

Chapter 10



Solid Waste Characterization

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Exclusions from Part 115 Definition of Solid Waste

Part 115, Sec. 11506 defines solid waste to specifically exclude the following materials:

- Human body waste.
- Medical waste.
- Organic waste generated in the production of livestock and poultry.
- Liquid waste.
- Ferrous or nonferrous scrap directed to a scrap metal processor or to a reuser of ferrous or nonferrous products.
- Slag or slag products directed to a slag processor or to a reuser of slag or slag products.
- Sludges and ashes managed as recycled or nondetrimental materials appropriate for agricultural or silvicultural use pursuant to a plan approved by the department.
- The following materials that are used as animal feed, or are applied on, or are composted and applied on, farmland or forestland for an agricultural or silvicultural purpose at an agronomic rate consistent with GAAMPS:
 - Food processing residuals and garbage.
 - Precipitated calcium carbonate from sugar beet processing.
 - Wood ashes resulting solely from a source that burns only wood that is untreated and inert.
 - Lime from kraft pulping processes generated prior to bleaching.
 - Aquatic plants.
- Materials approved for emergency disposal by the department.
- Source separated materials.
- Site separated material.
- Coal ash, when used under any of the following circumstances:
 - As a component of concrete, grout, mortar, or casting molds, if the coal ash does not have more than 6% unburned carbon.
 - As a raw material in asphalt for road construction, if the coal ash does not have more than 12% unburned carbon and passes Michigan test method for water asphalt preferential test, MTM 101, as set forth in the state transportation department's manual for the Michigan test methods (MTM).
 - As aggregate, road material, or building material that in ultimate use is or will be stabilized or bonded by cement, limes, or asphalt, or itself act as a bonding agent. To be considered to act as a bonding agent, the coal ash must have at least 10% available lime.
 - As a road base or construction fill that is placed at least 4 feet above the seasonal groundwater table and covered with asphalt, concrete, or other material approved by the department.
- Inert material.
- Soil that is washed or otherwise removed from sugar beets, has not more than 35% moisture content, and is registered as a soil conditioner under part 85. Any testing required to become registered under part 85 is the responsibility of the generator.
- Soil that is relocated under section 20120c.
- Diverted waste that is managed through a waste diversion center.
- Beneficial use by-products.
- Coal bottom ash, if substantially free of fly ash or economizer ash, when used as cold weather road abrasive.
- Stamp sands when used as cold weather road abrasive in the Upper Peninsula by any of the following:
 - A public road agency.
 - Any other person pursuant to a plan approved by a public road agency.
 - Any material that is reclaimed or reused in the process that generated it.
 - Any secondary material that, as specified in or determined pursuant to 40 CFR part 241, is not a solid waste when combusted.
 - Other wastes regulated by statute.

Inert Materials

Part 115, Section 11504 defines specific materials as inert materials that are not a waste. These inert materials include:

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- Rock
- Trees, stumps, or other land clearing debris if the following conditions are met:
 - The debris is buried on the site of origin or another site, with the approval of the owner of the site.
 - The debris is not buried in a wetland or floodplain.
 - The debris is placed at least 3 feet above the groundwater table as observed at the time of placement.
 - The placement of the debris does not violate federal, state, or local law or create a nuisance.
- Uncontaminated excavated soil or dredged sediment. Excavated soil or dredged sediment is considered uncontaminated if it does not contain more than de minimis amounts of solid waste and 1 of the following applies:
 - The soil or sediment is not contaminated by a hazardous substance as a result of human activity. Soil or sediment that naturally contains elevated levels of hazardous substances above unrestricted residential or any other part 201 generic soil cleanup criteria is not considered contaminated for purposes of this subdivision. A soil or sediment analysis is not required under this subparagraph if, based on past land use, there is no reason to believe that the soil or sediment is contaminated.
 - For any hazardous substance that could reasonably be expected to be present as a result of past land use and human activity, the soil or sediment does not exceed the background concentration, as that term is defined in part 201.
 - For any hazardous substance that could reasonably be expected to be present as a result of past land use and human activity, the soil or sediment falls below part 201 generic residential soil direct contact cleanup criteria and hazardous substances in leachate from the soil or sediment, using, at the option of the generator, EPA method 1311, 1312, or any other leaching protocol approved by the department, fall below part 201 generic residential health based groundwater drinking water values or criteria, and the soil or sediment would not cause a violation of any surface water quality standard established under part 31 at the area of placement, disposal, or use.
- Excavated soil from a site of environmental contamination, corrective action, or response activity if the soil is not a listed hazardous waste under part 111 and if hazardous substances in the soil do not exceed generic soil cleanup criteria for unrestricted residential use as defined in part 201 or background concentration as defined in part 201, as applicable.
- Portland cement clinker produced by a cement kiln using wood, fossil fuels, or solid waste as a fuel or feedstock, but not including cement kiln dust generated in the process.
- Asphalt pavement or concrete pavement that meets all of the following requirements:
 - Has been removed from a public right-of-way.
 - Has been stockpiled or crushed for reuse as aggregate material.
 - Does not include exposed reinforcement bars.
- Cuttings, drilling materials, and fluids used to drill or complete a well installed pursuant to part 127 of the public health code, 1978 PA 368, MCL 333.12701 to 333.12771, if the location of the well is not a facility under part 201.
- Any material determined by the department under section 11553(5) or (6) to be an inert material, either for general use or for a particular use.
 - [Scrap tires as specified in the Designation of Inertness #13-I-001](#)

Recyclable Materials

Recyclable materials that are not subject to hazardous waste regulation under Part 111 and not subject to liquid industrial waste regulation under Part 121, must be reviewed to determine if they are a solid waste under [Part 115](#). [Part 115 specifically defines](#) “recyclable material” and excludes them from solid waste regulation when managed as specified under Part 115.

“Recyclable materials” under Part 115 include glass, paper, plastic, metal (bits and pieces), untreated and uncoated wood, textiles, compost, other materials approved by the DEQ, “site separated materials,” and “source separated materials.”

“Site separated materials are defined as glass, metal, wood, paper products, plastics, rubber, textiles, garbage, or any other material approved by the department that is separated from solid waste for the purpose of recycling or conversion into raw materials or new products.

“Source separated material” includes the following materials separated at the source of generation:

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- Glass, metal, wood, paper products, plastics, rubber, textiles, garbage, or any other material approved by the department that is used for conversion into raw materials or new products. For the purposes of this subdivision, raw materials or new products include, but are not limited to, compost, biogas from anaerobic digestion, synthetic gas from gasification or pyrolysis, or other fuel.
- Scrap wood and railroad ties used to fuel an industrial boiler, kiln, power plant, or furnace, subject to part 55, for production of new wood products, or for other uses approved by the department.
- Chipped or whole tires used to fuel an industrial boiler, kiln, power plant, or furnace, subject to part 55, or for other uses approved by the department. This subdivision does not prevent material from being classified as a renewable energy resource as defined in section 11 of the clean, renewable, and efficient energy act, 2008 PA 295, MCL 460.1011.
- Recovered paint solids used to fuel an industrial boiler, kiln, power plant, or furnace, subject to part 55, or for other uses approved by the department.
- Gypsum drywall generated from the production of wallboard used for stock returned to the production process or for other uses approved by the department.
- Flue gas desulfurization gypsum used for production of cement or wallboard or other uses approved by the department.
- Asphalt shingles that do not contain asbestos, rolled roofing, or tar paper used as a component in asphalt or used to fuel an industrial boiler, kiln, power plant, or furnace, subject to part 55, or for other uses approved by the department.
- Municipal solid waste incinerator ash that meets criteria specified by the department and that is used as daily cover at a disposal facility licensed pursuant to this part.
- Utility poles or pole segments reused as poles, posts, or similar uses approved by the department in writing.
- Railroad ties reused in landscaping, embankments, or similar uses approved by the department in writing.
- Any materials and uses approved by the department under section 11553(8).

To qualify as a recyclable material not subject to solid waste regulation, materials defined as a recyclable material must:

1. Be at least 90% free of other solid waste and debris (e.g. not “processed”); and
2. Be recycled at a rate of at least 75% (e.g. not “speculatively accumulated”) by being:
 - Recycled into marketable raw materials,
 - Recycled into marketable new products, or
 - Transferred to another site for recycling.

If “recyclable materials” are not managed to meet the above criteria, they are a waste subject to solid waste permitting and licensing and the site must be included in the [county solid waste plan](#).

Addition to the materials may be specified as “recyclable materials” if approved by the Director. Recyclable materials approved by the Director include the following and may have additional management requirements beyond the criteria specified above:

- [Concrete Grinding Slurry](#)
- [Scrap Wood](#)
- [Ethanol](#)
- [Fish Waste Exemption](#)
- [Flue Gas Desulfurization Sludge](#)
- [Gypsum Drywall](#)
- [Lime Sludge](#)
- [Manure, Pauch, and Pen Waste](#)
- [On Farm Anaerobic Digestion](#)

More details regarding the management standard that apply to the Director approved recyclable materials can be found on the DEQ Solid Waste Program, Exemptions and Guidance Web page.

Beneficial Use By-products

Under Part 115, the following materials are eligible for use as a beneficial use by-product when managed as specified under one or more of five use options specially identified under [Part 115](#), Sections 11502(8), 11551, 11551a, 11552, and 11553:

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1. **Cement Kiln Dust/Lime Kiln Dust** - Particulate matter collected in air emission control devices serving Portland cement kilns and lime kilns
2. **Coal Bottom or Wood Ash** - Ash particles from combustion of coal or any type of ash or slag resulting from wood burning
3. **Coal or Wood Ash** - Material recovered from an air pollution control system or non-combusted residue from combustion of coal, wood, or both (although only cementitious ash is suitable for use as fill)
4. **Dewatered Concrete Grinding Sludge** – Sludge collected from grinding concrete when an agency builds or repairs a public roadway
5. **Flue Gas Desulfurization Material** - Material recovered from air pollution control systems that capture sulfur dioxide during wood, coal, or fossil fuel combustion including synthetic gypsum
6. **Foundry Sand** - Silica sand used in metal casting processes from ferrous or nonferrous foundries.
7. **Lime Softening Residuals** – Material recovered from the treatment and conditioning of water for domestic use or community water supply.
8. **Mixed Wood Ash** - Material recovered from air pollution control systems or non-combusted residue from combustion of wood, scrap wood, railroad ties, and tires.
9. **Pulp and Paper Mill Ash** - Non-combusted residue remaining after combustion of coal, wood, pulp and paper mill material, wood or biomass pellets, rail road ties, tires, and scrap wood.
10. **Pulp and Paper Mill Material** - Materials generated at pulp and paper mills including wastewater treatment sludge; rejects from screens, cleaners, and mills; bark, wood fiber, and chips; scrap paper and causticizing residues.
11. **Soils Washed or Removed from Sugar Beets**
12. **Spent Media from sandblasting** - with uncontaminated soil, newly manufactured, and unpainted steel.
13. **Stamp Sands**: Sand remaining after stamping and processing copper bearing ores.

The five use options for the materials listed above include:

- **Beneficial Use 1** - use of the material as aggregate, road material, or building material if it will be bonded or encapsulated by cement, limes, or asphalt.
- **Beneficial Use 2** - use of the material as construction fill, road base, soil stabilizer, or road shoulder material.
- **Beneficial Use 3** - use of the material as a fertilizer, soil conditioner under Part 85, or a liming material under 1955 PA 162.
- **Beneficial Use 4** - use of the material to stabilize, neutralize, or treat solid waste, wastewater, or hazardous substances; or to serve as a landfill construction material.
- **Beneficial Use 5** - use of the material as a component of a manufactured soil.

All of the beneficial use options are not available for all of the beneficial use materials. To understand the beneficial use options for each beneficial use material, see the [Beneficial Use Matrix](#). To understand the use conditions that must be met for each material use, see the Beneficial Use Options Condition Summaries that follow for beneficial use options [1](#), [2](#), [3](#), [4](#), and [5](#). For more specific questions, see the [Beneficial Use Frequently Asked Questions](#). All of these resources are found on the [DEQ Solid Waste Beneficial Use Web page](#).

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Beneficial Use Matrix

USE/MATERIAL	Bonded by lime, cement, or asphalt Beneficial Use 1	Construction fill under impervious surface/Road shoulder Beneficial Use 2	Land Applied Beneficial Use 3	Remediate/treat waste or used as fill at landfills Beneficial Use 4	Soil blending Beneficial Use 5	Flue gas scrubbing reagent
Wood ash/coal bottom ash			X			
Wood ash/coal ash	X	X		X		
Pulp/paper mill ash	X	X	X	X		
Mixed wood ash	X	X	X	X		
Cement kiln dust/Lime kiln dust	X	X	X	X		X
Foundry sands (ferrous/aluminum)	X	X	X	X	X	
Stamp sands	X	X				
Pulp/paper mill material			X			
Sand blasting media from new products	X	X				
Dewatered concrete grinding slurry	X	X	X	X		
Lime Softening residuals			X	X		
Sugar beet soils			X			
Flue gas desulfurization sludge	X		X			

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Beneficial Use 1 Conditions

This was developed to provide in one document all specific statutory requirements under Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, for the utilization of industrial by-products consistent with Beneficial Use 1. Other broader or more general requirements under Part 115 and other parts of Act 451 may also be applicable.

- Section 11502(3) - "Beneficial use 1" means use as aggregate, road material, or building material that in ultimate use is or will be bonded or encapsulated by cement, limes, or asphalt.
- Section 11551(1) (a) – The material is not a part 111 hazardous waste or mixed with a hazardous waste.
- Section 11551(1) (b) – The material is not stored at the site of generation or use for more than 3 years, or the amount that is transferred off site for use during a 3-year period equals at least 75% by weight or volume of the amount of that material stored on site for beneficial use at the beginning of the 3-year period.
- Section 11551(1) (c) – The material is stored in a manner that maintains its usefulness, controls wind dispersal, and prevents loss of the material beyond the storage area.
- Section 11551(1) (d) – The material is stored in a manner that does not cause groundwater to no longer be fit for 1 or more protected uses, does not cause a violation of a part 31 surface water quality standard, and otherwise does not violate part 31.
- Section 11551(1) (e) – The material is transported in a manner that prevents accidental leakage, spillage, or wind dispersal.
- Section 11551(1) (f) – The use of the material is for a legitimate beneficial purpose other than a means to discard the material and the material is used according to generally accepted engineering, industrial, or commercial standards for that use.
- Section 11551(2) – The determination whether a material meets the requirements of subsection (1)(a) shall be based on the analysis of a representative sample of the material by the initial generator. The initial generator shall maintain records of the test results for not less than 10 years after the date the material was sent off site and make the records available to the department upon request. The generator shall resample and analyze the material when raw materials or processes change in a way that could reasonably be expected to materially affect analysis results.
- Section 11551(3) – Except as otherwise provided in this act, storage and use of beneficial use by-products shall comply with all other applicable provisions of this act.
- Section 11551(5) – A person that actively manages and reuses a beneficial use by-product that has already been used in compliance with this part may rely on analytical data from the prior use.
- Section 11551(6) – All of the following apply to beneficial uses 1 and 2 at and along roadways:

Beneficial Use 1 Conditions

- (a) Routine repair and replacement of roadways constructed using beneficial use materials does not constitute generation of beneficial use by-products triggering the requirements of this section if the beneficial use by-products remain or are reused at the same roadway and are used in a manner that meets the definition of beneficial use 1 or beneficial use 2, as appropriate. If the beneficial use by-products will be reused at some place other than the same roadway, then the requirements applicable to generators of beneficial use by-products must be met, except as follows:
- (i) As set forth in subsection (5).
 - (ii) The requirements of section 11552 apply only if the category of beneficial use will change.
- (b) For beneficial use 2, the requirement that beneficial use materials be covered by concrete, asphalt, or 6 inches of gravel applies at the time of placement and use. The development of potholes, shoulder erosion, or similar deterioration does not result in a violation of this part.
- (c) If road materials containing beneficial use by-products are ground, reheated, or melted for reuse, the requirements of part 55 must be met.
- (d) This part does not prohibit the state transportation department from seeking additional data or information for road building materials or from requiring that road building materials meet state transportation department specifications and standards.
- Section 11551(9) - This part does not authorize open dumping prohibited by the solid waste disposal act, 42 USC 6901 to 6992k.
 - Section 11552(2) - By October 30 of each year, any generator or broker of more than 1,000 cubic yards of material used as beneficial use by-products for beneficial use 1 in the immediately preceding period of October 1 to September 30 shall submit a report to the department containing all of the following information, as applicable:
 - (a) The business name, address, telephone number, and name of a contact person for the generator, broker, or other person.
 - (b) The types and approximate amounts of beneficial use by-products generated, brokered, and stored during that period.
 - (c) The approximate amount of beneficial use by-products shipped off site during that period and the uses and conditions of use.
 - (d) The amount of source separated materials used or reused.

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Beneficial Use 2 Conditions

- Section 11502(4) – “Beneficial use 2” means use as any of the following:
 - (a) Construction fill at nonresidential property that meets all of the following requirements:
 - (i) Is placed at least 4 feet above the seasonal groundwater table.
 - (ii) Does not come into contact with a surface water body.
 - (iii) Is covered by concrete, asphalt pavement, or other material approved by the department.
 - (iv) Does not exceed 4 feet in thickness, except for areas where exceedances are incidental to variations in the existing topography. This subparagraph does not apply to construction fill placed underneath a building or other structure.
 - (b) Road base or soil stabilizer that does not exceed 4 feet in thickness except for areas where exceedances are incidental to variations in existing topography, is placed at least 4 feet above the seasonal groundwater table, does not come into contact with a surface water body, and is covered by concrete, asphalt pavement, or other material approved by the department.
 - (c) Road shoulder material that does not exceed 4 feet in thickness except for areas where exceedances are incidental to variations in existing topography, is placed at least 4 feet above the seasonal groundwater table, does not come into contact with a surface water body, is sloped, and is covered by asphalt pavement, concrete, 6 inches of gravel, or other material approved by the department.
- Section 11551(1) (a) – The material is not a part 111 hazardous waste or mixed with a hazardous waste.
- Section 11551(1) (b) – The material is not stored at the site of generation or use for more than 3 years, or the amount that is transferred off site for use during a 3-year period equals at least 75% by weight or volume of the amount of that material stored on site for beneficial use at the beginning of the 3-year period.
- Section 11551(1) (c) – The material is stored in a manner that maintains its usefulness, controls wind dispersal, and prevents loss of the material beyond the storage area.
- Section 11551(1) (d) – The material is stored in a manner that does not cause groundwater to no longer be fit for 1 or more protected uses, does not cause a violation of a part 31 surface water quality standard, and otherwise does not violate part 31.
- Section 11551(1) (e) – The material is transported in a manner that prevents accidental leakage, spillage, or wind dispersal.
- Section 11551(1) (f) – The use of the material is for a legitimate beneficial purpose other than a means to discard the material and the material is used according to generally accepted engineering, industrial, or commercial standards for that use.

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Beneficial Use 2 Conditions

- Section 11551(1)(g) - For beneficial use 2, the material, if specified below, meets the following environmental standards using, at the option of the generator of the by-product, EPA method 1311, 1312, or ASTM test method 3987:

Constituent - maximum leachate mg/l	Coal ash or wood ash	Pulp and paper mill ash, mixed wood ash	Foundry sand	Cement kiln dust, lime kiln dust	Water softening limes, dewatered grinding sludge	Stamp sand	Spent media from sand blasting
Arsenic - 0.2	X	X	X	X	X		
Boron - 10	X						
Cadmium - 0.1	X	X		X	X		
Chromium - 2.0	X						X
Lead - 0.08	X	X	X	X	X		
Mercury - 0.04	X	X		X	X		
Copper - 20		X			X	X	
Nickel - 2.0		X	X		X		X
Selenium - 1.0	X				X		
Thallium - 0.04	X			X			
Zinc - 48	X	X			X		

- Section 11551(2) – The determination whether a material meets the requirements of subsection (1)(a) shall be based on the analysis of a representative sample of the material by the initial generator. The initial generator shall maintain records of the test results for not less than 10 years after the date the material was sent off site and make the records available to the department upon request. The generator shall resample and analyze the material when raw materials or processes change in a way that could reasonably be expected to materially affect analysis results.
- Section 11551(3) – Except as otherwise provided in this act, storage and use of beneficial use by-products shall comply with all other applicable provisions of this act.
- Section 11551(5) – A person that actively manages and reuses a beneficial use by-product that has already been used in compliance with this part may rely on analytical data from the prior use.
- Section 11551(6) – All of the following apply to beneficial uses 1 and 2 at and along roadways:
 - Routine repair and replacement of roadways constructed using beneficial use materials does not constitute generation of beneficial use by-products triggering the requirements of this section if the beneficial use by-products remain or are reused at the same roadway and are used in a manner that meets the definition of beneficial use 1 or beneficial use 2, as appropriate. If the beneficial use by-products will be reused at some place other than the same roadway, then the requirements applicable to generators of beneficial use by-products must be met, except as follows:

- (i) As set forth in subsection (5).
 - (ii) The requirements of section 11552 apply only if the category of beneficial use will change.
 - (b) For beneficial use 2, the requirement that beneficial use materials be covered by concrete, asphalt, or 6 inches of gravel applies at the time of placement and use. The development of potholes, shoulder erosion, or similar deterioration does not result in a violation of this part.
 - (c) If road materials containing beneficial use by-products are ground, reheated, or melted for reuse, the requirements of part 55 must be met.
 - (d) This part does not prohibit the state transportation department from seeking additional data or information for road building materials or from requiring that road building materials meet state transportation department specifications and standards.
- Section 11551(9) - This part does not authorize open dumping prohibited by the solid waste disposal act, 42 USC 6901 to 692k.
 - Section 11551 (10) - If an owner of property has knowledge that a material has been used on the property for beneficial use 2, before transferring the property, the owner shall provide notice to a prospective transferee that the material was used for beneficial use 2, including the date and location of the use, if known. If a contractor, consultant, or agent of an owner of property uses a material on the property for beneficial use 2, the contractor, consultant, or agent shall provide notice to the owner that the material was used for beneficial use 2, including the date and location of the use.
 - Section 11552(1) - Written notice shall be submitted to the department before a beneficial use by-product is used for beneficial use 2 as construction fill at a particular site for the first time, if the amount used will exceed 5,000 cubic yards. The generator of the beneficial use by-product shall submit the notice unless the generator transfers material to a broker, in which case the broker shall submit the notice.
 - Section 11552(2) - By October 30 of each year, any generator or broker of more than 1,000 cubic yards of material used as beneficial use by-products for beneficial use 2 in the immediately preceding period of October 1 to September 30 shall submit a report to the department containing all of the following information, as applicable:
 - (a) The business name, address, telephone number, and name of a contact person for the generator, broker, or other person.
 - (b) The types and approximate amounts of beneficial use by-products generated, brokered, and stored during that period.
 - (c) The approximate amount of beneficial use by-products shipped off site during that period and the uses and conditions of use.
 - (d) The amount of source separated materials used or reused

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Beneficial Use 3 Conditions

- Section 11502(5) - Beneficial use 3" means applied to land as a fertilizer or soil conditioner under part 85 or a liming material under 1955 PA 162, MCL 290.531 to 290.538, if all of the following requirements are met:
 - (a) The material is applied at an agronomic rate consistent with generally accepted agricultural and management practices.
 - (b) The use, placement, or storage at the location of use does not do any of the following:
 - (i) Violate part 55 or create a nuisance.
 - (ii) Cause groundwater to no longer be fit for 1 or more protected uses as defined in R 323.2202 of the Michigan administrative code.
 - (iii) Cause a violation of a part 31 surface water quality standard.
- Section 11551(1) (a) – The material is not a part 111 hazardous waste or mixed with a hazardous waste.
- Section 11551(1) (b) – The material is not stored at the site of generation or use for more than 3 years, or the amount that is transferred off site for use during a 3-year period equals at least 75% by weight or volume of the amount of that material stored on site for beneficial use at the beginning of the 3-year period.
- Section 11551(1) (c) – The material is stored in a manner that maintains its usefulness, controls wind dispersal, and prevents loss of the material beyond the storage area.
- Section 11551(1) (d) – The material is stored in a manner that does not cause groundwater to no longer be fit for 1 or more protected uses, does not cause a violation of a part 31 surface water quality standard, and otherwise does not violate part 31.
- Section 11551(1) (e) – The material is transported in a manner that prevents accidental leakage, spillage, or wind dispersal.
- Section 11551(1) (f) – The use of the material is for a legitimate beneficial purpose other than a means to discard the material and the material is used according to generally accepted engineering, industrial, or commercial standards for that use.
- Section 11551(1) (h) - For beneficial use 3, the material or use of the material, as applicable, meets all of the following requirements:
 - (i) The material is coal bottom ash, wood ash, pulp and paper mill material, pulp and paper mill ash, mixed wood ash, foundry sand from ferrous or aluminum foundries, cement kiln dust, lime kiln dust, lime water softening residuals, flue gas desulfurization gypsum, soil washed or otherwise removed from sugar beets, or dewatered concrete grinding slurry from public transportation agency road projects.

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(ii) The amount of any constituent listed below applied to an area of land over any period of time does not exceed the following:

CONSTITUENT	CUMULATIVE LOAD POUNDS PER ACRE
Arsenic	37
Cadmium	35
Copper	1,335
Lead	267
Mercury	15
Nickel	374
Selenium	89
Zinc	2,492

(iii) If the department of agriculture and rural development determines, based on peer-reviewed scientific literature, that any other constituent is subject to a cumulative loading requirement, the amount of that constituent applied to an area of land over any period of time does not exceed that cumulative loading requirement. The cumulative load for that constituent shall be calculated as follows: constituent concentration (mg/kg dry weight) x conversion factor of 0.002 (concentration to pounds per dry ton) x the material application rate in dry tons per acre.

- Section 11551(4) – The storage of a material for beneficial use 3 that complies with regulation no. 641, commercial fertilizer bulk storage, R 285.641.1 to R 285.641.18 of the Michigan administrative code, shall be considered to comply with the storage requirements of this part.
- Section 11551(5) – A person that actively manages and reuses a beneficial use by-product that has already been used in compliance with this part may rely on analytical data from the prior use.
- Section 11551(7) - For beneficial use 3, the material that is offered for sale or use shall be annually registered or licensed under part 85 or 1955 PA 162, MCL 290.531 to 290.538. In addition to the information required under part 85 or 1955 PA 162, MCL 290.531 to 290.538, the following information shall be submitted to the department of agriculture and rural development with the license or registration application:
 - (a) Directions for use to ensure that the material is applied at an agronomic rate that has been reviewed by a certified crop advisor.
 - (b) A laboratory analysis report that contains all of the following:
 - (i) Sampling results that demonstrate that the material does not pose harm to human health or the environment. One method by which this demonstration can be made is by sampling results that comply with both of the following:
 - (A) The levels established pursuant to the association of American plant food control officials' statement of uniform interpretation and policy #25, as follows:
 - (I) A fertilizer with a phosphorus or micronutrient guarantee shall apply the policy in its entirety.
 - (II) A fertilizer with only a nitrogen, potassium, or secondary nutrient guarantee shall use the micronutrients column in the policy and apply a multiplier of 1 to determine the maximum allowable concentration of each metal.

- (III) A soil conditioner or liming material shall use the micronutrients column in the policy and apply a multiplier of 1 to determine the maximum allowable concentration of each metal.
- (B) The part 201 generic residential soil direct contact cleanup criteria for volatile organic compounds (as determined by U.S. EPA method 8260), semivolatile organic compounds (as determined by U.S. EPA method 8270c), and dioxins (as determined by U.S. EPA method 1613b). Results for dioxins shall be reported on a dry weight basis, and total dioxin equivalence shall be calculated and reported utilizing the U.S. EPA toxic equivalency factors (U.S. EPA/100/R10/005)
- (ii) For a fertilizer, all of the following used by a certified crop advisor to determine an agronomic rate consistent with generally accepted agricultural and management practices:
- (A) A demonstration that the material contains the minimum percentage of each plant nutrient guaranteed or claimed to be present.
- (B) The percentage of dry solids, nitrogen, ammonium nitrogen, nitrate nitrogen, phosphorus, and potassium in the material.
- (C) The levels of calcium, magnesium, acidity or basicity measured by pH, sulfur, chromium, copper, silver, chlorine, and boron.
- (iii) For a soil conditioner or a liming material, all of the following used by a certified crop advisor to determine an agronomic rate consistent with generally accepted agricultural and management practices:
- (A) The percentage of dry solids in the material.
- (B) The levels of calcium, magnesium, acidity or basicity measured by pH, sulfur, chromium, copper, silver, chlorine, and boron.
- (iv) For a soil conditioner, scientifically acceptable data that give reasonable assurance that the material will improve the physical nature of the soil by altering the soil structure by making soil nutrients more available or otherwise enhancing the soil media resulting in beneficial crop response or other plant growth.
- (v) For a liming material, scientifically acceptable data demonstrating that the material will correct soil acidity.
- Section 11551(8) - When a material is licensed or registered as described in subsection (7), the laboratory analysis report and the scientifically acceptable data submitted with a prior application may be resubmitted for a subsequent application unless the raw materials or processes used to generate the material change in a way that could reasonably be expected to materially affect the laboratory analysis report or scientifically acceptable data.
 - Section 11551(9) - This part does not authorize open dumping prohibited by the solid waste disposal act, 42 USC 6901 to 6992k.

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Michigan Department of Environmental Quality

Office of Waste Management and Radiological Protection

Beneficial Use 4 Conditions

- Section 11502(6) - "Beneficial use 4" means any of the following uses:
 - (a) To stabilize, neutralize, solidify, or otherwise treat waste for ultimate disposal at a facility licensed under this part or part 111.
 - (b) To treat wastewater, wastewater treatment sludge, or wastewater sludge in compliance with part 31 or the federal water pollution control act, 33 USC 1251 to 1387 at a private or publicly owned wastewater treatment plant.
 - (c) To stabilize, neutralize, solidify, cap, or otherwise remediate hazardous substances or contaminants as part of a response activity in compliance with part 201, part 213, or the comprehensive environmental response, compensation and liability act of 1980, 42 USC 9601 to 9657, or a corrective action in compliance with part 111 or the solid waste disposal act, 42 USC 6901 to 6992k.
 - (d) As construction material at a landfill licensed under this part.
- Section 11551(1) (a) – The material is not a part 111 hazardous waste or mixed with a hazardous waste.
- Section 11551(1) (b) – The material is not stored at the site of generation or use for more than 3 years, or the amount that is transferred off site for use during a 3-year period equals at least 75% by weight or volume of the amount of that material stored on site for beneficial use at the beginning of the 3-year period.
- Section 11551(1) (c) – The material is stored in a manner that maintains its usefulness, controls wind dispersal, and prevents loss of the material beyond the storage area.
- Section 11551(1) (d) – The material is stored in a manner that does not cause groundwater to no longer be fit for 1 or more protected uses, does not cause a violation of a part 31 surface water quality standard, and otherwise does not violate part 31.
- Section 11551(1) (e) – The material is transported in a manner that prevents accidental leakage, spillage, or wind dispersal.
- Section 11551(1) (f) – The use of the material is for a legitimate beneficial purpose other than a means to discard the material and the material is used according to generally accepted engineering, industrial, or commercial standards for that use.
- Section 11551(2) – The determination whether a material meets the requirements of subsection (1)(a) shall be based on the analysis of a representative sample of the material by the initial generator. The initial generator shall maintain records of the test results for not less than 10 years after the date the material was sent off site and make the records available to the department upon request. The generator shall resample and analyze the material when raw materials or processes change in a way that could reasonably be expected to materially affect analysis results.

Beneficial Use 4 Conditions

- Section 11551(3) – Except as otherwise provided in this act, storage and use of beneficial use by-products shall comply with all other applicable provisions of this act.
- Section 11551(5) – A person that actively manages and reuses a beneficial use by-product that has already been used in compliance with this part may rely on analytical data from the prior use.
- Section 11551(9) - This part does not authorize open dumping prohibited by the solid waste disposal act, 42 USC 6901 to 6992k.
- Section 11552(2) - By October 30 of each year, any generator or broker of more than 1,000 cubic yards of material used as beneficial use by-products for beneficial use 1, 2, or 4 in the immediately preceding period of October 1 to September 30 or any person that uses or reuses more than 1,000 cubic yards of a source separated material in that period shall submit a report to the department containing all of the following information, as applicable:
 - (a) The business name, address, telephone number, and name of a contact person for the generator, broker, or other person.
 - (b) The types and approximate amounts of beneficial use by-products generated, brokered, and stored during that period.
 - (c) The approximate amount of beneficial use by-products shipped off site during that period and the uses and conditions of use.
 - (d) The amount of source separated materials used or reused

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Office of Waste Management and Radiological Protection

Beneficial Use 5 Conditions

- Section 11502(7) - "Beneficial use 5" means blended with inert materials or with compost and used to manufacture soil.
- Section 11551(1) (a) – The material is not a part 111 hazardous waste or mixed with a hazardous waste.
- Section 11551(1) (b) – The material is not stored at the site of generation or use for more than 3 years, or the amount that is transferred off site for use during a 3-year period equals at least 75% by weight or volume of the amount of that material stored on site for beneficial use at the beginning of the 3-year period.
- Section 11551(1) (c) – The material is stored in a manner that maintains its usefulness, controls wind dispersal, and prevents loss of the material beyond the storage area.
- Section 11551(1) (d) – The material is stored in a manner that does not cause groundwater to no longer be fit for 1 or more protected uses, does not cause a violation of a part 31 surface water quality standard, and otherwise does not violate part 31.
- Section 11551(1) (e) – The material is transported in a manner that prevents accidental leakage, spillage, or wind dispersal.
- Section 11551(1) (f) – The use of the material is for a legitimate beneficial purpose other than a means to discard the material and the material is used according to generally accepted engineering, industrial, or commercial standards for that use.
- Section 11551(1) (i) - For beneficial use 5, the material is foundry sand from ferrous or aluminum foundries and representative sampling of the foundry sand using either a totals analysis, a leachate analysis (using EPA method 1311, EPA method 1312, ASTM method 3987, or other leaching protocol approved by the department), or any combination of the 2 types of analyses demonstrates that none of the following maximum concentrations are exceeded:

CHAPTER 10: Solid Waste Characterization

Beneficial Use 5 Conditions

CONSTITUENT ANALYSIS	TOTALS MG/KG	LEACHATE ANALYSIS MG/L
Antimony	4.3	0.006
Cobalt	0.8	0.01
Copper	5,800	1
Iron	23,185	2.0
Lead	700	0.004
Manganese	1,299	0.86
Molybdenum	5	0.073
Nickel	100	0.1
Thallium	2.3	0.0045
Zinc	2,400	2.4
Benzene	0.1	0.005
Formaldehyde	26	1.3
Phenol	88	4.4
Trichloroethylene	0.1	0.005

- Section 11551 (2) – The determination whether a material meets the requirements of subsection (1)(a) shall be based on the analysis of a representative sample of the material by the initial generator. The initial generator shall maintain records of the test results for not less than 10 years after the date the material was sent off site and make the records available to the department upon request. The generator shall resample and analyze the material when raw materials or processes change in a way that could reasonably be expected to materially affect analysis results.
- Section 1151 (3) - Except as otherwise provided in this act, storage and use of beneficial use by-products shall comply with all other applicable provisions of this act.
- Section 11551(5) – A person that actively manages and reuses a beneficial use by-product that has already been used in compliance with this part may rely on analytical data from the prior use.
- Section 11551 (9) - This part does not authorize open dumping prohibited by the solid waste disposal act, 42 USC 6901 to 6992k.

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Part 115 Beneficial Use Statute Provisions

IMPLEMENTATION

- Q1: How do I petition the DEQ to have a material declared inert, source/site separated, low-hazard industrial waste, or beneficial use by-product?
- A1: *A petitioning process similar to that in the former Rule 118 will be added to the Part 115 rules as part of the conforming rule amendments under development. Until those rule amendments are promulgated, it is recommended that petitions follow the general framework under the former Rule 118 to help ensure that all relevant information is included (see attachment 1).*
- Q2: Do self-declared inertness determinations under former Rule 114(2)(g) (which was rescinded on September 16, 2014) remain in effect until forfeited by the generator?
- A2: *Yes. The generator notifications in accordance with the self-declared inertness provisions, which were all acknowledged by the DEQ, satisfy the provisions under Section 11553(9).*
- Q3: How will the current generic exemptions that have been issued by the DEQ be affected by the new beneficial use provisions?
- A3: *The generic exemptions will remain in effect in accordance with the continuing provisions of Section 11553(9). A generator who is currently operating under one of those generic exemptions may continue to do so. Generators who are not currently operating under one of those generic exemptions may choose to do so after the effective date of the new provisions (September 16, 2014), as well.*
- Q4: Can a generator of a material that is listed as a beneficial use by-product in Part 115 petition the DEQ for uses other than those for which the material is listed?
- A4: *Yes. The generator may also petition the DEQ under Section 11553 for other beneficial uses not specifically identified in Section 11502(8). In addition, the generator may petition the DEQ to designate the material as a compostable material, site or source separated material, inert, or low-hazard industrial waste.*
- Q5: What conditions are placed on beneficial use by-products that are allowed to be used as a construction material at licensed landfills under Beneficial Use 4?
- A5: *There are numerous requirements in the Part 115 Rules that pertain to construction materials at licensed landfills. In addition, under Section 11551(f), the use must be for a legitimate beneficial purpose other than simply a means to discard the material, and the use must be according to generally accepted engineering, industrial, or commercial standards.*

CHAPTER 10: Solid Waste Characterization

LAND APPLICATION

- Q6: What responsibilities does a generator or broker have for ensuring that the maximum pollutant load rate for beneficial use 3 under Section 11551(1)(h) is not exceeded?
- A6: *The generator or broker (whichever entity registers the product with MDARD) shall be responsible for providing a label or invoice that is provided to the end user containing directions for use that include an application rate indicating the maximum lbs/acre/year of material that can be applied.*
- Q7: Who is responsible to have a material registered or licensed as a fertilizer, soil conditioner or liming material with MDARD for beneficial use 3 under Section 11551(7)?
- A7: *MDARD would let either the generator or broker apply for registration or licensing.*
- Q8: Does the end user get a copy of the use directions for a beneficial use by-product for beneficial use?
- A8: *Yes. The end user must be provided with direction for use of a registered or licensed fertilizer, soil conditioner, or liming agent.*
- Q9: If the end user applies a beneficial use by-product for beneficial use 3 contrary to directions, are they liable for any potential cleanup?
- A9: *The end user may be responsible or liable under Part 201 if there is a release that results from the misuse of a beneficial use byproduct. Under Section 20101(mm)(vii), a release would not occur from the use of a beneficial use by-product in accordance with Part 115.*
- Q10: How would the DEQ or MDARD know which requirements apply to sugar beet soils that are land applied?
- A10: *There are two locations where sugar beet soils are listed: 11502(7)(l) and 11506(1)(n). It may be difficult to determine which set of conditions apply. The burden of proof to verify the moisture level and that it meets one of the three categories below is on the generator. If there is no documentation to verify one of those three categories is met, then the material is a solid waste and enforcement falls under DEQ.*
- Sugar beet soils that have less than 35% moisture are not solid waste if registered under Part 85. (MDARD)*
 - Sugar beet soils are beneficial use by-products and not a solid waste when they are applied at agronomic rate, compliant with GAAMPS, create no nuisance conditions, are not impacting groundwater, and are registered as a beneficial use product 3 under Part 85. The generator of the material must inform the end user of their obligations under either of the exemptions listed above. (MDARD)*
 - Sugar beet soils with an existing AUA. (DEQ)*
- Q11: Which waste materials will MDARD oversee for land application?
- A11: *Under Part 115, MDARD will oversee the land application of the 12 materials identified in Section 11502(8) for beneficial use 3, which include:*
- coal bottom ash*
 - wood ash*
 - pulp and paper mill ash*
 - mixed wood ash*
 - cement kiln dust*
 - Lime kiln dust*
 - foundry sand*
 - pulp and paper mill material*
 - dewatered concrete grinding slurry*
 - lime softening residuals*
 - soil washed from sugar beets*
 - segregated flue gas desulfurization material.*

CHAPTER 10: Solid Waste Characterization

- Q12: Can materials other than those listed for beneficial use 3 be approved for land application?
- A12: *Yes. The DEQ can approve other materials for land application as compostable material, non-detrimental material, or source separated material under Section 11553. In addition, current written authorizations by the DEQ for land application will continue until they expire or are forfeited as provided in Section 11553(9).*
- Q13: What are the testing requirements to use a Beneficial Use By-Product for Beneficial Use 3?
- A13: *MDARD has developed a [testing protocol](#) that can be found at www.michigan.gov/mdard-licensing, select "Agricultural Products," then "Michigan Fertilizer and Liming Information."*
- Q14: What criteria will MDARD use for parameters that are not contained in Section 11551(1)(h)?
- A14: *MDARD will evaluate materials based on the Part 201 residential direct contact criteria for any additional parameters of concern.*

TESTING AND CRITERIA

- Q15: Foundry sand is listed as a beneficial use by-product. Is it expected that each waste stream (i.e. shakeout, shot blast, cores, molding sand, air pollution control dust, etc.) will be tested individually or is the testing required on a composite of all the various streams generated by each foundry?
- A15: *It is the responsibility of the generator to determine whether or not his sands meet the designation of a beneficial by-product. If the generator has knowledge that all of the individual sand waste streams are very similar, then he can collect a representative sample of the mixture for beneficial by-product determination testing. If he does not know for certain that the individual components are similar, or if he is unsure, it is best to test each of the individual sand waste streams initially to determine whether or not it is appropriate to combine them for subsequent characterization purposes. Ultimately the responsibility for proper characterization of the foundry sand is the responsibility of the generator.*
- Q16: Can the MDEQ consider for approval as a beneficial use byproduct or inert material a material that leaches contaminants above the most restrictive of the health based drinking water standard, the aesthetic criteria, or the groundwater/surface water interface (GSI) criteria?
- A16: *Yes. While Section 11553(3)(e)(ii) and 11553(5)(c) require that the material cannot form an unacceptably contaminated leachate, under Sections 11553(4) and (6), the MDEQ may consider other criteria that are protective of public health and the environment for that material and use. An unacceptably contaminated leachate would be one that exceeds either the Part 201 generic residential groundwater drinking water criteria (which include both health-based and aesthetic criteria) or surface water quality standards under Part 31 (which include the GSI criteria)*
- Q17: Can the MDEQ consider for approval as a beneficial use byproduct or inert material a material that poses a direct contact health hazard to humans?
- A17: *Yes. While Section 11553(3)(e)(i) and 11553(5)(b) require that the material cannot pose a direct contact health hazard to humans, under Sections 11553(4) and (6), the MDEQ may consider other criteria that are protective of public health and the environment for the material and use. For example, a means to eliminate this pathway, such as clean cover and deed restrictions, may be a consideration.*
- Q18: How is the GSI criteria developed?
- A18: *A calculation is performed based on either the pH or hardness of a potential receiving surface water body. The [excel spreadsheet for this calculation](#) (see Footnote (G) GSI/ GSIPC Calculation) can be found under **Operational Memoranda and Guidance (Cleanup Criteria Requirements)** at www.michigan.gov/deq/landcleanup (select "Site Investigation and Remediation.")*

CHAPTER 10: Solid Waste Characterization

Q19: What parameters currently have GSI criteria that are dependent on pH or hardness of the receiving surface water body?

A19: *Acetate, acetic acid, barium, beryllium, cadmium, chromium (III), copper, lead, manganese, nickel, zinc, and pentachlorophenol.*

Q20: Since the GSI criteria for a number of parameters are based on the hardness or pH of any potential body of water that may be near a site where beneficial use by-products, inert material, source separated materials, etc. are used, is there a way to use default hardness values based on location in Michigan as a starting point to calculate the GSI criteria?

A20: *Yes, the following hardness values may be used as a starting point to determine the GSI criteria.*

- a. *Any discharges directly to any of the Great Lakes in the Lower Peninsula (Lake Michigan, Lake Huron, or Lake Erie), a hardness value of 100 mg/l would be a conservative hardness value.*
- b. *A regional hardness value for the entire Upper Peninsula would be 50 mg/l.*
- c. *A regional hardness value for the upper portion of the Lower Peninsula north of a line crossing the state from approximately where M-46 crosses the state, a hardness value of 100 mg/l would be a conservative value.*
- d. *A regional hardness value for the lower portion of the Lower Peninsula south of a line crossing the state from approximately where M-46 crosses the state, a hardness value of 150 mg/l would be appropriate.*

Q21: What would the GSI criteria look like using the default hardness numbers from above?

A21: *Yes, the following hardness values may be used as a starting point to determine the GSI criteria.*

Parameter	GSI (µg/l) Hardness = 50 mg/l	GSI (µg/l) Hardness = 100 mg/l	GSI (µg/l) Hardness = 150 mg/l	Residential health based drinking water standard (µg/l)	Aesthetic criteria (µg/l)
Barium	210	440	670	2,000	NA
Beryllium	0.41	2.4	6.7	4	NA
Cadmium	1.3	2.2	3	5	NA
Chromium (III)	42	74	100	100	NA
Copper	5	9	13	1,000	1,400
Lead	12	21	29	4	NA
Manganese	1,100	2,000	2,800	860	50
Nickel	29	52	73	100	NA
Zinc	66	120	170	2,400	NA

Q22: If a contaminant leaches from a material in excess of the default GSI (from Q21), is it possible to use site specific pH or hardness to calculate the allowable GSI?

A22: *Yes, you may use site specific criteria from receiving water adjacent to where a waste material could be used.*

CHAPTER 10: Solid Waste Characterization

- Q23: If a contaminant leaches above the default GSI or site specific GSI (using the calculation from Q20 and Q21) is it still possible to use a material?
- A23: *Yes, you may be able to get a mixing zone determination that may allow contaminants to leach in excess of the calculated GSI criteria based on the specific criteria of a potential receiving body of water. To explore this option, contact Christine Alexander at 517-284-4670.*

OTHER

- Q24: Can pavement or broken concrete produced by a beneficial use by-product be an inert material?
- A24: *Yes. While Subsection 11551(6) limits the use of beneficial use by-products to the same roadway in which they were originally used, pavement and broken concrete specifically are inert under Subsection 11504(2)(e), regardless of whether they were produced from virgin materials or beneficial use by-products.*
- Q25: Can concrete and brick containing lead-based paint be used as an inert material or beneficial use by-product under 11504(2)(e)(ii), or 11553(3), (4), (5), or (6)?
- A25: *Yes. The DEQ can consider, on a case-by-case basis, petitions to exempt materials coated with lead-based paint. The DEQ will also consider issuing a generic exemption at a later date if sufficient analytical information is generated from multiple petitions. One method historically used to demonstrate that the material meets the inert criteria was a mass balance calculation on the total amount of lead paint compared to the total amount of painted material.*
- Q26: What amount of fly ash or economizer ash can be present in bottom ash used for cold weather road abrasive in 11506(1)(r)?
- A26: *Fly ash or economizer ash content is not limited, but the mixture must meet MDOT standards.*
- Q27: What are the differences in land applying paper mill sludge under:
- a. a self-declaration under old rule 114?
 - b. an agricultural use approval (AUA) under rule 111?
 - c. the beneficial use statute?
- A27: *The following chart shows differences between the various approval pathways.*

Required Information/Action	Self-Declared ¹	AUA	Ben Use By-Product
Sludge testing	X	X	X
Application at agronomic rates	X	X	X
Annual reporting	X ²	X	X
Petition DEQ for approval		X	
Register sludge with MDARD			X
Notify adjacent land owners and township of land application	X ²	X	
Maintain isolation distance for application from property lines, surface water, roads, etc.	X ²	X	
Verify exempt from creating a "facility" under Part 201 if done in accordance with Part 115			X
Site details, including plat map, address for use, latitude, longitude, owner's name, etc.	X ²	X	

¹ These self-declared designations are no longer available to generators but those in place remain in place until forfeited by the generator.

² Some self-declaration petitions for approval include these items.

CHAPTER 10: Solid Waste Characterization

- Q28: The new legislation lists stamp sands as a beneficial use by-product appropriate for use in asphalt/concrete, as fill material under an impervious surface, or as cold weather road abrasive. Are historical piles and deposits of stamp sands in violation of the speculative accumulation and other storage requirements under Subsection 11551(1)?
- A28: *No. The storage requirements would apply when the stamp sands are removed from their historical disposal locations and intended for beneficial use 1 or 2. The storage requirements are not applicable to stamp sands used as a cold weather road abrasive.*
- Q29: What materials have limits on the period of storage?
- A29: *The following materials have limits on the period of storage:*
- *Beneficial use by-products under Section 11551(b)*
 - *Source separated materials under Section 11506(6)*
 - *Yard clippings under Section 11521(4)(c)(iii)*
 - *Low-hazard industrial waste stored at the site of generation in uncontained waste piles under Rule 129(2)(a)*
- Q30: Who determines if testing is required on soils under 11504(2)(c)(i)?
- A30: *The owner of a property makes this decision for upland soils based on knowledge of the property.*
- Q31: Who determines if testing is required of dredged sediments under 11504(2)(c)(i)?
- A31: *The testing of dredged sediments is addressed in the MDEQ's Dredge Sediment Review policy and procedure Number 09-018 found at www.michigan.gov/documents/deq/deq-policy-09-018_414753_7.pdf (currently being revised to comply with the beneficial use statute).*
- Q32: Can two or more listed beneficial use by-products be mixed during use?
- A32: *Mixing two or more beneficial use by-products for the same use is not prohibited. However, the mixture must still satisfy all applicable requirements for that beneficial use (e.g., Section 11551 requires that they be used in accordance with generally accepted engineering, industrial, or commercial standards).*

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CHAPTER 10: Solid Waste Characterization

Petitions to Classify Solid Waste

For solid waste not otherwise excluded from regulation by statute or rule, a waste generator may petition the DEQ under Rule 118a to designate a material:

- a beneficial use by-product for beneficial use options 1, 2, 4, or 5;
- an inert material;
- a source separated material;
- a site separated material;
- a low hazard industrial waste;;
- a recycled material (see Rule 111);
- an inert material appropriate for specific reuse (Rule 117); or
- a compostable material (Rule 121).

When seeking to classify a waste, a petitioner must submit the information specified under Rule 118a to the DEQ for review and approval. Petitions must include information to verify the character and composition of the waste. Inertness often relies upon verification that the material is at or below the Part 201 residential direct contact criteria for any parameters of concern. As such, the Part 201, [table 1](#) “Groundwater: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk Based Screening Levels” and [table 2](#) “Soil: Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels are key to any petition for classification.

Low-Hazard Industrial Waste

If a material is not eligible for reclassification for use, it may be eligible for classification as a low-hazard industrial waste pursuant to [Part 115, Section 11553\(7\)](#) which allows the generator:

- to store the waste at the site of generation for up to 3 years under Rule 105(l);
- to store the waste in a non-contained waste pile under Rule 129 and
- to dispose of the material in a low-hazard industrial waste landfill without performing any testing.

The following tables provide the threshold values used for classification of a low-hazard industrial waste. The waste must be at or below the threshold when tested in accordance with Rule 302(2)(a) for approval.

Metals	
Constituent	Low-Hazard Waste Threshold Value (mg/l Milligrams per Liter)
Aluminum	0.50
Antimony	0.06
Arsenic	0.50
Barium	20.0
Beryllium	0.04
Boron	5.0
Cadmium	0.1
Cobalt	0.4
Chromium	0.5
Copper	10.0
Iron	3.0
Lead	0.5
Manganese	0.50
Mercury (inorganic)	0.02
Nickel (soluble salts)	1.0
Selenium	0.1
Silver	0.5

CHAPTER 10: Solid Waste Characterization

Metals	
Constituent	Low-Hazard Waste Threshold Value (mg/l Milligrams per Liter)
Thallium	0.02
Vanadium	0.045
Zinc	24.0

Phenolic Compounds	
Constituent	Low-Hazard Waste Threshold Value (mg/l Milligrams per liter)
2-chlorophenol	0.45
o-Cresol (2-methylphenol)	3.7
m-Cresol (3-methylphenol)	3.7
p-Cresol (4-methylphenol)	3.7
2,4-Dichlorophenol	0.730
2,4-Dimethylphenol	3.7
2,6 -Dimethylphenol	0.044
3,4 Dimethylphenol	0.1
2-Methyl-4,6-dinitrophenol	0.2
Pentachlorophenol	10.0
Phenol	44.0
2,4,5-Trichlorophenol	7.3
2,4,6-Trichlorophenol	1.2

Volatile Organic Compounds	
Constituent	Low-Hazard Waste Threshold Value (mg/l Milligrams per Liter)
Benzene	0.05
Benzyl chloride	0.077
Bromodichloromethane	0.8
Bromoform	0.8
Bromomethane	0.1
Carbon tetrachloride	0.05
Chlorobenzene	10.0
Chloroethane	4.3
Chloroform	0.8
Chloromethane	2.6
Dibromochloromethane	0.8
Dibromomethane	0.8
1,2-Dichlorobenzene	6.0
1,3-Dichlorobenzene	66.0
1,4-Dichlorobenzene	0.75
Dichlorodifluoromethane	17.0
1,1-Dichloroethane	8.8
1,2-Dichloroethane	0.05
1,1-Dichloroethylene	0.07
Cis-1,2-dichloroethylene	0.7
Trans-1,2-dichloroethylene	1.0
1,2-Dichloropropane	0.05
1,3-Dichloropropene	0.085

CHAPTER 10: Solid Waste Characterization

Volatile Organic Compounds	
Constituent	Low-Hazard Waste Threshold Value (mg/l Milligrams per Liter)
Diethyl ether	0.1
Ethylbenzene	0.74
Methylethylketone (2-butanone)	130.0
Methylisobutylketone (4-methyl-2-pentanone)	18.0
Methylene chloride	0.05
1,1,1,2-Tetrachloroethane	0.77
1,1,2,2-Tetrachloroethane	0.085
Tetrachloroethylene	0.07
Toluene	7.9
1,1,1-Trichloroethane	2.0
1,1,2-Trichloroethane	0.05
Trichloroethylene	0.05
Trichlorofluoromethane	26.0
1,2,3-Trichloropropane	0.42
Vinyl chloride	0.02
Total xylene isomers	2.8

Diverted Waste

Diverted waste includes waste commonly collected at community household hazardous waste collections that can lawfully be disposed in licensed sanitary landfill or at a municipal solid waste incinerator and is being diverted to an environmentally preferred management option. Diverted waste includes waste materials like pharmaceuticals, electronic waste, batteries, mercury containing light bulb, pesticides, thermostats, mercury switches, mercury bearing thermometers, household sharps, or other wastes approved by the DEQ that can be readily separated from solid waste for diversion to preferred methods of management and disposal.

Diverted waste must be source separated and collected at waste diversion centers that meet the management requirements found under Section 11521b of Part 115. Some of the primary management requirements for a waste diversion center include ensuring that the diverted waste is:

- collected safely and lawfully by personnel knowledgeable about safe management of the material;
- collected at a secure location protected from weather, fire, physical damage, and vandals;
- not processed except to the extent necessary for safe and efficient transport
- managed to prevent release to the environment;
- not stored for more than 1 year; and
- Documented (waste types, volumes, and disposition) for at least



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Acenaphthene	83329	1,300	3,800	38	4,200 (S)	4,200 (S)	4,240	ID
Acenaphthylene	208968	52	150	ID	3,900 (S)	3,900 (S)	3,930	ID
Acetaldehyde (I)	75070	950	2,700	130	1.10E+06	2.30E+06	1.00E+09	8.90E+06
Acetate	71561	4,200	12,000	(G)	ID	ID	ID	ID
Acetic acid	64197	4,200	12,000	(G)	NLV	NLV	6.00E+09	1.0E+9 (D)
Acetone (I)	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+09	1.50E+07
Acetonitrile	75059	140	400	NA	2.40E+07	4.50E+07	2.00E+08	2.10E+07
Acetophenone	98862	1,500	4,400	ID	8.1E+8 (S)	8.1E+8 (S)	6.10E+08	ID
Acrolein (I)	107028	120	330	NA	2,100	4,200	2.10E+08	8.70E+06
Acrylamide	79061	0.5 (A)	0.5 (A)	10 (X)	NLV	NLV	2.20E+09	NA
Acrylic acid	79107	3,900	11,000	NA	1.20E+07	2.80E+07	1.00E+09	1.0E+9 (D)
Acyromitrile (I)	107131	2.6	11	2.0 (M); 1.2	34,000	1.90E+05	7.50E+07	8.40E+06
Atachlor	15972608	2.0 (A)	2.0 (A)	11 (X)	NLV	NLV	1.83E+05	ID
Aldicarb	118063	3.0 (A)	3.0 (A)	NA	NLV	NLV	6.00E+06	ID
Aldicarb sulfone	1646884	2.0 (A)	2.0 (A)	NA	NLV	NLV	7.80E+06	ID
Aldicarb sulfoxide	1646873	4.0 (A)	4.0 (A)	NA	NLV	NLV	2.80E+07	ID
Aldrin	309002	0.088	0.4	0.01 (M); 8.7E-6	180 (S)	180 (S)	180	ID
Aluminum (E)	7429905	50 (V)	50 (V)	NA	NLV	NLV	NA	ID
Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	5.30E+08	ID
n-Amyl methyl ether (TAME)	994058	190 (E)	190 (E)	NA	2.60E+06	5.70E+05	2.64E+06	NA
Aniline	62533	53	220	4	NLV	NLV	3.60E+07	NA
Anthracene	120127	43 (S)	43 (S)	ID	43 (S)	43 (S)	43.4	ID
Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	NA	ID
Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	NA	ID
Asbestos (BB)	1332214	7.0E MFL (A)	7.0E MFL (A)	NA	NLV	NLV	NA	NA
Atrazine	1912249	3.0 (A)	3.0 (A)	7.3	NLV	NLV	70,000	ID
Acobenzene	103333	23	94	ID	6,400 (S)	6,400 (S)	6,400	ID
Barium (E)	7440393	2,000 (A)	2,000 (A)	(G)	NLV	NLV	NA	ID



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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Benzene (I)	71432	5.0 (A)	5.0 (A)	200 (X)	5,800	95,000	1.78E+06	68,000
Benzidine	92875	0.3 (M); 0.0037	0.3 (M); 0.015	0.3 (M); 0.073	NLV	NLV	5.20E+05	ID
Benzo(a)anthracene (Q)	56553	2.1	8.5	ID	NLV	NLV	9.4	ID
Benzopluoranthene (Q)	205992	1.5 (S,AA)	1.5 (S,AA)	ID	ID	ID	1.5	ID
Benzo(k)fluoranthene (Q)	207089	1.0 (M); 0.8 (S)	1.0 (M); 0.8 (S)	NA	NLV	NLV	0.8	ID
Benzofluoranthene (Q)	181242	1.0 (M); 0.26 (S)	1.0 (M); 0.26 (S)	ID	NLV	NLV	0.26	ID
Benzofluoranthene (Q)	50328	5.0 (A)	5.0 (A)	ID	NLV	NLV	1.62	ID
Benzole acid	65850	32,000	92,000	NA	NLV	NLV	3.50E+06	ID
Benzyl alcohol	100516	10,000	29,000	NA	NLV	NLV	4.40E+07	ID
Benzyl chloride	100447	7.7	32	NA	12,000	77,000	4.90E+05	NA
Beryllium	7440417	4.0 (A)	4.0 (A)	(G)	NLV	NLV	NA	ID
bis(2-Chloroethoxy)ethane	112265	ID	ID	ID	NLV	NLV	1.89E+07	ID
bis(2-Chloroethyl)ether (I)	111444	2	8.3	1.0 (M); 0.79	38,000	2.10E+05	1.72E+07	1.7E+7 (S)
bis(2-Ethylhexyl)phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	340	NA
Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	NA	ID
Bromate	15541454	10 (A)	10 (A)	40 (X)	NLV	NLV	88,000	ID
Bromobenzene (I)	108861	18	50	NA	1.80E+05	3.80E+05	4.13E+05	ID
Bromodichloromethane	75274	80 (A,W)	80 (A,W)	ID	4,800	37,000	6.74E+06	ID
Bromoform	75252	80 (A,W)	80 (A,W)	ID	4.70E+05	3.1E+6 (S)	3.10E+06	ID
Bromomethane	74839	10	29	35	4,000	9,000	1.45E+07	ID
n-Butanol (I)	71363	950	2,700	9,800 (X)	NLV	NLV	7.40E+07	4.70E+07
2-Butanone (MEX) (I)	78983	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.40E+08	ID
n-Butyl acetate	123864	550	1,600	NA	6.7E+6 (S)	6.7E+6 (S)	6.70E+06	2.50E+06
n-Butyl alcohol	75660	3,900	11,000	NA	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+09	6.10E+07
Butyl benzyl phthalate	86687	1,200	2,700 (S)	67 (X)	NLV	NLV	2,690	ID
n-Butylbenzene	104518	80	230	ID	ID	ID	NA	ID
sec-Butylbenzene	135988	80	280	ID	ID	ID	NA	ID
n-Butylbenzene (I)	98066	80	230	ID	ID	ID	NA	ID



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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Cadmium (B)	7440438	5.0 (A)	5.0 (A)	(G,X)	NLV	NLV	NA	ID
Camphane (I)	79925	ID	ID	NA	440	1,000	33,400	ID
Caprolactam	105802	5,800	17,000	NA	NLV	NLV	5,25E+09	NA
Carbaryl	63262	700	2,000	NA	ID	ID	1,28E+06	ID
Carbazole	88748	85	380	10 (M); 4.0	NLV	NLV	7,480	ID
Carbutran	1563862	40 (A)	40 (A)	NA	NLV	NLV	7,00E+05	ID
Carbon disulfide (I,R)	75160	800	2,300	ID	2,50E+05	5,50E+05	1,18E+08	13,000
Carbon tetrachloride	56235	5.0 (A)	5.0 (A)	45 (X)	370	2,400	7,93E+05	ID
Chlordane (J)	57749	2.0 (A)	2.0 (A)	2.0 (M); 0.00025	56 (S)	56 (S)	56	ID
Chloride	18887006	2.8E+5 (E)	2.8E+5 (E)	(FF)	NLV	NLV	NA	ID
Chlorobenzene (I)	108907	100 (A)	100 (A)	25	2,10E+05	4,7E+5 (S)	4,72E+05	1,80E+05
p-Chlorobenzene sulfonic acid	98668	7,300	21,000	ID	ID	ID	NA	ID
1-Chloro-1,1-difluoroethane	75683	15,000	44,000	NA	3,9E+6 (S)	3,9E+6 (S)	3,90E+06	NA
Chloroethane	75003	430	1,700	1,100 (X)	5,7E+6 (S)	5,7E+6 (S)	5,74E+06	1,10E+05
2-Chloroethyl vinyl ether	110758	ID	ID	NA	ID	ID	1,50E+07	ID
Chloroform	67663	80 (A,W)	80 (A,W)	350	28,000	1,80E+05	7,92E+06	ID
Chloroethane (I)	74873	260	1,100	ID	8,600	45,000	6,34E+06	36,000
4-Chloro-3-methylphenol	55507	150	420	7.4	NLV	NLV	3,90E+06	ID
beta-Chloronaphthalene	91587	1,800	5,200	NA	ID	ID	6,740	ID
2-Chlorophenol	95678	45	130	18	4,90E+05	1,10E+06	2,20E+07	ID
p-Chlorotoluene (I)	95498	150	420	ID	2,20E+05	3,7E+5 (S)	3,73E+05	ID
Chlorpyrifos	2921882	22	63	2.0 (M); 0.002	2.9	6.6	1,120	ID
Chromium (III) (B,H)	18065831	100 (A)	100 (A)	(G,X)	NLV	NLV	NA	ID
Chromium (VI)	18640299	100 (A)	100 (A)	11	NLV	NLV	NA	ID
Chrysene (Q)	218019	1.6 (S)	1.6 (S)	ID	ID	ID	1.6	ID
Cobalt	7440484	40	100	100	NLV	NLV	NA	ID
Copper (B)	7440508	1,000 (E)	1,000 (E)	(G)	NLV	NLV	NA	ID
Cyanazine	21725462	2.3	9.4	56 (X)	NLV	NLV	1,70E+05	ID



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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Cyanide (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	NA	ID
Cyclohexanone	108941	33,000	94,000	NA	1,500	3,300	2.30E+07	NA
Dachal	1861321	73	210	NA	NLV	NLV	500	ID
Dalapon	75990	200 (A)	200 (A)	NA	NLV	NLV	5.02E+08	ID
4,4'-DDD	72548	9.1	37	NA	NLV	NLV	90	ID
4,4'-DDE	72559	4.3	15	NA	NLV	NLV	120	ID
4,4'-DDT	50293	3.6	10	0.02 (M); 1.1E-5	NLV	NLV	25	NA
Decabromodiphenyl ether	1183195	30 (S)	30 (S)	NA	30 (S)	30 (S)	30	ID
Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,200	NA
Di(2-ethylhexyl) adipate	103231	400 (A)	400 (A)	ID	NLV	NLV	471	ID
Di-n-octyl phthalate	117840	130	380	ID	NLV	NLV	3,000	ID
Diacetone alcohol (I)	123422	ID	ID	NA	NLV	NLV	1.00E+09	1.0E+9 (S)
Diazinon	333415	1.3	3.8	1.0 (M); 0.004	NLV	NLV	88,800	NA
Dibenzo(a,h)anthracene (Q)	53703	2.0 (M); 0.21	2.0 (M); 0.85	ID	NLV	NLV	2.49	ID
Dibenzofuran	132649	ID	ID	4	10,000 (S)	10,000 (S)	10,000	ID
Dibromochloromethane	124481	80 (A,W)	80 (A,W)	ID	14,000	1.10E+05	2.60E+06	ID
Dibromochloropropane	98128	0.2 (A)	0.2 (A)	ID	220	1,200 (S)	1,230	NA
Dibromomethane	74953	80	230	NA	ID	ID	1.10E+07	ID
Dicamba	1918009	220	630	NA	NLV	NLV	4.50E+06	ID
1,2-Dichlorobenzene	95501	800 (A)	800 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.58E+05	NA
1,3-Dichlorobenzene	541731	6.6	19	28	18,000	41,000	1.11E+05	ID
1,4-Dichlorobenzene	106467	75 (A)	75 (A)	17	16,000	74,000 (S)	73,800	NA
3,3'-Dichlorobenzidine	91941	1.1	4.3	0.3 (M); 0.2	NLV	NLV	3,110	ID
Dichlorodifluoromethane	75718	1,700	4,900	ID	2,20E+05	3.0E+5 (S)	3.00E+05	ID
1,1-Dichloroethane	75343	880	2,500	74.0	1.00E+06	2.30E+06	5.06E+06	3.80E+05
1,2-Dichloroethane (I)	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	8.52E+06	2.50E+06
1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	2.25E+06	97,000
cis-1,2-Dichloroethylene	156592	70 (A)	70 (A)	620	93,000	2.10E+05	3.50E+06	5.30E+05



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trans-1,2-Dichloroethylene	156605	100 (A)	100 (A)	1,500 (X)	85,000	2,00E+05	6.30E+05	2,30E+05
2,6-Dichloro-4-nitroaniline	99309	2,200	6,300	NA	NLV	NLV	7,000	ID
2,4-Dichlorophenol	120832	73	210	11	NLV	NLV	4,50E+05	ID
2,4-Dichlorophenoxyacetic acid	84757	70 (A)	70 (A)	220	NLV	NLV	6,80E+05	ID
1,2-Dichloropropane (I)	78875	5.0 (A)	5.0 (A)	230 (X)	16,000	36,000	2,80E+05	5,50E+05
1,3-Dichloropropene	542756	8.5	35	9.0 (X)	3,900	26,000	2,80E+05	1,30E+05
Dichlorovos	62737	1.6	6.7	NA	NLV	NLV	1,60E+07	NA
Dicyclohexyl phthalate	84617	ID	ID	NA	ID	ID	4,000	ID
Dieldrin	60571	0.11	0.43	0.02 (M); 6.5E-6	200 (S)	200 (S)	185	ID
Diethyl ether	60297	10 (E)	10 (E)	ID	6.1E+7 (S)	6.1E+7 (S)	6,10E+07	6,50E+05
Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1,08E+06	NA
Diethylene glycol monobutyl ether	112345	88	250	NA	NLV	NLV	1,00E+09	ID
Diisopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,041	8,000 (S)
Diisopropylamine (I)	108189	5.6	1.6	NA	2,10E+07	3,7E+7 (S)	3,69E+07	4,60E+05
Dimethyl phthalate	131113	73,000	2,10E+05	NA	NLV	NLV	4,18E+06	NA
N,N-Dimethylacetamide	127195	180	520	4,100 (X)	NLV	NLV	1,00E+09	NA
N,N-Dimethylaniline	121897	16	46	NA	2,40E+05	1,3E+5 (S)	1,27E+06	NA
Dimethylformamide (I)	68122	700	2,000	NA	NLV	NLV	1,00E+09	ID
2,4-Dimethylphenol	106679	370	1,000	350	NLV	NLV	7,87E+06	ID
2,6-Dimethylphenol	576291	4.4	13	NA	NLV	NLV	6,14E+06	ID
3,4-Dimethylphenol	95653	10	29	25	NLV	NLV	4,93E+06	ID
Dimethylsulfoxide	67685	2,20E+05	6,30E+05	1,90E+05	NLV	NLV	1,66E+03	ID
2,4-Dinitrotoluene	121142	7.7	32	NA	NLV	NLV	2,70E+05	ID
Dinoseb	88857	7.0 (A)	7.0 (A)	1.0 (M); 0.48	NLV	NLV	52,000	ID
1,4-Dioxane (I)	123911	85	350	2,900 (X)	NLV	NLV	9,00E+08	1,40E+08
Diquat	85007	20 (A)	20 (A)	20 (M); 6.0	NLV	NLV	7,00E+05	ID
Dissolved oxygen (DO)	NA	ID	ID	(EE)	ID	ID	NA	NA
Diuron	330541	31	90	NA	NLV	NLV	37,300	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (µg/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§924.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Endosulfan (J)	115297	44	130	0.03 (M); 0.029	ID	ID	510	ID
Endothall	145733	100 (A)	100 (A)	NA	NLV	NLV	1.00E+08	ID
Endrin	72208	2.0 (A)	2.0 (A)	ID	NLV	NLV	260	ID
Epichlorohydrin (I)	106898	5.0 (M); 2.0 (A)	6.0 (M); 2.0 (A)	NA	3.20E+05	6.30E+05	6.80E+07	4.70E+07
Ethanol (I)	64175	1.90E+06	3.80E+06	ID	NLV	NLV	1.00E+09	9.70E+07
Ethyl acetate (I)	141786	6,900	19,000	NA	6.4E+7 (S)	6.4E+7 (S)	6.40E+07	4.20E+06
Ethyl-tert-butyl ether (ETBE)	637923	49 (E)	49 (E)	ID	2.90E+06	5.6E+6 (S)	5.63E+06	ID
Ethylbenzene (I)	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.69E+05	43,000
Ethylene dibromide	106934	0.05 (A)	0.05 (A)	5.7 (X)	2,400	15,000	4.20E+06	ID
Ethylene glycol	107211	15,000	42,000	1.8E+5 (X)	NLV	NLV	1.00E+09	NA
Ethylene glycol monobutyl ether	111762	3,700	10,000	NA	2,90E+06	6.50E+06	2.24E+08	NA
Fluoranthene	206440	210 (S)	210 (S)	1.6	210 (S)	210 (S)	206	ID
Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	1,980	ID
Fluorine (soluble fluoride) (B)	7782414	2,000 (E)	2,000 (E)	ID	NLV	NLV	NA	ID
Formaldehyde	50000	1,300	3,800	120	63,000	3.60E+05	5.60E+08	ID
Formic acid (I,U)	64186	10,000	29,000	ID	7.70E+06	1.50E+07	1.00E+09	1.0E+9 (D)
1-Formylpiperidine	2591868	80	230	NA	ID	ID	NA	ID
Gentian violet	548629	15	63	NA	NLV	NLV	1.00E+06	ID
Glyphosate	1071836	700 (A)	700 (A)	NA	NLV	NLV	1.16E+07	ID
Heptachlor	76448	0.4 (A)	0.4 (A)	0.01 (M); 0.0018	180 (S)	180 (S)	180	ID
Heptachlor epoxide	1024573	0.2 (A)	0.2 (A)	ID	NLV	NLV	200	ID
n-Heptane	142825	2,700 (S)	2,700 (S)	NA	2,700 (S)	2,700 (S)	2,690	200
Hexabromobenzene	87821	0.17 (S); 20	0.17 (S); 58	ID	ID	ID	0.17	ID
Hexachlorobenzene (C-86)	118741	1.0 (A)	1.0 (A)	0.2 (M); 0.0003	440	3,000	6,200	ID
Hexachlorobutadiene (C-46)	87683	15	42	0.053	1,600	3,200 (S)	3,230	ID
alpha-Hexachlorocyclohexane	319846	0.43	1.7	ID	2,000 (S)	2,000 (S)	2,000	ID
beta-Hexachlorocyclohexane	319857	0.68	3.6	ID	NLV	NLV	240	ID
Hexachlorocyclopentadiene (C-56)	77474	50 (A)	60 (A)	ID	130	420	1,800	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (µg/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(1.0)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Hexachloroethane	67721	7.3	21	6.7 (X)	27,000	50,000 (S)	50,000	ID
n-Hexane	110543	3,000	8,600	NA	12,000 (S)	12,000 (S)	12,000	12,000 (S)
2-Hexanone	591796	1,000	2,900	ID	4.20E+06	8.70E+06	1.60E+07	NA
Indeno(1,2,3-cd)pyrene (Q)	193395	2.0 (M); 0.022 (S)	2.0 (M); 0.022 (S)	ID	NLV	NLV	0.022	ID
Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	NA	ID
Isobutyl alcohol (I)	78831	2,300	6,700	NA	7.6E+7 (S)	7.6E+7 (S)	7.60E+07	ID
sophorone	78591	770	3,100	1,300 (X)	NLV	NLV	1.20E+07	ID
sopropyl alcohol (I)	67630	470	1,300	67,000 (X)	NLV	NLV	1.00E+09	6.00E+07
sopropyl benzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000	29,000
Lead (B)	7439921	4.0 (L)	4.0 (L)	(G X)	NLV	NLV	NA	ID
Lindane	58899	0.2 (A)	0.2 (A)	0.03 (M); 0.026	ID	ID	6,800	ID
Lithium (B)	7439932	170	360	440	NLV	NLV	NA	ID
Magnesium (B)	7439954	4,00E+05	1.10E+06	NA	NLV	NLV	NA	ID
Manganese (B)	7439965	50 (E)	50 (E)	(G X)	NLV	NLV	NA	ID
Mercury (Total) (B, Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56	ID
Methane	74828	ID	ID	NA	(K)	(K)	NA	(AA)
Methanol	67561	3,700	10,000	5.8E+5 (X)	2.9E+7 (S)	2.9E+7 (S)	2.90E+07	4.50E+06
Methoxychlor	72435	40 (A)	40 (A)	NA	ID	ID	45	ID
2-Methoxyethanol (I)	109894	7.3	21	NA	NLV	NLV	1.00E+09	ID
2-Methyl-4-chlorophenoxyacetic acid	94746	7.3	21	NA	NLV	NLV	9.24E+05	ID
2-Methyl-4,6-dinitrophenol	534521	20 (M); 2.6	20 (M); 7.3	NA	NLV	NLV	2.00E+05	ID
N-Methyl-morpholine (I)	109024	20	56	NA	NLV	NLV	1.00E+09	ID
Methyl parathion	298000	1.8	5.2	NA	NLV	NLV	50,000	ID
4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	2.00E+07	ID
Methyl-tert-butyl ether (MTBE)	1634044	40 (E)	40 (E)	7,100 (X)	4.7E+7 (S)	4.7E+7 (S)	4.68E+07	ID
Methylcyclopentane (I)	96377	ID	ID	NA	22,000	49,000	73,990	ID
4,4-Methylene-bis-2-chloroaniline	101144	1.1	4.5	NA	NLV	NLV	14,000	ID
Methylene chloride	75092	5.0 (A)	5.0 (A)	1,500 (X)	2.20E+05	1.40E+06	1.70E+07	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (µg/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.201.20a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface/Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
2-Methylnaphthalene	91576	260	750	19	25,000 (S)	26,000 (S)	24,600	ID
Methylphenols (J)	1318773	370	1,000	30 (M) X 25	NLV	NLV	2.80E+07	NA
Metolachlor	51218452	240	980	15	NLV	NLV	5.30E+05	ID
Metribuzin	21087649	180	520	NA	ID	ID	1.20E+06	ID
Mirex	23858655	0.02 (M) 6.8E-5 (S)	0.02 (M) 6.8E-6 (S)	0.02 (M) 6.8E-5 (S)	ID	ID	6.80E-05	NA
Molybdenum (B)	7439867	73	210	3,200 (X)	NLV	NLV	NA	ID
Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000	NA
Nickel (E)	7440020	100 (A)	100 (A)	(G)	NLV	NLV	NA	ID
Nitrate (B,N)	14797568	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	NA	ID
Nitrite (B,M)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	NA	ID
Nitrobenzene (I)	98953	3.4	9.6	180 (X)	2.80E+05	5.50E+06	2.09E+06	NA
2-Nitrophenol	86765	20	58	ID	NLV	NLV	2.50E+06	ID
n-Nitroso-di-n-propylamine	521647	5.0 (M); 0.19	5.0 (M); 0.77	NA	NLV	NLV	9.89E+06	ID
N-Nitrosodiphenylamine	86306	270	1,100	NA	NLV	NLV	35,100	ID
Oxamyl	23135220	200 (A)	200 (A)	NA	NLV	NLV	2.80E+08	ID
Oxo-hexyl acetate	86230357	73	210	NA	ID	ID	NA	ID
Pendimethalin	40487421	280 (S)	280 (S)	NA	NLV	NLV	275	ID
Pentachlorobenzene	608035	6.1	17	5.0 (M); 0.019	ID	ID	660	ID
Pentachloronitrobenzene	82688	32 (S)	32 (S)	NA	32 (S)	32 (S)	32	ID
Pentachlorophenol	87865	1.0 (A)	1.0 (A)	(G) X	NLV	NLV	1.86E+06	ID
Pentane	109660	ID	ID	NA	88,000 (S)	88,000 (S)	88,200	340
2-Pentene (I)	109682	ID	ID	NA	ID	ID	2.03E+05	ID
pH	NA	6.5 to 8.5 (E)	6.5 to 8.5 (E)	6.5 to 9.0	ID	ID	NA	NA
Phenanthrene	86018	52	150	2.0 (M); 1.4	1,000 (S)	1,000 (S)	1,000	ID
Phenol	108952	4,400	13,000	450	NLV	NLV	8.28E+07	NA
Phenytoln	57410	17	68	89 (X)	NLV	NLV	32,000	ID
Phosphorus (Total)	7723140	63,000	2.40E+05	(EE)	NLV	NLV	NA	ID
Phthalic acid	68993	14,000	40,000	NA	NLV	NLV	1.42E+07	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interfaces Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Phthalic anhydride	85449	15,000	44,000	NA	NLV	NLV	6.20E+06	NA
Picloram	1918021	500 (A)	500 (A)	46	NLV	NLV	4.30E+05	ID
Piperidine	110894	3.2	9.2	NA	NLV	NLV	1.00E+09	ID
Polychlorinated biphenyls (PCBs)	67774327	0.03	0.09	ID	NLV	NLV	1.86E+07	ID
Polychlorinated biphenyls (PCBs) (L)	1336363	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	45 (S)	44.7	ID
Prometon	1610180	160	480	NA	NLV	NLV	7.50E+05	ID
Propachlor	1918167	85	270	NA	NLV	NLV	6.56E+05	ID
Propazine	139402	200	560	NA	NLV	NLV	8,600	ID
Propionic acid	78093	12,000	35,000	ID	NLV	NLV	1.00E+09	1.0E+9 (D)
Propyl alcohol (I)	71238	1,400	4,000	NA	NLV	NLV	1.00E+09	7.10E+07
t-Propylbenzene (I)	103651	80	230	ID	ID	ID	NA	ID
Propylene glycol	57556	1.50E+05	4.20E+05	2.90E+05	NLV	NLV	1.00E+09	ID
Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	135	ID
Pyridine (I)	110861	20 (M); 7.3	21	NA	5,600	12,000	3.00E+06	81,000
Selenium (E)	7782492	50 (A)	50 (A)	5	NLV	NLV	NA	ID
Silver (E)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	NA	ID
Silvex (2,4,5-TP)	93721	50 (A)	50 (A)	30	NLV	NLV	1.40E+05	ID
Simazine	122949	4.0 (A)	4.0 (A)	17	NLV	NLV	4,470	ID
Sodium	17341262	2.3E+5 (HH)	3.50E+05	NA	NLV	NLV	NA	ID
Sodium azide	26626223	88	250	50 (M); 7.3	ID	ID	NA	ID
Strontium (E)	7440246	4,600	13,000	21,000	NLV	NLV	NA	ID
Styrene	100425	100 (A)	100 (A)	80 (X)	1.70E+05	3.1E+5 (S)	3.10E+05	1.40E+05
Sulfate	14806798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	NA	ID
Tebuthiuron	34014181	510	1,500	NA	NLV	NLV	2.60E+06	ID
2,3,7,8-tetrabromodibenzo-p-dioxin (O)	50585416	(O)	(O)	(O)	NLV	NLV	0.00996	ID
1,2,4,5-tetrachlorobenzene	95943	1,300 (S)	1,300 (S)	2.9 (X)	1,300 (S)	1,300 (S)	1,300	ID
2,3,7,8-tetrachlorodibenzo-p-dioxin (O)	1746016	3.0E-5 (A)	3.0E-5 (A)	1.0E-5 (M); 3.1E-9	NLV	NLV	0.019	ID
1,1,1,2-tetrachloroethane	630206	77	320	ID	15,000	96,000	1.10E+06	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
1,1,2,2-Tetrachloroethane	79345	8.5	95	78 (X)	12,000	77,000	2.97E+06	ID
Tetrachloroethylene	127184	5.0 (A)	5.0 (A)	60 (X)	25,000	1.70E+05	2.00E+05	ID
Tetrahydrofuran	109999	95	270	11,000 (X)	6,90E+06	1.60E+07	1.00E+09	60,000
Tetrahydrofuran	509148	ID	ID	NA	580	3,200	85,000	ID
Thallium (I)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	NA	ID
Toluene (I)	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.26E+05	61,000
p-Toluidine	106490	15	62	NA	NLV	NLV	7.60E+06	NA
Total dissolved solids (TDS)	N/A	5.0E+5 (E)	5.0E+5 (E)	(EE)	ID	ID	NA	NA
Toxaphene	8001352	3.0 (A)	3.0 (A)	1.0 (M); 6.8E-5	NLV	NLV	740	ID
Triallate	2303175	95	270	NA	ID	ID	4,000	ID
Tributylamine	102829	10	28	ID	14,000	32,000	75,400	ID
1,2,4-Trichlorobenzene	120621	70 (A)	70 (A)	99 (X)	3.0E+5 (S)	3.0E+5 (S)	3.00E+05	NA
1,1,1-Trichloroethane	71556	200 (A)	200 (A)	89	6.60E+05	1.3E+6 (S)	1.33E+06	ID
1,1,2-Trichloroethane	79005	5.0 (A)	5.0 (A)	330 (X)	17,000	1.10E+05	4.42E+06	NA
Trichloroethylene	79016	5.0 (A)	5.0 (A)	200 (X)	2,200	4,900	1.10E+06	ID
Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.10E+06	ID
2,4,5-Trichlorophenol	95954	730	2,100	NA	NLV	NLV	1.20E+06	ID
2,4,6-Trichlorophenol	88062	120	470	5	NLV	NLV	8.00E+05	ID
1,2,3-Trichloropropane	96184	42	120	NA	8,300	18,000	1.90E+06	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	1.7E+5 (S)	1.7E+5 (S)	32	1.7E+5 (S)	1.7E+5 (S)	1.70E+05	ID
Triethanolamine	102716	3,700	10,000	NA	NLV	NLV	1.00E+09	ID
Triethylene glycol	112276	4,300	12,000	NA	NLV	NLV	1.00E+06	ID
3-Trifluoromethyl-4-nitrophenol	85302	4,500	13,000	NA	NLV	NLV	5.00E+06	ID
Trifuralin	1582088	37	110	NA	ID	ID	8,100	ID
2,2,4-Trimethyl pentane	540841	ID	ID	NA	2,300 (S)	2,300 (S)	2,330	160
2,4,4-Trimethyl-2-pentene (I)	107404	ID	ID	NA	ID	ID	11,900	ID
1,2,4-Trimethylbenzene (I)	95536	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	55,890	56,000 (S)
1,3,5-Trimethylbenzene (I)	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,150	ID



TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Triphenyl phosphate	115866	1,200	1,400 (S)	NA	NLV	NLV	1.430	ID
tris(2,3-Dibromopropyl)phosphate	128727	10 (M); 0.71	10 (M); 2.9	ID	4,700 (S)	4,700 (S)	4.700	ID
Urea	57136	ID	ID	NA	NLV	NLV	NA	ID
Vanadium	7440632	4.5	62	27	NLV	NLV	NA	ID
Vinyl acetate (1)	108054	640	1,800	NA	4.10E+06	8.90E+06	2.00E+07	1.80E+06
Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	2.76E+06	33,000
White phosphorus (R)	12165103	0.11	0.31	NA	NLV	NLV	NA	ID
Xylenes (1)	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.88E+06	70,000
Zinc (B)	7440666	2,400	5,000 (E)	(S)	NLV	NLV	NA	ID



**TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 5 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection			Indoor Air			Ambient Air(C)			Soat	
			Residential Drinking Water Protection Criteria	Groundwater Surface (Water) Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIIC)	Finite VSIIC to 5 Meter Source Thickness	Finite VSIIC to 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels		
Arsenapentane	83329	NA	3.00E+05	8,700	1.90E+08	8.10E+07	8.10E+07	8.10E+07	1.40E+10	4.10E+07	NA		
Arsenapentane	208968	NA	5,900	ID	1.60E+06	2.20E+06	2.20E+06	2.20E+06	2.30E+09	1.60E+06	NA		
Acetaldehyde (1)	75070	NA	19,000	2,600	2.20E+05	1.70E+05	2.80E+05	2.80E+05	6.00E+08	2.90E+07	1.10E+08		
Acetate	71501	NA	ID	(G)	ID	ID	ID	ID	ID	ID	ID		
Acetic acid	64187	NA	84,000	(G)	NLV	NLV	NLV	NLV	1.70E+10	1.30E+08	6.50E+08		
Acetone (1)	67641	NA	15,000	34,000	2.9E+8 (C)	1.30E+08	1.90E+08	1.90E+08	3.90E+11	2.30E+07	1.10E+08		
Acetonitrile	75068	NA	2,800	NA	4.90E+06	1.60E+06	2.10E+06	4.00E+09	4.00E+09	4.30E+06	2.20E+07		
Acetophenone	98862	NA	30,000	ID	1.2E+8 (C)	4.40E+07	4.40E+07	3.30E+10	3.30E+10	4.7E+7 (C)	1.10E+06		
Acrolein (1)	107028	NA	2,400	NA	410	310	810	810	1.30E+06	3.60E+06	2.30E+07		
Acrylamide	79061	NA	10	200 (X)	NLV	NLV	NLV	NLV	2.40E+06	1.900	NA		
Acrylic acid	79107	NA	78,000	NA	2.40E+06	1.90E+06	2.30E+06	2.30E+06	6.70E+07	3.5E+7 (DD)	1.10E+08		
Acrylonitrile (1)	107131	NA	100 (M), 52	100 (M), 40	6,600	5,100	10,000	10,000	4.60E+07	16,000	8.30E+06		
Ala chlor	15972608	NA	52	290 (X)	NLV	NLV	NLV	NLV	ID	80,000	NA		
Aldicarb	116063	NA	60	NA	NLV	NLV	NLV	NLV	ID	2.30E+06	NA		
Aldicarb sulfone	1646884	NA	200 (M), 40	NA	NLV	NLV	NLV	NLV	ID	2.60E+06	NA		
Aldicarb sulfonide	1646873	NA	200 (M), 80	NA	NLV	NLV	NLV	NLV	ID	2.90E+06	NA		
Aldrin	309002	NA	NLL	NLL	1.30E+06	58,000	58,000	58,000	6.40E+06	1,000	NA		
Aluminum (B)	7429905	6.90E+06	1,000	NA	NLV	NLV	NLV	NLV	ID	5.0E+7 (DD)	NA		
Ammonia	7864417	NA	ID	(CC)	ID	ID	ID	ID	6.70E+09	ID	1.00E+07		
n-Amyl methyl ether (TAME)	994058	NA	3,800	NA	58,000	3.40E+05	7.60E+06	1.80E+06	4.10E+09	2.9E+7 (C)	4.40E+05		
Aniline	62533	NA	1,100	330 (M), 80	NLV	NLV	NLV	NLV	6.70E+07	3.30E+06	4.50E+06		
Anthracene	120127	NA	41,000	ID	1.0E+9 (D)	1.40E+09	1.40E+09	1.40E+09	6.70E+10	2.30E+08	NA		
Antimony	7490690	NA	4,300	94,000 (X)	NLV	NLV	NLV	NLV	1.30E+07	1.80E+06	NA		
Arsenic	7490382	5,800	4,600	4,600	NLV	NLV	NLV	NLV	7.20E+05	7,600	NA		
Asbestos (BB)	1332214	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (DD), 68,000	ID	NA		
Atrazine	1912249	NA	60	160	NLV	NLV	NLV	NLV	ID	71,000 (DD)	NA		
Azobenzene	103333	NA	4,200	ID	6.10E+06	6.30E+06	6.30E+06	6.30E+06	1.00E+08	1.40E+06	NA		



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (T)(C)		Contact	Soil Saturation Concentration Screening Levels		
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interiors Protection Criteria		Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIIC)			Finite VSIIC for 5 Meter Source Thickness	Finite VSIIC for 2 Meter Source Thickness
Barium (B)	7440383	75,000	1.30E+06	(G)	MLV	MLV	MLV	3.70E+07	NA		
Benzene (I)	71432	NA	100	4,000(X)	1,600	13,000	34,000	79,000	3.30E+08	1.80E+06	4.00E+06
Benzidine	92875	NA	1,000 (M); 8.0	1,000 (M); 8.0	MLV	MLV	MLV	MLV	46,000	1,000 (M); 23	NA
Benz(a)anthracene (D)	56563	NA	NIL	NIL	MLV	MLV	MLV	MLV	ID	20,000	NA
Benz(b)fluoranthene (D)	206992	NA	NIL	NIL	ID	ID	ID	ID	ID	20,000	NA
Benz(k)fluoranthene (D)	207080	NA	NIL	NIL	MLV	MLV	MLV	MLV	ID	2,00E+05	NA
Benz(a,h)pyrene	181242	NA	NIL	NIL	MLV	MLV	MLV	MLV	8,00E+08	2,50E+06	NA
Benz(a)pyrene (D)	50328	NA	NIL	NIL	MLV	MLV	MLV	MLV	1,50E+06	2,000	NA
Benzoic acid	86860	NA	8.40E+06	NA	MLV	MLV	MLV	MLV	ID	9.90E+08	NA
Benzyl alcohol	100516	NA	2.00E+06	NA	MLV	MLV	MLV	MLV	3.30E+11	3.2E+8 (C)	5,80E+06
Benzyl chloride	100447	NA	150	NA	5,300	14,000	14,000	17,000	6.20E+07	48,000	2.30E+05
Beryllium	7440417	NA	51,000	(G)	MLV	MLV	MLV	MLV	1.30E+06	4.10E+06	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	MLV	MLV	MLV	MLV	ID	ID	2.70E+06
bis(2-Chloroethyl)ether (I)	114444	NA	100	100 (M); 20	8,300	3,800	3,800	3,800	9.40E+06	13,000	2.20E+06
bis(2-Ethylhexyl)phthalate	117817	NA	NIL	NIL	MLV	MLV	MLV	MLV	7.00E+08	2,80E+06	1.00E+07
Boron (B)	7440428	NA	10,000	1.4E+5 (X)	MLV	MLV	MLV	MLV	ID	4.8E+7 (DD)	NA
Bromate	15541464	NA	200	800 (X)	MLV	MLV	MLV	MLV	ID	17,000	NA
Bromobenzene (I)	108861	NA	590	NA	3.10E+06	4.50E+05	4.50E+06	4.50E+06	5.30E+08	5.40E+06	7.60E+06
Bromodichloromethane	75274	NA	1,800 (M)	ID	1,200	8,400	9,700	19,000	8.40E+07	1.10E+06	1.50E+06
Bromoflour	75252	NA	1,800 (M)	ID	1,50E+06	9,00E+06	9,00E+06	9,00E+06	2.80E+09	8.20E+05	8.70E+05
Bromomethane	74838	NA	200	700	860	11,000	57,000	140E+06	3.30E+08	3.20E+06	2.20E+06
n-Butanol (I)	71963	NA	19,000	2.00E+05	MLV	MLV	MLV	MLV	2.30E+10	2.9E+7 (C)	8.70E+06
2-Butanone (MEK) (I)	78933	NA	2,60E+06	44,000	5.4E+7 (C)	2.90E+07	2.90E+07	3.50E+07	5.70E+10	1.2E+8 (C, DD)	2.70E+07
n-Butyl acetate	128164	NA	11,000	NA	5.8E+7 (C)	1.10E+08	2.60E+08	3.20E+08	4.70E+11	1.7E+7 (C)	1.10E+06
n-Butyl alcohol	75900	NA	78,000	NA	3.1E+8 (C)	9.70E+07	2.00E+08	2.00E+08	1.30E+11	1.2E+8 (C)	1.10E+08
Butyl benzyl phthalate	83687	NA	2.2E+6 (C)	1.2E+5 (X)	MLV	MLV	MLV	MLV	4.70E+10	3.6E+7 (C)	3.10E+06
n-Butylbenzene	104616	NA	1,800	ID	ID	ID	ID	ID	2.00E+09	2.50E+06	1.00E+07



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air		Ambient Air (C)				Contact	Soil Saturation Concentration Screening Levels
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (MSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria		
sec-Butylbenzene	139088	NA	1,800	ID	ID	ID	ID	ID	4.00E+08	2.50E+06	2.50E+06	1.00E+07
†-Ethylbenzene (I)	98068	NA	1,800	ID	ID	ID	ID	ID	6.70E+08	2.50E+06	2.50E+06	1.00E+07
Cadmium (B)	7440439	1,200	6,000 (G,X)	NA	3,700	NLV	NLV	NLV	1.70E+08	5.00E+05	ID	NA
Camphene (I)	78925	NA	ID	NA	3,700	NLV	1.50E+06	2.20E+06	5.30E+09	ID	ID	NA
Caprolactam	109602	NA	1,20E+05	NA	NLV	NLV	NLV	NLV	6.70E+08	5.3E+7 (DD)	5.3E+7 (DD)	NA
Carbaryl	63252	NA	14,000	NA	ID	ID	ID	ID	ID	2.20E+07	2.20E+07	NA
Carbazole	86748	NA	9,400	1,100	NLV	NLV	NLV	NLV	6.20E+07	5.30E+05	5.30E+05	NA
Carbolium	1553662	NA	800	NA	NLV	NLV	NLV	NLV	ID	1.10E+06	1.10E+06	NA
Carbon disulfide (IR)	75150	NA	18,000	ID	78,000	NLV	1.30E+06	7.90E+06	4.70E+10	7.2E+6 (C,DD)	7.2E+6 (C,DD)	280E+05
Carbon tetrachloride	58235	NA	100	800 (X)	190	190	3,600	12,000	28,000	96,000	96,000	3.90E+05
Chlordane (J)	57749	NA	NLL	NLL	1,10E+07	1,10E+07	1,20E+06	1,20E+06	3.10E+07	31,000	31,000	NA
Chloride	16827006	NA	5,00E+06	(X)	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	500	1,20E+05	1,20E+05	7.70E+05	9.90E+05	2.10E+06	4.3E+6 (C)	4.3E+6 (C)	260E+05
p-Chlorobenzene sulfonic acid	98668	NA	1,50E+05	ID	ID	ID	ID	ID	ID	2.30E+08	2.30E+08	ID
1-Chloro-1,1-difluoroethane	75683	NA	3,00E+05	NA	2.9E+6 (C)	2.9E+6 (C)	7.90E+07	5.60E+08	1.40E+09	4.7E+8 (C)	4.7E+8 (C)	9.60E+05
Chloroethane	75003	NA	8,600	22,000 (X)	2.8E+6 (C)	2.8E+6 (C)	3,00E+07	1,20E+08	2.80E+08	2.6E+6 (C)	2.6E+6 (C)	9.50E+05
2-Chloroethyl vinyl ether	110769	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	1.90E+08
Chloroform	67663	NA	1,600 (W)	7,000	7,200	7,200	46,000	1,20E+05	2.70E+05	1.20E+06	1.20E+06	1.50E+06
Chloromethane (I)	74873	NA	5,200	ID	2,300	2,300	40,000	4,10E+05	1,00E+06	1.6E+6 (C)	1.6E+6 (C)	1.10E+06
4-Chloro-3-methylphenol	59507	NA	5,900	280	NLV	NLV	NLV	NLV	NLV	4.60E+06	4.60E+06	NA
Beta-Chloronapthalene	91667	NA	6.20E+05	NA	ID	ID	ID	ID	ID	5.60E+07	5.60E+07	NA
2-Chlorophenol	95578	NA	900	360	4.30E+05	4.30E+05	9.60E+05	9.60E+05	9.60E+05	1.40E+06	1.40E+06	1.90E+07
o-Chlorotoluene (I)	95498	NA	3,300	ID	2.70E+05	2.70E+05	1,20E+06	2.90E+06	6.30E+06	4.5E+6 (C)	4.5E+6 (C)	5.00E+05
Chlorpyrifos	2821882	NA	17,000	1,600	130	130	4,600	23,000	55,000	1.10E+07	1.10E+07	NA
Chromium (II) (B,H)	1605683-1	18,000 (total)	1.0E+9 (D)	(G,X)	NLV	NLV	NLV	NLV	NLV	3.30E+08	7.90E+08	NA
Chromium(VI)	18640299	NA	30,000	3,300	NLV	NLV	NLV	NLV	NLV	2.50E+06	2.50E+06	NA
Chrysene (D)	218019	NA	NLL	NLL	ID	ID	ID	ID	ID	2.00E+06	2.00E+06	NA



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (C/D)				Contact	Soil Saturation Concentration Screening Levels	
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria		Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness			Particulate Soil Inhalation Criteria
Cobalt	7440484	6,800	800	2,000	NLV	NLV	NLV	NLV	1.30E+07	1.30E+07	2.60E+06	NA
Copper (B)	7440508	32,000	5,80E+06	(G)	NLV	NLV	NLV	NLV	1.30E+08	1.30E+08	2.00E+07	NA
Cyanazine	21725462	NA	200	1,400 (X)	NLV	NLV	NLV	NLV	ID	ID	14,000	NA
Cyanide (P,R)	57126	390 (total)	4,000	100	NLV	NLV	NLV	NLV	2.40E+05	2.40E+05	12,000	NA
Cyclohexanone	106841	NA	5,20E+06	NA	17,000	1,00E+06	1,10E+07	2,70E+07	6,70E+10	1,0E+8 (C,D)	2,20E+08	2,20E+08
Dacal	1801321	NA	50,000	NA	NLV	NLV	NLV	NLV	ID	ID	2,30E+06	NA
Dalapon	76980	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	ID	1,90E+07	5,90E+07
4,4'-DDD	72548	NA	NLL	NLL	NLV	NLV	NLV	NLV	4,40E+07	4,40E+07	95,000	NA
4,4'-DDE	72558	NA	NLL	NLL	NLV	NLV	NLV	NLV	3,20E+07	3,20E+07	45,000	NA
4,4'-DDT	60283	NA	NLL	NLL	NLV	NLV	NLV	NLV	3,20E+07	3,20E+07	57,000	NA
Diisobromodiphenyl ether	1163195	NA	1,40E+06	NA	1,0E+9 (D)	8,80E+07	8,60E+07	8,60E+07	2,30E+09	2,30E+09	3,80E+06	NA
Di-n-butyl phthalate	84742	NA	9,6E+5 (C)	11,000	NLV	NLV	NLV	NLV	NLV	NLV	2,7E+7 (C)	7,60E+05
Di(2-ethylhexyl) adipate	103231	NA	1,3E+7 (C)	ID	NLV	NLV	NLV	NLV	9,20E+09	9,20E+09	1,5E+7 (C, D)	9,60E+05
Di-n-octyl phthalate	117840	NA	1,00E+08	ID	NLV	NLV	NLV	NLV	3,10E+10	3,10E+10	6,90E+06	1,40E+08
Diacetone alcohol (J)	129422	NA	ID	NA	NLV	NLV	NLV	NLV	1,80E+11	1,80E+11	ID	1,10E+08
Diazinon	333416	NA	96	72	NLV	NLV	NLV	NLV	NLV	NLV	12,000 (D)	3,10E+05
Dibenz(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	ID	2,000	NA
Dibenzofuran	132649	NA	ID	1,700	2,00E+06	1,30E+05	1,30E+05	1,30E+05	6,70E+06	6,70E+06	ID	NA
Dibromochloromethane	124481	NA	1,600 (M)	ID	3,900	24,000	24,000	24,000	1,30E+08	1,30E+08	1,10E+05	6,10E+05
Dibromochloropropane	60128	NA	10 (M), 4 (D)	ID	220	260	260	260	5,60E+05	5,60E+05	4,400 (C)	1,200
Dibromomethane	74933	NA	1,600	NA	ID	ID	ID	ID	ID	ID	2,5E+6 (C)	2,00E+06
Dicamba	1918009	NA	4,400	NA	NA	NLV	NLV	NLV	ID	ID	3,40E+06	NA
1,2-Dichlorobenzene	95601	NA	14,000	280	1,1E+7 (C)	3,90E+07	3,90E+07	3,90E+07	5,20E+07	5,20E+07	1,9E+7 (C)	2,10E+05
1,3-Dichlorobenzene	544731	NA	170	680	26,000	79,000	79,000	79,000	1,10E+06	1,10E+06	2,0E+5 (C)	1,70E+05
1,4-Dichlorobenzene	106467	NA	1,700	360	19,000	77,000	77,000	77,000	1,10E+06	1,10E+06	4,00E+05	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M), 28	2,000 (M), 7.4	NLV	NLV	NLV	NLV	6,50E+06	6,50E+06	6,800	NA
Dichlorodifluoromethane	76718	NA	95,000	ID	9,00E+06	5,30E+07	5,60E+08	1,40E+08	3,30E+12	3,30E+12	5,2E+7 (C)	1,00E+06



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (C)				Contact	Soil Saturation Concentration Screening Levels
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria		Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (MSIC)	Finite Source 5 Meter Source Thickness	Finite MSIC for 2 Meter Source Thickness		
1,1-Dichloroethane	75343	NA	18,000	16,000	2,30E+06	2,10E+06	5,90E+06	1,40E+07	3,30E+10	2,7E+7 (C)	890E+06
1,2-Dichloroethane (1)	107062	NA	100	7,200 (X)	2,100	6,200	11,000	26,000	1,20E+08	91,000	1,20E+06
1,1-Dichloroethylene (1)	75354	NA	140	2,600	62	1,100	5,300	13,000	6,20E+07	2,00E+06	6,70E+05
cis-1,2-Dichloroethylene	166592	NA	1,400	12,000	22,000	1,80E+06	4,20E+06	9,90E+06	2,30E+09	2,5E+6 (C)	6,40E+05
trans-1,2-Dichloroethylene	166605	NA	2,000	30,000 (X)	23,000	2,80E+06	8,30E+06	2,00E+06	4,70E+09	3,8E+6 (C)	1,40E+05
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	NA	NLV	NLV	NLV	NLV	ID	6,80E+07	NA
2,4-Dichlorophenol	120832	NA	1,500	330 (M); 220	NLV	NLV	NLV	NLV	5,10E+09	6,6E+5 (DD)	1,80E+06
2,4-Dichlorophenoxy acetic acid	94757	NA	1,400	4,400	NLV	NLV	NLV	NLV	6,70E+09	2,50E+06	NA
1,2-Dichloropropane (1)	78876	NA	100	4,600 (X)	4,000	25,000	50,000	1,10E+06	2,70E+08	1,40E+06	5,50E+05
1,3-Dichloropropane	542766	NA	170	160 (X)	1,000	16,000	68,000	1,60E+06	7,80E+08	10,000	6,20E+05
Dichloroacetic acid	62737	NA	50 (M); 32	NA	NLV	NLV	NLV	NLV	3,90E+07	10,000	2,20E+06
Diglycyl ethyl phthalate	84617	NA	ID	NA	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NIL	NIL	1,40E+06	19,000	19,000	19,000	6,80E+05	1,100	NA
Diethyl ether	60297	NA	200	ID	2,8E+7 (C)	8,50E+07	1,50E+08	3,40E+08	8,00E+11	1,1E+8 (C)	7,40E+06
Diethyl phthalate	84662	NA	1,10E+06	2,200	NLV	NLV	NLV	NLV	3,90E+09	1,7E+8 (C)	7,40E+05
Diethylene glycol monobutyl ether	112346	NA	1,800	NA	NLV	NLV	NLV	NLV	1,30E+09	2,70E+06	1,10E+08
Diisopropyl ether	108203	NA	600	ID	6,7E+6 (C)	3,40E+06	7,60E+06	1,80E+06	4,10E+09	9,2E+5 (C)	1,300
Diisopropylamine (1)	108199	NA	110	NA	5,50E+06	6,20E+06	6,20E+06	7,30E+06	1,30E+10	1,70E+06	6,70E+06
Dimethyl phthalate	131113	NA	1,5E+6 (C)	NA	NLV	NLV	NLV	NLV	3,30E+09	1,0E+9 (C,D)	7,90E+05
N,N-Dimethylacetamide	127185	NA	3,600	82,000 (X)	NLV	NLV	NLV	NLV	ID	5,60E+06	1,10E+08
N,N-Dimethylmethanamine	121697	NA	320	NA	1,70E+06	1,50E+06	1,50E+06	1,50E+06	2,60E+08	5,00E+06	8,00E+05
Dimethylformamide (1)	68122	NA	14,000	NA	NLV	NLV	NLV	NLV	2,00E+09	2,20E+07	1,10E+08
2,4-Dimethylphenol	106679	NA	7,400	7,600	NLV	NLV	NLV	NLV	4,70E+09	1,10E+07	NA
2,6-Dimethylphenol	575261	NA	330 (M); 88	NA	NLV	NLV	NLV	NLV	1,30E+08	1,40E+06	NA
3,4-Dimethylphenol	95668	NA	330 (M); 200	500	NLV	NLV	NLV	NLV	2,30E+08	3,20E+06	NA
Dimethyl sulfoxide	67685	NA	4,40E+06	3,80E+06	NLV	NLV	NLV	NLV	1,30E+09	1,0E+9 (C,D)	1,80E+07
2,4-Dinitrotoluene	121142	NA	420	NA	NLV	NLV	NLV	NLV	1,60E+07	48,000	NA



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (Y)(C)		Contact	Soil Saturation Concentration Screening Levels
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria		Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (V)(C)		
Dioxin	88387	NA	300	200 (M); 43	NA	NA	NA	86,000 (DD)	1.40E+05
1,4-Dioxane (I)	123911	NA	1,700	56,000 (X)	NA	NA	NA	5,30E+05	6.70E+07
Diquat	85007	NA	400	400	NA	NA	NA	5,00E+05	NA
Dibrom	330641	NA	620	NA	NA	NA	NA	9,70E+05	NA
Endosulfan (J)	116287	NA	NLL	NLL	ID	ID	ID	1.40E+06	NA
Endosulfan	146733	NA	NLL	NLL	NA	NA	NA	3.80E+06	NA
Endrin	72208	NA	NLL	NLL	NA	NA	NA	86,000	NA
Epichlorohydrin (I)	106898	NA	100	NA	NA	NA	NA	8,900	7.30E+06
Ethanol (I)	64175	NA	3,80E+07	ID	NA	NA	NA	1.0E+08	1.10E+08
Ethyl acetate (I)	141786	NA	1,30E+05	NA	3.8E+7 (C)	4.90E+07	9.80E+07	2.0E+8 (C)	7.90E+06
Ethyl tert-butyl ether (ETBE)	637923	NA	980	ID	5.40E+05	1.90E+06	1.10E+07	ID	6.90E+05
Ethylbenzene (I)	100414	NA	1,500	360	87,000	7.20E+05	2.20E+06	2.2E+7 (C)	1.40E+05
Ethylene dibromide	106934	NA	20 (M); 1.0	110 (X)	670	1,700	3,300	92	8.90E+05
Ethylene glycol	107211	NA	8,00E+05	3.8E+6 (X)	NA	NA	NA	4.5E+8 (C)	1.10E+08
Ethylene glycol monobutyl ether	111762	NA	74,000	NA	7,40E+05	1.80E+07	3.60E+08	1.1E+8 (C)	4.10E+07
Fluoranthene	206440	NA	7,30E+05	5,500	1.0E+9 (D)	7.40E+08	7.40E+08	4.60E+07	NA
Fluorene	86737	NA	3,90E+05	5,300	5.80E+08	1.30E+08	1.30E+08	2.70E+07	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	ID	NA	NA	NA	9.0E+6 (DD)	NA
Formaldehyde	50000	NA	26,000	2,400	12,000	29,000	52,000	4.10E+07	6.00E+07
Formic acid (I,U)	64188	NA	2,00E+05	ID	1.50E+06	1.40E+05	1.40E+05	3.2E+8 (C)	1.10E+08
1-Formylpiperidine	2991868	NA	1,800	NA	ID	ID	ID	2.60E+06	1.00E+07
German violet	546929	NA	300	NA	NA	NA	NA	96,000	NA
Glyphosate	1071836	NA	NLL	NLL	NA	NA	NA	1.1E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	3.60E+05	62,000	62,000	5,600	NA
Heptachlor epoxide	1024673	NA	NLL	NLL	NA	NA	NA	8,100	NA
n-Heptane	142925	NA	4.6E+7 (C)	NA	1.5E+6 (C)	2.10E+07	1.00E+08	9.9E+8 (C)	2.40E+05
Hexabromobenzene	87621	NA	5,400	ID	ID	ID	ID	1.10E+06	NA



TABLE 2. SOIL: RESIDENTIAL
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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air		Ambient Air (Y)(C)			Contact	Soil Saturation Concentration Screening Levels
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIIC)	Finite VSIIC for 5 Meter Source Thickness	Finite VSIIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria		
Hexachlorobenzene (C-66)	116741	NA	1,800	360	41,000	17,000	17,000	17,000	6,80E+06	8,900	NA
Hexachlorobutadiene (C-4B)	67683	NA	26,000	91	1,30E+05	1,30E+05	1,30E+05	1,30E+05	1,40E+08	1,00E+05	3,50E+05
alpha-Hexachlorocyclohexane	316846	NA	18	ID	30,000	12,000	22,000	25,000	1,70E+08	2,600	NA
beta-Hexachlorocyclohexane	316857	NA	37	ID	MLV	MLV	MLV	MLV	5,90E+06	5,400	NA
Hexachlorocyclopentadiene (C-26)	77474	NA	3,20E+05	ID	30,000	50,000	50,000	50,000	1,30E+07	2,3E+6(C)	7,20E+05
Hexachloroethane	67721	NA	430	1,800 (X)	40,000	5,50E+05	9,30E+05	9,30E+05	2,30E+08	2,30E+05	NA
n-Hexane	110543	NA	1,8E+5 (C)	NA	5,1E+5 (C)	3,00E+05	3,20E+05	6,20E+05	1,30E+10	9,2E+7 (C)	44,000
2-Hexanone	561786	NA	20,000	ID	9,90E+05	1,10E+06	1,10E+06	1,40E+06	2,70E+08	3,2E+7 (C)	2,50E+06
Indenx(1,2,3-cd)pyrene (Q)	193395	NA	NLL	NLL	MLV	MLV	MLV	MLV	ID	20,000	NA
Iron (B)	7439946	1,20E+07	6,000	NA	MLV	MLV	MLV	MLV	ID	1,80E+08	NA
Isobutyl alcohol (I)	79831	NA	46,000	NA	2,3E+8 (C)	7,90E+07	7,90E+07	7,90E+07	1,00E+11	7,2E+7 (C)	8,90E+06
Isophorone	78691	NA	16,000	26,000 (X)	MLV	MLV	MLV	MLV	1,20E+10	4,8E+6 (C)	2,40E+06
Isopropyl alcohol (I)	67630	NA	9,400	1,1E+6 (X)	MLV	MLV	MLV	MLV	1,50E+10	1,40E+07	1,10E+08
Isopropylbenzene	96828	NA	91,000	3,200	4,0E+5 (C)	1,70E+06	1,70E+06	2,80E+06	5,80E+09	2,5E+7 (C)	3,90E+06
Lead (B)	7439921	21,000	7,00E+05	(G-X)	MLV	MLV	MLV	MLV	1,00E+08	4,00E+05	NA
Lindane	68389	NA	20 (M); 7.0	20 (M); 1.1	ID	ID	ID	ID	ID	8,300	NA
Lithium (B)	7439932	9,800	3,400	8,800	MLV	MLV	MLV	MLV	2,80E+09	4,2E+6 (DD)	NA
Magnesium (B)	7439954	NA	8,00E+06	NA	MLV	MLV	MLV	MLV	6,70E+09	1,0E+9 (D)	NA
Manganese (B)	7439965	4,40E+05	1,000	(G-X)	MLV	MLV	MLV	MLV	8,30E+06	2,90E+07	NA
Mercury (Total) (B-Z)	Varies	130	1,700	50 (M); 1.2	48,000	52,000	52,000	52,000	2,00E+07	1,80E+05	NA
Methane	74828	NA	ID	NA	8,4E+6 µg/m ³ (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	1,2E+7 (C)	3,7E+7 (C)	3,10E+07	4,40E+07	9,60E+07	2,20E+11	1,1E+8 (C)	3,10E+06
Methoxychlor	72465	NA	16,000	NA	ID	ID	ID	ID	ID	1,80E+06	NA
2-Methoxyethanol (I)	106964	NA	160	NA	MLV	MLV	MLV	MLV	1,30E+09	2,30E+05	1,10E+08
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	360	NA	MLV	MLV	MLV	MLV	ID	2,30E+05	NA
2-Methyl-4,5-dinitrophenol	524521	NA	860 (M); 400	NA	MLV	MLV	MLV	MLV	1,30E+08	79,000	NA
N-Methylmorpholine (I)	109024	NA	400	NA	MLV	MLV	MLV	MLV	ID	6,10E+05	1,10E+08



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air		Ambient Air (C)				Direct Contact Criteria	Soil Saturation Concentration Screening Levels	
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interests Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIIC)	Fine VSIIC for 5 Meter Source Thickness	Fine VSIIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Contact			
Methylparathion	298000	NA	48	NA	NLV	NLV	NLV	NLV	NLV	NLV	ID	56,000	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	ID	3.7E+7 (C)	3.7E+7 (C)	4.50E+07	4.50E+07	4.50E+07	6.70E+07	1.40E+11	5.6E+7 (C)	2.70E+06
Methyltertbutyl ether (MTBE)	1634044	NA	800	1.4E+5 (X)	9.9E+6 (C)	9.9E+6 (C)	2.50E+07	3.90E+07	3.90E+07	8.70E+07	2.00E+11	1.50E+08	5.90E+06
Methylcyclopentane (I)	98377	NA	ID	NA	92,000	92,000	2.30E+06	8.20E+06	8.20E+06	2.00E+07	4.70E+10	ID	3.50E+06
4,4'-Methylene-bis-2-chloroaniline (MOCA)	101144	NA	NLL	NLL	NLV	NLV	NLV	NLV	NLV	NLV	8.40E+07	8,800	NA
Methylene chloride	75082	NA	100	30,000 (X)	46,000	46,000	2.10E+05	5.90E+05	5.90E+05	1.40E+06	6.60E+09	1.30E+06	2.30E+06
2-Methylnaphthalene	91576	NA	57,000	4200	2.70E+06	2.70E+06	1.50E+06	1.50E+06	1.50E+06	1.50E+06	6.70E+08	8.10E+06	NA
Methylphenols (J)	1319773	NA	7,400	1,000 (M); 800	NLV	NLV	NLV	NLV	NLV	NLV	6.70E+09	1.10E+07	NA
Methoachlor	51248462	NA	4,800	300	NLV	NLV	NLV	NLV	NLV	NLV	ID	1.5E+6 (C, DD)	4.40E+05
Meth buzzin	21067648	NA	3,600	NA	ID	ID	ID	ID	ID	ID	ID	9,600	NA
Mirex	2886855	NA	NLL	NLL	ID	ID	ID	ID	ID	ID	ID	9,600	NA
Molybdenum (B)	7489867	NA	1,500	64,000 (X)	NLV	NLV	NLV	NLV	NLV	NLV	ID	2.80E+06	NA
Naphthalene	91203	NA	35,000	730	2.50E+06	2.50E+06	3.00E+05	3.00E+05	3.00E+05	3.00E+05	2.00E+08	1.60E+07	NA
Nickel (B)	7440020	20,000	1.00E+06	(G)	NLV	NLV	NLV	NLV	NLV	NLV	1.30E+07	4.00E+07	NA
Nitrate (B,N)	14797568	NA	2.0E+5 (N)	ID	NLV	NLV	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797660	NA	20,000 (N)	NA	NLV	NLV	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98963	NA	330 (M); 68	3,600 (X)	91,000	91,000	54,000	54,000	54,000	54,000	4.70E+07	1.00E+05	4.90E+05
2-Nitrophenol	88765	NA	400	ID	NLV	NLV	NLV	NLV	NLV	NLV	ID	6.30E+05	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	NA	NLV	NLV	NLV	NLV	NLV	NLV	1.60E+06	1,200	1.50E+06
N-Nitrosodiphenylamine	66306	NA	5,400	NA	NLV	NLV	NLV	NLV	NLV	NLV	2.20E+09	1.70E+06	NA
Oxamyl	23135220	NA	4,000	NA	NLV	NLV	NLV	NLV	NLV	NLV	ID	8.60E+06	NA
Oxo-hexyl acetate	66230367	NA	1,500	NA	ID	ID	ID	ID	ID	ID	5.40E+09	2.30E+06	1.00E+07
Pendimethalin	40487421	NA	1.10E+06	NA	NLV	NLV	NLV	NLV	NLV	NLV	ID	4.60E+07	NA
Pentachlorobenzene	608936	NA	29,000	9,500	ID	ID	ID	ID	ID	ID	ID	3.2E+5 (C)	1.90E+05
Pentachloronitrobenzene	82688	NA	37,000	NA	1.20E+05	1.20E+05	2.30E+05	2.30E+05	2.30E+05	2.30E+05	3.30E+08	1.70E+06	NA
Pentachlorophenol	87666	NA	22	(G-X)	NLV	NLV	NLV	NLV	NLV	NLV	1.00E+08	90,000	NA
Pentane	100660	NA	ID	NA	9.7E+5 (C)	9.7E+5 (C)	3.70E+07	3.10E+08	3.10E+08	5.80E+08	1.20E+12	ID	2.40E+05



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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air		Ambient Air (Y)(C)				Contact	Soil Saturation Concentration Screening Levels	
			Residential Drinking Water Protection Criteria	Surface Water Interference Protection Criteria	Soil Volatilization to Indo or Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSI)	Finite VSI for 5 Meter Source Thickness	Finite VSI for 12 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria			
2-Pentene (I)	106682	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	ID	2.20E+05
Phenanthrene	85018	NA	56,000	2,100	2,80E+06	1,60E+05	1,60E+05	1,60E+05	1,60E+05	1,60E+05	6.70E+06	1,60E+06	NA
Phenol	106962	NA	88,000	9,000	MLV	MLV	MLV	MLV	MLV	MLV	4.00E+10	9.0E+7 (C, DD)	1.20E+07
Phenolphthalein	57440	NA	830	4300 (X)	MLV	MLV	MLV	MLV	MLV	MLV	2.20E+08	1.00E+05	NA
Phosphorus (Total)	7723140	NA	1.30E+06	(EE)	MLV	MLV	MLV	MLV	MLV	MLV	6.70E+07	1.0E+8 (D)	NA
Phthalic acid	88683	NA	2,80E+06	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	4.3E+8 (C)	1.70E+06
Phthalic anhydride	85449	NA	3,00E+06	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	4.7E+8 (C)	1.10E+06
Picloram	1918021	NA	10,000	920	MLV	MLV	MLV	MLV	MLV	MLV	ID	1,60E+07	NA
Piperidine	110894	NA	64	NA	MLV	MLV	MLV	MLV	MLV	MLV	9.30E+08	99,000	1.20E+08
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	MLV	MLV	MLV	MLV	MLV	MLV	ID	1,200	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336863	NA	NLL	NLL	3,00E+06	2,40E+06	7,90E+06	7,90E+06	7,90E+06	7,90E+06	5.20E+06	(T)	NA
Prometon	1810180	NA	4,900	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	5,00E+06	NA
Propachlor	1818167	NA	1,900	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	2,90E+06	NA
Propazine	139402	NA	4,000	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	6,10E+06	NA
Propionic acid	79094	NA	2,40E+05	ID	MLV	MLV	MLV	MLV	MLV	MLV	2,00E+10	3.8E+8 (C)	1.10E+08
Propyl alcohol (I)	71238	NA	28,000	NA	MLV	MLV	MLV	MLV	MLV	MLV	4,90E+10	1.3E+7 (DD)	1.10E+08
n-Propylbenzene (I)	106651	NA	1,600	ID	ID	ID	ID	ID	ID	ID	1,30E+09	2,60E+06	1,00E+07
Propylene glycol	57666	NA	3,00E+06	5,80E+06	MLV	MLV	MLV	MLV	MLV	MLV	4,00E+11	1.0E+9 (C,D)	1.10E+08
Pyrene	123000	NA	4,80E+05	ID	1.0E+9 (D)	6,50E+08	6,50E+08	6,50E+08	6,50E+08	6,50E+08	6,70E+09	2,90E+07	NA
Pyridine (I)	110861	NA	400	NA	1,100	8,200	40,000	97,000	97,000	97,000	2,30E+08	2.3E+5 (C)	37,000
Selenium (B)	7782492	440	4,000	400	MLV	MLV	MLV	MLV	MLV	MLV	1,30E+08	2,60E+06	NA
Silver (B)	7440224	1,000	4,500	100 (M); 27	MLV	MLV	MLV	MLV	MLV	MLV	6,70E+06	2,50E+06	NA
Silvex (2,4,5-TP)	93721	NA	3,600	2,200	MLV	MLV	MLV	MLV	MLV	MLV	ID	1.70E+06	NA
Simazine	122349	NA	80	340	MLV	MLV	MLV	MLV	MLV	MLV	ID	1.20E+06	NA
Sodium	17341252	NA	4,60E+06	NA	MLV	MLV	MLV	MLV	MLV	MLV	ID	1.0E+8 (D)	NA
Sodium azide	26628228	NA	1,800	1,000	ID	ID	ID	ID	ID	ID	ID	2.70E+06	NA
Strontium (B)	7440246	NA	92,000	4,20E+06	MLV	MLV	MLV	MLV	MLV	MLV	ID	3,30E+06	NA

**TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (µg/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.201.20a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Groundwater Protection		Indoor Air Soil Volatilization to Indoor Air Inhalation Criteria	Ambient Air (C)			Contact Direct Contact Criteria	Soil Saturation Concentration Screening Levels
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria		Infinite Source Volatile Soil Inhalation Criteria (VSI)	Finite Source 5 Meter Source Thickness	Finite VSI for 2 Meter Source Thickness		
Styrene	100425	2,700	2,400 (X)	2,50E+06	9,70E+05	1,40E+06	5,50E+09	4,00E+05	5,20E+05
Sulfate	14803798	5,00E+06	NA	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	10,000	NA	NLV	NLV	NLV	ID	4,6E+6 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (TD)	50696416	NLV	NLV	NLV	NLV	NLV	(D)	(C)	NA
1,2,4,5-Tetrachlorobenzene	96943	1,50E+06	3,400 (X)	5,80E+05	2,30E+05	2,30E+05	6,70E+07	7,70E+07	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TD)	1746016	NLV	NLV	NLV	NLV	NLV	71 (D)	0.09 (D)	NA
1,1,1,2-Tetrachloroethane	630206	1,500	ID	6,200	54,000	1,00E+05	4,20E+08	4,8E+5 (C)	4,40E+05
1,1,1,2-Tetrachloroethane	79395	170	1,800 (X)	4,200	10,000	14,000	5,40E+07	53,000	8,70E+05
Tetrachloroethylene	127184	100	1,200 (X)	11,000	1,70E+05	1,10E+06	2,70E+09	2,0E+5 (C)	88,000
Tetrahydrofuran	109980	1,900	2,2E+5 (X)	1,30E+06	1,30E+07	1,80E+08	3,80E+11	2,90E+06	1,20E+08
Tetrahydrothiane	508148	ID	NA	500(M), 110	ID	ID	2,10E+05	ID	ID
Thallium (B)	7440280	2,300	4,200 (X)	NLV	NLV	NLV	1,30E+07	36,000	NA
Toluene (I)	108883	16,000	5,400	3,3E+5 (C)	5,10E+06	1,20E+07	2,70E+10	5,0E+7 (C)	2,50E+05
p-Toluidine	109490	660(M), 300	NA	NLV	NLV	NLV	1,00E+08	94,000	1,20E+06
Toxaphene	8001352	24,000	8,200	NLV	NLV	NLV	9,70E+06	20,000	NA
Treilate	2303175	95,000	NA	ID	ID	ID	ID	2,9E+6 (C)	2,80E+05
Trethylamine	102829	7,800	ID	5,80E+05	6,00E+05	6,00E+05	4,70E+08	7,90E+05	3,70E+06
1,2,4-Trichlorobenzene	12821	4,200	6,900 (X)	9,6E+6 (C)	2,80E+07	2,80E+07	2,60E+10	9,9E+5 (DD)	1,10E+06
1,1,1-Trichloroethane	71556	4,000	1,800	2,50E+05	3,80E+05	1,20E+07	6,70E+10	5,0E+8 (C)	4,80E+05
1,1,2-Trichloroethane	79005	100	6,800 (X)	4,800	17,000	21,000	1,90E+08	1,80E+05	9,20E+05
Trichloroethylene	79016	100	4,000 (X)	1,000	11,000	25,000	1,30E+09	1,1E+5 (DD)	5,00E+05
Trichlorofluoromethane	75684	62,000	NA	2,8E+6 (C)	9,20E+07	6,30E+08	3,80E+12	7,9E+7 (C)	5,60E+05
2,4,5-Trichlorophenol	95854	39,000	NA	NLV	NLV	NLV	2,30E+10	2,30E+07	NA
2,4,6-Trichlorophenol	88062	2,400	380 (M), 100	NLV	NLV	NLV	1,00E+08	7,10E+05	NA
1,2,3-Trichloropropane	96184	840	NA	4,000	9,200	11,000	2,00E+07	1,3E+6 (C)	8,30E+05
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	9,00E+6 (C)	1,700	5,1E+6 (C)	1,80E+08	8,80E+08	5,10E+12	1,0E+9 (C,D)	5,60E+05
Triethanolamine	102716	74,000	NA	NLV	NLV	NLV	3,30E+09	1,10E+08	1,10E+08



**TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a[10]). In those cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (C)				Contact	Csat	
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria		Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSI)	Finite Source 5 Meter Source Thickness	Finite VSI for 2 Meter Source Thickness			Particulate Soil Inhalation Criteria
Triethylene glycol	112278	NA	86,000	NA	NLV	NLV	NLV	NLV	ID	3.9E+7 (C,DD)	1.10E+05	1.10E+05
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.10E+06	NA	NLV	NLV	NLV	NLV	ID	4.1E+7 (DD)	NA	NA
Trifuralin	1682098	NA	1.90E+05	NA	ID	ID	ID	ID	ID	2.00E+06	NA	NA
2,2,4-Trimethylpentane	540841	NA	ID	NA	1.1E+5 (C)	5.20E+05	3.90E+07	9.60E+07	2.30E+11	ID	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	NA	ID	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	570	4.3E+6 (C)	2.10E+07	5.00E+08	5.00E+08	8.20E+10	3.2E+7 (C)	1.10E+05	1.10E+05
1,3,5-Trimethylbenzene (I)	106678	NA	1,800	1,100	2.6E+6 (C)	1.60E+07	3.80E+08	3.80E+08	8.20E+10	3.2E+7 (C)	94,000	94,000
Triphenyl phosphate	116966	NA	1.5E+6 (C)	NA	NLV	NLV	NLV	NLV	ID	3.6E+7 (C)	1.10E+05	1.10E+05
urea(2,3-Dithiompropyl)phosphate	126727	NA	890	ID	82,000 (C)	18,000	18,000	18,000	5.90E+06	9,400	27,000	27,000
Urea	57186	NA	ID	NA	NLV	NLV	NLV	NLV	ID	ID	NA	NA
Vanadium	7440622	NA	72,000	4.30E+05	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA	NA
Vinyl acetate (I)	106054	NA	13,000	NA	7.90E+05	1.70E+06	2.60E+06	5.80E+06	1.30E+10	5.8E+6 (C,DD)	2.40E+06	2.40E+06
Vinyl chloride	75014	NA	40	260 (X)	270	4,200	30,000	73,000	3.60E+09	3,800	490E+05	490E+05
White phosphorus (R)	12165103	NA	2.2	NA	NLV	NLV	NLV	NLV	ID	2,300 (DD)	NA	NA
Xylenes (I)	1330207	NA	5,600	820	6.3E+6 (C)	4.60E+07	6.10E+07	1.30E+08	2.90E+11	4.1E+8 (C)	1.50E+05	1.50E+05
Zinc (B)	7440666	47,000	2.40E+06	(G)	NLV	NLV	NLV	NLV	ID	1.70E+06	NA	NA