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Management of Petroleum-Contaminated Materials

The purpose of this guidance document is to explain the requirements for managing petroleum-contaminated materials. This will include disposal methods, alternative treatment, and disposal in landfills. The most common example of an alternative treatment and disposal method is a one-time land application of petroleum contaminated soils, also known as “land farming”. If there is an immediate response to an emergency (e.g. spill) this guidance document will only apply after the immediate response has ended. During an immediate response, alternative management procedures not addressed in this guidance document will take precedence.

1. Hazardous Waste Determinations:

All solid wastes except household wastes are required to have a hazardous waste determination. Petroleum contaminated materials are solid wastes when actively managed as wastes (e.g. excavated for treatment and disposal).

Sampling and Analysis:

The type of analysis conducted and the sampling procedures used are dependent upon the matrix (e.g. soil, water) and type of contaminant involved. For assistance on making a hazardous waste determination, please refer to [Title 128 – Nebraska Hazardous Waste Regulations](#), Chapter 3 & 4 and the guidance document *Waste Determinations and Hazardous Waste Testing* available on the NDEQ website.

Common materials that may routinely be contaminated with petroleum include media (e.g. water, soil, sand, gravel) and debris (e.g. trees, concrete). Media and debris from an underground storage tank (UST) subject to corrective action under 40 CFR Part 280 that fail the test for the toxicity characteristic (hazardous waste codes D018 through D043) are not a hazardous waste (Title 128, Chapter 2, [§009.10](#)). This exemption does not apply to the contents of an UST. The Nebraska State Fire Marshal handles registration of USTs and regulates their upkeep and removal.

The Nebraska Department of Environmental Quality (NDEQ) will not routinely ask for gasoline-contaminated media and debris to be analyzed for lead. NDEQ has not seen any evidence that media and debris contaminated with gasoline will ever contain enough lead to become a hazardous waste.

The following examples and Table 1 are based on media and debris contaminated with petroleum ONLY. Knowledge of past practices and procedures is critical in determining what additional

contaminants would reasonably be expected to be present. In many cases past practices and procedures (e.g. industrial areas) would require additional sampling of potential contaminants that are not identified in the following examples or Table 1.

Examples:

- A. Media and debris contaminated with gasoline or diesel only: If the material is *from* an UST and subject to corrective action; the media and debris can be taken to a Municipal Solid Waste Landfill (MSW Landfill) permitted to dispose waste pursuant to Title 132 – Integrated Solid Waste Management Regulations for disposal without sampling and analysis. Note: While NDEQ does allow this, there *may* be sampling and analysis requirements specific to and mandated by individual MSW Landfills.
- B. Media and debris contaminated with gasoline only: If the material is *not from* an UST and subject to corrective action; media and debris must have a waste determination for benzene.
- C. Media and debris contaminated with gasoline only: Whether the material is *from* an UST subject to corrective action *or not*, media and debris must have a waste determination for benzene if it is to be land applied.
- D. Media and debris contaminated with used oil only: Whether the material is *from* an UST subject to corrective action *or not*, media and debris must have a waste determination for the RCRA-8 toxicity characteristic metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) found in Title 128, Chapter 3, § 010, Table 3.

Table 1 provides a summary of the sampling actions required by the Department. The requirements are dependent on the petroleum contaminant, source of the contaminant, and ultimate disposal method.

TABLE 1: Minimum Sampling Requirements for Landfill Disposal and One-time Land Application

DISPOSAL SITE	CONTAMINANT	SOURCE	BENZENE ONLY	LEAD ONLY	RCRA METALS ¹
LANDFILL	Gasoline ²	UST	NA	NA	NA
		NON-UST	YES	NA	NA
	Other Petroleum ³	UST	NA	NA	NA
		NON-UST	NA	NA	NA
	Used Oil ⁴	UST	NA	See à	YES
		NON-UST	NA	See à	YES
LANDFARM	Gasoline ²	UST	YES	NA	NA
		NON-UST	YES	NA	NA
	Other Petroleum ³	UST	NA	NA	NA
		NON-UST	NA	NA	NA

NA = Not applicable

¹ RCRA metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver

² Gasoline includes aviation fuel

³ Other petroleum includes diesel, kerosene, mineral oil (no PCBs), heating oils, fuel oils, and bunker oils

⁴ Used oil whether it is subject to UST corrective action or not.

The contents of an UST are subject to full RCRA regulation under Title 128. The D018 through D043 exemption does not apply to the contents. For further hazardous waste determination assistance, please contact the Waste Management Section Environmental Assistance Coordinator at (402) 471-8308.

2. Fill:

Fill shall mean solid waste that consists only of one or more of the following: sand, gravel, stone, soil, rock, brick, concrete rubble, asphalt rubble or similar material. Fill that is not a hazardous waste may be used for the purpose of erosion control, erosion repair, channel stabilization, landscaping, roadbed preparation, or other land improvement provided the wastes used in these activities are not mixed with other solid wastes and do not, as a result of handling or disposal, have the potential to cause contamination that may threaten human health or the environment.

3. Petroleum-Contaminated Materials:

This section discusses treatment and disposal requirements for different types of petroleum contaminated materials. For the purpose of this guidance document the materials will be categorized as *Hazardous Waste Materials*, *Underground Storage Tank (UST) Contaminated Materials*, and *Petroleum-Contaminated Materials from Sources other than an UST*.

A. Hazardous Waste Materials:

Regardless of its source, a petroleum contaminated material that is also contaminated with a listed waste, fails its TCLP analysis, or is characteristic as a Hazardous Waste must be handled as such. If a hazardous waste generator is a Conditionally Exempt Small Quantity generator it may dispose of hazardous waste at an MSW Landfill. If a generator is a Conditionally Exempt Small Quantity Generator (CESQG) then refer to the section of this guidance document dealing with *requirements for disposal in landfills* below. If the generator's status is unknown or the hazardous waste generator is a Small Quantity Generator (SQG) or a Large Quantity Generator (LQG), contact the Waste Management Section Compliance Assistance Specialist at (402) 471-8308 for proper disposal information.

The NDEQ will not allow hazardous waste to be land applied. To inquire about alternative treatment and disposal methods of hazardous waste, contact the Waste Management Section Compliance Assistance Specialist at (402) 471-8308.

B. UST Contaminated Media and Debris:

This sub-section discusses the requirements and options for treatment and disposal of petroleum-contaminated media and debris associated with an Underground Storage Tank system.

Treatment and Disposal:

1. For disposal at a MSW Landfill, refer to *Requirements for Disposal in a Landfill* below.
2. For land application, refer to *Requirements for Alternative Treatment and Disposal by Land Application* below.
3. For alternative treatment and disposal, refer to *Requirements for Alternative Treatment and Disposal by Other Methods* near the end of this document.

Stockpiling:

Contaminated media that has been determined to contain hazardous waste should be

immediately containerized upon excavation whenever possible to avoid potential RCRA permitting and closure requirements that may result from stockpiling. NDEQ also recommends containerization when a hazardous waste determination has not yet been completed (e.g. awaiting analytical results), though in most cases it is our experience that contaminated soil resulting from a petroleum release does not fail a TCLP analysis. Under an emergency situation where excavation and stockpiling contaminated media is necessary to prevent imminent and substantial endangerment to human life, health, property or the environment, contaminated media may be stockpiled if there are no other practical alternatives. An emergency permit may be required if the contaminated media contains hazardous waste; one can be obtained on short notice by contacting the Department.

If you find it necessary to stockpile contaminated media and debris it must be done in a manner that will prevent additional hazards or contamination of the land, air or waters of the State. The following procedures must be applied:

1. The stockpile is to be placed in a safe and secure location to minimize exposure to human health and the environment.
2. Media and debris must be placed on and covered with an impermeable membrane.
3. Procedures should be implemented to limit access to the stockpile.
4. Implement storm water run-on and run-off controls.

C. Petroleum-Contaminated Materials from Sources Other than an UST:

Contaminated material that is not associated with an UST system and has been determined not to be a hazardous waste may be treated in a similar manner to UST contaminated media and debris. Refer to the sections on Treatment and Disposal and Stockpiling immediately above.

4. Requirements for Disposal in a Landfill:

Each MSW Landfill in Nebraska may have its own sampling, analysis and disposal requirements. These requirements may be in addition to NDEQ requirements discussed above under the heading *Hazardous Waste Determinations*. Each MSW Landfill has the right to reject any disposal request. The NDEQ recommends that the generator contact the MSW Landfill prior to delivering contaminated material to that landfill. A CESQG can dispose of only 19.5 kg (43 lbs) of hazardous waste per day at an MSW Landfill (Title 132, Chapter 1, §113) and a total of only 100kg (220 lbs) per calendar month. The contaminated media must not contain free liquids. The NDEQ may require verification by a paint filter test.

5. Requirements for Alternative Treatment and Disposal by Land Application:

This section discusses the requirements for treatment and disposal of materials by land application. Land application areas are categorized as either one-time land application sites or permitted land application facilities.

A. One-Time Land Application Site:

This section describes the site selection criteria, soil treatment procedures, and monitoring requirements for one-time land application sites. A one-time land application site is defined as a site that is used for the controlled application of material, from a single source, to the surface of the land for the purposes of treatment and disposal. Materials contaminated with “used” oil are not allowed to be land applied. **All one-time land applications must have prior approval by the NDEQ.** (NE Title 132, Chpt. 13)

Characteristics for the Selection of One-time Land Application Sites:

All of the items listed below must be addressed in writing and submitted to NDEQ with a *Special Waste Characterization Request Form* found at <http://deq.ne.gov/>.

1. The site should be large enough to enable contaminated material to be spread in a lift no thicker than four inches. (For reference, one cubic yard of soil spread to 4 inches in depth will cover an area approximately 27 feet long by 3 feet wide, or 81 square feet.)
2. The site should be located at least 1000 feet from inhabited residences, businesses, or facilities/lands frequented by the public.
3. The site should be located at least 1000 feet from any man-made or natural structures that may collect vapors. Examples of this type of structure are basements, outbuildings, pump houses, sewer lines or other utility corridors, or drain tile systems.
4. The site should be located at least 1000 feet from drinking water wells (municipal, domestic, etc.).
5. The site should be located at least 100 feet from other types of wells (livestock, irrigation, etc.).
6. The site should be located at least 1000 feet from any surface water features (ponds, lakes, streams, etc.).
7. The site must not be located within a designated wellhead protection area, or other Title 118 - Ground Water Quality Standards and Use Classification "Class GA" areas.
8. Sites with highly permeable soils (e.g. sand and/or gravel) should be avoided.
9. The site should not be located within a 100-year floodplain.
10. The site should not be located within areas designated as wetlands. Verification may be required by the NDEQ.
11. There should be a minimum separation of 25 feet between the land surface and the water table. The NDEQ may require greater separation in some cases.
12. The site should not be located in a quarry, gravel pit, or mine, unless as part of an approved reclamation project.
13. The site should not be located on any land with slopes greater than six percent.

B. Treatment Procedures:

The goal of the following treatment procedures is to provide conditions which are conducive to biodegradation as well as volatilization of the target petroleum contaminants. It is the site operator's responsibility to assure the treated materials meet the cleanup goal specified below. The following procedures are minimum requirements. It may be necessary to perform these procedures at a greater frequency or modify them in order to meet the cleanup goal.

1. All materials should be free of debris such as piping, tubing, concrete, electrical wiring and conduit, plastic tarp, etc. upon delivery to the site. All debris removed from the contaminated material must be properly recycled or disposed in a landfill permitted in accordance with NE Title 132.
2. For maximum effectiveness, land application of contaminated material should be limited to March 1st through November 30th. Treatment procedures should continue until all contaminated materials meet the cleanup goal or until site conditions, such as a frozen ground, prevent further treatment.
3. If materials are stockpiled, land application should begin within 48 hours after NDEQ approval is given. If the materials cannot be applied within 48 hours, an alternative plan should be submitted for review and approval by NDEQ.
4. Lifts of material should be no greater than four inches thick.
5. Material which is land applied should be incorporated (mixed) with the upper 4 to 6 inches of native soil within 48 hours after application. If soil amendments are used to enhance hydrocarbon breakdown, they should be added just before or just after material spreading, but prior to mixing with the upper 4 to 6 inches of native soil.
6. Soil amendment application rates should not exceed standard rates for crop production. The local University of Nebraska - Extension Service, the local Natural Resources District, or the Natural Resource Conservation Service may be able to provide this information.
7. Material should be turned at least once per month, or as frequently as necessary, to the depth of original incorporation. This is to enhance hydrocarbon breakdown and to prevent materials from remaining saturated after precipitation events.
8. The boundaries of the area of contaminated material should be flagged or staked to differentiate it from uncontaminated, native soils. The stakes must remain in place until the treatment of the material is complete.
9. Petroleum contaminated materials should be treated until the benzene level is less than 3.63 mg/kg and total extractable hydrocarbons (TEH) as diesel is less than 9520 mg/kg.

Saturated Soils:

Soils that are saturated with petroleum may be land-applied provided the soil does not contain any free liquids (paint filter test). The soil should be turned once per week for a month and then the normal treatment procedures described above may be initiated (unless otherwise directed by the NDEQ).

Reuse of Soils:

If soil is to be reused after treatment has been completed, the department should be notified prior to the reuse.

C. Permitted Land Application Facilities:

For the purposes of this guidance document a permitted land application facility is defined as a

site where contaminated materials are repeatedly land applied onto the same plot(s) of land or incorporated into the soil surface for agricultural purposes or for treatment and disposal. Any land application facility which proposes to accept, treat and dispose of soils in a manner which does not meet the definition of a one-time land application site must apply for and receive a permit from NDEQ prior to accepting contaminated soils. Sites such as this are considered to be disposal areas under Title 132 – Integrated Solid Waste Management Regulations and therefore must meet the siting, construction, operation, reporting, and monitoring requirements as outlined in Title 132.

6. Requirements for Alternative Treatment and Disposal by other methods:

Proposals for treatment and disposal methods other than land application or landfill disposal must be submitted to NDEQ. (e.g. low temperature thermal desorption, incineration, asphalt batching, soil washing, etc.) Reviews are performed on a case-by-case basis by the appropriate NDEQ section or program.

Prior to initiating any alternative treatments and disposal, the *Alternative Petroleum-Contaminated Soil Treatment and Disposal Form* must be completed and submitted to the Waste Management Section of the NDEQ. Upon review of this form, the NDEQ may require additional information (e.g. work plans, design plans, etc.) to be submitted in order for the treatment and disposal proposal to be evaluated.

RESOURCES:

Useful Website:

- NDEQ Home Page – <http://deq.ne.gov/>
- Nebraska State Fire Marshal, Fuels Division – <http://www.sfm.ne.gov/programs-services/fuels/>

NDEQ Publications*:

- [Title 128 – Nebraska Hazardous Waste Regulations](#)
- [Title 132 – Integrated Solid Waste Management Regulations](#)
- Environmental Fact Sheet – Comparison of Hazardous Waste Generators Requirements
- Environmental Guidance Document – Investigative-Derived Waste (IDW) & Remediation Waste Considerations
- Environmental Guidance Document – Waste Determinations & Hazardous Waste Testing
- NDEQ Report – Hazardous Waste Service Providers Directory

Contacts:

- NDEQ Hazardous Waste Compliance Assistance (402) 471-8308
- NDEQ Waste Management Section (402) 471-4210
- NDEQ Toll Free Number (877) 253-2603

**These are available on the NDEQ website or by calling the NDEQ Waste Management Section.*

Attachment:

- Alternative Petroleum-Contaminated Soil Treatment and Disposal Form



Return form to:
Nebraska Department of Environmental Quality
Waste Management Division
P.O. Box 98922
Lincoln, NE 68509-8922
Phone: (402) 471-4210, Toll Free: (877) 253-2603, Fax: (402) 471-2909

Special Waste Characterization and Land Disposal Request Form

A: Generator Information

Business/Organization/Entity: _____

Contact Person: _____ Title: _____

Address: _____

Telephone: _____ Fax: _____

Email: _____

Name/Briefly Describe the Waste: _____

Total amount of waste to be disposed _____ ft³ or lbs. (circle)

One Time Disposal (Yes / No) (circle)

If no, time frame (annually, monthly, etc.) _____

What process or incident generated the waste? _____

B: Physical Characteristics of the Waste

Color _____

Odor: (Please circle one) None Mild Strong

Describe odor: _____

Physical State, @ 70°F

(Please circle one) Solid Gas Liquid Semi-Solid

Layers (Please circle one) Multi-Layered Bi-Layered Single-Phased

Please provide: pH _____ Flash Point _____ Specific Gravity _____

Free Liquids? - Refer to Paint Filter Test (PFT) Method 9095 from SW-846

(Please circle one) Yes No

If yes, describe the method used to solidify the waste prior to disposal. _____

C: Chemical Composition (Attach Analytical Results)

Please Attach All Laboratory Analysis Data Sheets and/or Material Safety Data Sheets

D: Waste Analysis and Data (Circle)

Has the Toxicity Characteristic Leaching Procedure (TCLP) been run on this waste? Yes No

Is this a hazardous waste? Yes No

If yes, is this an exempt quantity of hazardous waste? Yes No

E: Disposal Method

How do you plan to dispose of this waste? (Please circle one below)

Landfill Name of Landfill _____

Land application (Fill in Section F if circled)

Other method Describe: _____

F. Land Application Information

Complete this section only if the waste will be land applied.

Type of Contaminants: _____

Assessment of the treatment/disposal by-products (e.g. air emissions, leachate, etc.); include type of by-product, amount and rate of emission:

Treatment/Disposal Location: _____

Area Size of Location: _____

Legal Description: _____ 1/4, _____ 1/4, _____ Sect., _____ Township, _____ Range

County: _____ Nearest City: _____

Treatment/Disposal Location Owner's Name, Address, & Phone Number: _____

Topography Description: _____

Distance in Feet to Nearest Inhabited Residence, Business or Facilities/Lands Frequented by the Public: _____

Distance in feet to the Nearest Manmade or Natural Structure that may Collect Vapors (Petroleum Contaminated Soils Only): _____

Distance in Feet to Nearest Drinking Well(s) (Domestic, Municipal, Etc.):

Distance in Feet to Nearest Surface Water (Pond, Lake, Stream, Wet Lands, Etc.):

Distance in Feet Between the Ground Surface and the Water Table: _____
Major Soil Type(s) Between Surface and Groundwater (i.e. Sand, Gravel, Loam):

Slope of Area (%): _____
Description of Proposed Effectiveness of Treatment: _____

Anticipated Treatment Rate (amount/time): _____

Anticipated Length of Treatment: _____

Certification. By signing below, the party(ies) certify that all above information and all attachments submitted with this document are complete and accurate and that information regarding all known or suspected hazards has been disclosed.

Signature – Responsible Party Title Date

Name (type or print)

Signature – Consultant/Contractor Title Date

Name – Consultant/Contractor (type or print)