director of an approved State shall consider at least the following factors:

- (1) The hydrogeologic characteristics of the facility and surrounding land;
- (2) The climatic factors of the area; and
- (3) The volume and physical and chemical characteristics of the leachate.

(d) The relevant point of compliance specified by the Director of an approved State shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the MSWLF unit. In determining the relevant point of compliance State Director shall consider at least the following factors:

- (1) The hydrogeologic characteristics of the facility and surrounding land;
- (2) The volume and physical and chemical characteristics of the leachate;
- (3) The quantity, quality, and direction, of flow of ground water;
- (4) The proximity and withdrawal rate of the ground-water users;
- (5) The availability of alternative drinking water supplies;
- (6) The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water, and whether the ground water is currently used or reasonably expected to be used for drinking water;
- (7) Public health, safety, and welfare effects; and
- (8) Practicable capability of the owner or operator.

(e) If EPA does not promulgate a rule establishing the procedures and requirements for State compliance with RCRA section 4005(c)(1)(B) by October 9, 1993, owners and operators in unapproved States may utilize a design meeting the performance standard in §258.40(a)(1) if the following conditions are met:

- (1) The State determines the design meets the performance standard in §258.40(a)(1);
- (2) The State petitions EPA to review its determination; and
- (3) EPA approves the State determination or does not disapprove the determination within 30 days.

NOTE TO SUBPART D: 40 CFR part 239 is reserved to establish the procedures and requirements for State compliance with RCRA section 4005(c)(1)(B).

**TABLE 1**

| <b>Chemical</b>      | <b>MCL (mg/l)</b> |
|----------------------|-------------------|
| Arsenic              | 0.05              |
| Barium               | 1.0               |
| Benzene              | 0.005             |
| Cadmium              | 0.01              |
| Carbon tetrachloride | 0.005             |

|                                    |        |
|------------------------------------|--------|
| Chromium (hexavalent)              | 0.05   |
| 2,4-Dichlorophenoxy acetic acid    | 0.1    |
| 1,4-Dichlorobenzene                | 0.075  |
| 1,2-Dichloroethane                 | 0.005  |
| 1,1-Dichloroethylene               | 0.007  |
| Endrin                             | 0.0002 |
| Fluoride                           | 4      |
| Lindane                            | 0.004  |
| Lead                               | 0.05   |
| Mercury                            | 0.002  |
| Methoxychlor                       | 0.1    |
| Nitrate                            | 10     |
| Selenium                           | 0.01   |
| Silver                             | 0.05   |
| Toxaphene                          | 0.005  |
| 1,1,1-Trichloromethane             | 0.2    |
| Trichloroethylene                  | 0.005  |
| 2,4,5-Trichlorophenoxy acetic acid | 0.01   |
| Vinyl Chloride                     | 0.002  |

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### **§258.41 Project XL Bioreactor Landfill Projects.**

(a) Buncombe County, North Carolina Project XL Bioreactor Landfill Requirements. Paragraph (a) of this section applies to Cells 1, 2, 3, 4, and 5 of the Buncombe County Solid Waste Management Facility located in the County of Buncombe, North Carolina, owned and operated by the Buncombe County Solid Waste Authority, or its successors. This paragraph (a) will also apply to Cells 6, 7, 8, 9, and 10, provided that the EPA Regional Administrator for Region 4 and the State Director determine that the pilot project in Cells 3, 4, and 5 is performing as expected and that the pilot project has not exhibited detrimental environmental results.

(1) The Buncombe County Solid Waste Authority is allowed to place liquid waste in the Buncombe County Solid Waste Management Facility, provided that the provisions of paragraphs (a)(2) through (9) of this section are met.

(2) The only liquid waste allowed under this section is leachate or gas condensate derived from the MSWLF, which may be supplemented with water from the French Broad River. The owner or operator shall control any liquids to the landfill to assure that the average moisture content of the landfill does not exceed 50% by weight. Liquid addition and recirculation is allowed only to the extent that the integrity of the landfill including its liner system is maintained, as determined by the State Director.

(3) The MSWLF unit shall be designed and constructed with a liner and leachate collection system as described in §258.40(a)(2) or paragraphs (a)(4) and (5) of this section. The owner or operator must place documentation of the landfill design in the operating record and notify the State Director that it has been placed in operating record;

(4) Cells 3-10 shall be constructed with a liner system consisting of the components described in paragraphs (a)(4)(i) through (v) of this section, or an equivalent or superior liner system as determined by the State Director:

(i) A lower component consisting of at least 18 inches of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-5}$  cm/sec., and

(ii) An upper component consisting of a minimum 30-millimeter ("mil") flexible membrane liner (FML) or 60-mil if High Density Polyethylene ("HDPE") is used, and

(iii) A geosynthetic clay liner (GCL) overlaying and in direct contact with the 18 inches of compacted soil in paragraph (a)(4) of this section and having the following properties:

(A) The GCL shall be formulated and manufactured from polypropylene geotextiles and high swelling containment resistant sodium bentonite. The bentonite-geotextile liner shall be manufactured using a minimum of one pound per square foot as determined using the Standard Test Method for Measuring Mass per Unit Area of Geotextiles, ASTM D-5261-92 (reapproved in 1996). The high swelling sodium montmorillonite clay shall be at 12% moisture content as determined by the Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass, ASTM D2216-98. The Director of the Federal Register approves this incorporation by reference with 5 U.S.C. 552(a) and 1 CFR part 51. These methods are available from The American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. These methods may be inspected at EPA's docket office located at Crystal Gateway, 1235 Jefferson Davis Highway, First Floor, Arlington, Virginia, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(B) The encapsulating geotextile shall be polypropylene and shall have a minimum weight of 6 oz./square yard.

(iv) The upper component shall be installed in direct and uniform contact with an overlaying soil cushioning component.

(v) Underlying the above liner system, there shall also be installed a leak detection system consisting of a 60-mil HDPE liner placed on a prepared subgrade.

(A) A 4 inch capped pipe will drain liquid collected in the sump out beyond the footprint of the landfill cell.

(B) Water collected on the leak detection liner shall be monitored at least semi-annually as directed by the State Director to determine whether any leachate escaped the liner system.

(5) Cells 3-10 shall be designed and constructed with a leachate collection system to maintain less than 30 centimeters depth of leachate is present at the sump location. The leachate collection system shall include a continuous monitoring system to monitor depth of leachate.

(6) The owner/operator shall keep the Federally Enforceable State Operating Permit (FESOP) issued by the Western North Carolina Air Quality Agency for the Buncombe County Solid Waste Management Facility in effect, and shall comply with the provisions of the FESOP, during the entire period of leachate recirculation and the post closure period. The FESOP was issued on November 13, 2000 and contains the air quality requirements for the Buncombe County Landfill XL project.

(7) *Monitoring and reporting requirements.* The owner or operator of the Buncombe County Solid Waste Management Facility shall monitor for the parameters listed in paragraphs (a)(7)(i) through (xiii) of this section and submit an annual report on the XL project to the EPA Regional Administrator for Region 4 and the State Director. The first report is due coincident with the October 2001 report to the state. The report should state what progress has been made toward the superior environmental performance and other commitments as stated in the Final Project Agreement. The report shall include, at a minimum, the following data:

(i) Amount of landfill gas generated;

(ii) Percent capture of landfill gas, if known;

(iii) Quality of the landfill gas, amount and type of liquids applied to the landfill;

(iv) Method of liquids application to the landfill;

- (v) Quantity of waste placed in the landfill;
- (vi) Quantity and quality of leachate collected;
- (vii) Quantity of leachate recirculated back into the landfill;
- (viii) Information on the pretreatment of waste applied to the landfill;
- (ix) Data collected on landfill temperature and moisture content;
- (x) Data on the leachate pressure (head) on the liner;
- (xi) Observations, information, and studies made on the physical stability of the MSWLF units that are developed during the project term, if any.
- (xii) The above data may be summarized, and, at a minimum shall contain, the minimum, maximum, median, and average data points as well as the frequency of monitoring as applicable.
- (xiii) The method and frequency of monitoring shall be specified by the State Director.

(8) *Termination and withdrawal.* (i) Paragraph (a) of this section will terminate August 22, 2026, unless a subsequent rulemaking is issued or terminated earlier pursuant to paragraph (a)(8)(ii) of this section.

(ii) In the event of noncompliance with paragraph (a) of this section, EPA may terminate the authority under paragraph (a) of this section and the authority to add liquid wastes to all or part of cells 3-10 under §258.28(a)(3). The EPA Regional Administrator will provide written notice of intent to terminate to the Buncombe County Solid Waste Authority with a copy to the State Director. The notice will state EPA's intent to terminate under the rules and will include a brief statement of EPA's reasons for its action. The termination will take effect 60 days from the date of the notice, unless the EPA Regional Administrator for Region 4 issues a written notice rescinding the termination.

(9) *Compliance requirements in the event of termination or withdrawal.* The Buncombe County Solid Waste Management Facility will be subject to all regulatory provisions applicable to MSWLFs upon termination of authority under this section. In the event of early termination of this section, the EPA Regional Administrator for Region 4 may provide an interim period of compliance to allow Buncombe County a reasonable period of time for transition following cessation of liquids addition.

(b) This section applies solely to Module D of the Yolo County Central Landfill owned and operated by the County of Yolo, California, or its successors. It allows the Yolo County Central Landfill to add bulk or noncontainerized liquid wastes to Module D under the following conditions:

(1) Module D shall be designed and constructed with a composite liner as defined in §258.40(b) and a leachate collection system that functions and continuously monitors to ensure that less than 30 centimeters depth of leachate is maintained over the liner.

(2) The owner or operator of the Yolo County Central Landfill must ensure that the concentration values listed in Table 1 of §258.40 are not exceeded in the uppermost aquifer at the relevant point of compliance for the landfill as specified by the State Director under §258.40(d).

(3) The owner or operator of the Yolo County Central Landfill shall demonstrate that the addition of any liquids to Module D does not result in an increased leakage rate, and does not result in liner slippage, or otherwise compromise the integrity of the landfill and its liner system, as determined by the State Director.

(4) The owner or operator of the Yolo County Central Landfill must ensure that Module D is operated in such a manner so as to prevent any landfill fires from occurring.

(5) The owner or operator of the Yolo County Central Landfill shall submit an annual report to the EPA Regional Administrator and the State Director. The first report is due within 18 months after August 13, 2001. The report shall state what progress the Project is making towards the superior environmental performance as stated in the Final Project Agreement. The data in paragraphs (b)(5)(i) through (xvi) of this section may be summarized, but,

at a minimum, shall contain the minimum, maximum, median, and average data points as well as the frequency of monitoring, as applicable. These reporting provisions shall remain in effect for as long as the owner or operator of the Yolo County Central Landfill continues to add liquid waste to Module D. Additional monitoring, record keeping and reporting requirements related to landfill gas will be contained in a permit executed by the local air quality management district pursuant to the Clean Air Act, 42 U.S.C. 7401 *et seq.* Application of this site-specific rule to the Yolo County Central Landfill is conditioned upon the issuance of such permit. The annual report will include, at a minimum, the following data:

- (i) Amount of landfill gas generated;
- (ii) Percent capture of landfill gas;
- (iii) Quality of the landfill gas;
- (iv) Amount and type of liquids applied to the landfill;
- (v) Method of liquids application to the landfill;
- (vi) Quantity of waste placed in the landfill;
- (vii) Quantity and quality of leachate collected, including at least the following parameters, monitored, at a minimum, on an annual basis:
  - (A) pH;
  - (B) Conductivity;
  - (C) Dissolved oxygen;
  - (D) Dissolved solids;
  - (E) Biochemical oxygen demand;
  - (F) Chemical oxygen demand;
  - (G) Organic carbon;
  - (H) Nutrients, (including ammonia ["NH<sub>3</sub>"], total kjeldahl nitrogen ["TKN"], and total phosphorus ["TP"]);
  - (I) Common ions;
  - (J) Heavy metals;
  - (K) Organic priority pollutants; and
  - (L) Flow rate;
- (viii) Quantity of leachate recirculated back into the landfill;
- (ix) Information on the pretreatment of solid and liquid waste applied to the landfill;
- (x) Landfill temperature;
- (xi) Landfill moisture content;
- (xii) Data on the leachate pressure (head) on the liner;
- (xiii) The amount of aeration of the waste;

(xiv) Data on landfill settlement;

(xv) Any information on the performance of the landfill cover; and

(xvi) Observations, information, or studies made on the physical stability of the landfill.

(6) This section will remain in effect until August 13, 2006. By August 13, 2006, Yolo County Central Landfill shall return to compliance with the regulatory requirements which would have been in effect absent the flexibility provided through this Project XL site-specific rule. This section applies to Phase I of Module D. This section also will apply to any phase of Module D beyond Phase I only if a second Final Project Agreement that describes the additional phase has been signed by representatives of EPA Region 9, Yolo County, and the State of California. Phase I of Module D is defined as the operation of twelve acres of the twenty acre Module D.

(c) *Virginia Landfills XL Project Requirements.* Paragraph (c) of this section applies solely to two Virginia landfills operated by the Waste Management, Inc. or its successors: The Maplewood Recycling and Waste Disposal Facility, located in Amelia County, Virginia ("Maplewood Landfill"); and the King George County Landfill and Recycling Facility, located in King George County, Virginia ("King George Landfill") collectively hereinafter, "the VA Project XL Landfills or landfill." The VA Project XL Landfills are allowed to add non-hazardous bulk or non-containerized liquids including, leachate, storm water and truck wash water, hereinafter, "liquid or liquids", to Cell 3 of the King George Landfill (hereinafter "Cell 3") and Phases 1 and 2 of the Maplewood Landfill (hereinafter "Phases 1 and 2") under the following conditions:

(1) The operator of the landfill shall maintain the liners underlying Cell 3 and Phases 1 and 2, which were designed and constructed with an alternative liner as defined in §258.40(a)(1) in accord with their current installed design in order to maintain the integrity of the liner system and keep it and the leachate collection system in good operating order. The operator of the landfill shall ensure that the addition of any liquids does not result in an increased leakage rate, and does not result in liner slippage, or otherwise compromise the integrity of the landfill and its liner system, as determined by the State Director. In addition, the leachate collection system shall be operated, monitored and maintained to ensure that less than 30 cm depth of leachate is maintained over the liner.

(2) The operator of the landfill shall ensure that the concentration values listed in Table 1 of §258.40 are not exceeded in the uppermost aquifer at the relevant point of compliance for the landfill, as specified by the State Director, under §258.40(d).

(3) The operator of the landfill shall monitor and report whether surface seeps are occurring and determine whether they are attributable to operation of the liquid application system. EPA and VADEQ shall be notified in the semi-annual report of the occurrence of any seeps.

(4) The operator of the landfill shall determine on a monthly basis the leachate quality in test and control areas with and without liquid addition. The operator of the landfill shall collect monthly samples of the landfill leachate and analyze them for the following parameters: pH, Conductivity, Dissolved Oxygen, Dissolved Solids, Biochemical Oxygen Demand, Chemical Oxygen Demand, Organic Carbon, Nutrients (ammonia, total kjeldahl nitrogen, total phosphorus), Common Ions, Heavy Metals and Organic Priority Pollutants.

(5) The operator of the landfill shall determine on a semi-annual basis the total quantity of leachate collected in test and control areas; the total quantity of liquids applied in the test areas and determination of any changes in this quantity over time; the total quantity of leachate in on-site storage structures and any leachate taken for offsite disposal.

(6) Prior to the addition of any liquid to the landfill, the operator of the landfill shall perform an initial characterization of the liquid and notify EPA and VADEQ of the liquid proposed to be added. The parameters for the initial characterization of liquids shall be the same as the monthly parameters for the landfill leachate specified in paragraph (c)(4) of this section. The operator shall annually test all liquids added to the landfill and compare these results to the initial characterization.

(7) The operator of the landfill shall ensure that Cell 3 and Phases 1 and 2 are operated in such a manner so as to prevent any landfill fires from occurring. The operator of the landfill shall monitor the gas temperature at well heads, at a minimum, on a monthly basis.



(8) The operator of the landfill shall perform an annual surface topographic survey to determine the rate of the settlement of the waste in the test and control areas.

(9) The operator of the landfill shall monitor and record the frequency of odor complaints during and after liquid application events. EPA and VADEQ shall be notified of the occurrence of any odor complaints in the semi-annual report.

(10) The operator of the landfill shall collect representative samples of the landfill waste in the test areas on an annual basis and analyze the samples for the following solid waste stabilization and decomposition parameters: Moisture Content, Biochemical Methane Potential, Cellulose, Lignin, Hemi-cellulose, Volatile Solids and pH.

(11) The operator of the landfill shall report to the EPA Regional Administrator and the State Director on the information described in paragraphs (c)(1) through (10) of this section on a semi-annual basis. The first report is due within 6 months after the effective date of this section. These reporting provisions shall remain in effect for the duration of the project term.

(12) Additional monitoring, record keeping and reporting requirements related to landfill gas will be contained in a Federally Enforceable State Operating Permit ("FESOP") for the VA Project XL Landfills issued pursuant to the Clean Air Act, 42 U.S.C. 7401 *et seq.* Application of this site-specific rule to the VA Project XL Landfills is conditioned upon the issuance of such a FESOP.

(13) This section applies until July 18, 2012. By July 18, 2012, the VA Project XL Landfills must return to compliance with the regulatory requirements which would have been in effect absent the flexibility provided through this section. If EPA Region 3's Regional Administrator, the Commonwealth of Virginia and Waste Management agree to an amendment of the project term, the parties must enter into an amended or new Final Project Agreement for any such amendment.

(14) The authority provided by this section may be terminated before the end of the 10 year period in the event of noncompliance with the requirements of paragraph (c) of this section, the determination by the EPA Region 3's Regional Administrator that the project has failed to achieve the expected level of environmental performance, or the promulgation of generally applicable requirements that would apply to all landfills that meet or exceed the performance standard set forth in §258.40(a)(1). In the event of early termination EPA in consultation with the Commonwealth of Virginia will determine an interim compliance period to provide sufficient time for the operator to return the landfills to compliance with the regulatory requirements which would have been in effect absent the authority provided by this section. The interim compliance period shall not exceed six months.

[66 FR 42449, Aug. 13, 2001, as amended at 66 FR 44069, Aug. 22, 2001; 67 FR 47319, July 18, 2002; 69 FR 18803, Apr. 9, 2004]

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## **§258.42 Approval of site-specific flexibility requests in Indian country.**

(a) Salt River Pima-Maricopa Indian Community (SRPMIC), Salt River Landfill Research, Development, and Demonstration Project Requirements. Paragraph (a) of this section applies to the Salt River Landfill, a municipal solid waste landfill owned and operated by the SRPMIC on the SRPMIC's reservation in Arizona, which includes waste disposal areas identified as "Phases I-VI." The application submitted by SRPMIC, "Research, Development, and Demonstration Permit Application Salt River Landfill," dated September 24, 2007 and amended on April 8, 2008 is hereby incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may inspect or obtain a copy at the Environmental Protection Agency Region IX, 75 Hawthorne Street, San Francisco, CA, or by calling the Docket Facility at (415) 947-4406, or go to <http://www.regulations.gov>, Docket ID No. EPA-R09-RCRA-2008-0354. You may also inspect a copy at the National Archives and Records Administration (NARA). For information on the availability at NARA, call (202) 741-6030 or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html). The facility owner and/or operator may operate the facility in accordance with this application, including the following activities more generally described as follows:

(1) The owner and/or operator may install a geosynthetic clay liner as an alternative bottom liner system in Phase VI.

(2) The owner and/or operator may operate Phase VI as a bioreactor by recirculating leachate and landfill gas condensate, and by adding storm water and groundwater, to the below grade portions of Phase VI.

(3) The owner and/or operator may increase the moisture content of the waste mass in Phases IIIB and IVA by recirculating leachate and landfill gas condensate, and by adding storm water and groundwater, to the below grade portions of Phases IIIB and IVA.

(4) The owner and/or operator shall maintain less than a 30-cm depth of leachate on the liner.

(5) The owner and/or operator shall submit reports to the Director of the Waste Management Division at EPA Region 9 as specified in "Research, Development, and Demonstration Permit Application Salt River Landfill," dated September 24, 2007 and amended on April 8, 2008 including an annual report showing whether and to what extent the site is progressing in attaining project goals. The annual report will also include a summary of all monitoring and testing results, as specified in the application.

(6) The owner and/or operator may not operate the facility pursuant to the authority granted by this section if there is any deviation from the terms, conditions, and requirements of this section unless the operation of the facility will continue to conform to the standards set forth in §258.4 of this chapter and the owner and/or operator has obtained the prior written approval of the Director of the Waste Management Division at EPA Region 9 or his or her designee to implement corrective measures or otherwise operate the facility subject to such deviation. The Director of the Waste Management Division or designee shall provide an opportunity for the public to comment on any significant deviation prior to providing his or her written approval of the deviation.

(7) Paragraphs (a)(2), (3), (5), (6) and (9) of this section will terminate 36 months after date of publication in the FEDERAL REGISTER unless the Director of the Waste Management Division at EPA Region 9 or his or her designee renews this authority in writing. Any such renewal may extend the authority granted under paragraphs (a)(2), (3), (5), (6) and (9) of this section for up to an additional three years, and multiple renewals (up to a total of 12 years) may be provided. The Director of the Waste Management Division or designee shall provide an opportunity for the public to comment on any renewal request prior to providing his or her written approval or disapproval of such request.

(8) In no event will the provisions of paragraphs (a)(2), (3), (5), (6) or (9) of this section remain in effect after 12 years after date of publication in the FEDERAL REGISTER. Upon termination of paragraphs (a)(2), (3), (5), (6) and (9) of this section, and except with respect to paragraphs (a)(1) and (4) of this section, the owner and/or operator shall return to compliance with the regulatory requirements which would have been in effect absent the flexibility provided through this site-specific rule.

(9) In seeking any renewal of the authority granted under or other requirements of paragraphs (a)(2), (3), (5) and (6) of this section, the owner and/or operator shall provide a detailed assessment of the project showing the status with respect to achieving project goals, a list of problems and status with respect to problem resolutions, and any other requirements that the Director of the Waste Management Division at EPA Region 9 or his or her designee has determined are necessary for the approval of any renewal and has communicated in writing to the owner and operator.

(10) The owner and/or operator's authority to operate the landfill in accordance with paragraphs (a)(2), (3), (5), (6) and (9) of this section shall terminate if the Director of the Waste Management Division at EPA Region 9 or his or her designee determines that the overall goals of the project are not being attained, including protection of human health or the environment. Any such determination shall be communicated in writing to the owner and operator.

(b) [Reserved]

[74 FR 11680, Mar. 19, 2009]

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**§§258.43-258.49 [Reserved]**

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## **Subpart E—Ground-Water Monitoring and Corrective Action**

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### **§258.50 Applicability.**

- (a) The requirements in this part apply to MSWLF units, except as provided in paragraph (b) of this section.
- (b) Ground-water monitoring requirements under §258.51 through §258.55 of this part may be suspended by the Director of an approved State for a MSWLF unit if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents from that MSWLF unit to the uppermost aquifer (as defined in §258.2) during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified ground-water scientist and approved by the Director of an approved State, and must be based upon:
- (1) Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, and
  - (2) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and environment.
- (c) Owners and operators of MSWLF units, except those meeting the conditions of §258.1(f), must comply with the ground-water monitoring requirements of this part according to the following schedule unless an alternative schedule is specified under paragraph (d) of this section:
- (1) Existing MSWLF units and lateral expansions less than one mile from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51-258.55 by October 9, 1994;
  - (2) Existing MSWLF units and lateral expansions greater than one mile but less than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51-258.55 by October 9, 1995;
  - (3) Existing MSWLF units and lateral expansions greater than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51-258.55 by October 9, 1996.
  - (4) New MSWLF units must be in compliance with the ground-water monitoring requirements specified in §§258.51-258.55 before waste can be placed in the unit.
- (d) The Director of an approved State may specify an alternative schedule for the owners or operators of existing MSWLF units and lateral expansions to comply with the ground-water monitoring requirements specified in §§258.51-258.55. This schedule must ensure that 50 percent of all existing MSWLF units are in compliance by October 9, 1994 and all existing MSWLF units are in compliance by October 9, 1996. In setting the compliance schedule, the Director of an approved State must consider potential risks posed by the unit to human health and the environment. The following factors should be considered in determining potential risk:
- (1) Proximity of human and environmental receptors;
  - (2) Design of the MSWLF unit;
  - (3) Age of the MSWLF unit;
  - (4) The size of the MSWLF unit; and
  - (5) Types and quantities of wastes disposed including sewage sludge; and
  - (6) Resource value of the underlying aquifer, including:

(i) Current and future uses;

(ii) Proximity and withdrawal rate of users; and

(iii) Ground-water quality and quantity.

(e) Owners and operators of all MSWLF units that meet the conditions of §258.1(f)(1) must comply with all applicable ground-water monitoring requirements of this part by October 9, 1997.

(f) Once established at a MSWLF unit, ground-water monitoring shall be conducted throughout the active life and post-closure care period of that MSWLF unit as specified in §258.61.

(g) For the purposes of this subpart, a *qualified ground-water scientist* is a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by State registration, professional Certifications, or completion of accredited university programs that enable that individual to make sound professional judgements regarding ground-water monitoring, contaminant fate and transport, and corrective-action.

(h) The Director of an approved State may establish alternative schedules for demonstrating compliance with §258.51(d)(2), pertaining to notification of placement of certification in operating record; §258.54(c)(1), pertaining to notification that statistically significant increase (SSI) notice is in operating record; §258.54(c)(2) and (3), pertaining to an assessment monitoring program; §258.55(b), pertaining to sampling and analyzing appendix II constituents; §258.55(d)(1), pertaining to placement of notice (appendix II constituents detected) in record and notification of notice in record; §258.55(d)(2), pertaining to sampling for appendix I and II to this part; §258.55(g), pertaining to notification (and placement of notice in record) of SSI above ground-water protection standard; §§258.55(g)(1)(iv) and 258.56(a), pertaining to assessment of corrective measures; §258.57(a), pertaining to selection of remedy and notification of placement in record; §258.58(c)(4), pertaining to notification of placement in record (alternative corrective action measures); and §258.58(f), pertaining to notification of placement in record (certification of remedy completed).

[56 FR 51016, Oct. 9, 1991; 57 FR 28628, June 26, 1992, as amended at 58 FR 51547, Oct. 1, 1993; 60 FR 52342, Oct. 6, 1995]

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## **§258.51 Ground-water monitoring systems.**

(a) A ground-water monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield ground-water samples from the uppermost aquifer (as defined in §258.2) that:

(1) Represent the quality of background ground water that has not been affected by leakage from a unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where:

(i) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or

(ii) Sampling at other wells will provide an indication of background ground-water quality that is as representative or more representative than that provided by the upgradient wells; and

(2) Represent the quality of ground water passing the relevant point of compliance specified by Director of an approved State under §258.40(d) or at the waste management unit boundary in unapproved States. The downgradient monitoring system must be installed at the relevant point of compliance specified by the Director of an approved State under §258.40(d) or at the waste management unit boundary in unapproved States that ensures detection of ground-water contamination in the uppermost aquifer. When physical obstacles preclude installation of ground-water monitoring wells at the relevant point of compliance at existing units, the down-gradient monitoring system may be installed at the closest practicable distance hydraulically down-gradient from

the relevant point of compliance specified by the Director of an approved State under §258.40 that ensure detection of groundwater contamination in the uppermost aquifer.

(b) The Director of an approved State may approve a multiunit ground-water monitoring system instead of separate ground-water monitoring systems for each MSWLF unit when the facility has several units, provided the multi-unit ground-water monitoring system meets the requirement of §258.51(a) and will be as protective of human health and the environment as individual monitoring systems for each MSWLF unit, based on the following factors:

- (1) Number, spacing, and orientation of the MSWLF units;
- (2) Hydrogeologic setting;
- (3) Site history;
- (4) Engineering design of the MSWLF units, and
- (5) Type of waste accepted at the MSWLF units.

(c) Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground-water samples. The annular space (*i.e.*, the space between the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground water.

(1) The owner or operator must notify the State Director that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record; and

(2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

(d) The number, spacing, and depths of monitoring systems shall be:

(1) Determined based upon site-specific technical information that must include thorough characterization of:

(i) Aquifer thickness, ground-water flow rate, ground-water flow direction including seasonal and temporal fluctuations in ground-water flow; and

(ii) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: Thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

(2) Certified by a qualified ground-water scientist or approved by the Director of an approved State. Within 14 days of this certification, the owner or operator must notify the State Director that the certification has been placed in the operating record.

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## **§258.52 [Reserved]**

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## **§258.53 Ground-water sampling and analysis requirements.**

(a) The ground-water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of ground-water quality at the background and downgradient wells installed in compliance with §258.51(a) of this part. The owner or operator

must notify the State Director that the sampling and analysis program documentation has been placed in the operating record and the program must include procedures and techniques for:

- (1) Sample collection;
- (2) Sample preservation and shipment;
- (3) Analytical procedures;
- (4) Chain of custody control; and
- (5) Quality assurance and quality control.

(b) The ground-water monitoring program must include sampling and analytical methods that are appropriate for ground-water sampling and that accurately measure hazardous constituents and other monitoring parameters in ground-water samples. Ground-water samples shall not be field-filtered prior to laboratory analysis.

(c) The sampling procedures and frequency must be protective of human health and the environment.

(d) Ground-water elevations must be measured in each well immediately prior to purging, each time ground water is sampled. The owner or operator must determine the rate and direction of ground-water flow each time ground water is sampled. Ground-water elevations in wells which monitor the same waste management area must be measured within a period of time short enough to avoid temporal variations in ground-water flow which could preclude accurate determination of ground-water flow rate and direction.

(e) The owner or operator must establish background ground-water quality in a hydraulically upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular ground-water monitoring program that applies to the MSWLF unit, as determined under §258.54(a) or §258.55(a) of this part. Background ground-water quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if it meets the requirements of §258.51(a)(1).

(f) The number of samples collected to establish ground-water quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph (g) of this section. The sampling procedures shall be those specified under §258.54(b) for detection monitoring, §258.55 (b) and (d) for assessment monitoring, and §258.56(b) of corrective action.

(g) The owner or operator must specify in the operating record one of the following statistical methods to be used in evaluating ground-water monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous constituent in each well.

(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method that meets the performance standards of §258.53(h). The owner or operator must place a justification for this alternative in the operating record and notify the State Director of the use of this alternative test. The justification must demonstrate that the alternative method meets the performance standards of §258.53(h).

(h) Any statistical method chosen under §258.53(g) shall comply with the following performance standards, as appropriate:

(1) The statistical method used to evaluate ground-water monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

(3) If a control chart approach is used to evaluate ground-water monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(4) If a tolerance interval or a predictional interval is used to evaluate ground-water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(5) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

(i) The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground-water monitoring program that applies to the MSWLF unit, as determined under §§258.54(a) or 258.55(a) of this part.

(1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the ground-water quality of each parameter or constituent at each monitoring well designated pursuant to §258.51(a)(2) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs (g) and (h) of this section.

(2) Within a reasonable period of time after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background at each monitoring well.

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### **§258.54 *Detection monitoring program.***

(a) Detection monitoring is required at MSWLF units at all ground-water monitoring wells defined under §§258.51 (a)(1) and (a)(2) of this part. At a minimum, a detection monitoring program must include the monitoring for the constituents listed in appendix I to this part.

(1) The Director of an approved State may delete any of the appendix I monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

(2) The Director of an approved State may establish an alternative list of inorganic indicator parameters for a MSWLF unit, in lieu of some or all of the heavy metals (constituents 1-15 in appendix I to this part), if the alternative parameters provide a reliable indication of inorganic releases from the MSWLF unit to the ground water. In determining alternative parameters, the Director shall consider the following factors:

- (i) The types, quantities, and concentrations of constituents in wastes managed at the MSWLF unit;
- (ii) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;
- (iii) The detectability of indicator parameters, waste constituents, and reaction products in the ground water; and
- (iv) The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background.

(b) The monitoring frequency for all constituents listed in appendix I to this part, or in the alternative list approved in accordance with paragraph (a)(2) of this section, shall be at least semiannual during the active life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and downgradient) must be collected and analyzed for the appendix I constituents, or the alternative list approved in accordance with paragraph (a)(2) of this section, during the first semiannual sampling event. At least one sample from each well (background and downgradient) must be collected and analyzed during subsequent semiannual sampling events. The Director of an approved State may specify an appropriate alternative frequency for repeated sampling and analysis for appendix I constituents, or the alternative list approved in accordance with paragraph (a)(2) of this section, during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the following factors:

- (1) Lithology of the aquifer and unsaturated zone;
- (2) Hydraulic conductivity of the aquifer and unsaturated zone;
- (3) Ground-water flow rates;
- (4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel); and
- (5) Resource value of the aquifer.

(c) If the owner or operator determines, pursuant to §258.53(g) of this part, that there is a statistically significant increase over background for one or more of the constituents listed in appendix I to this part or in the alternative list approved in accordance with paragraph (a)(2) of this section, at any monitoring well at the boundary specified under §258.51(a)(2), the owner or operator:

(1) Must, within 14 days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and notify the State director that this notice was placed in the operating record; and

(2) Must establish an assessment monitoring program meeting the requirements of §258.55 of this part within 90 days except as provided for in paragraph (c)(3) of this section.

(3) The owner/operator may demonstrate that a source other than a MSWLF unit caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist or approved by the Director of an approved State and be placed in the operating record. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this section. If, after 90 days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in §258.55.



## **§258.55 Assessment monitoring program.**

(a) Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the appendix I to this part or in the alternative list approved in accordance with §258.54(a)(2).

(b) Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the ground water for all constituents identified in appendix II to this part. A minimum of one sample from each downgradient well must be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells as a result of the complete appendix II analysis, a minimum of four independent samples from each well (background and downgradient) must be collected and analyzed to establish background for the constituents. The Director of an approved State may specify an appropriate subset of wells to be sampled and analyzed for appendix II constituents during assessment monitoring. The Director of an approved State may delete any of the appendix II monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

(c) The Director of an approved State may specify an appropriate alternate frequency for repeated sampling and analysis for the full set of appendix II constituents required by §258.55(b) of this part, during the active life (including closure) and post-closure care of the unit considering the following factors:

- (1) Lithology of the aquifer and unsaturated zone;
- (2) Hydraulic conductivity of the aquifer and unsaturated zone;
- (3) Ground-water flow rates;
- (4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel);
- (5) Resource value of the aquifer; and
- (6) Nature (fate and transport) of any constituents detected in response to this section.

(d) After obtaining the results from the initial or subsequent sampling events required in paragraph (b) of this section, the owner or operator must:

- (1) Within 14 days, place a notice in the operating record identifying the appendix II constituents that have been detected and notify the State Director that this notice has been placed in the operating record;
- (2) Within 90 days, and on at least a semiannual basis thereafter, resample all wells specified by §258.51(a), conduct analyses for all constituents in appendix I to this part or in the alternative list approved in accordance with §258.54(a)(2), and for those constituents in appendix II to this part that are detected in response to paragraph (b) of this section, and record their concentrations in the facility operating record. At least one sample from each well (background and downgradient) must be collected and analyzed during these sampling events. The Director of an approved State may specify an alternative monitoring frequency during the active life (including closure) and the post-closure period for the constituents referred to in this paragraph. The alternative frequency for appendix I constituents, or the alternative list approved in accordance with §258.54(a)(2), during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph (c) of this section;
- (3) Establish background concentrations for any constituents detected pursuant to paragraph (b) or (d)(2) of this section; and
- (4) Establish ground-water protection standards for all constituents detected pursuant to paragraph (b) or (d) of this section. The ground-water protection standards shall be established in accordance with paragraphs (h) or (i) of this section.

(e) If the concentrations of all appendix II constituents are shown to be at or below background values, using the statistical procedures in §258.53(g), for two consecutive sampling events, the owner or operator must notify the State Director of this finding and may return to detection monitoring.

(f) If the concentrations of any appendix II constituents are above background values, but all concentrations are below the ground-water protection standard established under paragraphs (h) or (i) of this section, using the statistical procedures in §258.53(g), the owner or operator must continue assessment monitoring in accordance with this section.

(g) If one or more appendix II constituents are detected at statistically significant levels above the ground-water protection standard established under paragraphs (h) or (i) of this section in any sampling event, the owner or operator must, within 14 days of this finding, place a notice in the operating record identifying the appendix II constituents that have exceeded the ground-water protection standard and notify the State Director and all appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:

(1)(i) Must characterize the nature and extent of the release by installing additional monitoring wells as necessary;

(ii) Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with §258.55(d)(2);

(iii) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with §258.55 (g)(1); and

(iv) Must initiate an assessment of corrective measures as required by §255.56 of this part within 90 days; or

(2) May demonstrate that a source other than a MSWLF unit caused the contamination, or that the SSI increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist or approved by the Director of an approved State and placed in the operating record. If a successful demonstration is made the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to §258.55, and may return to detection monitoring if the appendix II constituents are at or below background as specified in §258.55(e). Until a successful demonstration is made, the owner or operator must comply with §258.55(g) including initiating an assessment of corrective measures.

(h) The owner or operator must establish a ground-water protection standard for each appendix II constituent detected in the ground-water. The ground-water protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR part 141, the MCL for that constituent;

(2) For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with §258.51(a)(1); or

(3) For constituents for which the background level is higher than the MCL identified under paragraph (h)(1) of this section or health based levels identified under §258.55(i)(1), the background concentration.

(i) The Director of an approved State may establish an alternative ground-water protection standard for constituents for which MCLs have not been established. These ground-water protection standards shall be appropriate health based levels that satisfy the following criteria:

(1) The level is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants (51 FR 33992, 34006, 34014, 34028, Sept. 24, 1986);

(2) The level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 CFR part 792) or equivalent;

(3) For carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) with the  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  range; and

(4) For systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.

(ii) [Reserved]

(j) In establishing ground-water protection standards under paragraph (i) of this section, the Director of an approved State may consider the following:

- (1) Multiple contaminants in the ground water;
- (2) Exposure threats to sensitive environmental receptors; and
- (3) Other site-specific exposure or potential exposure to ground water.

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### **§258.56 *Assessment of corrective measures.***

(a) Within 90 days of finding that any of the constituents listed in appendix II to this part have been detected at a statistically significant level exceeding the ground-water protection standards defined under §258.55 (h) or (i) of this part, the owner or operator must initiate an assessment of corrective measures. Such an assessment must be completed within a reasonable period of time.

(b) The owner or operator must continue to monitor in accordance with the assessment monitoring program as specified in §258.55.

(c) The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under §258.57, addressing at least the following:

- (1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
  - (2) The time required to begin and complete the remedy;
  - (3) The costs of remedy implementation; and
  - (4) The institutional requirements such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).
- (d) The owner or operator must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

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### **§258.57 *Selection of remedy.***

(a) Based on the results of the corrective measures assessment conducted under §258.56, the owner or operator must select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section. The owner or operator must notify the State Director, within 14 days of selecting a remedy, a report describing the selected remedy has been placed in the operating record and how it meets the standards in paragraph (b) of this section.

(b) Remedies must:

- (1) Be protective of human health and the environment;
  - (2) Attain the ground-water protection standard as specified pursuant to §§258.55 (h) or (i);
  - (3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of appendix II constituents into the environment that may pose a threat to human health or the environment; and
  - (4) Comply with standards for management of wastes as specified in §258.58(d).
- (c) In selecting a remedy that meets the standards of §258.57(b), the owner or operator shall consider the following evaluation factors:
- (1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:
    - (i) Magnitude of reduction of existing risks;
    - (ii) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;
    - (iii) The type and degree of long-term management required, including monitoring, operation, and maintenance;
    - (iv) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of containment;
    - (v) Time until full protection is achieved;
    - (vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;
    - (vii) Long-term reliability of the engineering and institutional controls; and
    - (viii) Potential need for replacement of the remedy.
  - (2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
    - (i) The extent to which containment practices will reduce further releases;
    - (ii) The extent to which treatment technologies may be used.
  - (3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:
    - (i) Degree of difficulty associated with constructing the technology;
    - (ii) Expected operational reliability of the technologies;
    - (iii) Need to coordinate with and obtain necessary approvals and permits from other agencies;
    - (iv) Availability of necessary equipment and specialists; and
    - (v) Available capacity and location of needed treatment, storage, and disposal services.
  - (4) Practicable capability of the owner or operator, including a consideration of the technical and economic capability.

(5) The degree to which community concerns are addressed by a potential remedy(s).

(d) The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in paragraphs (d) (1)-(8) of this section. The owner or operator must consider the following factors in determining the schedule of remedial activities:

(1) Extent and nature of contamination;

(2) Practical capabilities of remedial technologies in achieving compliance with ground-water protection standards established under §258.55 (g) or (h) and other objectives of the remedy;

(3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;

(4) Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;

(5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;

(6) Resource value of the aquifer including:

(i) Current and future uses;

(ii) Proximity and withdrawal rate of users;

(iii) Ground-water quantity and quality;

(iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;

(v) The hydrogeologic characteristic of the facility and surrounding land;

(vi) Ground-water removal and treatment costs; and

(vii) The cost and availability of alternative water supplies.

(7) Practicable capability of the owner or operator.

(8) Other relevant factors.

(e) The Director of an approved State may determine that remediation of a release of an appendix II constituent from a MSWLF unit is not necessary if the owner or operator demonstrates to the satisfaction of the Director of the approved State that:

(1) The ground-water is additionally contaminated by substances that have originated from a source other than a MSWLF unit and those substances are present in concentrations such that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to actual or potential receptors; or

(2) The constituent(s) is present in ground water that:

(i) Is not currently or reasonably expected to be a source of drinking water; and

(ii) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the ground-water protection standards established under §258.55 (h) or (i); or

(3) Remediation of the release(s) is technically impracticable; or

(4) Remediation results in unacceptable cross-media impacts.

(f) A determination by the Director of an approved State pursuant to paragraph (e) of this section shall not affect the authority of the State to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the ground-water, to prevent exposure to the ground-water, or to remediate the ground-water to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

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### **§258.58 *Implementation of the corrective action program.***

(a) Based on the schedule established under §258.57(d) for initiation and completion of remedial activities the owner/operator must:

(1) Establish and implement a corrective action ground-water monitoring program that:

(i) At a minimum, meet the requirements of an assessment monitoring program under §258.55;

(ii) Indicate the effectiveness of the corrective action remedy; and

(iii) Demonstrate compliance with ground-water protection standard pursuant to paragraph (e) of this section.

(2) Implement the corrective action remedy selected under §258.57; and

(3) Take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to §258.57. The following factors must be considered by an owner or operator in determining whether interim measures are necessary:

(i) Time required to develop and implement a final remedy;

(ii) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;

(iii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

(iv) Further degradation of the ground-water that may occur if remedial action is not initiated expeditiously;

(v) Weather conditions that may cause hazardous constituents to migrate or be released;

(vi) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and

(vii) Other situations that may pose threats to human health and the environment.

(b) An owner or operator may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of §258.57(b) are not being achieved through the remedy selected. In such cases, the owner or operator must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under §258.58(c).

(c) If the owner or operator determines that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods, the owner or operator must:

(1) Obtain certification of a qualified ground-water scientist or approval by the Director of an approved State that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods;

(2) Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(3) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:

(i) Technically practicable; and

(ii) Consistent with the overall objective of the remedy.

(4) Notify the State Director within 14 days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.

(d) All solid wastes that are managed pursuant to a remedy required under §258.57, or an interim measure required under §258.58(a)(3), shall be managed in a manner:

(1) That is protective of human health and the environment; and

(2) That complies with applicable RCRA requirements.

(e) Remedies selected pursuant to §258.57 shall be considered complete when:

(1) The owner or operator complies with the ground-water protection standards established under §§258.55(h) or (i) at all points within the plume of contamination that lie beyond the ground-water monitoring well system established under §258.51(a).

(2) Compliance with the ground-water protection standards established under §§258.55(h) or (i) has been achieved by demonstrating that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) for a period of three consecutive years using the statistical procedures and performance standards in §258.53(g) and (h). The Director of an approved State may specify an alternative length of time during which the owner or operator must demonstrate that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) taking into consideration:

(i) Extent and concentration of the release(s);

(ii) Behavior characteristics of the hazardous constituents in the ground-water;

(iii) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and

(iv) Characteristics of the ground-water.

(3) All actions required to complete the remedy have been satisfied.

(f) Upon completion of the remedy, the owner or operator must notify the State Director within 14 days that a certification that the remedy has been completed in compliance with the requirements of §258.58(e) has been placed in the operating record. The certification must be signed by the owner or operator and by a qualified ground-water scientist or approved by the Director of an approved State.

(g) When, upon completion of the certification, the owner or operator determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (e) of this section, the owner or operator shall be released from the requirements for financial assurance for corrective action under §258.73.

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## **§258.59 [Reserved]**

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## **Subpart F—Closure and Post-Closure Care**

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### **§258.60 Closure criteria.**

(a) Owners or operators of all MSWLF units must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to:

(1) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than  $1 \times 10^{-6}$  cm/sec, whichever is less, and

(2) Minimize infiltration through the closed MSWLF by the use of an infiltration layer that contains a minimum 18-inches of earthen material, and

(3) Minimize erosion of the final cover by the use of an erosion layer that contains a minimum 6-inches of earthen material that is capable of sustaining native plant growth.

(b) The Director of an approved State may approve an alternative final cover design that includes:

(1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and

(2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.

(3) The Director of an approved State may establish alternative requirements for the infiltration barrier in a paragraph (b)(1) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative requirements established under this paragraph must:

(i) Consider the unique characteristics of small communities;

(ii) Take into account climatic and hydrogeologic conditions; and

(iii) Be protective of human health and the environment.

(c) The owner or operator must prepare a written closure plan that describes the steps necessary to close all MSWLF units at any point during their active life in accordance with the cover design requirements in §258.60(a) or (b), as applicable. The closure plan, at a minimum, must include the following information:

(1) A description of the final cover, designed in accordance with §258.60(a) and the methods and procedures to be used to install the cover;

(2) An estimate of the largest area of the MSWLF unit ever requiring a final cover as required under §258.60(a) at any time during the active life;

(3) An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and

(4) A schedule for completing all activities necessary to satisfy the closure criteria in §258.60.

(d) The owner or operator must notify the State Director that a closure plan has been prepared and placed in the operating record no later than the effective date of this part, or by the initial receipt of waste, whichever is later.

(e) Prior to beginning closure of each MSWLF unit as specified in §258.60(f), an owner or operator must notify the State Director that a notice of the intent to close the unit has been placed in the operating record.



(f) The owner or operator must begin closure activities of each MSWLF unit no later than 30 days after the date on which the MSWLF unit receives the known final receipt of wastes or, if the MSWLF unit has remaining capacity and there is a reasonable likelihood that the MSWLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Director of an approved State if the owner or operator demonstrates that the MSWLF unit has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed MSWLF unit.

(g) The owner or operator of all MSWLF units must complete closure activities of each MSWLF unit in accordance with the closure plan within 180 days following the beginning of closure as specified in paragraph (f) of this section. Extensions of the closure period may be granted by the Director of an approved State if the owner or operator demonstrates that closure will, of necessity, take longer than 180 days and he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed MSWLF unit.

(h) Following closure of each MSWLF unit, the owner or operator must notify the State Director that a certification, signed by an independent registered professional engineer or approved by Director of an approved State, verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.

(i)(1) Following closure of all MSWLF units, the owner or operator must record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during title search, and notify the State Director that the notation has been recorded and a copy has been placed in the operating record.

(2) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

(i) The land has been used as a landfill facility; and

(ii) Its use is restricted under §258.61(c)(3).

(j) The owner or operator may request permission from the Director of an approved State to remove the notation from the deed if all wastes are removed from the facility.

[56 FR 51016, Oct. 9, 1991; 57 FR 28628, June 26, 1992, as amended at 62 FR 40713, July 29, 1997]

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## **§258.61 *Post-closure care requirements.***

(a) Following closure of each MSWLF unit, the owner or operator must conduct post-closure care. Post-closure care must be conducted for 30 years, except as provided under paragraph (b) of this section, and consist of at least the following:

(1) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(2) Maintaining and operating the leachate collection system in accordance with the requirements in §258.40, if applicable. The Director of an approved State may allow the owner or operator to stop managing leachate if the owner or operator demonstrates that leachate no longer poses a threat to human health and the environment;

(3) Monitoring the ground water in accordance with the requirements of subpart E of this part and maintaining the ground-water monitoring system, if applicable; and

(4) Maintaining and operating the gas monitoring system in accordance with the requirements of §258.23.

(b) The length of the post-closure care period may be:

(1) Decreased by the Director of an approved State if the owner or operator demonstrates that the reduced period is sufficient to protect human health and the environment and this demonstration is approved by the Director of an approved State; or

(2) Increased by the Director of an approved State if the Director of an approved State determines that the lengthened period is necessary to protect human health and the environment.

(c) The owner or operator of all MSWLF units must prepare a written post-closure plan that includes, at a minimum, the following information:

(1) A description of the monitoring and maintenance activities required in §258.61(a) for each MSWLF unit, and the frequency at which these activities will be performed;

(2) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

(3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this part 258. The Director of an approved State may approve any other disturbance if the owner or operator demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

(d) The owner or operator must notify the State Director that a post-closure plan has been prepared and placed in the operating record no later than the effective date of this part, October 9, 1993, or by the initial receipt of waste, whichever is later.

(e) Following completion of the post-closure care period for each MSWLF unit, the owner or operator must notify the State Director that a certification, signed by an independent registered professional engineer or approved by the Director of an approved State, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record.

[56 FR 51016, Oct. 9, 1991; 57 FR 28628, June 26, 1992]

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## **§258.62 Approval of site-specific flexibility requests in Indian country.**

[Link to an amendment published at 82 FR 25535, June 2, 2017.](#)

(a) *Lake County Municipal Landfill final cover requirements.* Paragraph (a) of this section applies to the Lake County Landfill, a municipal solid waste landfill owned and operated by Lake County on the Confederated Salish and Kootenai Tribes' Flathead Reservation in Montana. The alternative final cover request submitted by Lake County, Montana, consisting of the "Lake County Landfill Alternative Cover," dated May 2007, the "Construction Quality Assurance & Control Plan for the Lake County Class II Landfill Unit Landfill Closure Project" and the "Lake County Landfill Plans for Final Closure January 2009," dated January 2009, is hereby incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may inspect or obtain a copy at the Environmental Protection Agency, Region VIII, Montana Office, 10 West 15th St., Suite 3200, Helena, MT or by calling 406-457-5000. You may also inspect a copy at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html). The facility owner and/or operator may close the facility in accordance with this application, including the following activities more generally described as follows:

(1) The owner and operator may install an evapotranspiration system as an alternative final cover for the 15.4 acre active area.

(2) The final cover system shall consist of a 5.5-foot-thick multi-layer cover system comprised, from bottom to top, of an 18-inch intermediate and gas vent layer, a 24-inch native sand layer, an 18-inch imported silt layer and a 6-inch topsoil layer, as well as seeding and erosion control.

(3) The final cover system shall be constructed to achieve an equivalent reduction in infiltration as the infiltration layer specified in §258.60(a)(1) and (a)(2), and provide an equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.

(4) In addition to meeting the specifications of the "Lake County Landfill Alternative Cover" dated May 2007, and the "Construction Quality Assurance & Control Plan for the Lake County Class II Landfill Unit Landfill Closure Project" dated January 2009, the owner and operator shall:

(i) At 50% final design, submit to EPA for approval an Operations and Maintenance Plan that includes an inspection schedule (at least quarterly) and remediation plan to address any potential rodent damage to the final cover; and

(ii) Achieve re-vegetation rates greater than 50% by the end of the first season and a complete stand of native grasses by the end of the third season.

(5) The owner and operator shall place documentation demonstrating compliance with the provisions of this Section in the operating record.

(6) All other applicable provisions of 40 CFR part 258 remain in effect.

(b) *Picacho Municipal Solid Waste Landfill—alternative list of detection monitoring parameters and alternative final cover.* This paragraph (b) applies to the Picacho Landfill, a Municipal Solid Waste Landfill operated by Imperial County on the Quechan Indian Tribe of the Fort Yuma Indian Reservation in California.

(1) In accordance with §258.54(a), the owner and operator may modify the list of heavy metal detection monitoring parameters specified in appendix I of this part, as required during Post-Closure Care by §258.61(a)(3), by replacing monitoring of the inorganic constituents, with the exception of arsenic, with the inorganic indicator parameters chloride, nitrate as nitrogen, sulfate, and total dissolved solids.

(2) In accordance with §258.60(b), the owner and operator may replace the prescriptive final cover set forth in §258.60(a), with an alternative final cover as follows:

(i) The owner and operator may install an evapotranspiration cover system as an alternative final cover for the 12.5 acre site.

(ii) The alternative final cover system shall be constructed to achieve an equivalent reduction in infiltration as the infiltration layer specified in §258.60(a)(1) and (2), and provide an equivalent protection from wind and water erosion as the erosion layer specified in §258.60(a)(3).

(iii) The final cover system shall consist of a minimum three-foot-thick multi-layer cover system comprised, from bottom to top, of:

(A) A minimum 30-inch thick infiltration layer consisting of:

(1) Existing intermediate cover; and

(2) Additional cover soil which, prior to placement, shall be wetted to optimal moisture and thoroughly mixed to near uniform condition, and the material shall then be placed in lifts with an uncompacted thickness of six to eight inches, spread evenly and compacted to 90 percent of the maximum dry density, and shall:

(i) Exhibit a grain size distribution that excludes particles in excess of three inches in diameter;

(ii) Have a minimum fines content (percent by weight passing U.S. No. 200 Sieve) of seven percent for an individual test and eight percent for the average of ten consecutive tests;

(iii) Have a grain size distribution with a minimum of five percent smaller than five microns for an individual test and six percent for the average of ten consecutive tests; and

(iv) Exhibit a maximum saturated hydraulic conductivity on the order of 1.0E-03 cm/sec.; and

(3) A minimum six-inch surface erosion layer comprised of a rock/soil admixture. The surface erosion layer admixture and gradations for 3% slopes and 3:1 slopes are detailed below:

(i) 3% slopes: For the 3% slopes the surface admixture shall be composed of pea gravel (  $\frac{3}{8}$  -inch to  $\frac{1}{2}$  -inch diameter) mixed with cover soil at the ratio of 25% rock to soil by volume with a minimum six-inch erosion layer.

(ii) For the 3:1 side slopes the surface admixture shall be composed of either: gravel/rock (  $\frac{3}{4}$  -inch to one-inch diameter) mixed with additional cover soil as described in paragraph (b)(2)(iii)(A)(2) of this section at the ratio of 50% rock to soil by volume and result in a minimum six-inch erosion layer, or gravel/rock (  $\frac{3}{4}$  -inch to two-inch diameter) mixed with additional cover soil as described in paragraph (b)(2)(iii)(A)(2) of this section at the ratio of 50% rock to soil by volume and result in a minimum 12-inch erosion layer.

(iii) The owner and operator shall place documentation demonstrating compliance with the provisions of this section in the operating record.

(iv) All other applicable provisions of this part remain in effect.

(B) [Reserved]

[75 FR 50932, Aug. 18, 2010, as amended at 81 FR 69409, Oct. 6, 2016]

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## **§§258.63-258.69 [Reserved]**

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### **Subpart G—Financial Assurance Criteria**

SOURCE: 56 FR 51029, Oct. 9, 1991, unless otherwise noted.

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## **§258.70 Applicability and effective date.**

(a) The requirements of this section apply to owners and operators of all MSWLF units, except owners or operators who are State or Federal government entities whose debts and liabilities are the debts and liabilities of a State or the United States.

(b) The requirements of this section are effective April 9, 1997 except for MSWLF units meeting the conditions of §258.1(f)(1), in which case the effective date is October 9, 1997.

(c) The Director of an approved State may waive the requirements of this section for up to one year until April 9, 1998 for good cause if an owner or operator demonstrates to the Director's satisfaction that the April 9, 1997 effective date for the requirements of this section does not provide sufficient time to comply with these requirements and that such a waiver will not adversely affect human health and the environment.

[56 FR 51029, Oct. 9, 1991, as amended at 60 FR 52342, Oct. 6, 1995; 61 FR 60337, Nov. 27, 1996]

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## **§258.71 Financial assurance for closure.**

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of all MSWLF units ever requiring a final cover as required under §258.60 at any time during the active life in accordance with the closure plan. The owner or operator must notify the State Director that the estimate has been placed in the operating record.

(1) The cost estimate must equal the cost of closing the largest area of all MSWLF unit ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see §258.60(c)(2) of this part).

(2) During the active life of the MSWLF unit, the owner or operator must annually adjust the closure cost estimate for inflation.

(3) The owner or operator must increase the closure cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes to the closure plan or MSWLF unit conditions increase the maximum cost of closure at any time during the remaining active life.

(4) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under paragraph (b) of this section if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the MSWLF unit. The owner or operator must notify the State Director that the justification for the reduction of the closure cost estimate and the amount of financial assurance has been placed in the operating record.

(b) The owner or operator of each MSWLF unit must establish financial assurance for closure of the MSWLF unit in compliance with §258.74. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with §258.60 (h) and (i).

[56 FR 51029, Oct. 9, 1991; 57 FR 28628, June 26, 1992]

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## **§258.72 Financial assurance for post-closure care.**

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the MSWLF unit in compliance with the post-closure plan developed under §258.61 of this part. The post-closure cost estimate used to demonstrate financial assurance in paragraph (b) of this section must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner or operator must notify the State Director that the estimate has been placed in the operating record.

(1) The cost estimate for post-closure care must be based on the most expensive costs of post-closure care during the post-closure care period.

(2) During the active life of the MSWLF unit and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation.

(3) The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes in the post-closure plan or MSWLF unit conditions increase the maximum costs of post-closure care.

(4) The owner or operator may reduce the post-closure cost estimate and the amount of financial assurance provided under paragraph (b) of this section if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must notify the State Director that the justification for the reduction of the post-closure cost estimate and the amount of financial assurance has been placed in the operating record.

(b) The owner or operator of each MSWLF unit must establish, in a manner in accordance with §258.74, financial assurance for the costs of post-closure care as required under §258.61 of this part. The owner or

operator must provide continuous coverage for post-closure care until released from financial assurance requirements for post-closure care by demonstrating compliance with §258.61(e).

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### **§258.73 *Financial assurance for corrective action.***

(a) An owner or operator of a MSWLF unit required to undertake a corrective action program under §258.58 of this part must have a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with the program required under §258.58 of this part. The corrective action cost estimate must account for the total costs of corrective action activities as described in the corrective action plan for the entire corrective action period. The owner or operator must notify the State Director that the estimate has been placed in the operating record.

(1) The owner or operator must annually adjust the estimate for inflation until the corrective action program is completed in accordance with §258.58(f) of this part.

(2) The owner or operator must increase the corrective action cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes in the corrective action program or MSWLF unit conditions increase the maximum costs of corrective action.

(3) The owner or operator may reduce the amount of the corrective action cost estimate and the amount of financial assurance provided under paragraph (b) of this section if the cost estimate exceeds the maximum remaining costs of corrective action. The owner or operator must notify the State Director that the justification for the reduction of the corrective action cost estimate and the amount of financial assurance has been placed in the operating record.

(b) The owner or operator of each MSWLF unit required to undertake a corrective action program under §258.58 of this part must establish, in a manner in accordance with §258.74, financial assurance for the most recent corrective action program. The owner or operator must provide continuous coverage for corrective action until released from financial assurance requirements for corrective action by demonstrating compliance with §258.58 (f) and (g).

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### **§258.74 *Allowable mechanisms.***

The mechanisms used to demonstrate financial assurance under this section must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action for known releases will be available whenever they are needed. Owners and operators must choose from the options specified in paragraphs (a) through (j) of this section.

(a) *Trust Fund.* (1) An owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of this paragraph. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency. A copy of the trust agreement must be placed in the facility's operating record.

(2) Payments into the trust fund must be made annually by the owner or operator over the term of the initial permit or over the remaining life of the MSWLF unit, whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the corrective action program in the case of corrective action for known releases. This period is referred to as the pay-in period.

(3) For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into the fund must be at least equal to the current cost estimate for closure or post-closure care, except as provided in paragraph (k) of this section, divided by the number of years in the pay-in period as defined in paragraph (a)(2) of this section. The amount of subsequent payments must be determined by the following formula:

Next Payment =  $[CE - CV]/Y$

where CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(4) For a trust fund used to demonstrate financial assurance for corrective action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for corrective action, except as provided in paragraph (k) of this section, divided by the number of years in the corrective action pay-in period as defined in paragraph (a)(2) of this section. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = [\text{RB} - \text{CV}]/\text{Y}$$

where RB is the most recent estimate of the required trust fund balance for corrective action (*i.e.*, the total costs that will be incurred during the second half of the corrective action period), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(5) The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997, or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1)), whichever is later, in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58.

(6) If the owner or operator establishes a trust fund after having used one or more alternate mechanisms specified in this section, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of this paragraph and paragraph (a) of this section, as applicable.

(7) The owner or operator, or other person authorized to conduct closure, post-closure care, or corrective action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or corrective action, and if justification and documentation of the cost is placed in the operating record. The owner or operator must notify the State Director that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(8) The trust fund may be terminated by the owner or operator only if the owner or operator substitutes alternate financial assurance as specified in this section or if he is no longer required to demonstrate financial responsibility in accordance with the requirements of §§258.71(b), 258.72(b), or 258.73(b).

(b) *Surety Bond Guaranteeing Payment or Performance.* (1) An owner or operator may demonstrate financial assurance for closure or post-closure care by obtaining a payment or performance surety bond which conforms to the requirements of this paragraph. An owner or operator may demonstrate financial assurance for corrective action by obtaining a performance bond which conforms to the requirements of this paragraph. The bond must be effective before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997, or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1)), whichever is later, in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58. The owner or operator must notify the State Director that a copy of the bond has been placed in the operating record. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure care or corrective action cost estimate, whichever is applicable, except as provided in §258.74(k).

(3) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.

(4) The owner or operator must establish a standby trust fund. The standby trust fund must meet the requirements of §258.74(a) except the requirements for initial payment and subsequent annual payments specified in §258.74 (a)(2), (3), (4) and (5).

(5) Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(6) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner and operator and to the State Director 120 days in advance of cancellation. If the surety cancels the bond, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) The owner or operator may cancel the bond only if alternate financial assurance is substituted as specified in this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with §258.71(b), §258.72(b) or §258.73(b).

(c) *Letter of credit.* (1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph. The letter of credit must be effective before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997, or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1)), whichever is later, in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58. The owner or operator must notify the State Director that a copy of the letter of credit has been placed in the operating record. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) A letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: Name, and address of the facility, and the amount of funds assured, must be included with the letter of credit in the operating record.

(3) The letter of credit must be irrevocable and issued for a period of at least one year in an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable, except as provided in paragraph (k) of this section. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution has cancelled the letter of credit by sending notice of cancellation by certified mail to the owner and operator and to the State Director 120 days in advance of cancellation. If the letter of credit is cancelled by the issuing institution, the owner or operator must obtain alternate financial assurance.

(4) The owner or operator may cancel the letter of credit only if alternate financial assurance is substituted as specified in this section or if the owner or operator is released from the requirements of this section in accordance with §258.71(b), §258.72(b) or §258.73(b).

(d) *Insurance.* (1) An owner or operator may demonstrate financial assurance for closure and post-closure care by obtaining insurance which conforms to the requirements of this paragraph. The insurance must be effective before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997, or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1)), whichever is later, in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States. The owner or operator must notify the State Director that a copy of the insurance policy has been placed in the operating record.

(2) The closure or post-closure care insurance policy must guarantee that funds will be available to close the MSWLF unit whenever final closure occurs or to provide post-closure care for the MSWLF unit whenever the post-closure care period begins, whichever is applicable. The policy must also guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner or operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy.

(3) The insurance policy must be issued for a face amount at least equal to the current cost estimate for closure or post-closure care, whichever is applicable, except as provided in paragraph (k) of this section. The term *face amount* means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) An owner or operator, or any other person authorized to conduct closure or post-closure care, may receive reimbursements for closure or post-closure expenditures, whichever is applicable. Requests for reimbursement will be granted by the insurer only if the remaining value of the policy is sufficient to cover the remaining costs of closure or post-closure care, and if justification and documentation of the cost is placed in the operating record.



The owner or operator must notify the State Director that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(5) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided that such consent is not unreasonably refused.

(6) The insurance policy must provide that the insurer may not cancel, terminate or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the owner and operator and to the State Director 120 days in advance of cancellation. If the insurer cancels the policy, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) For insurance policies providing coverage for post-closure care, commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to 85 percent of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.

(8) The owner or operator may cancel the insurance policy only if alternate financial assurance is substituted as specified in this section or if the owner or operator, is no longer required to demonstrate financial responsibility in accordance with the requirements of §258.71(b), §258.72(b) or §258.73(b).

(e) *Corporate financial test.* An owner or operator that satisfies the requirements of this paragraph (e) may demonstrate financial assurance up to the amount specified in this paragraph (e):

(1) *Financial component.* (i) The owner or operator must satisfy one of the following three conditions:

(A) A current rating for its senior unsubordinated debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; or

(B) A ratio of less than 1.5 comparing total liabilities to net worth; or

(C) A ratio of greater than 0.10 comparing the sum of net income plus depreciation, depletion and amortization, minus \$10 million, to total liabilities.

(ii) The tangible net worth of the owner or operator must be greater than: (A) The sum of the current closure, post-closure care, corrective action cost estimates and any other environmental obligations, including guarantees, covered by a financial test plus \$10 million except as provided in paragraph (e)(1)(ii)(B) of this section.

(B) \$10 million in net worth plus the amount of any guarantees that have not been recognized as liabilities on the financial statements provided all of the current closure, post-closure care, and corrective action costs and any other environmental obligations covered by a financial test are recognized as liabilities on the owner's or operator's audited financial statements, and subject to the approval of the State Director.

(iii) The owner or operator must have assets located in the United States amounting to at least the sum of current closure, post-closure care, corrective action cost estimates and any other environmental obligations covered by a financial test as described in paragraph (e)(3) of this section.

(2) *Recordkeeping and reporting requirements.* (i) The owner or operator must place the following items into the facility's operating record:

(A) A letter signed by the owner's or operator's chief financial officer that:

(1) Lists all the current cost estimates covered by a financial test, including, but not limited to, cost estimates required for municipal solid waste management facilities under this part 258, cost estimates required for UIC facilities under 40 CFR part 144, if applicable, cost estimates required for petroleum underground storage tank facilities under 40 CFR part 280, if applicable, cost estimates required for PCB storage facilities under 40 CFR

part 761, if applicable, and cost estimates required for hazardous waste treatment, storage, and disposal facilities under 40 CFR parts 264 and 265, if applicable; and

(2) Provides evidence demonstrating that the firm meets the conditions of either paragraph (e)(1)(i)(A) or (e)(1)(i)(B) or (e)(1)(i)(C) of this section and paragraphs (e)(1)(ii) and (e)(1)(iii) of this section.

(B) A copy of the independent certified public accountant's unqualified opinion of the owner's or operator's financial statements for the latest completed fiscal year. To be eligible to use the financial test, the owner's or operator's financial statements must receive an unqualified opinion from the independent certified public accountant. An adverse opinion, disclaimer of opinion, or other qualified opinion will be cause for disallowance, with the potential exception for qualified opinions provided in the next sentence. The Director of an approved State may evaluate qualified opinions on a case-by-case basis and allow use of the financial test in cases where the Director deems that the matters which form the basis for the qualification are insufficient to warrant disallowance of the test. If the Director of an approved State does not allow use of the test, the owner or operator must provide alternate financial assurance that meets the requirements of this section.

(C) If the chief financial officer's letter providing evidence of financial assurance includes financial data showing that owner or operator satisfies paragraph (e)(1)(i)(B) or (e)(1)(i)(C) of this section that are different from data in the audited financial statements referred to in paragraph (e)(2)(i)(B) of this section or any other audited financial statement or data filed with the SEC, then a special report from the owner's or operator's independent certified public accountant to the owner or operator is required. The special report shall be based upon an agreed upon procedures engagement in accordance with professional auditing standards and shall describe the procedures performed in comparing the data in the chief financial officer's letter derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements, the findings of that comparison, and the reasons for any differences.

(D) If the chief financial officer's letter provides a demonstration that the firm has assured for environmental obligations as provided in paragraph (e)(1)(ii)(B) of this section, then the letter shall include a report from the independent certified public accountant that verifies that all of the environmental obligations covered by a financial test have been recognized as liabilities on the audited financial statements, how these obligations have been measured and reported, and that the tangible net worth of the firm is at least \$10 million plus the amount of any guarantees provided.

(ii) An owner or operator must place the items specified in paragraph (e)(2)(i) of this section in the operating record and notify the State Director that these items have been placed in the operating record before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997 or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1)), whichever is later in the case of closure, and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58.

(iii) After the initial placement of items specified in paragraph (e)(2)(i) of this section in the operating record, the owner or operator must annually update the information and place updated information in the operating record within 90 days following the close of the owner or operator's fiscal year. The Director of a State may provide up to an additional 45 days for an owner or operator who can demonstrate that 90 days is insufficient time to acquire audited financial statements. The updated information must consist of all items specified in paragraph (e)(2)(i) of this section.

(iv) The owner or operator is no longer required to submit the items specified in this paragraph (e)(2) or comply with the requirements of this paragraph (e) when:

(A) He substitutes alternate financial assurance as specified in this section that is not subject to these recordkeeping and reporting requirements; or

(B) He is released from the requirements of this section in accordance with §258.71(b), §258.72(b), or §258.73(b).

(v) If the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must, within 120 days following the close of the owner or operator's fiscal year, obtain alternative financial assurance that meets the requirements of this section, place the required submissions for that assurance in the operating record, and notify the State Director that the owner or operator no longer meets the criteria of the financial test and that alternate assurance has been obtained.

(vi) The Director of an approved State may, based on a reasonable belief that the owner or operator may no longer meet the requirements of paragraph (e)(1) of this section, require at any time the owner or operator to provide reports of its financial condition in addition to or including current financial test documentation as specified in paragraph (e)(2) of this section. If the Director of an approved State finds that the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must provide alternate financial assurance that meets the requirements of this section.

(3) *Calculation of costs to be assured.* When calculating the current cost estimates for closure, post-closure care, corrective action, or the sum of the combination of such costs to be covered, and any other environmental obligations assured by a financial test referred to in this paragraph (e), the owner or operator must include cost estimates required for municipal solid waste management facilities under this part, as well as cost estimates required for the following environmental obligations, if it assures them through a financial test: obligations associated with UIC facilities under 40 CFR part 144, petroleum underground storage tank facilities under 40 CFR part 280, PCB storage facilities under 40 CFR part 761, and hazardous waste treatment, storage, and disposal facilities under 40 CFR parts 264 and 265.

(f) *Local government financial test.* An owner or operator that satisfies the requirements of paragraphs (f)(1) through (3) of this section may demonstrate financial assurance up to the amount specified in paragraph (f)(4) of this section:

(1) *Financial component.* (i) The owner or operator must satisfy paragraph (f)(1)(i)(A) or (B) of this section as applicable:

(A) If the owner or operator has outstanding, rated, general obligation bonds that are not secured by insurance, a letter of credit, or other collateral or guarantee, it must have a current rating of Aaa, Aa, A, or Baa, as issued by Moody's, or AAA, AA, A, or BBB, as issued by Standard and Poor's on all such general obligation bonds; or

(B) The owner or operator must satisfy each of the following financial ratios based on the owner or operator's most recent audited annual financial statement:

(1) A ratio of cash plus marketable securities to total expenditures greater than or equal to 0.05; and

(2) A ratio of annual debt service to total expenditures less than or equal to 0.20.

(ii) The owner or operator must prepare its financial statements in conformity with Generally Accepted Accounting Principles for governments and have its financial statements audited by an independent certified public accountant (or appropriate State agency).

(iii) A local government is not eligible to assure its obligations under §258.74(f) if it:

(A) Is currently in default on any outstanding general obligation bonds; or

(B) Has any outstanding general obligation bonds rated lower than Baa as issued by Moody's or BBB as issued by Standard and Poor's; or

(C) Operated at a deficit equal to five percent or more of total annual revenue in each of the past two fiscal years; or

(D) Receives an adverse opinion, disclaimer of opinion, or other qualified opinion from the independent certified public accountant (or appropriate State agency) auditing its financial statement as required under paragraph (f)(1)(ii) of this section. However, the Director of an approved State may evaluate qualified opinions on a case-by-case basis and allow use of the financial test in cases where the Director deems the qualification insufficient to warrant disallowance of use of the test.

(iv) The following terms used in this paragraph are defined as follows:

(A) *Deficit* equals total annual revenues minus total annual expenditures;

(B) *Total revenues* include revenues from all taxes and fees but does not include the proceeds from borrowing or asset sales, excluding revenue from funds managed by local government on behalf of a specific third party;

(C) *Total expenditures* include all expenditures excluding capital outlays and debt repayment;

(D) *Cash plus marketable securities* is all the cash plus marketable securities held by the local government on the last day of a fiscal year, excluding cash and marketable securities designated to satisfy past obligations such as pensions; and

(E) *Debt service* is the amount of principal and interest due on a loan in a given time period, typically the current year.

(2) *Public notice component.* The local government owner or operator must place a reference to the closure and post-closure care costs assured through the financial test into its next comprehensive annual financial report (CAFR) after the effective date of this section or prior to the initial receipt of waste at the facility, whichever is later. Disclosure must include the nature and source of closure and post-closure care requirements, the reported liability at the balance sheet date, the estimated total closure and post-closure care cost remaining to be recognized, the percentage of landfill capacity used to date, and the estimated landfill life in years. A reference to corrective action costs must be placed in the CAFR not later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58. For the first year the financial test is used to assure costs at a particular facility, the reference may instead be placed in the operating record until issuance of the next available CAFR if timing does not permit the reference to be incorporated into the most recently issued CAFR or budget. For closure and post-closure costs, conformance with Government Accounting Standards Board Statement 18 assures compliance with this public notice component.

(3) *Recordkeeping and reporting requirements.* (i) The local government owner or operator must place the following items in the facility's operating record:

(A) A letter signed by the local government's chief financial officer that:

(1) Lists all the current cost estimates covered by a financial test, as described in paragraph (f)(4) of this section;

(2) Provides evidence and certifies that the local government meets the conditions of paragraphs (f)(1)(i), (f)(1)(ii), and (f)(1)(iii) of this section; and

(3) Certifies that the local government meets the conditions of paragraphs (f)(2) and (f)(4) of this section.

(B) The local government's independently audited year-end financial statements for the latest fiscal year (except for local governments where audits are required every two years where unaudited statements may be used in years when audits are not required), including the unqualified opinion of the auditor who must be an independent, certified public accountant or an appropriate State agency that conducts equivalent comprehensive audits;

(C) A report to the local government from the local government's independent certified public accountant (CPA) or the appropriate State agency based on performing an agreed upon procedures engagement relative to the financial ratios required by paragraph (f)(1)(i)(B) of this section, if applicable, and the requirements of paragraphs (f)(1)(ii) and (f)(1)(iii) (C) and (D) of this section. The CPA or State agency's report should state the procedures performed and the CPA or State agency's findings; and

(D) A copy of the comprehensive annual financial report (CAFR) used to comply with paragraph (f)(2) of this section or certification that the requirements of General Accounting Standards Board Statement 18 have been met.

(ii) The items required in paragraph (f)(3)(i) of this section must be placed in the facility operating record as follows:

(A) In the case of closure and post-closure care, either before the effective date of this section, which is April 9, 1997, or prior to the initial receipt of waste at the facility, whichever is later, or

(B) In the case of corrective action, not later than 120 days after the corrective action remedy is selected in accordance with the requirements of §258.58.

(iii) After the initial placement of the items in the facility's operating record, the local government owner or operator must update the information and place the updated information in the operating record within 180 days following the close of the owner or operator's fiscal year.

(iv) The local government owner or operator is no longer required to meet the requirements of paragraph (f)(3) of this section when:

(A) The owner or operator substitutes alternate financial assurance as specified in this section; or

(B) The owner or operator is released from the requirements of this section in accordance with §258.71(b), 258.72(b), or 258.73(b).

(v) A local government must satisfy the requirements of the financial test at the close of each fiscal year. If the local government owner or operator no longer meets the requirements of the local government financial test it must, within 210 days following the close of the owner or operator's fiscal year, obtain alternative financial assurance that meets the requirements of this section, place the required submissions for that assurance in the operating record, and notify the State Director that the owner or operator no longer meets the criteria of the financial test and that alternate assurance has been obtained.

(vi) The Director of an approved State, based on a reasonable belief that the local government owner or operator may no longer meet the requirements of the local government financial test, may require additional reports of financial condition from the local government at any time. If the Director of an approved State finds, on the basis of such reports or other information, that the owner or operator no longer meets the requirements of the local government financial test, the local government must provide alternate financial assurance in accordance with this section.

(4) *Calculation of costs to be assured.* The portion of the closure, post-closure, and corrective action costs for which an owner or operator can assure under this paragraph is determined as follows:

(i) If the local government owner or operator does not assure other environmental obligations through a financial test, it may assure closure, post-closure, and corrective action costs that equal up to 43 percent of the local government's total annual revenue.

(ii) If the local government assures other environmental obligations through a financial test, including those associated with UIC facilities under 40 CFR 144.62, petroleum underground storage tank facilities under 40 CFR Part 280, PCB storage facilities under 40 CFR Part 761, and hazardous waste treatment, storage, and disposal facilities under 40 CFR Parts 264 and 265, it must add those costs to the closure, post-closure, and corrective action costs it seeks to assure under this paragraph. The total that may be assured must not exceed 43 percent of the local government's total annual revenue.

(iii) The owner or operator must obtain an alternate financial assurance instrument for those costs that exceed the limits set in paragraphs (f)(4) (i) and (ii) of this section.

(g) *Corporate Guarantee.* (1) An owner or operator may meet the requirements of this section by obtaining a written guarantee. The guarantor must be the direct or higher-tier parent corporation of the owner or operator, a firm whose parent corporation is also the parent corporation of the owner or operator, or a firm with a "substantial business relationship" with the owner or operator. The guarantor must meet the requirements for owners or operators in paragraph (e) of this section and must comply with the terms of the guarantee. A certified copy of the guarantee must be placed in the facility's operating record along with copies of the letter from the guarantor's chief financial officer and accountants' opinions. If the guarantor's parent corporation is also the parent corporation of the owner or operator, the letter from the guarantor's chief financial officer must describe the value received in consideration of the guarantee. If the guarantor is a firm with a "substantial business relationship" with the owner or operator, this letter must describe this "substantial business relationship" and the value received in consideration of the guarantee.

(2) The guarantee must be effective and all required submissions placed in the operating record before the initial receipt of waste or before the effective date of the requirements of this section (April 9, 1997 or October 9, 1997 for MSWLF units meeting the conditions of §258.1(f)(1), whichever is later, in the case of closure and post-closure care, or in the case of corrective action no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58.

(3) The terms of the guarantee must provide that:

(i) If the owner or operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will:

(A) Perform, or pay a third party to perform, closure, post-closure care, and/or corrective action as required (performance guarantee); or

(B) Establish a fully funded trust fund as specified in paragraph (a) of this section in the name of the owner or operator (payment guarantee).

(ii) The guarantee will remain in force for as long as the owner or operator must comply with the applicable financial assurance requirements of this Subpart unless the guarantor sends prior notice of cancellation by certified mail to the owner or operator and to the State Director. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the State Director, as evidenced by the return receipts.

(iii) If notice of cancellation is given, the owner or operator must, within 90 days following receipt of the cancellation notice by the owner or operator and the State Director, obtain alternate financial assurance, place evidence of that alternate financial assurance in the facility operating record, and notify the State Director. If the owner or operator fails to provide alternate financial assurance within the 90-day period, the guarantor must provide that alternate assurance within 120 days of the cancellation notice, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the State Director.

(4) If a corporate guarantor no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must, within 90 days, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the State Director. If the owner or operator fails to provide alternate financial assurance within the 90-day period, the guarantor must provide that alternate assurance within the next 30 days.

(5) The owner or operator is no longer required to meet the requirements of this paragraph (g) when:

(i) The owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The owner or operator is released from the requirements of this section in accordance with §258.71(b), §258.72(b), or §258.73(b).

(h) *Local government guarantee.* An owner or operator may demonstrate financial assurance for closure, post-closure, and corrective action, as required by §§258.71, 258.72, and 258.73, by obtaining a written guarantee provided by a local government. The guarantor must meet the requirements of the local government financial test in paragraph (f) of this section, and must comply with the terms of a written guarantee.

(1) *Terms of the written guarantee.* The guarantee must be effective before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure, post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58. The guarantee must provide that:

(i) If the owner or operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will:

(A) Perform, or pay a third party to perform, closure, post-closure care, and/or corrective action as required; or

(B) Establish a fully funded trust fund as specified in paragraph (a) of this section in the name of the owner or operator.

(ii) The guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the owner or operator and to the State Director. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the State Director, as evidenced by the return receipts.

(iii) If a guarantee is cancelled, the owner or operator must, within 90 days following receipt of the cancellation notice by the owner or operator and the State Director, obtain alternate financial assurance, place evidence of that alternate financial assurance in the facility operating record, and notify the State Director. If the owner or operator fails to provide alternate financial assurance within the 90-day period, the guarantor must provide that alternate assurance within 120 days following the guarantor's notice of cancellation, place evidence of the alternate assurance in the facility operating record, and notify the State Director.

(2) *Recordkeeping and reporting.* (i) The owner or operator must place a certified copy of the guarantee along with the items required under paragraph (f)(3) of this section into the facility's operating record before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure, post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58.

(ii) The owner or operator is no longer required to maintain the items specified in paragraph (h)(2) of this section when:

(A) The owner or operator substitutes alternate financial assurance as specified in this section; or

(B) The owner or operator is released from the requirements of this section in accordance with §258.71(b), 258.72(b), or 258.73(b).

(iii) If a local government guarantor no longer meets the requirements of paragraph (f) of this section, the owner or operator must, within 90 days, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the State Director. If the owner or operator fails to obtain alternate financial assurance within that 90-day period, the guarantor must provide that alternate assurance within the next 30 days.

(i) *State-Approved mechanism.* An owner or operator may satisfy the requirements of this section by obtaining any other mechanism that meets the criteria specified in §258.74(1), and that is approved by the Director of an approved State.

(j) *State assumption of responsibility.* If the State Director either assumes legal responsibility for an owner or operator's compliance with the closure, post-closure care and/or corrective action requirements of this part, or assures that the funds will be available from State sources to cover the requirements, the owner or operator will be in compliance with the requirements of this section. Any State assumption of responsibility must meet the criteria specified in §258.74(l).

(k) *Use of multiple mechanisms.* An owner or operator may demonstrate financial assurance for closure, post-closure, and corrective action, as required by §§258.71, 258.72, and 258.73 by establishing more than one mechanism per facility, except that mechanisms guaranteeing performance rather than payment, may not be combined with other instruments. The mechanisms must be as specified in paragraphs (a), (b), (c), (d), (e), (f), (g), (h), (i), and (j) of this section, except that financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care, and/or corrective action may be provided by a combination of mechanisms rather than a single mechanism.

(l) The language of the mechanisms listed in paragraphs (a), (b), (c), (d), (e), (f), (g), (h), (i), and (j) of this section must ensure that the instruments satisfy the following criteria:

(1) The financial assurance mechanisms must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed;

(2) The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed;

(3) The financial assurance mechanisms must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of §258.58, until the owner or operator is released from the financial assurance requirements under §§258.71, 258.72 and 258.73.

(4) The financial assurance mechanisms must be legally valid, binding, and enforceable under State and Federal law.

[56 FR 51029, Oct. 9, 1991, as amended at 58 FR 51547, Oct. 1, 1993; 60 FR 40105, Aug. 7, 1995; 60 FR 52342, Oct. 6, 1995; 61 FR 60337, Nov. 27, 1996; 63 FR 17729, Apr. 10, 1998]

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### **§258.75 Discounting.**

The Director of an approved State may allow discounting of closure cost estimates in §258.71(a), post-closure cost estimates in §258.72(a), and/or corrective action costs in §258.73(a) up to the rate of return for essentially risk free investments, net of inflation, under the following conditions:

- (a) The State Director determines that cost estimates are complete and accurate and the owner or operator has submitted a statement from a Registered Professional Engineer so stating;
- (b) The State finds the facility in compliance with applicable and appropriate permit conditions;
- (c) The State Director determines that the closure date is certain and the owner or operator certifies that there are no foreseeable factors that will change the estimate of site life; and
- (d) Discounted cost estimates must be adjusted annually to reflect inflation and years of remaining life.

[61 FR 60339, Nov. 27, 1996]

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### **Appendix I to Part 258—Constituents for Detection Monitoring**

| <b>Common name<sup>1</sup></b> | <b>CAS RN<sup>2</sup></b> |
|--------------------------------|---------------------------|
| <i>Inorganic Constituents:</i> |                           |
| (1) Antimony                   | (Total)                   |
| (2) Arsenic                    | (Total)                   |
| (3) Barium                     | (Total)                   |
| (4) Beryllium                  | (Total)                   |
| (5) Cadmium                    | (Total)                   |
| (6) Chromium                   | (Total)                   |
| (7) Cobalt                     | (Total)                   |
| (8) Copper                     | (Total)                   |
| (9) Lead                       | (Total)                   |
| (10) Nickel                    | (Total)                   |
| (11) Selenium                  | (Total)                   |
| (12) Silver                    | (Total)                   |
| (13) Thallium                  | (Total)                   |
| (14) Vanadium                  | (Total)                   |
| (15) Zinc                      | (Total)                   |
| <i>Organic Constituents:</i>   |                           |
| (16) Acetone                   | 67-64-1                   |



|  |            |
|--|------------|
| (17) Acrylonitrile   | 107-13-1   |
| (18) Benzene   | 71-43-2    |
| (19) Bromochloromethane  | 74-97-5    |
| (20) Bromodichloromethane  | 75-27-4    |
| (21) Bromoform; Tribromomethane                                    | 75-25-2    |
| (22) Carbon disulfide  | 75-15-0    |
| (23) Carbon tetrachloride  | 56-23-5    |
| (24) Chlorobenzene   | 108-90-7   |
| (25) Chloroethane; Ethyl chloride                                  | 75-00-3    |
| (26) Chloroform; Trichloromethane                                  | 67-66-3    |
| (27) Dibromochloromethane; Chlorodibromomethane                    | 124-48-1   |
| (28) 1,2-Dibromo-3-chloropropane; DBCP                             | 96-12-8    |
| (29) 1,2-Dibromoethane; Ethylene dibromide; EDB                    | 106-93-4   |
| (30) o-Dichlorobenzene; 1,2-Dichlorobenzene                        | 95-50-1    |
| (31) p-Dichlorobenzene; 1,4-Dichlorobenzene                        | 106-46-7   |
| (32) trans-1, 4-Dichloro-2-butene                                  | 110-57-6   |
| (33) 1,1-Dichloroethane; Ethylidene chloride                       | 75-34-3    |
| (34) 1,2-Dichloroethane; Ethylene dichloride                       | 107-06-2   |
| (35) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride | 75-35-4    |
| (36) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene              | 156-59-2   |
| (37) trans-1, 2-Dichloroethylene; trans-1,2-Dichloroethene         | 156-60-5   |
| (38) 1,2-Dichloropropane; Propylene dichloride                     | 78-87-5    |
| (39) cis-1,3-Dichloropropene                                       | 10061-01-5 |
| (40) trans-1,3-Dichloropropene                                     | 10061-02-6 |
| (41) Ethylbenzene  | 100-41-4   |
| (42) 2-Hexanone; Methyl butyl ketone                               | 591-78-6   |
| (43) Methyl bromide; Bromomethane                                  | 74-83-9    |
| (44) Methyl chloride; Chloromethane                                | 74-87-3    |
| (45) Methylene bromide; Dibromomethane                             | 74-95-3    |
| (46) Methylene chloride; Dichloromethane                           | 75-09-2    |
| (47) Methyl ethyl ketone; MEK; 2-Butanone                          | 78-93-3    |
| (48) Methyl iodide; Iodomethane                                    | 74-88-4    |
| (49) 4-Methyl-2-pentanone; Methyl isobutyl ketone                  | 108-10-1   |
| (50) Styrene   | 100-42-5   |
| (51) 1,1,1,2-Tetrachloroethane                                     | 630-20-6   |
| (52) 1,1,2,2-Tetrachloroethane                                     | 79-34-5    |
| (53) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene     | 127-18-4   |
| (54) Toluene   | 108-88-3   |

|  |           |
|--|-----------|
| (55) 1,1,1-Trichloroethane; Methylchloroform | 71-55-6   |
| (56) 1,1,2-Trichloroethane                   | 79-00-5   |
| (57) Trichloroethylene; Trichloroethene      | 79-01-6   |
| (58) Trichlorofluoromethane; CFC-11          | 75-69-4   |
| (59) 1,2,3-Trichloropropane                  | 96-18-4   |
| (60) Vinyl acetate                           | 108-05-4  |
| (61) Vinyl chloride                          | 75-01-4   |
| (62) Xylenes                                 | 1330-20-7 |

<sup>1</sup>Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

<sup>2</sup>Chemical Abstract Service registry number. Where "Total" is entered, all species in the ground water that contain this element are included.

[70 FR 34555, June 14, 2005; 70 FR 44150, Aug. 1, 2005]

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## ***Appendix II to Part 258—List of Hazardous Inorganic and Organic Constituents***

| <b>Common name<sup>1</sup></b>     | <b>CAS RN<sup>2</sup></b> | <b>Chemical abstracts service index name<sup>3</sup></b>  |
|------------------------------------|---------------------------|---|
| Acenaphthene                       | 83-32-9                   | Acenaphthylene, 1,2-dihydro-  |
| Acenaphthylene                     | 208-96-8                  | Acenaphthylene  |
| Acetone                            | 67-64-1                   | 2-Propanone   |
| Acetonitrile; Methyl cyanide       | 75-05-8                   | Acetonitrile  |
| Acetophenone                       | 98-86-2                   | Ethanone, 1-phenyl-   |
| 2-Acetylaminofluorene; 2-AAF       | 53-96-3                   | Acetamide, N-9H-fluoren-2-yl-   |
| Acrolein                           | 107-02-8                  | 2-Propenal  |
| Acrylonitrile                      | 107-13-1                  | 2-Propenenitrile  |
| Aldrin                             | 309-00-2                  | 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-(1,4,4a,5,8,8a)- |
| Allyl chloride                     | 107-05-1                  | 1-Propene, 3-chloro-  |
| 4-Aminobiphenyl                    | 92-67-1                   | [1,1'-Biphenyl]-4-amine   |
| Anthracene                         | 120-12-7                  | Anthracene  |
| Antimony                           | (Total)                   | Antimony  |
| Arsenic                            | (Total)                   | Arsenic   |
| Barium                             | (Total)                   | Barium  |
| Benzene                            | 71-43-2                   | Benzene   |
| Benzo[a]anthracene; Benzanthracene | 56-55-3                   | Benz[a]anthracene   |
| Benzo[b]fluoranthene               | 205-99-2                  | Benz[e]acephenanthrylene  |
| Benzo[k]fluoranthene               | 207-08-9                  | Benzo[k]fluoranthene  |

|   |                |   |
|---|----------------|---|
| Benzo[ghi]perylene  | 191-24-2       | Benzo[ghi]perylene  |
| Benzo[a]pyrene  | 50-32-8        | Benzo[a]pyrene  |
| Benzyl alcohol  | 100-51-6       | Benzenemethanol   |
| Beryllium   | (Total)        | Beryllium   |
| alpha-BHC   | 319-84-6       | Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 $\alpha$ ,2 $\alpha$ ,3 $\beta$ ,4 $\alpha$ ,5 $\beta$ ,6 $\beta$ )-     |
| beta-BHC  | 319-85-7       | Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 $\alpha$ ,2 $\beta$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )-     |
| delta-BHC   | 319-86-8       | Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 $\alpha$ ,2 $\alpha$ ,3 $\alpha$ ,4 $\beta$ ,5 $\alpha$ ,6 $\beta$ )-    |
| gamma-BHC; Lindane  | 58-89-9        | Cyclohexane, 1,2,3,4,5,6- hexachloro-, (1 $\alpha$ ,2 $\alpha$ , 3 $\beta$ , 4 $\alpha$ ,5 $\alpha$ ,6 $\beta$ )- |
| Bis(2-chloroethoxy)methane  | 111-91-1       | Ethane, 1,1'-[methylenebis (oxy)]bis [2-chloro-   |
| Bis(2-chloroethyl)ether; Dichloroethyl ether  | 111-44-4       | Ethane, 1,1'-oxybis[2-chloro-   |
| Bis(2-chloro-1-methylethyl) ether; 2,2'-Dichlorodiisopropyl ether; DCIP, See footnote 4 | 108-60-1       | Propane, 2,2'-oxybis[1-chloro-  |
| Bis(2-ethylhexyl) phthalate   | 117-81-7       | 1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl)ester  |
| Bromochloromethane; Chlorobromomethane  | 74-97-5        | Methane, bromochloro-   |
| Bromodichloromethane; Dibromochloromethane  | 75-27-4        | Methane, bromodichloro-   |
| Bromoform; Tribromomethane  | 75-25-2        | Methane, tribromo-  |
| 4-Bromophenyl phenyl ether  | 101-55-3       | Benzene, 1-bromo-4-phenoxy-   |
| Butyl benzyl phthalate; Benzyl butyl phthalate  | 85-68-7        | 1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester  |
| Cadmium   | (Total)        | Cadmium   |
| Carbon disulfide  | 75-15-0        | Carbon disulfide  |
| Carbon tetrachloride  | 56-23-5        | Methane, tetrachloro-   |
| Chlordane   | See footnote 5 | 4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-  |
| p-Chloroaniline   | 106-47-8       | Benzenamine, 4-chloro-  |
| Chlorobenzene   | 108-90-7       | Benzene, chloro-  |
| Chlorobenzilate   | 510-15-6       | Benzeneacetic acid, 4-chloro-(4-chlorophenyl)-hydroxy-, ethyl ester.  |
| p-Chloro-m-cresol; 4-Chloro-3-methylphenol  | 59-50-7        | Phenol, 4-chloro-3-methyl-  |
| Chloroethane; Ethyl chloride  | 75-00-3        | Ethane, chloro-   |
| Chloroform; Trichloromethane  | 67-66-3        | Methane, trichloro-   |
| 2-Chloronaphthalene   | 91-58-7        | Naphthalene, 2-chloro-  |
| 2-Chlorophenol  | 95-57-8        | Phenol, 2-chloro-   |
| 4-Chlorophenyl phenyl ether   | 7005-72-3      | Benzene, 1-chloro-4-phenoxy-  |
| Chloroprene   | 126-99-8       | 1,3-Butadiene, 2-chloro-  |

|  |           |  |
|--|-----------|--|
| Chromium   | (Total)   | Chromium   |
| Chrysene   | 218-01-9  | Chrysene   |
| Cobalt   | (Total)   | Cobalt   |
| Copper   | (Total)   | Copper   |
| m-Cresol; 3-Methylphenol   | 108-39-4  | Phenol, 3-methyl-  |
| o-Cresol; 2-Methylphenol   | 95-48-7   | Phenol, 2-methyl-  |
| p-Cresol; 4-Methylphenol   | 106-44-5  | Phenol, 4-methyl-  |
| Cyanide  | 57-12-5   | Cyanide  |
| 2,4-D; 2,4-Dichlorophenoxyacetic acid                                | 94-75-7   | Acetic acid, (2,4-dichlorophenoxy)-  |
| 4,4'-DDD   | 72-54-8   | Benzene 1,1'-(2,2-dichloroethylidene) bis[4-chloro-                          |
| 4,4'-DDE   | 72-55-9   | Benzene, 1,1'-(dichloroethenylidene) bis[4-chloro-                           |
| 4,4'-DDT   | 50-29-3   | Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-                      |
| Diallate   | 2303-16-4 | Carbamothioic acid, bis(1-methylethyl)-, S- (2,3-dichloro-2-propenyl) ester. |
| Dibenz[a,h]anthracene  | 53-70-3   | Dibenz[a,h]anthracene  |
| Dibenzofuran   | 132-64-9  | Dibenzofuran   |
| Dibromochloromethane;<br>Chlorodibromomethane                        | 124-48-1  | Methane, dibromochloro-  |
| 1,2-Dibromo-3-chloropropane; DBCP                                    | 96-12-8   | Propane, 1,2-dibromo-3-chloro-   |
| 1,2-Dibromoethane; Ethylene dibromide;<br>EDB                        | 106-93-4  | Ethane, 1,2-dibromo-   |
| Di-n-butyl phthalate   | 84-74-2   | 1,2-Benzenedicarboxylic acid, dibutyl ester                                  |
| o-Dichlorobenzene; 1,2-Dichlorobenzene                               | 95-50-1   | Benzene, 1,2-dichloro-   |
| m-Dichlorobenzene; 1,3-Dichlorobenzene                               | 541-73-1  | Benzene, 1,3-dichloro-   |
| p-Dichlorobenzene; 1,4-Dichlorobenzene                               | 106-46-7  | Benzene, 1,4-dichloro-   |
| 3,3'-Dichlorobenzidine   | 91-94-1   | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-                                 |
| trans-1,4-Dichloro-2-butene  | 110-57-6  | 2-Butene, 1,4-dichloro-, (E)-  |
| Dichlorodifluoromethane; CFC 12                                      | 75-71-8   | Methane, dichlorodifluoro-   |
| 1,1-Dichloroethane; Ethyldidene chloride                             | 75-34-3   | Ethane, 1,1-dichloro-  |
| 1,2-Dichloroethane; Ethylene dichloride                              | 107-06-2  | Ethane, 1,2-dichloro-  |
| 1,1-Dichloroethylene; 1,1-Dichloroethene;                            | 75-35-4   | Ethene, 1,1-dichloro-  |
| Vinylidene chloride cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene | 156-59-2  | Ethene, 1,2-dichloro-(Z)-  |
| trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene                 | 156-60-5  | Ethene, 1,2-dichloro-, (E)-  |
| 2,4-Dichlorophenol   | 120-83-2  | Phenol, 2,4-dichloro-  |
| 2,6-Dichlorophenol   | 87-65-0   | Phenol, 2,6-dichloro-  |
| 1,2-Dichloropropane  | 78-87-5   | Propane, 1,2-dichloro-   |
| 1,3-Dichloropropane; Trimethylene dichloride                         | 142-28-9  | Propane, 1,3-dichloro-   |
| 2,2-Dichloropropane; Isopropylidene                                  | 594-20-7  | Propane, 2,2-dichloro-   |

|   |            |  |
|---|------------|--|
| chloride  |            |  |
| 1,1-Dichloropropene                                   | 563-58-6   | 1-Propene, 1,1-dichloro-   |
| cis-1,3-Dichloropropene                               | 10061-01-5 | 1-Propene, 1,3-dichloro-, (Z)-   |
| trans-1,3-Dichloropropene                             | 10061-02-6 | 1-Propene, 1,3-dichloro-, (E)-   |
| Dieldrin  | 60-57-1    | 2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1 $\alpha$ ,2 $\beta$ ,2 $\alpha$ ,3 $\beta$ ,6 $\beta$ ,6 $\alpha$ ,7 $\beta$ ,7 $\alpha$ )-                              |
| Diethyl phthalate                                     | 84-66-2    | 1,2-Benzenedicarboxylic acid, diethyl ester  |
| O,O-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin | 297-97-2   | Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester.   |
| Dimethoate  | 60-51-5    | Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester  |
| p-(Dimethylamino)azobenzene                           | 60-11-7    | Benzenamine, N,N-dimethyl-4-(phenylazo)-   |
| 7,12-Dimethylbenz[a]anthracene                        | 57-97-6    | Benz[a]anthracene, 7,12-dimethyl-  |
| 3,3'-Dimethylbenzidine                                | 119-93-7   | [1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-   |
| alpha, alpha-Dimethylphenethylamine                   | 122-09-8   | Benzeneethanamine, $\alpha,\alpha$ -dimethyl-  |
| 2,4-Dimethylphenol; m-Xylenol                         | 105-67-9   | Phenol, 2,4-dimethyl-  |
| Dimethyl phthalate                                    | 131-11-3   | 1,2-Benzenedicarboxylic acid, dimethyl ester   |
| m-Dinitrobenzene                                      | 99-65-0    | Benzene, 1,3-dinitro-  |
| 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol      | 534-52-1   | Phenol, 2-methyl-4,6-dinitro-  |
| 2,4-Dinitrophenol                                     | 51-28-5    | Phenol, 2,4-dinitro-   |
| 2,4-Dinitrotoluene                                    | 121-14-2   | Benzene, 1-methyl-2,4-dinitro-   |
| 2,6-Dinitrotoluene                                    | 606-20-2   | Benzene, 2-methyl-1,3-dinitro-   |
| Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol          | 88-85-7    | Phenol, 2-(1-methylpropyl)-4,6-dinitro-  |
| Di-n-octyl phthalate                                  | 117-84-0   | 1,2-Benzenedicarboxylic acid, dioctyl ester  |
| Diphenylamine   | 122-39-4   | Benzenamine, N-phenyl-   |
| Disulfoton  | 298-04-4   | Phosphorodithioic acid, O,O-diethyl S-[2- (ethylthio)ethyl] ester  |
| Endosulfan I  | 959-98-8   | 6,9-Methano-2,4,3-benzodiox-athiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide,  |
| Endosulfan II   | 33213-65-9 | 6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro- 1,5,5a,6,9,9a-hexahydro-, 3-oxide, (3 $\alpha$ ,5 $\alpha$ ,6 $\beta$ ,9 $\beta$ , 9 $\alpha$ )-  |
| Endosulfan sulfate                                    | 1031-07-8  | 6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3,3-dioxide  |
| Endrin  | 72-20-8    | 2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1 $\alpha$ , 2 $\beta$ ,2 $\alpha$ $\beta$ , 3 $\alpha$ ,6 $\alpha$ ,6 $\alpha$ $\beta$ ,7 $\beta$ ,7 $\alpha$ )-           |
| Endrin aldehyde                                       | 7421-93-4  | 1,2,4-Methenocyclo-penta[cd]pentalene-5-carboxaldehyde,2,2a,3,3,4,7-hexachlorodecahydro-(1 $\alpha$ ,2 $\beta$ ,2 $\alpha$ $\beta$ ,4 $\beta$ ,4 $\alpha$ $\beta$ ,5 $\beta$ ,6 $\alpha$ $\beta$ ,6 $\beta$ $\beta$ ,7R*)- |

|                                      |               |  |
|--------------------------------------|---------------|--|
| Ethylbenzene                         | 100-41-4      | Benzene, ethyl-  |
| Ethyl methacrylate                   | 97-63-2       | 2-Propenoic acid, 2-methyl-, ethyl ester   |
| Ethyl methanesulfonate               | 62-50-0       | Methanesulfonic acid, ethyl ester  |
| Famphur                              | 52-85-7       | Phosphorothioic acid, O-[4-<br>[(dimethylamino)sulfonyl]phenyl]-O,O-dimethyl ester   |
| Fluoranthene                         | 206-44-0      | Fluoranthene   |
| Fluorene                             | 86-73-7       | 9H-Fluorene  |
| Heptachlor                           | 76-44-8       | 4,7-Methano-1H-indene,1,4,5,6,7,8,8-heptachloro-<br>3a,4,7,7a-tetrahydro-  |
| Heptachlor epoxide                   | 1024-57-<br>3 | 2,5-Methano-2H-indeno[1,2-b]oxirene,<br>2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a,-hexahydro-<br>,(1a $\alpha$ ,1b $\beta$ ,2 $\alpha$ ,5 $\alpha$ ,5a $\beta$ ,6 $\beta$ ,6a $\alpha$ ) |
| Hexachlorobenzene                    | 118-74-1      | Benzene, hexachloro-   |
| Hexachlorobutadiene                  | 87-68-3       | 1,3-Butadiene, 1,1,2,3,4,4-hexachloro-   |
| Hexachlorocyclopentadiene            | 77-47-4       | 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-   |
| Hexachloroethane                     | 67-72-1       | Ethane, hexachloro-  |
| Hexachloropropene                    | 1888-71-<br>7 | 1-Propene, 1,1,2,3,3,3-hexachloro-   |
| 2-Hexanone; Methyl butyl ketone      | 591-78-6      | 2-Hexanone   |
| Indeno(1,2,3-cd)pyrene               | 193-39-5      | Indeno[1,2,3-cd]pyrene   |
| Isobutyl alcohol                     | 78-83-1       | 1-Propanol, 2-methyl-  |
| Isodrin                              | 465-73-6      | 1,4,5,8-Dimethanonaphthalene,1,2,3,4,1 0,10-hexachloro-<br>1,4,4a,5,8,8a hexahydro-(1 $\alpha$ , 4 $\alpha$ , 4a $\beta$ ,5 $\beta$ ,8 $\beta$ ,8a $\beta$ )-                            |
| Isophorone                           | 78-59-1       | 2-Cyclohexen-1-one, 3,5,5-trimethyl-   |
| Isosafrole                           | 120-58-1      | 1,3-Benzodioxole, 5-(1-propenyl)-  |
| Kepone                               | 143-50-0      | 1,3,4-Metheno-2H-cyclobuta-[cd]pentalen-2-one,<br>1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-   |
| Lead                                 | (Total)       | Lead   |
| Mercury                              | (Total)       | Mercury  |
| Methacrylonitrile                    | 126-98-7      | 2-Propenenitrile, 2-methyl-  |
| Methapyrilene                        | 91-80-5       | 1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-<br>thienylmethyl)-   |
| Methoxychlor                         | 72-43-5       | Benzene, 1,1'-(2,2,2,trichloroethylidene)bis [4-methoxy-   |
| Methyl bromide; Bromomethane         | 74-83-9       | Methane, bromo-  |
| Methyl chloride; Chloromethane       | 74-87-3       | Methane, chloro-   |
| 3-Methylcholanthrene                 | 56-49-5       | Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-  |
| Methyl ethyl ketone; MEK; 2-Butanone | 78-93-3       | 2-Butanone   |
| Methyl iodide; Iodomethane           | 74-88-4       | Methane, iodo-   |
| Methyl methacrylate                  | 80-62-6       | 2-Propenoic acid, 2-methyl-, methyl ester  |
| Methyl methanesulfonate              | 66-27-3       | Methanesulfonic acid, methyl ester   |
| 2-Methylnaphthalene                  | 91-57-6       | Naphthalene, 2-methyl-   |

|   |                |  |
|---|----------------|--|
| Methyl parathion; Parathion methyl  | 298-00-0       | Phosphorothioic acid, O,O-dimethyl                               |
| 4-Methyl-2-pentanone; Methyl isobutyl ketone                              | 108-10-1       | 2-Pentanone, 4-methyl-   |
| Methylene bromide; Dibromomethane   | 74-95-3        | Methane, dibromo-  |
| Methylene chloride; Dichloromethane                                       | 75-09-2        | Methane, dichloro-   |
| Naphthalene   | 91-20-3        | Naphthalene  |
| 1,4-Naphthoquinone  | 130-15-4       | 1,4-Naphthalenedione   |
| 1-Naphthylamine   | 134-32-7       | 1-Naphthalenamine  |
| 2-Naphthylamine   | 91-59-8        | 2-Naphthalenamine  |
| Nickel  | (Total)        | Nickel   |
| o-Nitroaniline; 2-Nitroaniline  | 88-74-4        | Benzenamine, 2-nitro-  |
| m-Nitroaniline; 3-Nitroaniline  | 99-09-2        | Benzenamine, 3-nitro-  |
| p-Nitroaniline; 4-Nitroaniline  | 100-01-6       | Benzenamine, 4-nitro-  |
| Nitrobenzene  | 98-95-3        | Benzene, nitro-  |
| o-Nitrophenol; 2-Nitrophenol  | 88-75-5        | Phenol, 2-nitro-   |
| p-Nitrophenol; 4-Nitrophenol  | 100-02-7       | Phenol, 4-nitro-   |
| N-Nitrosodi-n-butylamine  | 924-16-3       | 1-Butanamine, N-butyl-N-nitroso-                                 |
| N-Nitrosodiethylamine   | 55-18-5        | Ethanamine, N-ethyl-N-nitroso-                                   |
| N-Nitrosodimethylamine  | 62-75-9        | Methanamine, N-methyl-N-nitroso-                                 |
| N-Nitrosodiphenylamine  | 86-30-6        | Benzenamine, N-nitroso-N-phenyl-                                 |
| N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine | 621-64-7       | 1-Propanamine, N-nitroso-N-propyl-                               |
| N-Nitrosomethylethalamine   | 10595-95-6     | Ethanamine, N-methyl-N-nitroso-                                  |
| N-Nitrosopiperidine   | 100-75-4       | Piperidine, 1-nitroso-   |
| N-Nitrosopyrrolidine  | 930-55-2       | Pyrrolidine, 1-nitroso-  |
| 5-Nitro-o-toluidine   | 99-55-8        | Benzenamine, 2-methyl-5-nitro-                                   |
| Parathion   | 56-38-2        | Phosphorothioic acid, O,O-diethyl-O-(4-nitrophenyl) ester        |
| Pentachlorobenzene  | 608-93-5       | Benzene, pentachloro-  |
| Pentachloronitrobenzene   | 82-68-8        | Benzene, pentachloronitro-                                       |
| Pentachlorophenol   | 87-86-5        | Phenol, pentachloro-   |
| Phenacetin  | 62-44-2        | Acetamide, N-(4-ethoxyphenyl)                                    |
| Phenanthrene  | 85-01-8        | Phenanthrene   |
| Phenol  | 108-95-2       | Phenol   |
| p-Phenylenediamine  | 106-50-3       | 1,4-Benzenediamine   |
| Phorate   | 298-02-2       | Phosphorodithioic acid, O,O-diethyl S- [(ethylthio)methyl] ester |
| Polychlorinated biphenyls; PCBs   | See footnote 6 | 1,1'-Biphenyl, chloro derivatives                                |
| Pronamide   | 23950-         | Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-             |

|   |                |   |
|---|----------------|---|
|   | 58-5           |   |
| Propionitrile; Ethyl cyanide                              | 107-12-0       | Propanenitrile                                |
| Pyrene  | 129-00-0       | Pyrene  |
| Safrole   | 94-59-7        | 1,3-Benzodioxole, 5-(2-propenyl)-             |
| Selenium  | (Total)        | Selenium                                      |
| Silver  | (Total)        | Silver  |
| Silvex; 2,4,5-TP  | 93-72-1        | Propanoic acid, 2-(2,4,5-trichlorophenoxy)-   |
| Styrene   | 100-42-5       | Benzene, ethenyl-                             |
| Sulfide   | 18496-25-8     | Sulfide                                       |
| 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid                | 93-76-5        | Acetic acid, (2,4,5-trichlorophenoxy)-        |
| 2,3,7,8-TCDD; 2,3,7,8-Tetrachlorodibenzo-p-dioxin         | 1746-01-6      | Dibenzo[b,e][1,4]dioxin, 2,3,7,8-tetrachloro- |
| 1,2,4,5-Tetrachlorobenzene                                | 95-94-3        | Benzene, 1,2,4,5-tetrachloro-                 |
| 1,1,1,2-Tetrachloroethane                                 | 630-20-6       | Ethane, 1,1,1,2-tetrachloro-                  |
| 1,1,2,2-Tetrachloroethane                                 | 79-34-5        | Ethane, 1,1,2,2-tetrachloro-                  |
| Tetrachloroethylene; Tetrachloroethene; Perchloroethylene | 127-18-4       | Ethene, tetrachloro-                          |
| 2,3,4,6-Tetrachlorophenol                                 | 58-90-2        | Phenol, 2,3,4,6-tetrachloro-                  |
| Thallium  | (Total)        | Thallium                                      |
| Tin   | (Total)        | Tin   |
| Toluene   | 108-88-3       | Benzene, methyl-                              |
| o-Toluidine   | 95-53-4        | Benzenamine, 2-methyl-                        |
| Toxaphene   | See footnote 7 | Toxaphene                                     |
| 1,2,4-Trichlorobenzene                                    | 120-82-1       | Benzene, 1,2,4-trichloro-                     |
| 1,1,1-Trichloroethane; Methylchloroform                   | 71-55-6        | Ethane, 1,1,1-trichloro-                      |
| 1,1,2-Trichloroethane                                     | 79-00-5        | Ethane, 1,1,2-trichloro-                      |
| Trichloroethylene; Trichloroethene                        | 79-01-6        | Ethene, trichloro-                            |
| Trichlorofluoromethane; CFC-11                            | 75-69-4        | Methane, trichlorofluoro-                     |
| 2,4,5-Trichlorophenol                                     | 95-95-4        | Phenol, 2,4,5-trichloro-                      |
| 2,4,6-Trichlorophenol                                     | 88-06-2        | Phenol, 2,4,6-trichloro-                      |
| 1,2,3-Trichloropropane                                    | 96-18-4        | Propane, 1,2,3-trichloro-                     |
| O,O,O-Triethyl phosphorothioate                           | 126-68-1       | Phosphorothioic acid, O,O,O-triethyl ester    |
| sym-Trinitrobenzene                                       | 99-35-4        | Benzene, 1,3,5-trinitro-                      |
| Vanadium  | (Total)        | Vanadium                                      |
| Vinyl acetate   | 108-05-4       | Acetic acid, ethenyl ester                    |
| Vinyl chloride; Chloroethene                              | 75-01-4        | Ethene, chloro-                               |
| Xylene (total)  | See footnote   | Benzene, dimethyl-                            |



|      |         |      |
|------|---------|------|
|      | 8       |      |
| Zinc | (Total) | Zinc |

<sup>1</sup>Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

<sup>2</sup>Chemical Abstracts Service registry number. Where "Total" is entered, all species in the ground water that contain this element are included.

<sup>3</sup>CAS index names are those used in the 9th Cumulative Index.

<sup>4</sup>This substance is often called bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, propane, 2,2"-oxybis[2-chloro-(CAS RN 39638-32-9).

<sup>5</sup>Chlordane: This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6).

<sup>6</sup>Polychlorinated biphenyls (CAS RN 1336-36-3); this category contains congener chemicals, including constituents of Aroclor-1016 (CAS RN 12674-11-2), Aroclor-1221 (CAS RN 11104-28-2), Aroclor-1232 (CAS RN 11141-16-5), Aroclor-1242 (CAS RN 53469-21-9), Aroclor-1248 (CAS RN 12672-29-6), Aroclor-1254 (CAS RN 11097-69-1), and Aroclor-1260 (CAS RN 11096-82-5).

<sup>7</sup>Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.

<sup>8</sup>Xylene (total): This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

[70 FR 34556, June 14, 2005; 70 FR 44150, Aug. 1, 2005]