

**Chapter 173-351 WAC**  
**CRITERIA FOR MUNICIPAL SOLID WASTE LANDFILLS**

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**WAC**

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**WAC 173-351-010 Purpose, applicability, and effective dates.**

(1) Purpose. The purpose of this regulation is to establish minimum statewide standards for all municipal solid waste landfill (MSWLF) units under the authority of chapter 70.95 RCW as amended in order that jurisdictional health departments can enact ordinances equally as or more stringent than this regulation and to have jurisdictional health departments implement such ordinances through a permit system set forth in WAC 173-351-700. It is also the purpose of this regulation to implement rule making by the U.S. Environmental Protection Agency (EPA) under the authority of subtitle D of the Resource Conservation and Recovery Act (RCRA), as amended in 1984, and under the authority of Section 405(d) of the Clean Water Act as amended. The Clean Water Act required EPA "to establish standards for sewage sludge that is co-disposed with municipal solid waste." EPA satisfied both statutory requirements with the publication of 40 C.F.R. Part 258-Criteria For Municipal Solid Waste Landfills on October 9, 1991. These minimum statewide criteria ensure the protection of human health and the environment.

(2) Applicability.

(a) These criteria apply to new MSWLF units, existing MSWLF units, and lateral expansions, except as otherwise specifically provided in this regulation. All other solid waste disposal facilities and practices that are not regulated under subtitle C of RCRA and chapter 70.105 RCW are subject to the criteria contained in 40 C.F.R. Part 257, Criteria For Classification of Solid Waste Disposal Facilities, chapter 173-350 WAC, and/or chapter 173-304 WAC as amended.

Note: These rules do not apply to facilities that receive only inert waste, demolition waste, wood waste, industrial solid wastes, or other types of solid waste (other than household waste) disposed of in landfills regulated in chapter 173-350 WAC, Solid waste handling standards. Codisposal of any solid waste with household waste is governed by these rules.

(b) These criteria do not apply to MSWLF units that do not receive waste on or after November 26, 1993. MSWLF units that stopped receiving waste prior to October 9, 1991, are subject to closure and post-closure rules under chapter 173-304 WAC, the Minimum Functional Standards for Solid Waste Handling. MSWLF units that received waste on and after October 9, 1991, but stop receiving waste prior to November 26, 1993:

(i) Are also subject to federal closure rules under 40 C.F.R. Part 258.60(a);

(ii) Will be subject to all the requirements of this regulation unless otherwise specified, if such MSWLF units fail to meet the federal closure rules under 40 C.F.R. Part 258.60(a) by April 9, 1994, and the closure standards of chapter 173-304 WAC; except that jurisdictional health departments may grant time extensions to complete closure under 40 C.F.R. Part 258.60(a) by October 9, 1994; and

(iii) Will be subject to the groundwater monitoring and remedial action requirements of WAC 173-351-400 and the permitting requirements of WAC 173-351-700 if such MSWLF units are part of a multiunit groundwater monitoring system of WAC 173-351-450(4).

(3) Effective dates.

(a) All MSWLF units that receive waste on or after November 26, 1993, must comply with this chapter by November 26, 1993, unless:

(i) Later effective dates are specified elsewhere in this chapter, such as WAC 173-351-400 (1)(b), groundwater monitoring, WAC 173-351-430 (2)(b), detection monitoring program, WAC 173-351-440(2), assessment monitoring, and WAC 173-351-500 (2)(c), closure and post-closure care; or

(ii) The MSWLF unit is an existing MSWLF unit or an existing lateral expansion of an existing unit that:

(A) Disposed of 100 tons per day or less of solid waste during a representative period prior to November 26, 1993;

(B) Does not dispose of more than an average of 100 tons per day of solid waste each month between November 26, 1993, and April 9, 1994; and

(C) Is not on the National Priorities List (NPL) as found in Appendix B to 40 C.F.R. Part 300.

(b) MSWLF units that meet conditions of (a)(ii) of this subsection are exempt from all requirements of this rule but must meet the final cover requirement specified in 40 C.F.R. 258.60(a) and the requirements of chapter 173-304 WAC. The final cover must be installed by October 9, 1994. Owners or operators of MSWLF units described in (a)(ii) of this subsection that fail to complete cover installation by October 9, 1994, will be subject to all requirements of this chapter, unless otherwise specified.

(c) MSWLF units failing to satisfy these criteria are considered open dumps for purposes of state solid waste management planning under RCRA.

(d) MSWLF units failing to satisfy these criteria constitute open dumps, which are prohibited under section 4005 of RCRA.

(e) MSWLF units containing sewage sludge and failing to satisfy these criteria violate Sections 309 and 405(e) of the Federal Clean Water Act.

Note: All state codes standards, rules and regulations cited in this chapter are available by writing to the Department of Ecology, P.O. Box 4-7600, Olympia, Washington 98504-7600, or call 1-800-RECYCLE for the location of the nearest regional office of the department.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-010, filed 11/8/12,

effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-010, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-100 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 regulation; additional definitions appear in the specific sections to which they apply.

"Active area" means that part of a facility that includes the active portion and portions of a facility that recycle, store, treat, or dispose of solid (including liquid) wastes. The active area includes leachate treatment facilities and runoff ponds. It excludes run-on ponds and on-site roads which are used for any purpose; on-site roads are considered part of the buffer zone. See active portion and buffer zone definition below.

"Active life" means the period beginning with the initial receipt of solid waste and ending at completion of closure activities in accordance with WAC 173-351-500(1), Closure criteria.

"Active portion" means that part of a facility or MSWLF unit that has received or is receiving wastes and that has not been closed in accordance with WAC 173-351-500(1), Closure criteria.

"Airport" means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities. See WAC 173-351-130 (2)(d)(i).

"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 human-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. See WAC 173-351-130 (7)(b)(iv).

"Biosolids" means municipal sewage sludge that is a primarily organic, semisolid product resulting from the wastewater treatment process, that can be beneficially recycled and meets all requirements under chapter 70.95J RCW. Biosolids includes septic tank sludge, also known as septage, that can be beneficially recycled and meets all requirements of chapter 70.95J RCW.

"Bird hazard" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants. See WAC 173-351-130 (2)(d)(ii).

"Buffer zone" means that part of a facility which lies between the active area and the property boundary.

"Channel migration zone" means the lateral extent of likely movement of a stream or river channel along a stream reach.

"Cleanup action plan" means the document that selects the cleanup action and specifies cleanup standards and other requirements for the cleanup action. These include:

- A final cleanup action plan issued by the department (or a record of decision prepared under the federal cleanup law) meeting the requirements of WAC 173-340-380;
- Cleanup action plans developed by the owner or operator of a MSWLF unit in accordance with the procedures in WAC 173-340-350 through 173-340-390 for independent remedial actions; and

• Plans developed for interim actions conducted under WAC 173-340-430.

"Closure" means those actions taken by the owner or operator of a MSWLF unit or facility to cease disposal operations and to ensure that a MSWLF unit or facility is closed in conformance with applicable regulations at the time of such closures and to prepare the site for the post-closure period. Closure is considered part of operation. See definition of operation.

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

"Composite layer." See WAC 173-351-500 (1) (a) (i) (B).

"Composite liner." See WAC 173-351-300(3).

"Construction quality assurance" means a planned system of activities that provide assurance that a facility is constructed as specified in the design and that the materials used in construction are manufactured according to specifications. Construction quality assurance includes inspections, verifications, audits, and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility.

"Construction quality control" means a planned system of activities that is used to directly monitor and control the quality of a construction project. Construction quality controls are the measures under taken by the contractor or installer to determine compliance with requirements for workmanship and materials put forth in the plans and specification for the construction project.

"Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally in the environment or that occurs at concentrations greater than natural background levels.

"Contaminated" or "contamination" means the alteration of the physical, chemical, biological, or radiological properties of soil or waters of the state such that the soil or water could pose a threat to human health or the environment or the alteration is a violation of any applicable environmental regulation.

"Demonstration" means a showing by the owner or operator that human health and the environment can be protected as equally as a given requirement in the regulation. A demonstration is made in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). A successful demonstration allows or authorizes an activity authorized for the life of the facility unless an alternative time period is approved by the jurisdictional health department.

"Department" means the department of ecology.

"Disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans. See WAC 173-351-200 (3) (b).

"Displacement" means the relative movement of any two sides of a fault measured in any direction. See WAC 173-351-130 (5) (b) (ii).

"Disposal" or "deposition" means the discharge, deposit, injection, dumping, leaking, or placing of any solid waste into or on any land or water.

"Establish" means to construct a new or laterally expanded MSWLF unit.

"Existing MSWLF unit" means any municipal solid waste landfill unit that is receiving solid waste as of the appropriate dates specified in WAC 173-351-010 (3) (a). Waste placement in existing units must be consistent with past operating practices or modified practices to

ensure good waste management practices, including operating plans approved under chapter 173-304 WAC.

"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. See WAC 173-351-130 (5)(b)(i).

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

"Flood plain" 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. See WAC 173-351-130 (3)(b)(i).

"Free liquids" means any portion of material passing through and dropping from a filter as determined by Method 9095B (Paint Filter Liquids Test), in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200(9).

"Gas condensate" means the liquid generated as a result of gas recovery processes at the MSWLF unit. See WAC 173-351-200 (9)(c)(ii).

"Groundwater" means water below the land surface in a zone of saturation.

"Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present. See WAC 173-351-130 (5)(b)(iii).

"Household waste" means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including household hazardous waste) (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). This term does not include commercial, industrial, inert and demolition waste, or wood waste.

Note: Sanitary waste in septic tanks that is not disposed of in a MSWLF unit is subject to other state and federal rules.

"Hydrostratigraphic unit" means any water-bearing geologic unit or units hydraulically connected or grouped together on the basis of similar hydraulic conductivity which can be reasonably monitored; several geologic formations or part of a geologic formation may be grouped into a single hydrostratigraphic unit; perched sand lenses may be considered a hydrostratigraphic unit or part of a hydrostratigraphic unit, for example.

Note: 'Hydraulically connected' denotes water-bearing units which can transmit water to other transmissive units.

"Inert waste" means solid waste identified as inert waste in chapter 173-350 WAC, Solid waste handling standards.

"Industrial solid wastes" means solid waste or waste by-products generated by manufacturing or industrial processes such as scraps, trimmings, packing, pallets, and other discarded materials not otherwise designated as dangerous waste under chapter 173-303 WAC, the Dangerous waste regulations. This term does not include commercial, inert, demolition, construction, woodwaste, mining waste, or oil and gas waste but does include lunch room, office, or other similar waste generated by employees at the industrial facility.

"Jurisdictional health department" means city, county, city-county, or district public health department as defined in chapters 70.05, 70.08, and 70.46 RCW.

"Landfill." See "Facility."

"Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit that is not an existing horizontal expansion. (See also definition of "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.

"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. See WAC 173-351-200 (6) (b) (iii).

"Liquid waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846. See WAC 173-351-200 (9) (c) (i).

"Lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at twenty-five degrees C and atmospheric pressure. See WAC 173-351-200 (4) (d).

"Maximum horizontal acceleration in lithified earth material" means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a ninety percent or greater probability that the acceleration will not be exceeded in two hundred fifty years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment. See WAC 173-351-200 (6) (b) (ii).

"Modification" means a substantial change in the design or operational plans including removal of a design element of a MSWLF unit previously set forth in a permit application or a disposal or processing activity that is not approved in the permit. To be considered a substantial change, a modification must be reasonably related to a specific requirement of this rule. A substantial change includes any change in the design, operation, closure, post-closure, financial assurance, environmental monitoring or other aspect of an MSWLF unit that is reasonably related to a specific requirement of this rule and was not previously set forth in a permit application or approved in the permit. Lateral expansions, a fifty percent increase or greater in design volume capacity or changes resulting in significant adverse environmental impacts that have led a responsible official to issue a declaration of significance under WAC 197-11-736 are not considered a modification but require permit reissuance under these rules.

"Municipal sewage sludge" means a semisolid substance consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a publicly owned wastewater treatment plant. For the purposes of this rule sewage sludge generated from publicly owned leachate waste treatment works that receive sewage from on-site sanitary facilities are not municipal sewage sludge.

"Municipal solid waste landfill unit (MSWLF unit)" means a discrete area of land or an excavation that receives household waste, and that is not a land application site, surface impoundment, injection well, or pile, as those terms are defined under chapter 173-350 WAC, Solid waste handling standards or chapter 173-218 WAC, Underground injection control program. A MSWLF unit also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally-exempt 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.

"Natural background" means the concentration of chemical, physical, biological, or radiological substances consistently present in the environment that has not been influenced by regional or localized human activities. Metals at concentrations naturally occurring in bedrock, sediments and soils due solely to the geologic processes that formed the materials are natural background. In addition, low concentrations of other persistent substances due solely to the global use or formation of these substances are natural background.

"New MSWLF unit" means any municipal solid waste landfill unit that has not received waste prior to November 26, 1993.

"Nuisance" means unlawfully doing an act, or omitting to perform a duty, which act or omission either annoys, injures, or endangers the comfort, repose, health or safety of others, offends decency, or unlawfully interferes with, obstructs or tends to obstruct, any lake or navigable river, bay, stream, canal, or basin, or any public park, square, street or highway; or in any way renders other persons insecure in life, or in the use of property.

"100-year flood" or "base flood" means a flood that has a one percent or less chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in one hundred years on the average over a significantly long period. See WAC 173-351-130 (3) (b) (ii).

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

Control of combustion air to maintain adequate temperature for efficient combustion;

Containment of the combustion reaction in an enclosed device so as to provide sufficient residence time and mixing for complete combustion; and

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.

"Operation" means those actions taken by an owner or operator of a facility or MSWLF unit beginning with waste acceptance at a facility or MSWLF unit up to and including closure of the facility or MSWLF unit.

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

"Point of compliance." See WAC 173-351-300(6).

"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 a MSWLF unit. See WAC 173-351-130 (7) (b) (ii).

"Post-closure" means those actions taken by an owner or operator of a facility or MSWLF unit after closure.

"Purchase" means execution of a long term lease, securing of options to purchase or execution of agreements to purchase.

"Random inspection." See WAC 173-351-200 (1) (b) (ii).

"Regulated dangerous waste" means a solid waste that is a dangerous waste as defined in WAC 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070. See WAC 173-351-200 (1) (b) (i).

"Runoff" 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.

"Scavenging" means the removal of materials at a disposal facility, or intermediate solid waste-handling facility, without the approval of the owner or operator and the jurisdictional health department.

"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, will exceed 0.10g in two hundred fifty years. See WAC 173-351-130 (6) (b) (i).

"Sewage sludge" means a semisolid substance consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a wastewater treatment system, that does not meet the requirements of chapter 70.95J RCW.

"Sludge" means any solid, semisolid, 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.

"Sole source aquifer" means an aquifer designated by the Environmental Protection Agency pursuant to Section 1424e of the Safe Drinking Water Act (PL 93-523). See WAC 173-351-140 (1) (b) (vii).

"Solid waste" means all putrescible and nonputrescible solid and semisolid wastes including, but not limited to garbage, rubbish, ashes, industrial wastes, commercial waste, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, discarded commodities and recyclable materials.

"Structural components" means liners, leachate collection systems, final covers, run-on/runoff 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. See WAC 173-351-130 (7) (b) (ii).

"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, and areas susceptible to mass movements. See WAC 173-351-130 (7) (b) (i).

"Vadose zone" means that portion of a geologic formation in which soil pores contain some water, the pressure of that water is less than atmospheric, and the formation occurs above the zone of saturation.

"Vulnerability" means the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or cleanup, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. See WAC 173-351-140 (1) (b).

"Waste management unit" means a MSWLF unit.

"Waste management unit boundary" means a vertical surface located at the hydraulically down gradient limit of the unit. This vertical surface extends down into the hydrostratigraphic unit(s) identified in the hydrogeologic report.



"Waters of the state" means lakes, rivers, ponds, streams, inland waters, underground waters, salt water, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

"Wetlands" means those areas that are defined in 40 C.F.R. 232.2(r): Areas that are inundated or saturated by surface or ground-water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas. See WAC 173-351-130 (4) (b).

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-100, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-100, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-120 Consideration of other local, state, and federal laws.** The owner or operator of a municipal solid waste landfill unit must comply with any other applicable federal, state, and local rules, laws, regulations, or other requirements.

Note: Except for 40 C.F.R. Part 258.60(f) and 258.60(g) set forth in WAC 173-351-010 (2)(b)(ii), 40 C.F.R. Part 258 is not an applicable federal rule for purposes of this section.

[Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-120, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-130 Location restrictions.** (1) Applicability.

(a) On and after November 26, 1993, all MSWLF units must meet the location restrictions of this section unless otherwise specified.

(b) Existing MSWLF units that cannot make the demonstration specified in subsection (2)(a) of this section, pertaining to airports, subsection (3)(a) of this section, pertaining to flood plains, subsection (7)(a) of this section, pertaining to unstable areas, must close by October 9, 1996, and conduct post-closure in accordance with WAC 173-351-500, Closure and post-closure care.

(c) The deadline for closure required by (b) of this subsection may be extended up to two years if the owner or operator demonstrates to the jurisdictional health department during the permitting process of WAC 173-351-700 that:

(i) There is no available alternative disposal capacity; and

(ii) There is no immediate threat to human health and the environment.

Note: Owners or operators of MSWLFs should be aware that the state department of health has adopted a state wellhead protection program in accordance with section 1428 of the Safe Drinking Water Act. Owners and operators should also be aware of location restrictions which may exist through the process of designating and implementing Groundwater Management Areas, under chapter 173-100 WAC, and through the Special Protection Areas of chapter 173-200 WAC.

(2) Airport safety.

(a) Owners or operators of new MSWLF units, existing MSWLF units, and/or lateral expansions that are located within ten thousand feet (three thousand forty-eight meters) of any airport runway end used by turbojet aircraft or within five thousand feet (one thousand twenty-four 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 within a six-mile (ten kilometer) radius or lateral expansions within a five-mile (eight kilometer) radius of any airport runway end used by turbo-jet or piston-type aircraft must notify the effected airport and the Federal Aviation Administration (FAA) and conform to all applicable requirements.

(c) The owner or operator must place the demonstration required by (a) of this subsection in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6).

(d) For purposes of this subsection:

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

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

(3) Flood plains.

(a) Owners or operators of new MSWLF units, existing MSWLF units, and lateral expansions located in 100-year flood plains must demonstrate that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the flood plain, 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 application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6).

(b) For purposes of this subsection:

(i) "Flood plain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of off-shore islands, that are inundated by the 100-year flood.

(ii) "100-year flood" or "base flood" means a flood that has a one percent or less chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in one hundred years on the average over a significantly long period.

(iii) "Washout" means the carrying away of solid waste by waters of the base flood.

(4) Wetlands.

(a) New MSWLF units and lateral expansions must not be located in wetlands, unless the owner or operator can make the following demonstrations during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6):

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

(A) Cause or contribute to violations of chapter 173-201A WAC, Water quality standards for surface waters of the state of Washington and chapter 173-200 WAC, Water quality standards for groundwaters of the state of Washington;

(B) Violate any applicable toxic effluent standard or prohibition under Section 307 of the Federal Clean Water Act or chapter 173-220 WAC, the National Pollutant discharge elimination system permit program;

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

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

(ii) The MSWLF unit will not cause or contribute to significant degradation of wetlands. The owner or operator must demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) the integrity of the MSWLF unit and its ability to protect ecological resources by addressing the following factors:

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

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

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

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

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

(F) Any additional factors, as necessary, to demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that ecological resources in the wetland are sufficiently protected.

(iii) Where applicable under Section 404 of the Federal Clean Water Act or applicable state wetlands laws and regulations (e.g. chapter 173-22 WAC, Adoption of designations of wetlands associated with shorelines of the state), the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;

(iv) To the extent required under Section 404 of the Federal Clean Water Act steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by:

(A) Avoiding impacts to wetlands to the maximum extent practicable as required by (a)(iii) of this subsection;

(B) Minimizing unavoidable impacts to the maximum extent practicable; and

(C) Finally offsetting remaining unavoidable wetlands impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration and maintenance of existing degraded wetlands or creation of man-made wetlands);

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

(b) For purposes of this subsection, "wetlands" means those areas that are defined in 40 C.F.R. 232.2(r): Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas.

(5) Fault areas.

(a) New MSWLF units and lateral expansions must not be located within two hundred feet (sixty meters) of a fault that has had displacement in Holocene time unless the owner or operator demonstrates during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that an alternative setback distance of less than two hundred feet (sixty 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 subsection:

(i) "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.

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

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

(6) Seismic impact zones.

(a) New MSWLF units and lateral expansions must not be located in seismic impact zones, unless the owner or operator demonstrates during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) to the jurisdictional health department 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 application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6).

(b) For the purposes of this subsection:

(i) "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, will exceed 0.10g in two hundred fifty years.

(ii) "Maximum horizontal acceleration in lithified earth material" means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a ninety percent or greater probability that the acceleration will not be exceeded in two hundred fifty years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

(iii) "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.

(7) 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 units will not be disrupted. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). The owner or operator must consider the following factors, at a minimum, when determining whether an area is unstable:

(i) On-site or local soil conditions that may result in significant differential settling;

(ii) On-site or local geologic or geomorphologic features; and

(iii) On-site or local human-made features or events (both surface and subsurface).

(b) For purposes of this subsection:

(i) "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, and areas susceptible to mass movements.

(ii) "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.

(iii) "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 a MSWLF unit.

(iv) "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 human-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.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-130, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-130, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-140 Other location restrictions.** (1) Groundwater.

(a) Sole source aquifers. New MSWLF units and lateral expansions may not be located over a designated sole source aquifer unless the owner or operator can demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the sole source aquifer is not vulnerable to potential groundwater contamination from the active area. Vulnerability is defined as the propensity or likelihood of a sole source aquifer to become contaminated should the integrity of the engineering control (including liners) fail; it is a measure of the propensity to deteriorate the water quality of a sole source aquifer, and takes into account an assessment of the physical barriers, the physical movement of contaminants, the hydraulic properties of the subsurface lithology; the rate of a contaminant plume movement; the physical and chemical characteristics of contaminants; and it also includes an assessment of the likelihood and ease for contaminant removal or clean-up, or the arrest of contamination, so as to not impact any further portion of the designated sole source aquifer. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Such a vulnerability demonstration must include the submission of a hydrogeologic report as required in WAC 173-351-490 and additionally must meet the following performance criteria:

(i) Demonstrates the presence of confining units or other lithology that will prevent the migration of groundwater contamination;

(ii) Addresses the fate and transport of contaminants, including interactions in the lithologic framework, hydrogeochemical facies, contaminant travel times;

(iii) Defines and summarizes the groundwater budgets for the active area and the sole source aquifer including recharge and discharge areas and includes flow net diagrams;

(iv) Provides a contingency and groundwater assessment plan for the immediate arrest of any groundwater contamination and steps to assess the extent of contamination;

(v) Design specifications for the proposed ground and surface water monitoring systems;

(vi) Is prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists; and

(vii) "Sole source aquifer" means an aquifer designated by the Environmental Protection Agency pursuant to Section 1424e of the Safe Drinking Water Act (PL 93-523).

(b) Drinking water supply wells. New MSWLF units and lateral expansions active area may not be located closer than one thousand feet (three hundred meters) to any drinking water supply well, in use and existing at the time of the purchase of the property containing the active area unless the owner or operator can demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the active area is no less than a ninety-day hydraulic travel time to the nearest down-gradient drinking water supply well in the first useable aquifer. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Such a demonstration must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and include:

(i) A hydrogeologic report required in WAC 173-351-490; and the necessary calculations for showing compliance with the ninety-day travel time; the ninety-day travel time must be based on the peak or full pumping capacity of installed nearby wells and include potentiometric surface maps showing well capture zones and radius of influence;

(ii) Any available ground/surface water quality data for aquifers, springs, or streams in direct hydrologic contact with landfill's active area;

(iii) The waste management unit boundaries at facility closure; and

(iv) Design specifications for the proposed ground and surface water monitoring systems.

(2) Surface water. New MSWLF units and lateral expansions active area may not be located in a channel migration zone or within two hundred feet (sixty-one meters) measured horizontally from the ordinary high water mark, of a shoreline of the state as defined in RCW 90.58.030 (which includes some wetlands associated with waters of the state), nor any public land that is being used by a public water system for watershed control for municipal drinking water purposes in accordance with WAC 246-290-450.

See also wetlands in WAC 173-351-130(4). Local wetlands protection ordinances should be consulted to determine if greater setbacks are required.

(3) Land use. New MSWLF units and lateral expansions may not be located:

(a) In areas designated by the United States Fish and Wildlife Service or the department of wildlife as critical habitat for endangered or threatened species of plants, fish, or wildlife;

(b) So that the active area is closer than one hundred feet (thirty meters) to the facility property line for land zoned as non-residential or unzoned lands, or closer than two hundred fifty feet

(seventy-six meters) to the property line of adjacent land zoned as residential, existing at the time of the purchase of the property containing the active area;

(c) So as to be at variance with any locally-adopted land use plan or zoning requirement unless otherwise provided by local law or ordinance; or

(d) So that the active area is any closer than one thousand feet (three hundred meters) to any state or national park.

(4) All landfill facilities must comply with the location restrictions specified in RCW 70.95.060.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-140, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-140, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-200 Operating criteria.** (1) Procedures for excluding the receipt of prohibited waste.

(a) Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of prohibited wastes. This program must include, at a minimum:

(i) Random inspections of incoming loads unless the owner or operator takes other steps (for example, instituting source controls and restricting the type of waste received) to ensure that incoming loads do not contain prohibited waste;

(ii) Records of any inspections;

(iii) Training of facility personnel to recognize prohibited wastes; and

(iv) Immediate notification of the department and the jurisdictional health department if a prohibited waste is discovered at the facility.

(b) For purposes of this subsection:

(i) "Prohibited waste" means a solid waste that is:

(A) A dangerous waste as defined in WAC 173-303-040 that is not excluded from regulation as a dangerous waste under WAC 173-303-071 or 173-303-073, or was not generated by an exempted small quantity generator as defined in WAC 173-303-070;

(B) Polychlorinated biphenyls (PCBs) regulated under Title 40 C.F.R. Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibition; and

(C) Asbestos not managed in accordance to 40 C.F.R. Part 61.

(ii) "Random inspection" means:

(A) Discharging a random waste load onto a suitable surface. A suitable surface must be chosen to avoid interference with operations so that sorted waste can be distinguished from other loads of uninspected waste, so as to avoid litter and to contain runoff;

(B) Viewing the contents prior to actual disposal of the waste; and

(C) Allowing the facility owner or operator to return excluded wastes to the hauler, arrange for disposal of excluded wastes at a facility permitted to manage prohibited waste, or take other measures to prevent disposal of the excluded wastes at the facility.

(2) Cover material requirements.

(a) Except as provided in (b) of this subsection, the owners or operators of all MSWLF units must cover disposed solid waste with six

inches (fifteen centimeters) of earthen material, i.e., soils, 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 (15 centimeters) of earthen material may be approved by the jurisdictional health department. The owner or operator must demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the alternative material and thickness will not present a threat to human health or the environment; will not adversely affect gas or leachate composition or collection; will control disease vectors, fires, odors, blowing litter, and scavenging; and provide adequate access for heavy vehicles.

(c) The jurisdictional health department may grant a temporary waiver not to exceed three months from the requirement of (a) and (b) of this subsection if the owner or operator demonstrates that there are extreme seasonal climatic conditions that make meeting such requirements impractical.

(3) 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 subsection, "disease vectors" means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

(4) Explosive gases control.

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

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

(ii) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary or beyond; and

(iii) The concentration of methane gases does not exceed one hundred parts per million by volume of methane in offsite structures.

(b) Owners or operators of all MSWLF units must control explosive gases and implement a routine methane monitoring program to ensure that the standards of (a)(i) and (ii) of this subsection are met.

(i) The explosive gas controls and type and frequency of monitoring must be determined based on the following factors:

(A) Soil conditions;

(B) The hydrogeologic conditions surrounding the facility;

(C) The hydraulic conditions surrounding the facility;

(D) The location of facility structures and property boundaries;

and

(E) The design and operation of the MSWLF unit.

(ii) The minimum frequency of monitoring must be quarterly.

Note: All gas monitoring wells must be constructed and decommissioned to ensure protection of the groundwater and to prevent groundwater contamination and follow the requirements of chapter 173-160 WAC, Minimum standards for construction and maintenance of wells, unless otherwise approved by the department and the jurisdictional health department.

(c) If methane gas levels exceeding the limits specified in subsection (4)(a)(i) or (ii) of this section are detected, the owner or operator must:

(i) Immediately take all necessary steps to ensure protection of human health including:



- (A) Notifying the jurisdictional health department;
- (B) Where subsection (4) (a) (ii) of this section is exceeded, monitoring of offsite structures for compliance with subsection (4) (a) (iii) of this section;
- (C) Daily monitoring of methane gas levels unless otherwise authorized by the jurisdictional health department; and
- (D) Evacuation of buildings affected by landfill gas must be determined by the jurisdictional health department and fire department.
  - (ii) Within seven calendar 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
  - (iii) Within sixty 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 jurisdictional health department that the plan has been implemented. The plan must describe the nature and extent of the problem and the remedy.
  - (iv) The jurisdictional health department may establish alternative schedules for demonstrating compliance with (c) (ii) and (iii) of this subsection.
- (d) For purposes of this subsection, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at twenty-five degrees C and atmospheric pressure.
- (5) Air criteria.
  - (a) Owners or operators of all MSWLF units must ensure that the units not violate any applicable requirements developed under the Washington state implementation plan approved or promulgated by the U.S. Environmental Protection Agency pursuant to Section 110 of the Federal Clean Air Act, as amended.
  - (b) Open burning of solid waste is prohibited at all MSWLF units, except: For the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees or debris from emergency cleanup operations, provided that such open burning is not inconsistent with policies, regulations, and permits administered by the jurisdictional air pollution control agency or the department under the Washington Clean Air Act, chapter 70.94 RCW. Household waste must not be open burned.
  - (6) Access requirements. Owners or operators of all MSWLF units must control public access and prevent unauthorized vehicular traffic, illegal dumping of wastes, and controls to keep animals out by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment. A lockable gate is required at each entry to the facility.
  - (7) Run-on/runoff control systems.
    - (a) Except as allowed under WAC 173-351-710, owners or operators of all MSWLF units must design, construct, and maintain:
      - (i) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a twenty-five year storm;
      - (ii) A runoff control system from the active portion of the landfill to collect and control at least the water volume resulting from a twenty-four hour, twenty-five year storm.
    - (b) Runoff from the active portion of the landfill unit must be handled in accordance with WAC 173-351-200(8).
  - (8) Surface water requirements. MSWLF units must not:
    - (a) Cause a discharge of pollutants into waters of the state, including wetlands, that violates any requirements of chapter 90.48 RCW,

Water pollution control, including, but not limited to, chapter 173-201A WAC, Water quality standards for surface waters of the state of Washington, chapter 173-220 RCW, the National pollutant discharge elimination system permit program and chapter 173-216 WAC, State waste discharge permit program.

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

(9) Liquids restrictions.

(a) Except as allowed under WAC 173-351-710, bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:

(i) The liquid waste is household waste other than septic waste; or  
(ii) The liquid waste is leachate or gas condensate derived from the MSWLF unit and:

(A) The MSWLF unit is designed with a leachate collection system and composite liner as described in WAC 173-351-300(3); and

(B) The owner or operator has obtained approval during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) prior to placing liquid waste in the MSWLF unit.

Note: Condensate and leachate are subject to designation to determine whether either is a dangerous waste under chapter 173-303 WAC.

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

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

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

(iii) The waste is household waste.

(c) For purposes of this subsection:

(i) "Liquid waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," SW-846.

(ii) "Gas condensate" means the liquid generated as a result of gas recovery processes at the MSWLF unit.

(10) Recordkeeping requirements.

(a) The owner or operator of a MSWLF unit must record and retain the required information as it becomes available. The operating record must be retained at or near the facility in an operating record or in an alternative location approved by the jurisdictional health department during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). The required information includes:

(i) Copies of all initial, renewal, reissued, and modified permit applications including all demonstrations, and issued permits;

(ii) Inspection records, training procedures, and notification procedures required in subsection (1) of this section, Procedures for excluding the receipt of prohibited waste, and inspection documents associated with the plan of operation, WAC 173-351-210.

(iii) Gas monitoring results from monitoring and any remediation plans required by WAC 173-351-200(4);

(iv) Any demonstration, certification, declaration of construction, finding, monitoring, testing, or analytical data as required by WAC 173-351-400 (Groundwater monitoring systems and remedial action);

(v) Major deviations from the plan of operation required in WAC 173-351-210; and

(vi) Daily records of weights or volumes of solid waste and, if available, types of waste received at the facility.

(b) The owner or operator must notify the jurisdictional health department when the documents from (a) of this subsection have been placed in or added to the operating record, unless:

(i) Such documents have been made a part of a permit application under this regulation;

(ii) Notification occurs under the renewal application requirements of WAC 173-351-730 (3)(b)(iv); or

(iii) The documents are daily records of weights or volumes specified in WAC 173-351-200 (10)(a)(vi).

(c) The jurisdictional health department can set alternative schedules during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) for recordkeeping and notification requirements as specified in (a) and (b) of this subsection, except for the notification requirements in WAC 173-351-130 (2)(b), the Federal Aviation Administration and in WAC 173-351-440 (6)(c), notification of land owners under assessment monitoring.

(d) All information contained in the operating record must be furnished upon request to the jurisdictional health department or be made available at all reasonable times for inspection by the jurisdictional health department and the department.

(11) Annual reports. Each owner or operator must prepare and submit a copy of an annual report to the jurisdictional health department and the department by April 1 of each year. The annual report must:

(a) Include information on facility activities during the previous year;

(b) Be on forms supplied by the department; and

(c) Include the following information:

(i) Facility location;

(ii) Facility contact;

(iii) Operational and/or post-closure information;

(iv) Permit status;

(v) Compliance information;

(vi) Facility capacity information;

(vii) Information on groundwater monitoring as required in WAC 173-351-415(1).

(viii) Information on violation of ambient standards for surface water and explosive gases whose monitoring is required by chapter 173-351 WAC or performed as part of the permit issued under WAC 173-351-700;

(ix) Financial assurance audit reports in accordance with WAC 173-351-600 if applicable; and

(x) Other information as required.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-200, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-200, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-210 Plan of operation.** Each owner or operator must develop, keep, and abide by a plan of operation approved as part of the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). The plan of operation must describe the facilities' operation and must convey to site operating personnel the concept of operation intended by the designer. The plan of operation must be available for inspection at the request of the jurisdictional health department and the department. The facility must be operated in accordance with the plan of operation or the plan must be so modified with the approval of the jurisdictional health department.

Each plan of operation must include:

- (1) How solid wastes are to be handled on-site during its active life including transportation, routine filling, grading, cover, and housekeeping;
- (2) How inspections are conducted and their frequency;
- (3) Actions to take if there is a fire or explosion;
- (4) Actions to take for sudden releases (e.g., failure of run-off containment system);
- (5) How equipment such as leachate collection and gas collection equipment are to be operated and maintained;
- (6) A safety plan or procedure;
- (7) How operators will meet each requirement of WAC 173-351-200 and 173-351-220; and
- (8) Other such details as required by the jurisdictional health department.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-210, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-210, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-220 Additional operating criteria.** All owners or operators of MSWLF units must operate the facility so as to:

- (1) Control road dust;

Note: Operators should carefully select dust suppressants approved by the jurisdictional health departments that do not pose a threat to surface or groundwater quality.

- (2) Collect scattered litter as necessary to prevent vector harborage, a fire hazard, an aesthetic nuisance, or adversely affect wildlife or its habitat;
- (3) Prohibit scavenging;
- (4) Landfill personnel. All landfills must:
  - (a) Ensure that at least two landfill personnel are on-site with one person at the active portion when the site is open to the public for landfills with a permitted capacity of greater than fifty thousand cubic yards per year; and
  - (b) Comply with the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities.

Note: The definition of operators in chapter 173-300 WAC is not the same as the definition of operator in this rule.

- (5) Ensure that reserve operational equipment is available to maintain and meet all operating criteria;
- (6) Clearly mark the active area boundaries authorized in the permit, with permanent posts or equivalent method;

- (7) Thoroughly compact the solid waste before succeeding layers are added except for the first lift over a liner;
- (8) Maintain the monitoring system required in WAC 173-351-400, Groundwater monitoring systems and remedial action, WAC 173-351-200(4), explosive gas monitoring of this regulation and any other monitoring specified in the permit issued in WAC 173-351-700;
- (9) Require recycling.
- (a) All owners and operators must provide the opportunity for the general public to conveniently recycle cans, bottles, paper, and other material brought to the landfill site and for which a market exists or as required according to the most recently adopted county comprehensive solid waste management plan:
- (i) During the normal hours of operation; and
- (ii) In facilities convenient to the public (i.e., near entrance to the gate).
- (b) Owners or operators must conduct recycling activities in an orderly, sanitary manner and in a way that does not interfere with MSWLF operations.
- (c) Owners or operators may demonstrate during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) alternative means to providing an opportunity to the general public to recycle household solid waste including other conveniently located facilities which offer recycling opportunities.
- (10) Prohibiting disposal of municipal sewage sludge or biosolids in MSWLF units.
- (a) The disposal of municipal sewage sludge or biosolids or any material containing municipal sewage sludge or biosolids in a MSWLF unit is prohibited unless the municipal sewage sludge or biosolids or material containing municipal sewage sludge or biosolids is not a liquid as defined in this rule, and such disposal is specifically approved as part of a valid NPDES permit, or a valid permit issued in accordance with chapter 70.95J RCW and rules promulgated under that authority.
- (b) Notwithstanding WAC 173-351-220 (10)(a), the jurisdictional health department may allow disposal of municipal sewage sludge or biosolids, or any material containing municipal sewage sludge or biosolids in a landfill on a temporary basis if the jurisdictional health department determines that a potentially unhealthful circumstance exists and other management options are unavailable or would pose a threat to human health or the environment.
- (c) In accordance with (b) of this subsection upon determination that a potentially unhealthful circumstance exists, the jurisdictional health department must notify the department in writing, of its findings and basis for its determination. In its notification, the jurisdictional health department must state the date on which disposal is approved to commence, any conditions, and the date after which continued disposal is prohibited.
- (d) For the purposes of this regulation, the use of sewage sludge or biosolids or any material containing sewage sludge or biosolids, which is subject to regulation under 40 C.F.R. Part 503 and or chapter 70.95J RCW, as daily cover or as an amendment to daily cover is considered disposal.
- (11) Disposal of dangerous waste prohibited. Owners or operators of landfills must not knowingly dispose, treat, store, or otherwise handle dangerous waste unless the requirements of the Dangerous waste regulation, chapter 173-303 WAC are met;

(12) Jurisdictional health department inspection of activities. In accordance with RCW 70.95.190, employees of the jurisdictional health department or their agents may enter upon, inspect, sample, and move freely about the premises of any MSWLF, after presentation of credentials.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-220, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-220, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-300 Design criteria.** (1) Applicability. New MSWLF units and lateral expansions must be constructed in accordance with the requirements under subsection (2) of this section. Existing MSWLF units are not subject to this section. Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management, including operating plans approved under chapter 173-304 WAC.

(2) New MSWLF units and lateral expansions must be constructed:

(a) With a composite liner as defined in subsection (3) of this section and a leachate collection system that is designed and constructed to maintain less than a 1 foot (30 cm) depth of leachate over the liner and less than a 2-foot depth over the leachate pump sump area; or

(b) In accordance with an alternative design approved by the jurisdictional health department with the department's written consent. Alternative designs must ensure that the concentration values listed in Table 1 of this section and the criteria in the water quality standards for groundwaters of the state of Washington, chapter 173-200 WAC, will not be exceeded in the hydrostratigraphic unit(s) identified in the hydrogeologic characterization/report at the relevant point of compliance as specified during the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Alternative designs must also sufficiently control methane to meet the criteria in WAC 173-351-200 (4) (a).

(3) For the purpose of this section, "composite liner" means a system consisting of two components; the upper component must consist of a minimum of 60 mil thickness high density polyethylene (HDPE) geomembrane. The lower component must consist of at least a two-foot (60 cm) layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec. The geomembrane must be installed in direct and uniform contact with the compacted soil component. Thinner geomembranes of other than high density polyethylene may be used provided that a demonstration can be made that the alternative has equivalent mechanical strength, permeability, chemical resistance and other factors under conditions of construction and use. Minimum thickness of geomembranes other than high density polyethylene must be 30 mils.

(4) When demonstrating that a proposed alternative design meets the standards of this section, the owner or operator may use:

(a) Existing information such as vadose zone, groundwater monitoring, or leachate characterization that has previously been conducted at the facility;

(b) Contaminant transport modeling in accordance with the requirements of WAC 173-351-480; and/or

(c) Other information determined as appropriate and relevant by the jurisdictional health department.

(5) When approving an alternative design, the jurisdictional health department must consider at least the following factors:

(a) The hydrogeologic characteristics of the facility and surrounding land;

(b) The climatic factors of the area; and

(c) The volume, physical and chemical characteristics of the leachate.

(6) The relevant point of compliance approved during the permitting process in WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6), must be no more than one hundred fifty meters (four hundred ninety-two feet) from the waste management unit boundary and must be located on land owned by the owner of the MSWLF unit. In approving the relevant point of compliance the jurisdictional health department must consider at least the following factors:

(a) The hydrogeologic characteristics of the facility and surrounding land;

(b) The volume, and physical/chemical characteristics of the leachate;

(c) The quantity and quality, and direction of flow of groundwater;

(d) The proximity and withdrawal rate of the groundwater users;

(e) The availability of alternative drinking water supplies;

(f) The existing quality of the groundwater, including other sources of contamination and their cumulative impacts on the groundwater, and whether the groundwater is currently used or reasonably expected to be used for drinking water;

(g) Public health, safety, and welfare effects; and

(h) Practical capability of the owner or operator.

(7) Liner separation from groundwater. New MSWLF units and lateral expansions may not be designed such that the bottom of the lowest liner component is any less than ten feet (three meters) above the seasonal high level of groundwater, unless a demonstration can be made during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that a hydraulic gradient control system, or the equivalent, can be installed which prevents the controlled seasonal high level of groundwater in the identified water-bearing unit from contacting the bottom of the lowest liner component. For the purposes of this section, groundwater includes any water-bearing unit that is horizontally and vertically extensive, hydraulically recharged and volumetrically significant as to harm or endanger the integrity of the liner at any time. The owner or operator must place the demonstration in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). This demonstration must include:

(a) A hydrogeologic report required in WAC 173-351-490 including a discussion showing the effects from subsoil settlement, changes in surrounding land uses affecting groundwater levels, liner leakage or other impacts will not bring any hydrostratigraphic unit in contact with the bottom of the lowest liner during the active life, closure, post-closure, and upon completion of post-closure care of the MSWLF unit;

(b) Any available ground/surface water quality data for aquifers, springs, or streams in direct hydrologic contact with landfill's active area;

(c) A showing that any gradient-control discharges to groundwater will not adversely impact existing groundwater/surface water users or the instream flow of surface waters in direct hydrologic contact or continuity with the landfill's hydraulic gradient control system;

(d) Conceptual engineering drawings of the proposed MSWLF unit and discussion as to how the hydraulic gradient control system will not affect the structural integrity nor performance of the liner during the active life, closure, post-closure, and upon completion of post-closure care of the MSWLF unit;

(e) Design specifications for the proposed ground and surface water monitoring systems;

(f) A discussion of the potential impacts from the gradient control system on the capability of collecting groundwater samples that represent the quality of groundwater passing the relevant point of compliance; and

(g) Preliminary engineering drawings of the hydraulic gradient control system.

TABLE 1

CHEMICAL	Maximum Concentration (mg/l)
ARSENIC	0.00005
BARIUM	1.0
BENZENE	0.001
CADMIUM	0.005
CARBON TETRACHLORIDE	0.0003
CHROMIUM (HEXAVALENT)	0.05
2,4-DICHLOROPHENOXY ACETIC ACID	0.07
1,4-DICHLOROBENZENE	0.004
1,2-DICHLOROETHANE	0.0005
1,1 DICHLOROETHYLENE	0.007
ENDRIN	0.0002
FLUORIDE	4
LINDANE	0.00006
LEAD	0.015
MERCURY	0.002
METHOXYCHLOR	0.04
NITRATE	10
SELENIUM	0.01
SILVER	0.05
TOXAPHENE	0.00008
1,1,1-TRICHLOROETHANE	0.20
TRICHLOROETHYLENE	0.003
2,4,5-TRICHLOROPHENOXY ACETIC ACID	0.01
VINYL CHLORIDE	0.00002

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-300, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-300, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-400 Groundwater monitoring systems and remedial action.** (1) Applicability.



(a) The requirements of WAC 173-351-400 through WAC 173-351-490 apply to MSWLF units whose owners and operators are required to perform groundwater monitoring under chapter 173-351 WAC.

(b) Owners and operators of MSWLF units must comply with the groundwater monitoring requirements of this regulation according to the following schedule:

(i) Existing MSWLF units and lateral expansions less than one mile (1.6 kilometers) from a drinking water intake (surface or subsurface) must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 by October 9, 1994;

Note: A drinking water intake is any surface water or groundwater intake that is used for the purposes of drinking water i.e., water supply wells.

(ii) Existing MSWLF units and lateral expansions greater than one mile (1.6 kilometers) from a drinking water intake (surface or subsurface) must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 by October 9, 1995;

(iii) New MSWLF units and lateral expansions must be in compliance with the groundwater monitoring requirements specified in WAC 173-351-400 through 173-351-450, and 173-351-490 before waste can be placed in the MSWLF unit.

(c) Existing MSWLF units and lateral expansions with groundwater contamination as defined under WAC 173-304-100 and chapter 173-200 WAC must begin an assessment groundwater monitoring program under WAC 173-351-440 by October 9, 1994.

(d) Interim groundwater monitoring programs. Prior to the compliance schedules in (b) of this subsection, all existing MSWLF units and lateral expansions must either:

(i) Continue to monitor under WAC 173-304-490; or

(ii) Begin to monitor under this section.

(e) All MSWLF units closed in accordance with chapter 173-304 WAC must continue to monitor groundwater in accordance with chapter 173-304 WAC.

(2) The following reports, demonstrations and information must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists:

(a) The hydrogeologic report(s) of WAC 173-351-490;

(b) The groundwater monitoring program(s) including the groundwater monitoring system design and well placement of WAC 173-351-405; the groundwater sampling and analysis plan of WAC 173-351-410; the detection monitoring program(s) of WAC 173-351-430; and the assessment monitoring program(s) of WAC 173-351-440;

(c) Any demonstration(s) under WAC 173-351-430 (4)(c), 173-351-440 (6)(e), 173-351-140(1), or 173-351-300(7);

(d) Any modification(s) proposals/requests to the approved groundwater monitoring program in accordance with WAC 173-351-450;

(e) Any groundwater modeling demonstrations made under WAC 173-351-480; and

(f) The groundwater reports required under WAC 173-351-415.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-400, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-400, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-405 Performance standards for groundwater monitoring system designs.** Groundwater monitoring well placement.

The groundwater monitoring system design must meet the following performance criteria:

(1) A sufficient number of wells must be installed at appropriate locations and depths to yield representative groundwater samples from those hydrostratigraphic units which have been identified as the earliest target hydraulic pathways and conduits of flow for groundwater and contaminant movement, and storage.

(2) The number, spacing, and depths of monitoring wells must be based on the site characteristics including the area of the MSWLF unit and the hydrogeological characterization of WAC 173-351-490, and requires a demonstration based on all of the following information:

(a) A groundwater flow path analysis which supports why the chosen hydrostratigraphic unit best serves the installation of a detection or assessment groundwater monitoring well system capable of providing early warning detection of any groundwater contamination.

(b) Documentation and calculations of all of the following information:

(i) Hydrostratigraphic unit thicknesses including confining units and transmissive units;

(ii) Vertical and horizontal groundwater flow directions including seasonal, man-made, or other short term fluctuations in groundwater flow;

(iii) Stratigraphy and lithology;

(iv) Hydraulic conductivity; and

(v) Porosity and effective porosity.

(3) Hydraulically placed upgradient wells (background wells) must meet the following performance criteria:

(a) Must be installed in groundwater that has not been affected by leakage from a MSWLF unit; or

(b) If hydrogeologic conditions do not allow for the determination of a hydraulically placed upgradient well then sampling at other monitoring wells which provide representative background groundwater quality may be allowed.

(4) Hydraulically placed down-gradient wells (compliance wells) must meet the following performance criteria:

(a) Represent the quality of groundwater passing the relevant point of compliance specified by the jurisdictional health department. The downgradient monitoring system must be installed at the relevant point of compliance specified by the jurisdictional health department during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6). Additional wells may be required by the jurisdictional health department based upon areal extent of the MSWLF unit, complex hydrogeologic settings or to define the extent of contamination under WAC 173-351-440 and 173-351-450.

(b) When physical obstacles preclude installation of groundwater monitoring wells at the relevant point of compliance at existing units, the downgradient monitoring system may be installed at the closest practicable distance hydraulically down gradient from the relevant point of compliance that ensures detection of groundwater contamination in the chosen hydrostratigraphic unit.

(5) All monitoring wells must be cased in a manner that maintains the integrity of the bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of samples. The annular space between the bore hole and well casing above the sampling depth must be sealed to prevent corruption

of samples and contamination of groundwater. All wells must be constructed in accordance with chapter 173-160 WAC, Minimum standards for construction and maintenance of water wells and chapter 173-162 WAC, Regulation and licensing of well contractors and operators. All wells must be clearly labeled, capped, and locked.

(6) The owner or operator must apply for a permit modification under WAC 173-351-720(6) or must apply during the renewal process of WAC 173-351-720(5), for any proposed changes to the design, installation, development, and decommission of any monitoring wells, piezometers, and other measurement, sampling, and analytical devices. Upon completing changes, all documentation, including date of change, new well location maps, boring logs, and well diagrams must be submitted to the jurisdictional health department and must be placed in the operating record of WAC 173-351-200(10).

(7) All 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.

(8) The groundwater monitoring system and hydrogeologic report including any changes to the groundwater monitoring system must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists.

(9) The groundwater monitoring system design and hydrogeologic report must be made a part of the permit application in accordance with WAC 173-351-730 (1)(b)(iii).

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-405, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-405, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-410 Groundwater sampling and analysis requirements.**

(1) The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells installed in compliance with WAC 173-351-400 and with this section. The owner or operator must submit the sampling and analysis program documentation as a part of the permit application in accordance with WAC 173-351-730 (1)(b)(iii). The program must include procedures and techniques for:

- (a) Sample collection and handling;
- (b) Sample preservation and shipment;
- (c) Analytical procedures;
- (d) Chain-of-custody control;
- (e) Quality assurance and quality control;
- (f) Cleansing of drilling and sampling equipment;
- (g) Procedures to ensure employee health and safety during well installation and monitoring; and
- (h) Well operation and maintenance procedures.

(2) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples or reflect an acceptable practical quantitation limit (PQL). Groundwater samples must not be field-filtered prior to laboratory analysis except for geochemical indicator

parameters used for cation-anion balance evaluations in WAC 173-351-430(5). All analyses must be sent to an accredited laboratory in accordance with chapter 173-50 WAC, Accreditation of environmental laboratories.

(3) Groundwater elevations must be measured in each well immediately prior to purging, each time groundwater is sampled. The owner or operator must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same MSWLF unit must be measured within a period of time short enough to avoid any groundwater fluctuations which could preclude the accurate determination of groundwater flow rate and direction. All groundwater elevations must be determined:

(a) By a method that ensures measurement to the 0.01 (one/one hundredth) of a foot (3mm) relative to the top of the well casing; and

(b) The orthometric elevation of the top of the well casing is related to a vertical benchmark based on the North American vertical datum of 1988 (NAVD88) and be established to 3rd order classification standards per federal geodetic control committee.

(4) The owner or operator must establish background groundwater quality in hydraulically placed upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under WAC 173-351-430, 173-351-440, or 173-351-450. Background groundwater quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if it meets the requirements of WAC 173-351-400 through 173-351-490.

(5) The number of samples collected to establish water quality data must be consistent with the appropriate statistical procedures determined pursuant to WAC 173-351-420. The sampling procedures must be those specified under WAC 173-351-430 for detection monitoring, WAC 173-351-440 for assessment monitoring, and WAC 173-351-440(7) for remedial action.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-410, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-410, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-415 Groundwater reporting.** (1) Each owner or operator must prepare and submit a copy of an annual groundwater report to the jurisdictional health department and the department by April 1st of each year. The groundwater annual report must include completed forms developed by the department and the following information:

(a) A brief summary of statistical results and/or any statistical trends including any findings of any statistical increases for the year;

(b) A brief summary of groundwater flow rate and direction for the year, noting any trends or changes;

(c) A copy of all potentiometric surface maps developed for each quarter or approved semi-annual period; and

(d) A summary geochemical evaluation noting any changes or trends in the cation-anion balances, Trilinear diagrams and general water chemistry for each well.

(2) A quarterly, or alternate frequency approved in accordance with WAC 173-351-450, groundwater report must be submitted to the ju-

isdictional health department and the department no later than sixty days after the receipt of the analytical data. The groundwater report must include completed forms developed by the department and all of the following:

- (a) All groundwater monitoring data for the sampling period;
  - (b) A brief summary of statistical results and/or any statistical trends and all statistical calculations;
  - (c) Notification of any statistical increase and concentrations above the criteria in chapter 173-200 WAC, Water quality standards for groundwaters of the state of Washington;
  - (d) Static water level readings for each monitoring well for each sampling event;
  - (e) Potentiometric surface elevation maps depicting groundwater flow rate and direction;
  - (f) Cation-anion balances and Trilinear diagrams; and
  - (g) Leachate analysis results if sampled and tested.
- (3) All groundwater monitoring data must be submitted consistent with procedures specified by the department. Unless otherwise specified by the department, all groundwater monitoring data must be submitted in an electronic form capable of being transferred into the department's data management system.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-415, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-415, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-420 Statistical methods for groundwater monitoring.**

- (1) The owner or operator must calculate and evaluate all of the following statistics for background groundwater quality data:
- (a) The background mean;
  - (b) The background variance;
  - (c) The standard deviation of the background data;
  - (d) The coefficient of variation of the background data;
  - (e) The standard error of the background data; and
  - (f) Other statistics testing for homogeneity of variance and the normality of the background data.
- (2) The owner or operator must specify in the permit application in accordance with WAC 173-351-730 (1)(b)(iii) appropriate statistical methods to be used in evaluating groundwater monitoring data for each constituent. The statistical test chosen must be conducted separately for each constituent in each well. The owner or operator must demonstrate that the statistical methods meet the following performance standards, as appropriate:
- (a) The statistical method used to evaluate groundwater monitoring data must be appropriate for the distribution of chemical parameters or constituents. If the distribution of the chemical parameters or constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data must be evaluated to determine if nonnormal conditions are due to laboratory or sampling error, poor well construction, seasonal or spatial variability, or actual site conditions. Transformed or a distribution-free theory test may be used, upon a determination of why nonnormal conditions exist. If the distributions for the constituents differ, more than one statistical method may be needed.

(b) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test must be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparison procedure is used, the Type I experiment wise error rate for each testing period must 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.

(c) Parameter values must be protective of human health and the environment. The parameters must be determined after considering the number of samples in the background database, the data distribution, and the range of the concentration values for each constituent of concern.

(d) The statistical method must 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 must 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.

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

(3) 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 groundwater monitoring program that applies to the MSWLF unit after each sampling event and as determined under this section.

(a) In determining whether a statistically significant increase has occurred, the owner or operator must compare the groundwater quality of each parameter or constituent at each monitoring well designated pursuant to WAC 173-351-430 or 173-351-440 to the background value of that constituent, according to the statistical procedures and performance standards specified under this section.

(b) Within thirty days after receipt of the analytical data, the owner or operator must determine whether there has been a statistically significant increase over background at each monitoring well.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-420, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-420, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-430 Detection monitoring program.** (1) Detection monitoring must be conducted at MSWLF units at all groundwater monitoring wells required under WAC 173-351-405. At a minimum, a detection monitoring program must include monitoring for the constituents listed in Appendix I and II of this regulation.

(2) Background data.

(a) Background data development for new MSWLF units.

(i) A minimum of eight independent samples must be collected from each monitoring well and analyzed for Appendix I constituents for the first year of groundwater monitoring unless background data already

exists for Appendix I constituents and performance criteria of WAC 173-351-400 are met.

(ii) Each independent sampling event must be no less than one month apart from the previous independent sampling event.

(iii) Sampling for Appendix II parameters must be done quarterly.

(b) Total metals background data development for existing MSWLF units.

(i) An owner or operator must follow the permit modification process in WAC 173-351-720(6) to amend the sampling and analysis program to address (b)(ii) and (iii) of this subsection by May 31, 2013. Amendments must meet the standards of WAC 173-351-410 (1) and (2).

(ii) Beginning at the first sampling event after jurisdictional health department approval of amendments to the sampling and analysis program in (b)(i) of this subsection, independent samples must be collected from each monitoring well and analyzed for the parameters in (ii)(A) and (B) of this subsection. Samples must be collected and analyzed over eight sampling periods, which may be quarterly or semi-annually to coincide with routine monitoring as approved by the jurisdictional health department.

(A) Total metals from Appendix I Inorganic Constituents 1-15.

(B) Dissolved metals:

- Antimony (Dissolved).
- Arsenic (Dissolved).
- Barium (Dissolved).
- Beryllium (Dissolved).
- Cadmium (Dissolved).
- Chromium (Dissolved).
- Cobalt (Dissolved).
- Copper (Dissolved).
- Lead (Dissolved).
- Nickel (Dissolved).
- Selenium (Dissolved).
- Silver (Dissolved).
- Thallium (Dissolved).
- Vanadium (Dissolved).
- Zinc (Dissolved).

(iii) After collecting and analyzing samples for total and dissolved metals for eight sampling periods, collection and analysis of Appendix I Inorganic Constituents 1-15 (total metals) must continue and collection and analysis of dissolved metals under (b)(ii)(B) of this subsection can cease.

(3) Routine sampling. Except as allowed under WAC 173-351-450, the monitoring frequency for all constituents listed in Appendix I and II must be quarterly in each well during the active life of the MSWLF unit including the closure and the post-closure period and begins after background data development.

(4) If the owner or operator determines, pursuant to WAC 173-351-420, that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I, at any monitoring well at the boundary specified under WAC 173-351-405, the owner or operator:

(a) Must, within fourteen days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and send the same notice to the jurisdictional health department and the department; and

(b) Must establish an assessment monitoring program meeting the requirements of WAC-173-351-440 within ninety days except as provided for in (c) of this subsection; or

(c) 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 groundwater quality. A report documenting this demonstration must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, and approved by the jurisdictional health department 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 ninety days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in WAC 173-351-440.

(5) A geochemical evaluation of Appendix II parameters must be conducted at each well on a quarterly basis and include all of the following methods:

(a) A cation-anion balance evaluating the difference between the cation and anion sums expressed in milliequivalents per liter. If the following threshold limits are exceeded, the owner or operator must provide a summary explanation and examine whether the difference is due to a laboratory error, poor well conditions, or other ions not accounted for in natural or impacted groundwater conditions. A ten percent difference threshold is used if the total cation-anion sums are less than 5.0 meq/liter. A five percent difference threshold is used if the total cation-anion sums are greater than or equal to 5.0 meq/liter.

(b) A plot of cations and anions for each well on a trilinear diagram, as recommended in hydrogeologic texts and/or the department guidance documents.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-430, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-430, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-440 Assessment monitoring program.** (1) 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 or in the alternative list approved in accordance with WAC 173-351-450, Alternative groundwater monitoring programs.

(2) Background data development for total metals must be done in accordance with WAC 173-351-430 (2)(b) for existing MSWLF units under assessment monitoring as of November 1, 2012.

(3) Within ninety days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the groundwater for all constituents identified in Appendix III. A minimum of one sample from each well (background and down-gradient) must be collected and analyzed during each sampling event. For any constituent detected in wells as a result of the complete Appendix III analysis, a minimum of four independent samples must be collected from each well (background and downgradient) within a time period of one hundred eighty days, and analyzed to establish back-



ground for the constituents. Each independent sample must be collected no less than one month apart from the previous sampling event.

(4) After obtaining the results from initial or subsequent sampling events required in subsection (3) of this section, the owner or operator must:

(a) Within fourteen days, notify the jurisdictional health department of the increase, identifying the Appendix III constituent(s) that have been detected and place this notice in the operating record;

(b) Within ninety days, and on a quarterly basis thereafter, re-sample all wells, conduct analyses for all constituents in Appendix I and II and constituents in Appendix III that are detected in response to subsection (3) of this section. Record their concentrations in the facility operating record and notify the jurisdictional health department. At least one sample from each well (background and downgradient) must be collected and analyzed during these sampling events;

(c) Establish background concentrations for any constituents detected pursuant to subsection (3) of this section;

(d) Establish groundwater protection standards for all constituents detected pursuant to subsection (3) or (4) of this section. The groundwater protection standards must be established in accordance with subsection (8) of this section; and

(e) Continue performing geochemical evaluations in accordance with WAC 173-351-430(5) on a quarterly basis.

(5) If the concentrations of all Appendix III constituents are shown to be at or below background values, using the statistical procedures in WAC 173-351-420, for two consecutive sampling events, the owner or operator may return to detection monitoring after:

(a) Notifying the jurisdictional health department of this finding;

(b) Receiving approval in writing from the jurisdictional health department; and

(c) Placing the notice and the approval in (a) and (b) of this subsection in the operating record.

(6) If the concentrations of any Appendix III constituents are above background values, but all concentrations are below the groundwater protection standard established under subsection (8) of this section, using the statistical procedures in WAC 173-351-420, the owner or operator must continue assessment monitoring in accordance with this section.

(7) If one or more Appendix III constituents are detected at statistically significant levels above the groundwater protection standard established under subsection (8) of this section in any sampling event, the owner or operator must, within fourteen days of this finding, notify the jurisdictional health department, the department and all appropriate local government officials of the increase and place a notice in the operating record identifying the Appendix III constituents that have exceeded the groundwater protection standard. The owner or operator also:

(a) Must characterize the chemical composition of the release, the contaminant fate and transport characteristics; the rate and extent of contamination in all groundwater flow paths by installing additional monitoring wells as necessary;

(b) 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 subsection (3) of this section;

(c) 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 offsite if indicated by sampling of wells in accordance with subsection (7) of this section; and

(d) Must initiate an assessment, selection, and implementation of remedial actions in accordance with chapter 173-340 WAC, the Model Toxics Control Act regulation and continue monitoring in accordance with the assessment monitoring program pursuant to this section; or

(e) 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 groundwater quality. A report documenting this demonstration must be prepared by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, approved by the jurisdictional health department, 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 this section, and may return to detection monitoring if the Appendix III constituents are at or below background as specified in subsection (5) of this section. Until a successful demonstration is made, the owner or operator must comply with this subsection (7) including initiating an assessment of remedial actions.

(8) The owner or operator:

(a) Must establish a groundwater protection standard using the groundwater quality criteria of chapter 173-200 WAC; and

(b) For constituents for which the background level is higher than the protection standard identified under (a) of this subsection, must use the background concentration for the constituents established from wells in accordance with WAC 173-351-405 through 173-351-430.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-440, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-440, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-450 Alternate groundwater monitoring programs. (1)**

The owner or operator may propose changes and/or alternate groundwater monitoring programs for detection monitoring after the second year of groundwater monitoring under WAC 173-351-430(3), or the assessment monitoring program of WAC 173-351-440 as follows:

(a) An alternate groundwater monitoring frequency for sampling and analysis of Appendix I and II constituents;

(b) A deletion of Appendix I, II, and III constituents or alternate groundwater monitoring constituents;

(c) An appropriate subset of wells to be sampled and analyzed for Appendix III under WAC 173-351-440(2).

(2) All proposed changes in groundwater monitoring frequency must be no less than semiannually for detection monitoring and no less than quarterly for assessment monitoring. The owner or operator must apply for a permit modification under WAC 173-351-720(6) or must apply during the renewal process of WAC 173-351-720(5) for changes in groundwater monitoring frequency making a demonstration based on the following information:

(a) A characterization of the hydrostratigraphic unit(s) including the unsaturated zone, transmissive and confining units and include all of the following:

- (i) Hydraulic conductivity; and
- (ii) Groundwater flow rates.
- (b) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring wells (minimum distance of travel); and
- (c) Contaminant fate and transport characteristics.
- (3) The owner or operator must apply for a permit modification under WAC 173-351-720(6) or must apply during the renewal process of WAC 173-351-720(5) for all proposed deletions or changes to groundwater monitoring constituents of Appendix I, II, and III based on all of the following information:

Verification that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit, by:

- (a) Leachate monitoring results consisting of those parameters listed in Appendix I and II for deletions or changes to detection monitoring and Appendix III for assessment monitoring. All leachate monitoring must be quarterly unless otherwise approved by the jurisdictional health department and the department;
- (b) The types, quantities, and concentrations of constituents in wastes managed at the MSWLF unit;
- (c) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;
- (d) The detectability of indicator parameters, waste constituents, and reaction products in the groundwater; and
- (e) The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background.
- (4) Multiunit groundwater monitoring systems.

An owner or operator may propose during the permitting process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) a multiunit groundwater monitoring system instead of separate groundwater monitoring systems for each MSWLF unit, including MSWLF units which were closed in accordance with chapter 173-351, 173-304, or 173-301 WAC. The multiunit system must meet all of the requirements of WAC 173-351-400 through WAC 173-351-490 and will be as protective of human health and environment as individual groundwater monitoring systems for each MSWLF unit. Permit approval for multiunit groundwater monitoring systems and programs will be based on the ability to provide early warning detection of any contaminant releases including:

- (a) Number, spacing, and orientation of the MSWLF units;
- (b) Hydrogeologic setting;
- (c) Site history;
- (d) Engineering design of the MSWLF units;
- (e) Type of waste accepted at the MSWLF units; and
- (f) Leachate analysis as referenced in subsection (3)(a) of this section for MSWLF units with leachate collection systems.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-450, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-450, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-460 Role of jurisdictional health department in remedial action.** The jurisdictional health department:

(1) May provide input to the department in negotiations, meetings, and correspondence between the potentially liable person(s) and the department in implementing the Model Toxics Control Act, chapter 70.105D RCW;

(2) May comment upon and participate in all decisions made by the department in assessing, choosing, and implementing a remedial action program;

(3) Must require the owner or operator to continue closure and post-closure activities as appropriate under these rules, after remedial action measures are completed; and

(4) Must continue to regulate all MSWLF units during construction, operation, closure and post-closure, that are not exempt from procedural requirements under chapter 70.105D RCW.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-460, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-460, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-465 Role of department of ecology in remedial action.** The department will carry out all the responsibilities assigned to it under the Model Toxics Control Act (MTCA), chapter 70.105D RCW, during the remedial action process.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-465, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-465, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-480 Groundwater modeling.** All groundwater and contaminant fate and transport modeling must meet the following performance standards:

(1) The model must have supporting documentation that establishes its ability to represent groundwater flow and contaminant transport and any history of previous applications;

(2) The set of equations representing groundwater movement and contaminant transport must be theoretically sound and well documented;

(3) The numerical solution methods must be based upon sound mathematical principles and be supported by verification and checking techniques;

(4) The model must be calibrated and verified against site-specific field data;

(5) A sensitivity analysis must be conducted to measure the model's responses to changes in the values assigned to major parameters, specified tolerances, and numerically assigned space and time discretizations;

(6) Mass balance calculations on selected elements in the model must be performed to verify physical validity. Where the model does not prescribe the amount of mass entering the system as a boundary condition, this step may be ignored;

(7) The values of the model's parameters requiring site specific data must be based upon actual field or laboratory measurements; and

(8) The values of the model's parameters which do not require site specific data must be supported by laboratory test results or equivalent methods documenting the validity of the chosen parameter values.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-480, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-480, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-490 The hydrogeologic report contents.** (1) The hydrogeologic report must meet all of the following performance standards as follows:

(a) Examine existing site conditions for compliance with groundwater and surface water location restrictions under WAC 173-351-130, 173-351-140, and 173-351-300(7);

(b) Determine existing or background groundwater quality conditions, including any groundwater contamination; and

(c) Define a detection groundwater monitoring program capable of immediate and early warning detection for potential contamination as required in WAC 173-351-400 and the information required in subsection (2) of this section.

(2) The hydrogeologic report contents must include the following information:

(a) A summary of local and regional geology and hydrology, including faults, zones of joint concentrations, unstable slopes and subsidence areas on site; areas of groundwater recharge and discharge; stratigraphy; erosional and depositional environments and facies interpretation(s);

(b) A borehole program which identifies all performance criteria of WAC 173-351-405 including lithology, soil/bedrock types and properties, preferential groundwater flow paths or zones of higher hydraulic conductivity, the presence of confining unit(s) and geologic features such as fault zones, cross-cutting structures etc., and the target hydrostratigraphic unit(s) to be monitored. The borehole program must meet the following standards:

(i) A minimum of twenty subsurface borings is required for MSWLF sites which are 50 acres or less in aerial extent. For sites greater than fifty acres, twenty borings, plus three borings for each additional ten acres thereafter, is required. Soil borings must be established in a grid pattern with a boring in each major geomorphic feature such as topographic divides and lowlands;

(ii) Each boring will be of sufficient depth below the proposed grade of the bottom liner as to identify soil, bedrock and hydrostratigraphic unit(s) conditions as required in WAC 173-351-405;

(iii) The jurisdictional health department, with the written concurrence of the department, may approve alternate methods including geophysical techniques, either surface or downhole including electric logging, sonic logging, nuclear logging, seismic profiling, electromagnetic profiling and resistivity profiling in lieu of some of the number of borings required in the subsurface borehole program of (b)(i) of this subsection, provided sufficient hydrogeological site characterization can be accomplished and prior approval is obtained;

(iv) Each boring sample must be collected from each lithologic unit and tested for all of the following:

(A) Particle size distribution by both sieve and hydrometer analyses in accordance with approved ASTM methods (D422 and D1120);  
(B) Atterburg limits following approved ASTM methods (D4318); and  
(C) Classification under the unified soil classification system, following ASTM standard D2487-85.

(v) Each lithologic unit on site will be analyzed for:

(A) Moisture content, following approved ASTM methods (D2216);  
and

(B) Hydraulic conductivity by an in-situ field method or laboratory method approved by the jurisdictional health department and the department. All samples collected for the determination of permeability must be collected by standard ASTM procedures.

(vi) All boring logs must be submitted with the following information:

(A) Soil and rock descriptions and classifications;

(B) Method of sampling;

(C) Sample depth;

(D) Date of boring;

(E) Water level measurements;

(F) Soil test data;

(G) Boring location; and

(H) Standard penetration number of ASTM standard D1586-67.

(vii) All borings not converted to monitoring wells or piezometers must be carefully backfilled, plugged and recorded in accordance with WAC 173-160-420;

(viii) During the borehole drilling program, any on-site drilling and lithologic unit identification must be performed by a geologist or other licensed professional in accordance with the requirements of chapter 18.220 RCW, Geologists, who is trained to sample and identify soils and bedrock lithology.

(c) Depths to groundwater and hydrostratigraphic unit(s) including transmissive and confining units;

(d) Potentiometric surface elevations and contour maps; direction and rate of horizontal and vertical groundwater flow;

(e) A description of regional groundwater trends including vertical and horizontal flow directions and rates;

(f) All elevations and top of well casings must be related to the North American vertical datum of 1988 (NAVD88) and the horizontal datum must be in accordance with chapter 58.20 RCW, Washington Coordinate System and as amended per chapter 332-130 WAC;

(g) Quantity, location, and construction (where available) of private and public wells within a two thousand foot (six hundred ten meter) radius of site;

(h) Tabulation of all water rights for groundwater and surface water within a two thousand foot (six hundred ten meter) radius of the site;

(i) Identification and description of all surface waters within a one-mile (1.6 kilometer) radius of the site;

(j) A summary of all previously collected groundwater and surface water analytical data, and for expanded facilities, identification of impacts from the existing facility on ground and surface waters;

(k) Calculation of a site water balance;

(l) Conceptual design of a groundwater and surface water monitoring system, including proposed installation methods for all devices and well construction diagrams, and where applicable a vadose zone monitoring plan;

(m) Land use in the area, including nearby residences;

(n) A topographic map of the site and drainage patterns; an outline of the waste management area and MSWLF units, property boundary, the proposed location of groundwater monitoring wells; and

(o) Geologic cross-sections.

(3) Groundwater flow path analysis. The hydrogeologic report must include a summary groundwater flow path analysis which includes all supportive documentation, and calculations of the performance criteria of WAC 173-351-405.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-490, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-490, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-500 Closure and post-closure care.** (1) Closure criteria.

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

(i) The final cover system must be designed and constructed to:

(A) Have a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and minimize infiltration through the closed MSWLF by the use of an anti-infiltration layer that contains a composite layer as defined in (a)(i)(B) of this subsection;

(B) For the purpose of this section, "composite layer" means a system consisting of two components; the upper component must consist of a minimum of 30 mil (0.76 mm) thickness of geomembrane (60 mils (1.5 mm) for high density polyethylene geomembranes). The lower component must consist of at least a two-foot (60 cm) layer of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-5}$  cm/sec. The geomembrane must be installed in direct and uniform contact with the compacted soil component;

(C) Minimize erosion of the final cover by use of an anti-erosion layer that contains a minimum of a one-foot (30 cm) layer of earthen material of which at least six inches (15 cm) of the uppermost layer is capable of sustaining native plant growth; and

(D) Address anticipated settlement (with a goal of achieving no less than two to five percent slopes after settlement), drainage and/or the need for drainage layers, gas generation and/or the need for gas layers, freeze-thaw, desiccation and stability and mechanical strength of the design.

(ii) The jurisdictional health department, with the written concurrence of the department, may approve an alternative final cover design equivalent to that specified in (a)(i) of this subsection that includes:

(A) An anti-infiltration layer that has a permeability less than or equal to the permeability of any bottom liner system and natural subsoils present, and achieves an equivalent reduction in infiltration as an anti-infiltration layer with a permeability no greater than  $1 \times 10^{-5}$  cm/sec containing at least two feet (60 cm) of earthen material;

(B) An anti-erosion layer that provides equivalent protection from wind and water erosion as a layer that contains a minimum of one foot (30 cm) of earthen material of which at least six inches (15 cm)

of the uppermost layer is capable of sustaining native plant growth; and

(C) The additional design features of (a)(i)(D) of this subsection.

(b) The owner or operator must prepare a written closure plan that describes the steps necessary to close all MSWLF units at any point during its active life. The closure plan must be submitted to and approved by the jurisdictional health department during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) and must include the following information:

(i) A description of the final cover, designed in accordance with (a) of this subsection and the methods and procedures to be used to install the cover;

(ii) An estimate of the largest area of the MSWLF unit or all MSWLF units ever requiring a final cover as required under (a) of this subsection at any time during the active life;

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

(iv) A schedule for completing all activities necessary to satisfy the closure criteria in this subsection including sequencing of each MSWLF unit and the use of intermediate cover.

(c) The owner or operator of existing MSWLF units must no later than November 26, 1993:

(i) Prepare a closure plan;

(ii) Place the closure plan in the operating record; and

(iii) Notify the jurisdictional health department that (c)(i) and (ii) of this subsection have occurred.

(d) One hundred eighty days (but no sooner than November 26, 1993) prior to beginning closure activities of each MSWLF unit or all MSWLF units as specified in (e) of this subsection, the owner or operator must:

(i) Notify the jurisdictional health department and the financial assurance trustee and/or insurer of the intent to close the MSWLF unit or all MSWLF units according to the approved closure plan; and

(ii) Submit final engineering closure plans for review, comment, and approval by the jurisdictional health department.

(e) The owner or operator must begin closure activities of each MSWLF unit or all MSWLF units in accordance with the closure plan no later than thirty days after the date on which the MSWLF unit or all MSWLF units receives the known final receipt of wastes. If the MSWLF unit or all MSWLF units has remaining capacity and there is a reasonable likelihood that the MSWLF unit or all MSWLF units will receive additional wastes, the owner or operator must begin closure activities 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 jurisdictional health department if the owner or operator demonstrates during the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that the MSWLF unit or all MSWLF units has the capacity to receive additional waste and the owner or operator has taken and will continue to take all steps including the application of intermediate cover necessary to prevent threats to human health and the environment from the unclosed MSWLF unit or all MSWLF units.

(f) The owner or operator of all MSWLF units must complete closure activities of each MSWLF unit or all MSWLF units in accordance with the closure plan within one hundred eighty days following the beginning of closure as specified in (e) of this subsection. Extensions



of the closure period may be granted by the jurisdictional health department if the owner or operator demonstrates that closure will, of necessity, take longer than one hundred eighty days and he/she has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed MSWLF unit.

(g) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must submit to the jurisdictional health department a certification or declaration of construction signed by an independent registered professional engineer verifying that closure has been completed in accordance with the approved final engineering plans and the closure plan.

(h) Environmental covenant. Following closure of all MSWLF units, the owner or operator must file an environmental covenant conforming to the procedures and requirements of chapter 64.70 RCW, Uniform Environmental Covenants Act. Unless waived in writing by the department, the environmental covenant shall be in a form approved by the department and include at a minimum the following provisions:

(i) State that the document is an environmental covenant executed pursuant to chapter 64.70 RCW;

(ii) Contain a legally sufficient description of the real property subject to the covenant;

(iii) Designate the department, or other person approved by the department, as the holder of the covenant;

(iv) Be signed by the department, every holder, and, unless waived by the department, every owner of a fee simple interest in the real property subject to the covenant;

(v) Identify the name and location of the administrative record for the property subject to the environmental covenant;

(vi) Describe with specificity the activity or use limitations on the real property subject to the covenant. At a minimum, this shall prohibit uses and activities that:

(A) Threatens the integrity of any cover, waste containment, stormwater control, gas, leachate, public access control, or environmental monitoring systems;

(B) May interfere with the operation and maintenance, monitoring, or other measures necessary to assure the integrity of the MSWLF unit and continued protection of human health and the environment; and

(C) May result in the release of solid waste constituents or otherwise exacerbate exposures.

(i) Grant the department and the jurisdictional health department the right to enter the property at reasonable times for the purpose of evaluating compliance with the environmental covenant, including the right to take samples.

(2) Post-closure care requirements.

(a) Following closure of each MSWLF unit or all MSWLF units, the owner or operator must conduct post-closure care. Post-closure care must be conducted for thirty years or as long as necessary for the landfill to become functionally stable. A landfill is functionally stable when it does not present a threat to human health or the environment at the point of exposure for humans or environmental receptors. The point of exposure is identified as the closest location at which a receptor could be exposed to contaminants and receive a dose by a credible pathway from the MSWLF unit. Potential threats to human health or the environment are assessed by considering leachate quality and quantity, landfill gas production rate and composition, cover system integrity, and groundwater quality. The post-closure care period

may be adjusted as provided under (b) of this subsection. Post-closure care must consist of at least the following:

(i) 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, maintaining the vegetative cover (including cutting of vegetation when needed) or other events, and preventing run-on and runoff from eroding or otherwise damaging the final cover;

(ii) Maintaining and operating the leachate collection system in accordance with the requirements in WAC 173-351-300 if applicable. The jurisdictional health department may recommend to the department and the department under its authority in chapter 90.48 RCW, the Water Pollution Control Act, 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;

(iii) Monitoring the groundwater in accordance with the requirements of WAC 173-351-400 and maintaining the groundwater monitoring system; and

(iv) Maintaining and operating the gas monitoring system in accordance with the requirements of WAC 173-351-200(4).

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

(i) Decreased by the jurisdictional health department 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 jurisdictional health department; or

(ii) Increased by the jurisdictional health department if the jurisdictional health department determines that the lengthened period is necessary to protect human health and the environment;

(iii) The jurisdictional health department and owner or operator will consider at least the following factors when determining when a landfill unit is functionally stable or whether to decrease or increase the post-closure care period:

(A) Leachate. Leachate production and quality must be such that maintenance and operation of the leachate collection system can be ceased beyond the post-closure care period without posing a threat to human health or the environment.

(B) Landfill gas. Landfill gas production and composition must be such that maintenance and operation of the gas collection system can be ceased beyond the post-closure care period while meeting the criteria in WAC 173-351-200 (4)(a)(i) through (iii) and not pose a threat to human health or the environment from methane or nonmethane compounds.

(C) Settlement and cover integrity. The cover system must attain geotechnical stability for slope and settlement. Vegetation and other erosion controls must prevent exposing waste or otherwise threaten integrity of the cover system. The cover system must stabilize such that no additional care is required beyond the post-closure care period to ensure its integrity from settlement or erosion.

(D) Groundwater quality. Groundwater quality must remain in compliance with the protection standards established in WAC 173-351-440(8) at the relevant point of compliance.

(c) The owner or operator of all MSWLF units must prepare and submit a written post-closure plan to the jurisdictional health department through the permit process of WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) that includes the following information. Owners or operators must prepare and submit modifications to existing post-closure plans to incorporate the crite-

ria in (b)(iii) of this subsection or environmental covenants in subsection (1)(h) of this section by November 1, 2013.

(i) A description of the monitoring and maintenance activities required in (a) of this subsection for each MSWLF unit or all MSWLF units, and the frequency at which these activities will be performed;

(ii) A description of the monitoring performed and an estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in (b)(iii) of this subsection;

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

(iv) A description of the planned uses of the property during the post-closure period and activity or use limitations placed on the real property by the environmental covenant (1)(h) of this section. Post-closure use of the property must not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring or control systems unless necessary to comply with the requirements of this regulation. The jurisdictional health department 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) Following completion of the post-closure care period for each MSWLF unit or all MSWLF units, the owner or operator must submit to the jurisdictional health department a certification or declaration of construction signed by an independent licensed professional engineer verifying that post-closure has been completed in accordance with the post-closure plan.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-500, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-500, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-600 Financial assurance criteria.** (1) Applicability and effective date.

(a) The requirements of this section apply to owners and operators of all MSWLF units.

(b) The requirements of this section are effective on the effective date of this rule.

(2) 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 under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to close the largest area of all MSWLF units ever requiring a final cover as required under WAC 173-351-500(1), Closure criteria, at any time during the active life in accordance with the closure plan. The owner or operator must submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6).

(i) The cost estimate must equal the cost of closing the largest area of all MSWLF units 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 the closure plan as required in WAC 173-351-500 (1)(b)(ii).

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

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

(iv) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of all MSWLF units. The owner or operator must submit justification for the reduction of the closure cost estimate and the amount of financial assurance to the jurisdictional health department for approval as a condition of the solid waste permit.

(b) The owner or operator of each MSWLF unit must establish financial assurance for closure of the MSWLF unit in compliance with subsection (5) of this section. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with WAC 173-351-500 (1)(g) and (h).

(3) 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 under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to conduct post-closure care for all MSWLF units in compliance with the post-closure plan developed under WAC 173-351-500(2). The post-closure cost estimate 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 submit the detailed written estimate for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6).

(i) 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.

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

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

(iv) The owner or operator may reduce the post-closure cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner or operator must submit justification for the reduction of the post-closure cost estimate and the amount of financial assurance to the jurisdictional health department for approval as a condition of the solid waste permit.

(b) The owner or operator of each MSWLF unit must establish, in a manner in accordance with subsection (5) of this section, financial assurance for the costs of post-closure care as required under WAC

173-351-500(2). 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 WAC 173-351-500 (2)(e).

(4) Financial assurance for remedial action.

(a) An owner or operator of a MSWLF unit required to undertake a remedial action program under WAC 173-351-440(7) must have a detailed written estimate, in current dollars, of the cost of hiring a third party under a contract subject to chapter 39.12 RCW, Prevailing wages on public works, to perform the remedial action in accordance with the program required under WAC 173-351-440(7). The remedial action cost estimate must account for the total costs of remedial action activities as described in the cleanup action plan for the entire remedial action period. Cost estimates are not required for interim actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit. The owner or operator must submit the remedial action cost estimate to the department for approval.

(i) The owner or operator must annually adjust the estimate for inflation until the remedial action program is completed in accordance with WAC 173-351-440(7).

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

(iii) The owner or operator may reduce the amount of the remedial action cost estimate and the amount of financial assurance provided under (b) of this subsection if the cost estimate exceeds the maximum remaining costs of remedial action. The owner or operator must submit justification for the reduction of the remedial action cost estimate and the amount of financial assurance to the department for approval.

(b) The owner or operator of each MSWLF unit required to undertake a remedial action program under WAC 173-351-440(7), must establish, in a manner in accordance with subsection (5) of this section, financial assurance for the costs of remedial actions identified in the cleanup action plan. The owner or operator must provide continuous coverage for remedial action until released from remedial action under the Model Toxics Control Act regulation, chapter 173-340 WAC. Financial assurance is not required for interim actions when the estimated time required to complete the interim action is less than the remaining active life of the MSWLF unit.

(5) Allowable mechanisms. Owners and operators of MSWLF units must use the financial mechanisms specified in (a), (b), or (c) of this subsection.

(a) Municipal corporations owning or operating MSWLF units must establish closure, post-closure, and remedial action reserve accounts in one of the following ways:

(i) Reserve account. Cash and investments accumulated in a reserve fund restricted for the purpose of closure, post-closure care, or remedial action for known releases;

(ii) Cash and investments in a trust fund;

(iii) Surety bond(s);

(iv) Letter of credit; or

(v) Municipal corporations may satisfy the financial assurance requirements of this section for remedial action in one of the following additional ways:

(A) An interlocal agreement entered into under the Interlocal Cooperation Act, chapter 39.34 RCW, obligating the participating local governments to pay for the remedial action; and

(B) Local government financial test in conformance with 40 C.F.R. 258.74(f). All records required under 40 C.F.R. Part 358.74 (f)(3) must be submitted to the jurisdictional health department and the department.

(b) Private companies owning or operating MSWLF units must establish closure, post-closure, and remedial action financial assurance in one of the following ways:

(i) Cash or investments in a trust fund;

(ii) Surety bond(s);

(iii) Letter of credit.

(c) Use of multiple financial mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility. The mechanisms must be as specified in (a) and (b) of this subsection, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure, or remedial action, whichever is applicable. Mechanisms guaranteeing performance rather than payment may not be combined with other instruments.

(d) The language of the financial assurance mechanisms listed in this section must ensure that the instruments satisfy the following criteria:

(i) The amount of funds assured is sufficient to cover the costs of closure, post-closure, and remedial action for known releases when needed;

(ii) The funds will be available in a timely fashion when needed; and

(iii) The owner or operator must obtain financial assurance by the effective date of these requirements or prior to the initial receipt of solid waste for closure and post-closure, and no later than one hundred twenty days after establishment of the cleanup action plan for remedial action.

(e) The financial assurance mechanisms must be legally valid, binding, and enforceable under state and federal law.

(f) An owner or operator satisfying the requirements of this section using a reserve account or trust fund must file with the jurisdictional health department and the department audit reports of the financial assurance accounts established for closure, post-closure, and remedial action, and a statement of the percentage of user fees, as applicable, diverted to the financial assurance instruments:

(i) For facilities owned and operated by municipal corporations, the financial assurance accounts must be audited according to the audit schedule of the office of state auditor. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(ii) For facilities not owned or operated by municipal corporations:

(A) Annual audits must be conducted by a certified public accountant licensed in the state of Washington. A certification of audit completion and summary findings must be filed with the jurisdictional health department and the department, including during the post-closure care period and while required to undertake remedial action.

(B) The audit must also include, as applicable, calculations demonstrating the proportion of closure, post-closure, or remedial action activities completed during the preceding year as specified in the closure, post-closure, or cleanup action plans.

(6) Financial assurance instruments established under this section must meet the following criteria.

(a) Trust fund. An owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of (a)(i) through (viii) of this subsection.

(i) 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. The owner or operator must place a copy of the trust agreement for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) for closure and post-closure financial assurance and to the department for approval for remedial action financial assurance.

(ii) Pay-in period. Payments into the trust fund must be made annually by the owner or operator over the duration (as defined in WAC 173-351-750) of the initial or reissued 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 remedial action program in the case of remedial action for known releases. This period is referred to as the pay-in period.

(iii) 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 when using multiple mechanisms as provided in subsection (5)(c) of this section, divided by the number of years in the pay-in period as defined in (a)(ii) of this subsection. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{CE-CV}{Y}$$

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.

(iv) For a trust fund used to demonstrate financial assurance for remedial action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for remedial action, except when using multiple mechanisms as provided in subsection (5)(c) of this section, divided by the number of years in the remedial action pay-in period as defined in (a)(ii) of this subsection. The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{RB-CV}{Y}$$

where RB is the most recent estimate of the required trust fund balance for remedial action (i.e., the total costs that will be incurred during the second half of the remedial action period), CV is the cur-

rent value of the trust fund, and Y is the number of years remaining in the pay-in period.

(v) The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of this section, whichever is later, in the case of closure and post-closure care, or no later than one hundred twenty days after the cleanup action plan has been established in accordance with the requirements of WAC 173-351-440 (6) and (7).

(vi) If the owner or operator establishes a trust fund after having used one or more alternate mechanisms specified in this subsection, 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 (a)(iii) and (iv) of this subsection as applicable.

(vii) The owner or operator, or other person authorized to conduct closure, post-closure care, or remedial action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if:

(A) Sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or remedial action;

(B) If justification and documentation of the cost is submitted to the jurisdictional health department for closure and post-closure or the department for remedial action for review and approval; and

(C) The owner or operator has a post-closure permit in effect according to WAC 173-351-720 (4)(c).

(viii) The trust fund may be terminated by the owner or operator only if:

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

(B) The owner or operator is no longer required to demonstrate financial responsibility in accordance with the requirements of subsection (2)(b), (3)(b), or (4)(b) of this section.

(b) Surety bond guaranteeing payment or performance. An owner or operator may satisfy the requirements of this section with a surety bond guaranteeing payment or performance which conforms to the requirements of (b)(i) through (viii) of this subsection.

(i) The owner or operator must place a copy of the bond and standby trust agreement for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 or through the permit modification process of WAC 173-351-720(6) for closure and post-closure financial assurance and the department for approval for remedial action financial assurance.

(ii) The surety company must be listed as acceptable in Circular 570 of the United States Treasury Department.

(iii) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure, or remedial action cost estimate except when using multiple financial mechanisms as provided in subsection (5)(d) of this section.

(iv) The surety must become liable for the bond obligation if the owner or operator fails to perform as guaranteed by the bond.

(v) The owner or operator must also establish a standby trust fund meeting the requirements of (6)(a) of this subsection except for specified initial and subsequent annual payments. 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.



(vi) The surety may not cancel the bond until at least one hundred twenty days after the owner or operator, the jurisdictional health department, and the department have received notice of cancellation. If the owner or operator has not provided alternate financial assurance conforming to this section within ninety days of the cancellation notice, the surety must pay the amount of the bond into the standby trust fund.

(vii) The owner or operator may cancel the bond only by substituting alternate financial assurance conforming to this section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with subsection (2)(b), (3)(b), or (4)(b) of this section.

(viii) The following types of surety bonds are allowed:

(A) Surety bond; or

(B) Surety bond guaranteeing that the owner or operator will perform final closure, post-closure, or remedial action activities.

(c) Irrevocable letter of credit. An owner or operator may satisfy the requirements of this section with an irrevocable letter of credit which conforms to the requirements of (c)(i) through (v) of this subsection. The issuing institution must have the authority to issue letters of credit and its letter of credit operations must be regulated and examined by a federal or state agency.

(i) The owner or operator must also establish a standby trust fund meeting the requirements of (a) of this subsection except for specified initial and subsequent annual payments. Payments made under the terms of the irrevocable letter of credit will be deposited by the institution directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(ii) The following must be submitted for approval by the jurisdictional health department in the application for a permit under WAC 173-351-700 for closure and post-closure financial assurance, and to the department for approval for remedial action financial assurance:

(A) The letter of credit;

(B) 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, address of the facility, and the amount of funds assured; and

(C) A copy of the standby trust agreement.

(iii) 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 closure, post-closure, or remedial action cost estimate except when using multiple financial mechanisms as provided in subsection (5)(d) 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 notifies the owner or operator, the jurisdictional health department, and the department at least one hundred twenty days before the current expiration date.

(iv) If the owner or operator fails to perform activities according to the closure, post-closure, or cleanup action plans, or if the owner or operator fails to provide alternate financial assurance conforming to this section within ninety days after notification that the letter of credit will not be extended, the issuing institution must deposit the funds from the letter of credit to the standby trust fund.

(v) The owner or operator may cancel the letter of credit only by substituting alternate financial assurance conforming to this section or if the owner or operator is no longer required to demonstrate fi-

financial responsibility in accordance with subsection (2)(b), (3)(b), or (4)(b) of this section.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-600, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-600, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-700 Permitting requirements.** (1) WAC 173-351-700 through 173-351-750 are the permitting requirements of chapter 173-351 WAC, Criteria for municipal solid waste landfills. Except as provided in subsection (4) of this section, no owner or operator shall construct, operate, close, or perform post-closure activity with respect to a facility except in conformance with a valid MSWLF permit issued pursuant to this chapter.

(2) Transition rules for existing MSWLF units. The following constitute the transition rules for this section:

(a) Existing MSWLF units with valid chapter 173-304 WAC permits expiring before November 26, 1993. Owners or operators of existing MSWLF units having valid permits expiring before November 26, 1993, must apply for a valid MSWLF permit no later than January 24, 1994, to continue operation under the terms of this regulation. Each valid chapter 173-304 WAC permit expiring before November 26, 1993, is hereby continued until the valid MSWLF permit is issued under these rules. For these transition rules, the owner or operator must prepare applications according to WAC 173-351-730(4), Reissuance/transition applications. Upon issuance of a valid MSWLF permit, the owner or operator must comply with the requirements of this regulation.

Note: MSWLF units that do not accept waste on or after November 26, 1993, and close under chapter 173-304 WAC, Minimum functional standards for solid waste handling, and the federal rules for closure under 40 C.F.R. Part 258.60 would continue to be permitted under chapter 173-304 WAC unless such MSWLF units are part of a multiunit groundwater monitoring system according to WAC 173-351-450(4).

(b) Existing MSWLF units with valid chapter 173-304 WAC permits expiring on or after November 26, 1993. Each valid chapter 173-304 WAC permit (for existing MSWLF units) expiring on or after November 26, 1993, is hereby continued until the expiration date set forth in the permit. Owners and operators must comply with the conditions of the permit and the regulations of chapter 173-304 WAC, in effect on October 8, 1993, for the duration of that permit. Owners or operators of existing MSWLF units with valid chapter 173-304 WAC permits expiring on or after November 26, 1993, must apply for a valid MSWLF permit no later than January 24, 1994. For these transition rules, the owner or operator must prepare applications according to WAC 173-351-730(4), Reissuance/transition applications. Upon issuance of a valid MSWLF permit, the owner or operator must comply with the requirements of this regulation.

(3) New and laterally expanded MSWLF units. New and laterally expanded MSWLF units receiving waste after November 26, 1993, must meet the requirements of this section before construction has begun and before waste is accepted to the MSWLF unit or lateral expansion.

Note: Any owner or operator planning to incorporate a 50 percent increase or greater in design volume capacity not previously authorized in permit, or unpermitted changes resulting in significant adverse environmental impacts that have led a responsible official to issue a declaration of significance under WAC 197-11-736 must meet the requirements of this section before construction has begun and before waste is accepted to the MSWLF unit, or lateral expansion.

(4) Exemptions. The MSWLF units identified in this subsection are exempt from this section:

(a) MSWLF units that are excluded under WAC 173-351-010 (2)(b);

(b) Single family residences and single family farms dumping or depositing solid waste resulting from their own domestic, on-site activities onto or under the surface of land owned or leased by them when such action does not create a nuisance, violate any other statutes, ordinances, regulations, or this regulation, provided that such facilities:

(i) Are fenced or otherwise protected by natural barriers from unauthorized entry by the general public and large animal scavengers; and

(ii) Have placed a monthly soil cover to allow no visible solid waste.

(c) Remedial actions at a MSWLF unit performed by the state and/or in conjunction with the United States Environmental Protection Agency to implement the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), the Model Toxics Control Act or remedial actions taken by others to comply with a state and/or federal cleanup order provided that:

(i) The action results in an overall improvement of the environmental impact of the site;

(ii) The action does not require or result in additional waste being delivered to the facility or increase the amount of waste or contamination present at the facility;

(iii) The substantive provisions of this chapter are met; and

(iv) The jurisdictional health department is informed of the actions to be taken and is given the opportunity to review and comment upon the proposed remedial action plans.

Note: MSWLF units not covered under remedial action are not exempted from permitting under this section.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-700, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-700, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-710 Research, development, and demonstration permits.** (1) The jurisdictional health department, with the written concurrence of the department, may issue a research, development, and demonstration permit for a new MSWLF unit, existing MSWLF unit, or lateral expansion, from which the owner or operator proposes to utilize innovative methods which vary from the following criteria provided that the MSWLF unit has a leachate collection system designed and constructed to maintain less than a one foot (30 cm) depth of leachate on the liner and has not been identified as a potential source of contamination:

(a) The run-on control system in WAC 173-351-200(7); and

(b) The liquids restriction in WAC 173-351-200(9).

(2) The jurisdictional health department, with the written concurrence of the department, 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 methods which vary from the final cover criteria of WAC 173-351-500 (1)(a), provided the MSWLF unit owner or operator demonstrates that the MSWLF unit is not a source of contamination and the infiltration of liquid through the alternative cover system will not

cause contamination of groundwater or surface water, or cause the leachate depth on the liner to exceed one foot (30 cm).

(3) The jurisdictional health department and the department must follow the procedures of WAC 173-351-720(1) except the jurisdictional health department must not issue a permit if the department recommends against its issuance. Any permit issued under this section must include terms and conditions that are at least as protective as the criteria for municipal solid waste landfills, and assure protection of human health and the environment. Such permits must:

(a) Include clearly stated and demonstrable project goals;

(b) Provide for the construction and operation of such facilities as necessary, for not longer than three years, unless renewed as provided in subsections (5) and (6) of this section;

(c) Provide that the MSWLF unit must receive only those types and quantities of municipal solid waste and nonhazardous waste which the jurisdictional health department deems appropriate for the purposes of determining the efficacy and performance capabilities of the technology or process;

(d) Include requirements necessary to protect human health and the environment, including requirements necessary for testing and providing information to the jurisdictional health department with respect to the operation of the facility;

(e) Require the owner or operator of a permitted MSWLF unit under this section to submit an annual report to the jurisdictional health department and the department 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 and any other operating information specified by the jurisdictional health department in the permit; and

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

(4) The jurisdictional health department may order an immediate termination of all operations at the facility permitted under this section or other corrective measures any time it determines that the overall goals of the project are not being attained or protecting human health and the environment.

(5) Any permit issued under this section must not exceed three years and each renewal must not exceed three years. The total term for a project permit including renewals may not exceed twelve years.

(6) Permit renewal.

(a) The owner or operator of a MSWLF unit must apply for renewal of a permit under this section at least ninety days before the existing permit expires. The owner or operator must provide the jurisdictional health department two copies of:

(i) A detailed assessment of the project showing the status with respect to achieving project goals;

(ii) A list of problems and status with respect to problem resolutions;

(iii) The information required in WAC 173-351-730 (3)(b); and

(iv) Any other requirements that the jurisdictional health department determines necessary for permit renewal.

(b) Once the jurisdictional health department determines that a renewal application is factually complete, it must refer one copy to the appropriate regional office of the department for review and comment.

(c) Standards for approval. The jurisdictional health department and the department must review the original application and additional

information contained in the renewal application to determine whether the facility meets all applicable laws and regulations and conforms to the most recently adopted comprehensive solid waste management plan.

(d) Fees. The jurisdictional health department may establish reasonable fees for permits and renewal of permits. All permit fees collected by the health department must be deposited in the account from which the jurisdictional health department's operating expenses are paid.

(e) Department's findings. The department will report to the jurisdictional health department its findings on each renewal permit application within thirty days of receipt of a complete application. Additionally, the department must recommend for or against the renewal of each research, demonstration, and demonstration permit by the jurisdictional health department.

(f) Permit approval. When the jurisdictional health department has evaluated all information in the renewal application, it will, with the written concurrence of the department renew the permit for a period not to exceed three years or deny the permit. Every complete renewal application must be approved or disapproved within forty-five days after its receipt by the jurisdictional health department or inform the owner or operator as to the status of the application with a schedule for final determination.

(g) Permit format. Every permit issued by a jurisdictional health department must be on a format prescribed by the department and contain specific requirements necessary for the proper operation of the facility including the requirement that final engineering plans and specifications be submitted for approval by the jurisdictional health department.

(h) Filing permits with the department. The jurisdictional health department must mail all renewed permits to the department no more than seven days after the date of issuance. The department will review and may appeal the permit as set forth in RCW 70.95.185 and 70.95.190. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-710, filed 11/8/12, effective 12/9/12.]

**WAC 173-351-720 Permit application procedures.** (1) Initial and reissuance procedures.

(a) Forms and complete application. An application for a permit under this regulation must be submitted on a form prescribed by the department. In order to be complete:

(i) Two or more copies (as determined by the jurisdictional health department) of the application must have been signed by the owner and operator and received by the jurisdictional health department;

(ii) The application must include evidence of compliance with the State Environmental Policy Act (SEPA) rules, chapter 197-11 WAC; and

(iii) The application must include the plans, reports, and other supporting information required by this regulation.

(b) Notice. Once the jurisdictional health department determines that an application for a permit is complete, it will:

(i) Refer one copy to the appropriate regional office of the department for review and comment;

(ii) For all permits except renewal, modified and transition permits give notice of its receipt of a complete permit application to the public and to interested persons for public comment for thirty days after the publication date of the notice and perform the following additional public notification requirements:

(A) Mail the notice to persons who have requested notice in writing;

(B) Mail the notice to state agencies and local governments with a regulatory interest in the proposal;

(C) Include in the public notice a statement that any person may express their views in writing to the jurisdictional health department within thirty days of the last date of publication;

(D) Mail a copy of the MSWLF permit decision to any person who has made written request for such decision; and

(E) Add the name of any person, upon request, to a mailing list to receive copies of notices for all applications.

(c) Standards for approval. The jurisdictional health department must investigate every application to determine whether the facility meets all applicable laws and regulations, conforms to the most recently adopted comprehensive solid waste management plan in effect at the time of application and complies with all zoning requirements. A land use permit or letter from the jurisdictional zoning authority is sufficient to demonstrate compliance with zoning requirements.

(d) Fees. The jurisdictional health department may establish reasonable fees for permits and renewal of permits. All permit fees collected by the health department must be deposited in the account from which the jurisdictional health department's operating expenses are paid.

(e) Department's findings. The department will report to the jurisdictional health department its findings on each permit application within forty-five days of receipt of a complete application or inform the jurisdictional health department as to the status of the application and when it expects its findings will be transmitted to the jurisdictional health department. Additionally, the department must recommend for or against the issuance of each permit by the jurisdictional health department.

(f) Permit approval. When the jurisdictional health department has evaluated all information in the public record, it will issue or deny a permit. Every complete permit application must be approved or disapproved within ninety days after its receipt by the jurisdictional health department or inform the owner or operator as to the status of the application with a schedule for final determination.

(g) Permit format. Every permit issued by a jurisdictional health department must be on a format prescribed by the department and contain specific requirements necessary for the proper operation of the facility including the requirement that final engineering plans and specifications be submitted for approval by the jurisdictional health department.

(h) Filing permits with the department. The jurisdictional health department must mail all issued permits to the department no more than seven days after the date of issuance. The department will review and may appeal the permit as set forth in RCW 70.95.185 and 70.95.190. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

(2) SEPA review. The State Environmental Policy Act (SEPA), the SEPA rules and local SEPA rules apply to permit decisions made pursuant to this chapter.

(3) Preapplication meetings. Preapplication meetings between the jurisdictional health department and the owner or operator are encouraged to address, among other things, the development of a complete application.

(4) Activities authorized in permits, generally.

(a) Construction. A valid MSWLF permit entitles the owner or operator to construct the MSWLF unit or MSWLF units, subject to conditions the jurisdictional health department may impose. Authorization to construct each lateral expansion or subsequent MSWLF unit is subject to the preconstruction review requirements of WAC 173-351-750(4) and the construction of each lateral expansion or MSWLF unit must comply with all requirements of this regulation and other regulations applicable at the time jurisdictional health department approval is granted.

(b) Operation. Except for MSWLF units governed by the transition rules of WAC 173-351-700(2), the jurisdictional health department's approval to accept solid waste will not be given until the owner or operator has demonstrated to the jurisdictional health department's satisfaction that each MSWLF unit has been constructed in accordance with the approved plans and specifications for that MSWLF unit.

(c) Post-closure activities. The jurisdictional health department's approval for post-closure activities will not be given until the permittee has demonstrated to the jurisdictional health department's satisfaction that the MSWLF unit or all the MSWLF units have been closed in accordance with the final engineering plans of WAC 173-351-500 (1)(e)(ii) and the approved closure plan.

Note: Failure to obtain approval for post-closure activities may prevent reimbursement under post-closure financial assurance in WAC 173-351-600.

(5) Renewal procedures. Except as provided in WAC 173-351-710(6), the owner or operator of a facility must apply for renewal of the MSWLF permit at least thirty days before the renewal date. The owner or operator is authorized to continue activities authorized under the most recent expired permit, if the jurisdictional health department has not rendered a decision on renewal by the renewal date of the current permit.

(a) Prior to renewing a permit, the jurisdictional health department will:

(i) Review the original application, modifications, and additional information required in WAC 173-351-730 (3)(b) for compliance with these regulations; and

(ii) Collect the renewal fee if the jurisdictional health department so chooses.

(b) If the facility meets all applicable laws and regulations and conforms to the most recently adopted comprehensive solid waste management plan, the jurisdictional health department may renew the permit for a period not to exceed five years; and

(c) The jurisdictional health department must file the renewed permit with the department no more than seven days after the date of renewal. The department will review and may appeal the renewal as set forth in RCW 70.95.185 and 70.95.190. See also reissuance under subsection (6) of this section. No permit issued pursuant to this chapter will be valid unless it has been reviewed by the department.

(6) Permit modifications.

(a) Any owner or operator intending to modify a valid MSWLF permit must file a modification application at least forty-five days before the intended modification. A modification application must be made on forms authorized by the jurisdictional health department and

the department, and the forms must include information identified in WAC 173-351-730 (3) (a).

(b) The jurisdictional health department will follow the procedures of subsection (1) of this section in issuing a permit modification except for the following:

(i) Subsection (1) (b) (ii) and (iii) of this section, public notice;

(ii) The department will report its findings under subsection (1) (e) of this section within thirty days; and

(iii) The jurisdictional health department will approve or disapprove the modification application within forty-five days after its receipt or inform the owner or operator as to the status of the application with a schedule for final determination.

(c) To allow for permit modifications to be authorized at the time of permit renewal, any owner or operator may combine the application required for a permit modification in WAC 173-351-730 (3) (a) with the application required for a renewal permit in WAC 173-351-730 (3) (b).

(d) Lateral expansions, a fifty percent increase or greater in design volume capacity, or changes resulting in significant adverse environmental impacts that have led a responsible official to issue a declaration of significance under WAC 197-11-736 are not considered a modification but require permit reissuance under these rules.

(7) Permit reissuance. Any owner or operator intending to continue construction, operation, or post-closure beyond the permitted duration of a valid MSWLF permit must file a reissuance application at least ninety days before the existing permit expires. Reissuance applications are subject to the public notification process of subsection (1) (b) of this section. A reissuance application must be made on forms authorized by the jurisdictional health department and the department, and must include information identified in WAC 173-351-730(4). The jurisdictional health department will follow the procedures of subsection (1) of this section in reissuing a permit.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-720, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-720, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-730 Contents of applications.** (1) Applications for MSWLF permits and level of detail.

(a) General requirements for MSWLF permit applications and level of detail.

(i) An application for an MSWLF permit to construct, operate, and conduct post-closure activities at a facility must include all applicable information identified in this section.

(ii) The information in every application submitted under this regulation must be of sufficient detail so as to allow the jurisdictional health department to fulfill its responsibilities under SEPA and this regulation by:

(A) Having detail sufficient to be readily understood by the persons using the documents to enable them to determine how the facility will be constructed, operated, and closed and how it will be monitored and maintained after closure;



(B) Providing the jurisdictional health department with sufficient detail to ascertain the environmental impact of the proposed project; and

(C) Providing sufficient detail to demonstrate that the location, design, construction, operation, closure, and post-closure monitoring and maintenance of the MSWLF will be capable of compliance with the applicable requirements of this regulation.

(iii) If the facility is to be constructed in phases, the initial application must contain the conceptual design for the entire facility and the information of subsection (1)(b) of this section for the initial MSWLF unit and other MSWLF units that will be constructed during the active life of the facility.

(iv) Applications for new MSWLF units or lateral expansions must include documentation that all owners of property located within one thousand feet of the facility property boundary have been notified that the proposed facility may impact their ability to construct water supply wells in accordance with chapter 173-160 WAC, Minimum standards for construction and maintenance of wells.

(b) Specific requirements for permit applications. In addition to other requirements set forth in this section, complete applications for MSWLF permits must contain the following:

(i) Engineering plans that set forth the proposed facility's location, property boundaries, adjacent land uses, and detailed construction plans pursuant to subsection (5)(a) of this section;

(ii) How the facility will meet the location standards of WAC 173-351-130 and 173-351-140;

(iii) A hydrogeologic report and water quality monitoring plan prepared in accordance with the provisions of WAC 173-351-400;

(iv) A plan of operation that describes how the facility will meet the operating requirements set forth in WAC 173-351-200, 173-351-210, and 173-351-220;

(v) An engineering report describing the existing site conditions and an analysis of the facility, including closure and post-closure criteria conforming with subsection (5)(b) of this section;

(vi) A construction quality assurance and quality control plan prepared in accordance with subsection (6) of this section;

(vii) Closure and post-closure plans required by WAC 173-351-500;

(viii) A permit or signed permit application satisfying the applicable requirements for MSWLF units with leachate collection systems:

(A) Discharge under the Water Pollution Control Act, chapter 90.48 RCW;

(B) Either a legal document (contract, local permit, a signed permit application etc.) certifying acceptance of leachate by the operator of a wastewater treatment facility for the discharge of leachate to that facility;

(C) Surface impoundments or tanks under WAC 173-350-330; and

(D) Other environmental permits applicable to managing leachate at the facility.

(ix) Cost estimates and mechanisms the owner or operator will use to meet the financial assurance requirements of WAC 173-351-600;

(x) How the owner or operator will meet the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities;

(xi) A demonstration of how the MSWLF conforms to the approved local comprehensive solid waste management plan in place at the time of application; and

(xii) Any other information as required by the jurisdictional health department.

(2) Combined applications. Owners or operators may file a combined application for MSWLF units and other solid waste handling units, such as surface impoundments, composting facilities, and storage piles regulated under chapter 173-350 WAC, Solid waste handling standards, and MSWLF units closed under and/or regulated by chapter 173-304 WAC, Minimum functional standards for solid waste handling or other rules promulgated under the authority of chapter 70.95 RCW, including this regulation. The combined application must contain information required by each applicable regulation.

(3) Modification and renewal applications.

(a) Modification applications. An application specified by the jurisdictional health department and the department to modify a valid MSWLF permit issued pursuant to WAC 173-351-700 must include, and address, the following:

- (i) A description of the proposed modification;
- (ii) The reasons for the proposed modification;
- (iii) A description of the impacts from the proposed modification upon the MSWLF unit or the facility as presently permitted;
- (iv) A showing that, as modified, the MSWLF unit will be capable of compliance with the applicable requirements of this regulation; and
- (v) Any other information as required by the jurisdictional health department.

(b) Renewal applications. An application specified by the jurisdictional health department and the department to renew a permit issued pursuant to WAC 173-351-700 must include and address the following:

- (i) Any changes in operating methods or other changes not falling under the definition of a permit modification;
- (ii) Any changes as revealed by inspections, or complaints;
- (iii) A list of documents added to the operating record according to WAC 173-351-200(10);
- (iv) Evidence that all MSWLF unit operators have continued to comply with the certification requirements of chapter 173-300 WAC, Certification of operators of solid waste incinerator and landfill facilities; and
- (v) Any other information as required by the jurisdictional health department.

(4) Reissuance/transition applications. An application to reissue a permit previously issued pursuant to this regulation or to convert a chapter 173-304 WAC permit to a valid MSWLF permit under the transition permit rules of WAC 173-351-700(2) must include and address the following:

(a) Review the original application and permit for compliance with these regulations and submit additional information as follows:

- (i) A compliance summary showing how the facility's construction, operation, closure and post-closure activities, as applicable, have been undertaken either in compliance or not in compliance with the terms and conditions of the expiring permit;
- (ii) Specify any changes proposed by the owner or operator to the design, construction, operation, closure, or post-closure care of the facility and describing how the proposed changes will comply with the applicable requirements of this regulation.

(b) Review information collected from inspections, complaints, or known changes in the operations including:

- (i) Results of groundwater monitoring; and

(ii) Results of surface water and methane monitoring.

(5) Engineering plans, reports, and specifications. Unless otherwise specified in chapter 173-351 WAC, all engineering plans, reports, specifications, programs, and manuals must comply with the requirements of this subsection. Engineering plans, reports, specifications, programs, and manuals submitted to the jurisdictional health department or the department must be prepared and certified by an individual licensed to practice engineering in the state of Washington, in engineering disciplines associated with landfill design and construction or with experience in landfill design and construction and to practice engineering.

(a) Engineering plans. Unless otherwise specified in this chapter, engineering plans for all MSWLF units must be submitted using the following format:

(i) The sheet size with title blocks must be twenty-two inches by thirty-four inches or twenty-four inches by thirty-six inches.

(ii) The cover sheet must include the project title, owner's and operator's name, sheet index, legend of symbols, and the engineer's name, address, signature, date of signature, and seal.

(iii) The preliminary engineering plans relating the project to its environmental setting must include:

(A) A regional plan or map (having a minimum scale of 1:62,500) and indicate directions and distances to airports within six miles (ten kilometers) of the facility;

(B) A vicinity plan or map (having a minimum scale of 1:24,000) that shows the area within one mile (1.6 kilometers) of the property boundaries of the facility in terms of, the existing and proposed zoning and land uses within that area; and residences, public and private water supply wells, known private water supply aquifers, sole source aquifers, groundwater management areas, well-head protection zones, special protection areas and surface waters (with quality classifications), access roads, bridges, railroads, airports, historic sites, and other existing and proposed man-made or natural features relating to the facility; and

(C) An overall site plan (having a minimum scale of 1:2,400 with five foot (or one meter) minimum contour intervals) that must show the landfill's property boundaries (as certified by an individual licensed to practice land surveying in the state of Washington), offsite and onsite utilities (such as electric, gas, water, storm, and sanitary sewer systems) and right of way easements; the 100-year flood plain, wetlands, Holocene faults, unstable areas; the names and addresses of contiguous property owners; the location of soil borings, excavations, test pits, gas venting structures, wells (including down-gradient drinking water supply wells within two thousand feet (six hundred ten meters) of the property boundary), lysimeters, piezometers, environmental and facility monitoring points and devices (with each identified in accordance with a numbering system acceptable to the jurisdictional health department and whose horizontal location are accurate to the nearest 0.5 foot (0.15 meter) and all orthometric evaluations should be related to a vertical benchmark based on the North American vertical datum of 1988 (NAVD88) and be established to 3rd order classification standards per federal geodetic control committee, as measured from the ground surface and top of well casing), benchmarks and permanent survey markers, and onsite buildings and appurtenances, fences, gates, roads, parking areas, drainage culverts, and signs; the delineation of the total landfill area including planned staged development of the landfill's construction and operation, and the lateral

and vertical limits of previously filled areas; the location and identification of the sources of cover materials; the location and identification of special waste handling areas; a wind rose; and site topography with five foot (or one meter) minimum contour intervals.

Note: All horizontal locations must be based upon a control station related to a horizontal datum specified in chapter 58.20 RCW and chapter 332-130 WAC (NAD.83).

(D) Detailed plans of the landfill that clearly show in plan and cross-sectional views, the original, undeveloped site topography before excavation or placement of solid waste; the existing site topography (if different from the original, undeveloped site topography) including the location and approximate thickness and nature of any existing solid waste; the seasonal high groundwater table; generalized geologic units; known and interpolated bedrock elevations; the proposed limits of excavation and waste placement; the location and placement of each liner system and of each leachate collection system, locating and showing all critical grades and elevations of the collection pipe inverts and drainage envelopes, manholes, cleanouts, valves, sumps, and drainage blanket thicknesses; all berms, dikes, ditches, swales and other devices as needed to divert or collect surface water runoff; the final elevations and grades of the landfill cover system including the grading and gas venting layer, low permeability barrier, topsoil layers; the system used for monitoring and venting the decomposition gases generated within the landfill; groundwater monitoring wells; geophysical and geochemical monitoring devices or structures; leachate storage, treatment and disposal systems including the collection network, sedimentation ponds and any treatment, pre-treatment, or storage facilities; typical roadway sections, indicating the pavement type, dimensions, slopes and profiles; the building floor plans, elevations, appurtenances; and plans detailing the landfill entrance area including gates, fences, and signs.

(b) Engineering reports. The engineering reports for a facility must:

(i) Contain a cover sheet, stating the project title and location, the owner's or operator's name, and the engineer's name, address, signature, date of signature, and seal;

(ii) Have its text printed on 8 1/2" by 11" pages (paginated consecutively);

(iii) Contain a table of contents or index describing the body of the report and the appendices;

(iv) Include a body of report whose content is described by (c) of this subsection; and

(v) Include all appendices.

(c) An engineering report must contain a description of the existing site conditions and, at a minimum, an analysis of the proposed facility that must:

(i) Describe current operating practices, expected life and any pending litigation or remedial actions relating to the existing or past facilities;

(ii) Specify the proposed design capacity of the MSWLF unit for which approval is being sought, describing the number, types, and the minimum specifications of all the necessary machinery and equipment needed to effectively operate the landfill at the proposed design capacity;

(iii) Contain a site analysis including:

(A) The location of the closest population centers;

(B) A comprehensive description of the primary transportation systems and routes in the facility service area (i.e., highways, airports, railways, etc.);

(C) An analysis of the existing topography, surface water and subsurface geological conditions in accordance with the hydrogeologic report requirements of WAC 173-351-490;

(D) A description of the materials and construction methods used for the placement of each groundwater monitoring well pursuant to the requirements of WAC 173-351-400 and gas monitoring well pursuant to WAC 173-351-200(4); all gas venting systems; each liner and leachate collection and removal system; leachate storage, treatment, and disposal systems; and cover systems to demonstrate conformance with the design requirements found in WAC 173-351-300, 173-351-320, and 173-351-500. This description also must include a discussion of provisions to be taken to prevent frost action upon each liner system in areas where refuse has not been placed;

(E) An estimate of the expected quantity of leachate to be generated, including:

(I) An annual water budget that estimates leachate generation quantities during operation, upon application of intermediate cover, and following MSWLF unit or all MSWLF units closure. At a minimum, the following factors must be considered in the preparation of the water budget to determine the amount of leachate generated as a result of precipitation infiltration into the MSWLF unit or all the MSWLF units: Average monthly temperature, average monthly precipitation, evaporation, evapotranspiration which considers the vegetation type and root zone depth, surface/cover soil conditions and their relation to precipitation runoff which must account for the surface conditions and soil moisture holding capacity and all other sources of moisture contribution to the landfill;

(II) Liner and leachate collection system efficiencies that must be calculated using an appropriate analytical or numerical assessment. The factors to be considered in the calculation of collection system efficiency must include, at a minimum, the saturated hydraulic conductivity of the liner, the liner thickness, the saturated hydraulic conductivity of the leachate collection system, the leachate collection system porosity, the base slope of the liner and leachate collection and removal system interface, the maximum flow distance across the liner and leachate collection and removal system interface to the nearest leachate collection pipe, the estimated leachate generation quantity as computed in accordance with the requirements of (c)(iii)(E)(I) of this subsection; and

(III) Predictions of the static head of leachate on the liners, volume of leachate to be collected, and the volume of leachate that may permeate through the entire liner system, all on a monthly basis. Information gained from the collection efficiency calculations required in (c)(iii)(E)(I) and (II) of this subsection must be used to make these predictions. This assessment also must address the amount of leachate expected to pass through the liner system in gallons per acre per day (liters per square meter per day).

(d) Discuss the closure and post-closure maintenance and operation of the facility which must include, but not be limited to:

(i) A closure design consistent with the requirements of WAC 173-351-500;

(ii) A post-closure water quality monitoring program consistent with the requirements of WAC 173-351-400 and 173-351-500;

(iii) An operation and closure plan for the leachate collection, treatment, and storage facilities consistent with the requirements of this regulation and chapter 173-350 WAC;

(iv) An estimate of the time required following closure of each MSWLF unit or all MSWLF units to meet the criteria in WAC 173-351-500 (2) (b) (iii); and

(v) A discussion of the future use of the facility, including the specific proposed or alternative uses during the post-closure period. Future uses must not adversely affect the final cover system. See WAC 173-351-500 (2) (c) (iii).

(e) Appendices must be submitted as part of an engineering report with an application to construct a new or laterally expanded MSWLF unit and must contain:

(i) Appropriate charts and graphs;

(ii) Copies of record forms used at the MSWLF unit;

(iii) Test pit logs, soil boring logs, and geological information (such as stratigraphic sections, geophysical and geochemical surveys, and water quality analyses);

(iv) Engineering calculations (including the raw data from which they were made);

(v) Other supporting data, including literature citations.

(6) Construction quality assurance and construction quality control plans.

The construction quality assurance (QA) and construction quality control (QC) plan must address the construction of the MSWLF unit according to the designs set forth in chapter 173-351 WAC. (Construction QA and construction QC are defined in WAC 173-351-100.) The owner or operator may submit separate construction QA plans and construction QC plans. For each phase of construction, these plans must include:

(a) A delineation of responsibilities for the QA management organization and the QC management organization, including the chain of command of the QA inspectors and contractors and the QC inspectors and contractors; quality assurance must be performed by a third-party organization that is independent of the landfill owner/operator/contractor.

(b) A description of the required level of experience and training for the contractor, his/her crew, and QA and QC inspectors for every phase of construction in sufficient detail to demonstrate that the approved installation methods and procedures will be properly implemented; and

(c) A description of the QA and QC testing protocols for every major phase of construction, which must include, at a minimum, the frequency of inspection, field testing, sampling for laboratory testing, the sampling and field testing procedures and equipment to be utilized, the calibration of field testing equipment, the frequency of performance audits, the sampling size, the laboratory procedures to be utilized, the calibration of laboratory equipment and QA/QC of laboratory procedures, the limits for test failure, and a description of the corrective procedures to be used upon test failure.

Note: It is intended that owners or operators will select and pay for the independent third party construction quality assurance firm, who will report to the owner or operator.

(7) Signature and verification of applications.

(a) All applications for permits must be accompanied by evidence of authority to sign the application and must be signed by the owner or operator as follows:

(i) In the case of corporations, by a duly authorized principal executive officer of at least the level of vice president; in the case of a partnership or limited partnership, by:

(ii) A general partner;

(iii) Proprietor; or

(iv) In the case of a sole proprietorship, by the proprietor;

(v) In the case of a municipal, state, or other governmental entity, by a duly authorized principal executive officer or elected official.

(b) Applications must be sworn to by, or on behalf of, the owner or operator, in respect to the veracity all statements therein; or must bear an executed statement by, or on behalf of, the owner or operator to the effect that false statements made therein are made under penalty of perjury.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-730, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-730, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-740 Permit issuance criteria.** The jurisdictional health department may issue, reissue, or modify a MSWLF permit to a facility, only if:

(1) The application's engineering and hydrogeological data and construction plans and specifications required by this regulation demonstrate that the proposed MSWLF unit or MSWLF units meets the requirements of this regulation;

(2) The application demonstrates the facility's ability to operate and close in accordance with the requirements of this regulation;

(3) The application demonstrates the facility's ability to conduct post-closure activities in accordance with the requirements of this regulation;

(4) The owner or operator has established a financial assurance mechanism meeting the requirements of this regulation and has submitted, as applicable:

(a) A copy of the ordinance establishing the reserve account; or

(b) The original signed documents for trust funds, surety bonds, or letters of credit for closure and post-closure financial assurance; and

(5) The application demonstrates the facility's consistency with the local solid waste management plan in effect at the time of application.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-740, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-740, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-750 Permit provisions.** (1) Mitigation of adverse impacts. The jurisdictional health department may impose conditions in each permit, to assure mitigation of adverse environmental impacts pursuant to SEPA, chapter 43.21C RCW and to ensure compliance with the

requirements of this regulation and with other applicable laws and regulations.

(2) Transferability.

(a) All permits issued pursuant to this regulation are transferable only upon prior written approval of the jurisdictional health department and a demonstration that the prospective transferee will be able to comply with applicable laws and regulations, permit conditions, and other requirements to which the prospective transferor is subject.

(b) Upon transfer of ownership of all or part of a facility, a provision must be included in the property deed indicating the period of time during which the facility has been disposing of solid waste, a description of the solid waste contained within, and the fact that the records for the facility have been filed with the jurisdictional health department. The deed also must reference a map, which must be filed with the county clerk, showing the limits of the active areas as defined in WAC 173-351-100.

(3) Duration of permits. The jurisdictional health department must specify the duration of the MSWLF permit. Except as provided in WAC 173-351-710(5), permits must be renewed at least every five years on a date established by the jurisdictional health department. If a permit is to be renewed for longer than one year, the jurisdictional health department may hold a public hearing before making a decision. Permits must be renewed according to WAC 173-351-710(5) or 173-351-720(5), and reissued according to WAC 173-351-720(7).

(4) Preconstruction review condition. The jurisdictional health department must include in each permit for a new MSWLF unit or lateral expansion a condition requiring the owner or operator to submit the following documents sixty days prior to beginning construction, and to obtain the jurisdictional health department's approval that the following documents conform to the engineering report and with the requirements of this chapter:

(a) Final design drawings;

(b) Construction specifications; and

(c) A construction quality assurance manual for the following MSWLF components:

(i) Bottom liner;

(ii) Leachate collection and removal system;

(iii) Landfill gas control system;

(iv) Leachate and landfill gas condensate treatment and disposal system; and

(v) Final cover system.

(5) Supervision and certification or declaration of construction. The construction of a MSWLF unit must be undertaken:

(a) Under the supervision of an individual licensed to practice engineering in the state of Washington; and

(b) In conformance with the construction quality assurance plan of WAC 173-351-730(6).

(6) Preoperation review conditions. Each permit issued under this chapter for a new MSWLF unit or lateral expansion must contain a condition requiring that upon completion of construction, the licensed engineer who supervised construction must certify or declare in writing that the construction is in accordance with the terms of the applicable permit and tested in accordance with construction quality assurance plans of WAC 173-351-730(6). Except as specified elsewhere in this regulation, this certification or declaration must be submitted to the jurisdictional health department within three months after com-



pletion of construction and must include recorded construction drawings and specifications. The owner or operator must notify the jurisdictional health department, in writing, of the date when solid waste will be first received at the MSWLF unit.

(7) Cessation of construction or operation activities. If construction or operation activities started under a permit issued pursuant to this chapter cease for a period of twelve consecutive months, the jurisdictional health department may in its discretion revoke the permit. The jurisdictional health department must provide notice to the owner or operator in writing explaining the reasons for revocation. The jurisdictional health department must not revoke a permit where the cessation of construction or operation is caused by factors beyond the reasonable control of the permittee or when such cessation is in accordance with the provisions of the permit.

(8) Design volume capacity and construction. Every MSWLF permit must specify the facility's approved design volume capacity and identify the extent of each permitted MSWLF unit and the specific time frames for construction of the first MSWLF unit and estimated time frames for construction of subsequent MSWLF units.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-750, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-750, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-760 Appeals.** Whenever the jurisdictional health department denies a permit or suspends a permit for a solid waste disposal site, it must, upon request of the application or holder of the permit, grant a hearing on such denial or suspension within thirty days after the request is made. Notice of the hearing must be given to all interested parties including the county or city having jurisdiction over the site and the department. Within thirty days after the hearing the health officer must notify the applicant or the holder of the permit in writing of the determination. Any party aggrieved by such determination may appeal to the pollution control hearings board by filing with the hearings board a notice of appeal within thirty days after receipt of notice of the determination of the health officer. The hearings board will hold a hearing in accordance with the provisions of the Administrative Procedure Act, chapter 34.05 RCW, as now or hereafter amended.

[Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-760, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-760, filed 10/26/93, effective 11/26/93.]

**WAC 173-351-990 Appendices.**

APPENDIX I  
**Appendix I - Constituents for Detection  
Monitoring**

	COMMON NAME <sup>1</sup>	CAS RN <sup>2</sup>
<b>Inorganic Constituents</b>		
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)
16)	Nitrate. . . . .	
<b>Organic Constituents</b>		
17)	Acetone. . . . .	67-64-1
18)	Acrylonitrile. . . . .	107-13-1
19)	Benzene. . . . .	71-43-2
20)	Bromochloromethane. . . . .	74-97-5
21)	Bromodichloromethane. . . . .	75-27-4
22)	Bromoform; Tribromomethane. . . . .	75-25-2
23)	Carbon disulfide. . . . .	75-15-0
24)	Carbon tetrachloride. . . . .	56-23-5
25)	Chlorobenzene. . . . .	108-90-7
26)	Chloroethane; Ethyl chloride. . . . .	75-00-3
27)	Chloroform; Trichloromethane. . . . .	67-66-3
28)	Dibromochloromethane; Chlorodibromomethane. . . . .	124-48-1
29)	1,2-Dibromo-3-chloropropane; DBCP. . . . .	96-12-8
30)	1,2-Dibromoethane; Ethylene dibromide; EDB. . . . .	106-93-4
31)	o-Dichlorobenzene; 1,2-Dichlorobenzene. . . . .	95-50-1
32)	p-Dichlorobenzene; 1,4-Dichlorobenzene. . . . .	106-46-7
33)	trans-1,4-Dichloro-2-butene. . . . .	110-57-6
34)	1,1-Dichloroethane; Ethylidene chloride. . . . .	75-34-3
35)	1,2-Dichloroethane; Ethylene dichloride. . . . .	107-06-2
36)	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride. . . . .	75-35-4
37)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene. . . . .	156-59-2
38)	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene. . . . .	156-60-5

	COMMON NAME <sup>1</sup>	CAS RN <sup>2</sup>
<b>Inorganic Constituents</b>		
39)	1,2-Dichloropropane; Propylene dichloride. . . . .	78-87-5
40)	cis-1,3-Dichloropropene. . . . .	10061-01-5
41)	trans-1,3-Dichloropropene. . . . .	10061-02-6
42)	Ethylbenzene. . . . .	100-41-4
43)	2-Hexanone; Methyl butyl ketone. . . . .	591-78-6
44)	Methyl bromide; Bromomethane. . . . .	74-83-9
45)	Methyl chloride; Chloromethane. . . . .	74-87-3
46)	Methylene bromide; Dibromomethane. . . . .	74-95-3
47)	Methylene chloride; Dichloromethane. . . . .	75-09-2
48)	Methyl ethyl ketone; MEK; 2-Butanone. . . . .	78-93-3
49)	Methyl iodide; Iodomethane. . . . .	74-88-4
50)	4-Methyl-2-pentanone; Methyl isobutyl ketone. . . . .	108-10-1
51)	Styrene. . . . .	100-42-5
52)	1,1,1,2-Tetrachloroethane. . . . .	630-20-6
53)	1,1,2,2-Tetrachloroethane. . . . .	79-34-5
54)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene. . . . .	127-18-4
55)	Toluene. . . . .	108-88-3
56)	1,1,1-Trichloroethane; Methyl chloroform. . . . .	71-55-6
57)	1,1,2-Trichloroethane. . . . .	79-00-5
58)	Trichloroethylene; Trichloroethene. . . . .	79-01-6
59)	Trichlorofluoromethane; CFC-11. . . . .	75-69-4
60)	1,2,3-Trichloropropane. . . . .	96-18-4
61)	Vinyl acetate. . . . .	108-05-4
62)	vinyl chloride. . . . .	75-01-4
63)	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 Abstracts Service registry number.

**APPENDIX II  
GROUNDWATER QUALITY PARAMETERS**

**Field Parameters**

- pH
- specific conductance
- temperature
- static water level

**Geochemical Indicator Parameters**

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| Calcium (Ca)                    | Sodium (Na)                         |
| Bicarbonate (HCO <sub>3</sub> ) | Chloride (Cl)                       |
| Magnesium (Mg)                  | Potassium (K)                       |
| Sulfate (SO <sub>4</sub> )      | Alkalinity (as Ca CO <sub>3</sub> ) |
| Total suspended solids (TSS)    | Iron (Fe) (Dissolved)               |
|                                 | Manganese (Mn) (Dissolved)          |

### Leachate Indicators

Ammonia (NH<sub>3</sub>-N)  
Total Organic Carbon (TOC)  
Total Dissolved Solids (TDS)

#### APPENDIX III

#### List of Hazardous Inorganic and Organic Constituents.

Common Name <sup>1</sup>	CAS RN <sup>2</sup>	Chemical abstracts service index name <sup>3</sup>
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-(1α,4α,4aβ,5α,8α,8aβ)-
Allyl chloride	107-05-1	1-Propene, 3-chloro-
4-Aminobiphenyl	92-67-1	[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-, (1α,2α,3β,4α,5β,6β)-
beta-BHC	319-85-7	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2β,3α,4β,5α,6β)-
delta-BHC	319-86-8	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3α,4β,5α,6β)-
gamma-BHC; Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α,2α,3β,4α,5α,6β)-
Bis(2-chloroethoxy)methane	111-91-1	Ethane, 1,1 1 -[methylenebis(oxy)]bis[2-chloro-
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4	Ethane, 1,1 1 -oxybis[2-chloro-
Bis-(2-chloro-1-methylethyl) ether; 2,2 1 -	108-60-1	Propane, 2,2 1 -oxybis[1-chloro-
Dichlorodiisopropyl ether; DCIP, See note 4		
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-

<b>Common Name<sup>1</sup></b>	<b>CAS RN<sup>2</sup></b>	<b>Chemical abstracts service index name<sup>3</sup></b>
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 Note 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	Benzenoacetic acid, 4-chloro- $\alpha$ -(4-chlorophenyl)- $\alpha$ -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 1 -(2,2-dichloroethylidene)bis[4-chloro-
4,4'-DDE	72-55-9	Benzene, 1,1 1 -(dichloroethenylidene)bis[4-chloro-
4,4'-DDT	50-29-3	Benzene, 1,1 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; 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; 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 1 -Biphenyl]-4,4 1 -diamine, 3,3 1 - dichloro-

<b>Common Name<sup>1</sup></b>	<b>CAS RN<sup>2</sup></b>	<b>Chemical abstracts service index name<sup>3</sup></b>
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, 1,1-dichloro-
1,1-Dichloroethylene; 1,1-Dichloroethene;	75-35-4	Ethene, 1,1-dichloro-
Vinylidene chloride		
cis-1,2-Dichloroethylene; cis-1,2-	156-59-2	Ethene, 1,2-dichloro-, (Z)-
Dichloroethene		
trans-1,2-Dichloroethylene; trans-1,2-	156-60-5	Ethene, 1,2-dichloro-, (E)-
Dichloroethene		
2,4-Dichlorophenol	120-83-2	Phenol, 2,4-dichloro-
2,6-Dichlorophenol	87-65-0	Phenol, 2,6-dichloro-
1,2-Dichloropropane; Propylene dichloride	78-87-5	Propane, 1,2-dichloro-
1,3-Dichloropropane; Trimethylene dichloride	142-28-9	Propane, 1,3-dichloro-
2,2-Dichloropropane; Isopropylidene chloride	594-20-7	Propane, 2,2-dichloro-
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-hexa, chloro-1a,2,2a,3,6,6a,7,7a- octahydro-, (1a $\alpha$ ,2 $\beta$ ,2a $\alpha$ ,3 $\beta$ ,6 $\beta$ , 6a $\alpha$ ,7 $\beta$ ,7a $\alpha$ )-
Diethyl phthalate	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
0,0-Diethyl 0-2-pyrazinyl phosphorothioate;	297-97-2	Phosphorothioic acid, 0,0-diethyl 0-pyrazinyl ester
Thionazin		
Dimethoate	60-51-5	Phosphorodithioic acid, 0,0-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 1 -Biphenyl]-4,4 1 -diamine, 3,3 1 - 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-	534-52-1	Phenol, 2-methyl-4,6-dinitro
methylphenol		
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-	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
dinitrophenol		
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, 0,0-diethyl S-[2- (ethylthio)ethyl] ester
Endosulfan I	959-98-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexa-chloro-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-hexa- chloro-1,5,5a,6,9,9a- hexahydro-, 3-oxide, (3 $\alpha$ ,5 $\alpha$ , 6 $\beta$ ,9 $\beta$ ,9 $\alpha$ )-

<b>Common Name<sup>1</sup></b>	<b>CAS RN<sup>2</sup></b>	<b>Chemical abstracts service index name<sup>3</sup></b>
Endosulfan sulfate	1031-07-8	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10, 10-hexa- chloro-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 $\beta$ ,2a $\beta$ ,3 $\alpha$ ,6 $\alpha$ , 6a $\beta$ ,7 $\beta$ ,7a $\alpha$ )-
Endrin aldehyde	7421-93-4	1,2,4-Methenocyclopenta[cd]pentalene-5-carboxaldehyde, 2,2a,3,3,4,7-hexachlorodecahydro-, (1 $\alpha$ ,2 $\beta$ , 2a $\beta$ ,4 $\beta$ ,4a $\beta$ ,5 $\beta$ ,6a $\beta$ ,6b $\beta$ ,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, 0-[4-[(dimethylamino)sulfonyl]pheny l] 0,0-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-3a,4,7,7a-tetrahydro-
Heptachlor epoxide	1024-57-3	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a-hexahydro-, (1 $\alpha$ , 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	1888-71-7	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, 2,3,4,10,10-hexachloro-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)-
Kepon	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 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 1 -2-pyridinyl-N1/2-thienylmethyl)-
Methoxychlor	72-43-5	Benzene,1,1 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

<b>Common Name<sup>1</sup></b>	<b>CAS RN<sup>2</sup></b>	<b>Chemical abstracts service index name<sup>3</sup></b>
2-Methylnaphthalene	91-57-6	Naphthalene, 2-methyl-
Methyl parathion; Parathion methyl	298-00-0	Phosphorothioic acid, 0,0-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-Nitrosomethylethylamine	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, 0,0-diethyl 0-(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, 0,0-diethyl S-[(ethylthio)methyl] ester
Polychlorinated biphenyls; PCBs; Aroclors	See Note 6	1,1'-Biphenyl, chloro derivatives
Pronamide	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
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



Common Name <sup>1</sup>	CAS RN <sup>2</sup>	Chemical abstracts service index name <sup>3</sup>
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 Note 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-
0,0,0-Triethyl phosphorothioate	126-68-1	Phosphorothioic acid, 0,0,0-triethylester
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 Note 8	Benzene, dimethyl-
Zinc	(Total)	Zinc

Notes:

- 1 Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.
- 2 Chemical Abstracts Service registry number. Where "Total" is entered, all species in the groundwater that contain this element are included.
- 3 CAS index are those used in the 9th Collective Index.
- 4 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).
- 5 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).
- 6 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).
- 7 Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), i.e., chlorinated camphene.
- 8 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).

[Statutory Authority: RCW 70.95.060(1) and 70.95.260(6). WSR 15-20-096 (Order 15-01), § 173-351-990, filed 10/6/15, effective 11/6/15. Statutory Authority: RCW 70.95.020(3), 70.95.060(1), and 70.95.260(1), (6). WSR 12-23-009 (Order 07-15), § 173-351-990, filed 11/8/12, effective 12/9/12. Statutory Authority: Chapter 70.95 RCW and 40 C.F.R. 258. WSR 93-22-016, § 173-351-990, filed 10/26/93, effective 11/26/93.]

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.