

The attached guidance "Waste Soil Determinations and Identifying Clean Soil" was developed to assist generators, regulators, and property owners manage waste soil properly. This guidance was prepared by the DNR's Waste and Materials Management and Remediation and Redevelopment (R&R) Programs. This guidance relates to the DNR's R&R Program draft guidance number RR-060 titled "Management of Contaminated Soil and Other Solid Wastes Wis. Admin. Code §§ NR 718.12 and NR 718.15", which is posted for public comment concurrently.

Comments related to the "Waste Soil Determination and Identifying Clean Soil" draft guidance document should be sent to [John.Morris@wisconsin.gov](mailto:John.Morris@wisconsin.gov).

# Waste Soil Determinations and Identifying Clean Soil

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## **Purpose:**

This guidance is intended to assist generators, regulators, and property owners to manage waste soil properly. This document provides guideline criteria for determining when the Department of Natural Resources (DNR) would consider waste soil to be eligible for the “clean fill” exemption in s. NR 500.08(2)(a), Wisconsin Administrative Code (Wis. Adm. Code). For convenience, soil subject to this exemption will be referred to as “clean soil,” in this guidance document. It also provides guidance as to when you can assume soil is clean soil without sampling and when it may be appropriate to sample and analyze soil in order to determine if it is clean soil. If the soil is considered clean soil, then the facility where it is managed is exempt from state solid waste regulations as long as it is managed in a nuisance-free and aesthetic manner. Other management options are discussed for soil that does not meet definition of clean soil (contaminated soil).

## **Background:**

Soil that is excavated to be discarded is a solid waste, and for convenience, will be referred to as “waste soil,” in this guidance. Waste soil generated as part of a project can be classified into one of four categories: clean soil (no DNR approval needed), restricted use soil (DNR approval needed), soil requiring landfill disposal, and hazardous waste soil. Because waste soil is a solid waste it is in the best interest of the generator to determine whether the soil may be eligible for use as clean fill or needs to be disposed of in a more secure manner to prevent environmental pollution.

Most earthworks projects generate waste soil that is clean soil. Clean soil can be used as exempt clean fill without DNR approval if done so in a manner and location consistent with the provisions in ss. 504.04(3)(c) and 504.04(4)(a) through (f), Wis. Adm. Code, as discussed below. Clean soil is referenced in the “clean fill” exemption (s. NR 500.08(2)(a), Wis. Adm. Code), but not defined.

## **Definitions:**

**Soil:** Defined in s. NR 500.03(214), Wis. Adm. Code, as material that has been physically and chemically derived from the bedrock by nature (from NR 500.03(214),). “Soil” also includes topsoil as defined in s. NR 500.03(236), Wis. Adm. Code.

**Solid waste:** Defined in s. 289.01(33), Wisconsin Statutes (Wis. Stats.), and includes discarded or salvageable materials, including waste soil.

## **Explanation of terms which will be used for purposes of this guidance:**

Please note these terms are for guidance purposes only and should not be relied on to make regulatory decisions.

**Contaminated soil:** Soil that is not clean, contains one or more hazardous substances or environmental pollutants, and is not a hazardous waste as defined in s. NR 660.10(52), Wis. Adm. Code, or chapter 42 of the United States Code.

**Generator:** Any person, whose act or process produces a waste soil.

**Hazardous waste soil:** Contaminated soil which must be managed as a hazardous waste because the soil exhibits a hazardous waste characteristic or was mixed with a listed hazardous waste. Managing hazardous waste soil is addressed later in this document and in publication RR-705.

Residual Contaminant Levels (RCLs): Defined by s. NR 720.10, Wis. Adm. Code. RCLs for a variety of contaminants have been developed to prevent excessive exposures to these substances through direct contact in industrial and nonindustrial land uses, as well as through these contaminants leaching to groundwater.

Restricted use soil: Contaminated soil which requires a low hazard waste grant of exemption or NR 718 approval to be managed in a location other than a licensed solid waste landfill.

Waste soil: For the purposes of this document, waste soil is soil that is unwanted in its current location and is excavated to be disposed of or managed at another location, on or off the property at which it was generated.

**Responsibility:**

It is the generator's responsibility to apply best professional judgment in making a waste soil determination. Inaccurate waste soil determinations may result in improper placement or reuse of the soil and leave the generator with financial liability for cleanup. In addition to the generator, parties moving or accepting waste soil for placement on their property may also be responsible for any environmental contamination that may result from the soil. It is in the best interest of the receiving property owner to ensure that the material being accepted has an acceptable waste determination made by the generator.

**Waste Determination:**

The initial step in evaluating waste soil placement or disposal options is to complete a waste determination. The waste determination typically starts with generator knowledge of the soil. The first question a generator should ask is "Is there any reason to believe that a release of contaminants has occurred at the property or that the soil may not be clean?" Most soils are determined to be clean based on this approach. However in some areas, such as areas of commercial or industrial use and transportation corridors, the generator may have reason to believe the soil isn't clean, and should apply professional judgment in determining next steps to take in making a waste determination. In these areas it may be prudent for a generator or person responsible for the proper management or disposal of the soil to take samples to determine if the soil is clean before moving it to another location.

A determination should assess known and suspected contamination that may be present in the soil. It should rely on historical information and past land use practices as well as a visual and olfactory assessment. DNR rules do not require sampling of soil in making a waste determination. However, sampling may be warranted or advised in some cases, particularly where the generator or recipient wants the greatest assurance of the proper options for the management of the material. If laboratory analysis is completed, the results can be used to confirm the soil meets the criteria for classification as clean soil. DNR recommends that the generator document and maintain a record of the waste determination, even though it is not required by state law. Having a written record of the waste determination may prove useful in transactions such as a property sale or loan acquisition.

The following is a list of some key factors the generator or recipient may want to consider in determining whether sampling should be performed. Only one of the following factors supporting soil sampling is necessary for soil sampling to be a reasonable decision and each decision should be made on a case by case basis. DNR understands many properties may not have had a Phase I or Phase II Environmental Site Assessment (ESA) performed prior to soil excavation:

Factors during planning stages that would likely support NOT sampling the waste soil to be generated because the soil is unlikely to contain contaminants:

- The present and past land uses are limited to residential, forestry, open space, or most types of agricultural.
- There is little or no paved surface on this or adjacent properties (paved surfaces tend to concentrate contaminants in the remaining exposed soil).
- The soil was generated as spoils from a nonmetallic mining site, as defined in s. NR 135.03 (16), Wis. Adm. Code.

Observations prior to excavation that would support sampling soils because they may contain contaminants:

- There are known environmental concerns identified from evidence such as:
  - Evaluation of environmental sampling and analysis that was previously conducted;
  - A Phase I ESA indicates there are Recognized Environmental Conditions (RECs) at the property;
  - A review of Superfund data from Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), the Bureau for Remediation and Redevelopment Tracking System (BRRTS) and the Solid and Hazardous Waste Information System (SHWIMS) databases indicates that the property or adjacent properties are sites with known disposal or contamination concerns, or the facility generated hazardous waste;
  - The site or adjacent properties have signs of ongoing remedial investigation or action including soil boreholes, monitoring wells, former excavations or stockpiled soils; and/or
  - The site is a response action site which is undergoing or has completed a response to a hazardous substance discharge or environmental pollution.
- The following are seen or observed on or around the property:
  - Stained or discolored soils;
  - Lack of vegetation where it should be present, or discolored or stressed vegetation;
  - Odors present (e.g., hydrocarbon or solvent odors);
  - Multicolored or oily seeps;
  - Presence of waste indicated by unusual-colored soil-like materials, demolition waste, or industrial waste materials disposed of or stored on the site;
  - The site has suspicious fill areas, old non-residential building foundations, or artificial-looking fill formations;
  - Drums on site or adjacent to the site;
  - Equipment or material on the property that indicates the potential for discharge resulting in environmental concern;
  - The site receives runoff from driveways or parking lots that have had coal tar and other sealers applied to them, or receives runoff from a significant area; and/or
  - The site is in an urban, railroad, industrial, or other setting that may suggest the possibility of aerial deposition of contaminants.

- Review of information, such as the items in the list below, may indicate reasons for environmental concern and the potential for environmental impacts.
  - Ownership and history of the property;
  - Present and past land use of the property (e.g., gas stations, automobile repair facilities, dry cleaners, foundries, salvage yards, smelters, bulk chemical plants, railroad properties, agricultural chemical facilities, historic fill sites and landfills would indicate the potential for a hazardous substance discharge);
  - Review of department files on facility compliance and enforcement for waste, air, wastewater, storm water, etc. violations.
  - Historic aerial photographs; environmental licenses, permits and orders applicable to the property; and/or
  - Other visual or historical signs that environmental contamination or a hazardous substance discharge may have occurred at the site.
  
- Field observations during excavation that could affect the decision to not sample soils: Even if the original waste determination did not indicate a need for sampling, field observations and information may support changing the decision to sample. Soils should be sampled under the following circumstances:
  - Stained or discolored soils;
  - Odors present (e.g. hydrocarbon or solvent odors);
  - Presence of waste materials such as cinders, foundry sand, and ash;
  - Presence of barrels or portions of such that cannot be explained indicate a former disposal area; and
  - Presence of waste materials indicative of a former municipal solid waste dump/landfill or farm dump, including household garbage, burnt waste, agricultural chemical containers, etc.

**Sampling Frequency and Parameters:**

When the generator or receiver decides sampling is warranted, a representative sample or samples of the waste soil should be obtained and analyzed for all contaminants likely to be present; the judgment of an environmental professional may help determine what contaminants should be analyzed for in the sample(s). Sample analyte consideration should include what ingredients, products, and wastes may have been used, mixed, generated, stored, spilled, or disposed on the site. Records such as safety data sheets, hazardous waste reports, and toxic release inventory data may provide useful information to select analytes.

The DNR encourages sampling frequency consistent with s. NR 718.12, Wis. Adm. Code, when sampling is performed to determine whether soil can be classified as clean soil. Section NR 718.12, Wis. Adm. Code states "The sampling frequency is one sample for every 100 cubic yards of contaminated soil for the first 600 cubic yards with a minimum of 2 samples being collected and for volumes of contaminated soil that exceed 600 cubic yards, one sample for each additional 300 cubic yards." If landfill disposal is a possibility, sample analysis should include methods and analytes to meet the landfill's acceptance requirements.

**Interpreting Laboratory Data:**

Soil is likely considered clean soil if the sampling data, where it exists, meets all of the following criteria:

- Does not contain detectable concentrations of compounds that are not naturally occurring (e.g., volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), pesticides, and other contaminants of concern);
- Contains naturally occurring compounds, at concentrations that are at or below Wisconsin background threshold values (Wisconsin BTVs for select parameters are listed in the table found later in this document), and
- If it contains PAHs, which may or may not be naturally occurring, they are present at concentrations below the non-industrial direct contact and groundwater protective residual contaminant levels (RCLs) calculated using default parameters as specified in ch. NR 720, Wis. Adm. Code, and DNR guidance document RR 890.

**Clean Soil Placement Requirements:**

Clean soil placement must be conducted and maintained in a nuisance-free and aesthetic manner, in accordance with s. NR 500.08(2), Wis. Adm. Code, the following standards, and any other applicable codes.

**Location Standards:**

- Do not place the soil within a floodplain, (s. NR 504.04(3)(c), Wis. Adm. Code).

**Performance Standards:**

Do not place the soil where there is a reasonable probability that it will cause (ss. NR 504.04(4)(a) through (f), Wis. Adm. Code):

- Significant adverse impacts to wetlands.
- Take of an endangered or threatened species.
- Detrimental effect on surface water.
- Detrimental effect on groundwater quality or cause or exacerbate a groundwater quality exceedance (NR 140 ES or PAL).
- Migration and concentration of explosive gases.
- Emission of any hazardous air contaminant.

**Options for Restricted Use Soil:****Non-Landfill Management Options:**

Management of restricted use soil on a site other than disposal within a licensed solid waste landfill requires a separate DNR approval or grant of exemption from NR 500 requirements. Non-landfill management of mildly contaminated soil may be permitted via a NR 718 exemption or a s. 289.43(8), Wis. Stats., Low-Hazard Waste Exemption (LHWE) from the DNR. When reviewing requests for non-landfill disposal, DNR staff use the information submitted in the applicant's request and professional judgment to determine if the proposed use is unlikely to cause environmental pollution. Acceptable placement options for soil that is determined not to be clean soil ("contaminated soil") should provide adequate protection of human health and the environment from the contaminants present. Non-landfill options for placement could include under a road, building or paved surface. This helps to restrict direct contact or stormwater quality concerns and leaching into groundwater. Placement under a layer of clean soil may restrict direct contact and stormwater impacts if the clean soil is thick enough and well vegetated. Non-landfill placement may require department approval, continuing maintenance obligations, landowner approval, and tracking the location on a database.

Chapter NR 718, Wis. Adm. Code, governs the management of contaminated soils and some solid waste materials originating at response action sites. "Response" or "response action" is defined in s. NR 700.03(50), Wis. Adm. Code, and means "any action taken to respond to a hazardous substance discharge or environmental pollution, including emergency and non-emergency immediate actions, investigations, interim actions and remedial actions." A response action site would include any site subject to jurisdiction under ch. 292, Wis. Stats., whether the person has or has not notified the DNR of the discharge.

The management of contaminated soil and certain solid wastes excavated as part of a response action taken to comply with Wis. Stats. 292 and the Wis. Admin. Code NR 700 rule series may utilize the exemptions specified in Wis. Adm. Code NR 718 entitled, "Management of Contaminated Soil or Solid Wastes Excavated During Response Actions." Applications to manage contaminated soil and other soil wastes excavated at a response action site or facility in accordance with Wis. Admin. Code ss. NR 718.12 and 718.15 should be submitted to and generally will be reviewed by the Remediation and Redevelopment (RR) Program project manager, not the Waste and Materials Management Program (WMMP).

There may be limited situations where management of contaminated soil generated from a site other than a response action site would be regulated by the WMMP. An example of that would be where soil containing high levels of naturally occurring arsenic needs to be excavated and managed at a non-response action site or facility. In such a situation, a low-hazard waste exemption may be an option. The WMMP project manager will consider the provisions in ch. NR 718, Wis. Adm. Code, to guide whether to approve the disposal of non-response action contaminated soil at a site other than a licensed landfill.

Landfill Disposal Option:

Soil that does not meet the criteria for clean soil must be landfilled or be managed under a separate DNR approval or low-hazard waste exemption.

Hazardous waste soil:

Soil that is also a hazardous waste has special safe handling requirements and limited disposal options. Please see the DNR "Guidance for Hazardous Waste Remediation" (Pub RR-705), <http://dnr.wi.gov/files/PDF/pubs/rr/RR705.pdf>, for more information.

Low Hazard Waste Exemptions:

For more information on LHWEs please see "Exempting Low-Hazard Wastes from Solid Waste Regulations" at <http://dnr.wi.gov/files/pdf/pubs/wa/wa1645.pdf>. For more information regarding NR 718 exemptions from the Remediation and Redevelopment Program see R&R Program draft guidance number RR-060 titled "Management of Contaminated Soil and Other Solid Wastes Wis. Admin. Code §§ NR 718.12 and NR 718.15" at <http://dnr.wi.gov/news/input/Guidance.html>.

Wisconsin Background Threshold Values (BTVs)			
Parameter	mg/kg	Parameter	mg/kg
Aluminum (Al)	29,000	Iron (Fe)	34,000
Arsenic (As)	8	Lead (Pb)	52
Barium (Ba)	360	Magnesium (Mg)	8,300
Cadmium (Cd)	1	Manganese (Mn)	2,900
Calcium (Ca)	15,000	Nickel (Ni)	31
Chromium (Cr), Total	44	Strontium (Sr)	55
Cobalt (Co)	22	Vanadium (V)	85
Copper (Cu)	35	Zinc (Zn)	150

Background threshold values are non-outlier parameter maximum levels in Wisconsin surface soils from the USGS Report "Distribution and Variation of Arsenic in Wisconsin Surface Soils, With Data on Other Trace Elements" at: <http://pubs.usgs.gov/sir/2011/5202>.

If you have any questions about this document, please contact the Regional Waste and Materials Management Program Manager:

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