
**WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY
SOLID AND HAZARDOUS WASTE DIVISION**

SOLID WASTE GUIDELINE #2 “Petroleum Contaminated Soils”

1.0 Introduction

The purpose of this guideline is to provide information for the management (i.e. storage, treatment, and disposal or reuse) of petroleum contaminated soil (PCS) as defined in Solid Waste Rules and Regulations (SWRR) Chapter 1, Section 1(e) and:

- Is not a hazardous waste as defined in Hazardous Waste Rules and Regulations (HWRR) Chapter 1, Section 1 (f)
- Is exempt as a hazardous waste (e.g., petroleum exploration and production (E&P) exemption; petroleum storage tank cleanups for certain constituents)
- May be exempt from solid waste permitting because it meets the definition of a de minimus quantity (SWRR Chapter 1, Section 1(l)) per the following criteria:
 - Less than 200 cubic yards of PCS from an E&P exempt source of crude oil or condensate
 - Less than 20 yards of non-hazardous PCS contaminated with gasoline, refined oil or used oil

This guideline is intended to be consistent with regulations and guidelines established under the Solid and Hazardous Waste Division (SHWD) remediation programs (i.e. Solid Waste Permitting and Corrective Action, Hazardous Waste Permitting and Corrective Action, Voluntary Remediation Program and the Storage Tank Program).

This guideline can be used for the temporary storage, treatment and/or disposal or reuse of PCS at or near the point of generation in cases where a permit, order or some other administrative mechanism (e.g. Voluntary Remediation Program (VRP) Remedy Agreement) is not in place or required. If an administrative mechanism is required, the requirements for management of PCS will be memorialized in that mechanism and may include the considerations outlined in this guidance.

Standards for the management of petroleum-contaminated soils at a permitted solid waste management facility are located in SWRR Chapter 8, Section 5. Standards for the treatment, transfer, or storage of non-hazardous solid waste are located in SWRR Chapter 6. It is the responsibility of any PCS generator to adequately characterize and manage PCS, including PCS that has the potential to be a hazardous waste. Once adequately characterized, PCS may be treated, disposed or reused as outlined in this guidance.

2.0 PCS Characterization

Analytical requirements for PCS are dependent upon whether the PCS is a solid waste, a potential hazardous waste or PCS generated during cleanup by the STP. Once the waste is characterized, the applicability of this guidance and the PCS management options can be determined.

Sampling frequency to characterize PCS is at least one (1) 3- point composite sample collected and analyzed (as described below) for every 200 cubic yards of PCS or an alternate frequency based on site specific information as approved by the appropriate program in the SHWD.

2.1 Solid Waste

PCS properly characterized per this guideline may be managed at a permitted solid waste facility. Generators of PCS need to contact the facility operator before transporting PCS to ensure that the facility will accept PCS and if the operator has any site specific conditions which must be met. Generators of PCS may contact SHWD for information on facilities permitted to receive PCS.

2.2 Hazardous Waste

Wastes generated during the exploration, development, and production of crude oil, natural gas, and geothermal energy are categorized by EPA as "special wastes" and are exempt from federal hazardous waste regulations under Subtitle C of the Resource Conservation and Recovery Act (RCRA). If the PCS is not exempted as a hazardous waste, the PCS must be sampled to determine if the PCS meets the definition of a characteristic hazardous waste (see Appendices A and B of this guideline). Alternatively, the PCS generator can make a waste determination based on process knowledge and the source of the petroleum contamination to soils. Further guidance on characterization of PCS based on the type of petroleum released can be found in the VRP Fact Sheet #12, Appendix A.

2.3 Storage Tank Program Waste

Certain petroleum constituents (e.g., benzene) found in PCS generated during the cleanup of STP-regulated underground storage tanks (USTs) are exempted from consideration when making a hazardous waste determination. If an UST was installed prior to 1996, the PCS may contain hazardous inorganic constituents, including lead, cadmium and chromium that may make the PCS hazardous if the constituent(s) exceed toxicity criteria. These soils must be analyzed for lead, cadmium and chromium toxicity using the Toxicity Characteristic Leaching Procedure (TCLP).

PCS from a STP-regulated above ground storage tank (AST) must be analyzed for the constituents shown in Appendix A of this guideline. Additionally, the soil must be analyzed for lead, cadmium, and chromium using the TCLP if the AST was installed prior to 1996 or it is known the tank contained leaded gasoline or used oil.

3.0 Temporary Storage

PCS may be temporarily stored until the PCS has been characterized to determine appropriate management options. If the PCS is determined to meet the definition of a hazardous waste, the generator can store the hazardous PCS for up to 90 days, in accordance with specific hazardous waste storage regulations for the type of storage (waste piles or containers, etc.), but must ultimately manage the hazardous PCS at an approved hazardous waste treatment, storage or disposal facility after the 90 day period. If the PCS is non-hazardous, the time for waste management (i.e., storage and treatment) is limited to 180 days (beginning with the first day PCS is placed in the storage area). PCS may be temporarily stored at the point of generation on land owned or controlled by the generator if the following storage area requirements are met.

3.1 Storage Area Requirements

- PCS must pass Paint Filter Liquids Test (PFLT) prior to being placed in the storage area, unless PCS is stored in a liquid tight, compatible container, tank or transportation vehicle,
- Public access to the storage must be controlled,
- Storage area must be bermed, lined and covered with an impermeable material that has a nominal thickness of at least 6-mils, unless PCS is stored in a liquid tight, compatible container, tank or transportation vehicle ,
- Storage area must be posted with a sign identifying the accumulation date and the words: “Caution – Petroleum Contaminated Soils – No Smoking”,
- The storage area must be located to:
 - Prevent public exposure to vapors and wind-blown materials (this requirement may be deferred if the storage area is covered),
 - Avoid areas prone to flooding and surface water run-off, and
 - Avoid areas near private or drinking water supply wells.

Long-term storage activities (i.e. greater than the allowable temporary storage period) may be conducted with prior approval from SHWD, but generally must be done under a permit, order or some other administrative mechanism (e.g., VRP Remedy Agreement, One-Time or Emergency Management Authorization).

4.0 Treatment

The objective for treatment of PCS is to make them suitable for disposal, a beneficial use, or use as a clean fill material. This treatment can be done using a variety of methods, including but not limited to land treatment, land farming, composting, bio-piles, mobile treatment units or in-situ burning. Some of these treatment methods may require permits or notifications to other Department of Environmental Quality (DEQ) divisions or governmental entities. It is the responsibility of the generator or operator of the treatment unit to obtain appropriate permits or authorizations. A current listing of permitted mobile treatment units may be obtained from the SHWD.

The Solid Waste Permitting and Corrective Action Program may, under limited circumstances, issue a one-time or emergency management authorization in accordance with Chapter 1, Section 5(a) of the SWRR. One-time or emergency authorizations apply to emergency situations, spilled solid wastes and residues from uncontrolled releases. These authorizations may be issued under the conditions specified in the SWRR, but at a minimum must be a single occurrence of limited duration, no other reasonable alternatives are available, meets the location standards identified in SWRR Chapter 8, Section 5(b) and the treatment area meets the requirements specified below. Three (3) copies of the waste management authorization request shall be submitted to the administrator. The request shall be organized in a three ring binder. A completed application form (Appendix C) shall be included with the authorization request.

Treatment authorization under this guidance must be provided by the appropriate program in the SHWD and in limited circumstances may be approved by another division in the DEQ. Sites wishing to treat soils for a restricted site use (e.g. industrial, commercial, recreational) are not allowed under this guidance. These sites must be in the VRP where a restricted site cleanup has been established under a Remedy Agreement with a Use Control Area designated by the local government.

As defined in Section 3.0, the time for waste management (i.e., storage and treatment) is limited

to 180 days (beginning with the first day PCS is placed in the storage or treatment area). PCS may be treated at the point of generation on land owned or controlled by the generator if the following treatment area requirements are met.

4.1 Treatment Area Requirements

Treatment of non-hazardous PCS in a land treatment unit/area may be allowed under the following conditions:

- PCS must pass Paint Filter Liquids Test (PFLT) prior to being placed in the treatment area,
- Public access to the treatment area must be controlled,
- Treatment area must be bermed and lined with an impermeable material that has a nominal thickness of at least 6-mils. In certain circumstances an impermeable cover may be needed.
- Treatment area must be posted with a sign identifying the accumulation date and the words: "Caution – Petroleum Contaminated Soils – No Smoking", and
- Treatment area must be located to:
 - Prevent public exposure to vapors and wind-blown materials (this requirement may be deferred if the treatment area is covered),
 - Avoid areas prone to flooding and surface water run-off, and
 - Avoid areas near private or drinking water supply wells.

5.0 Disposal and Reuse

The current options for the disposal or reuse of non-hazardous PCS are described below. These options are not appropriate if the PCS is a regulated hazardous waste. Additional options may be available, but they must be approved by the SHWD.

5.1 Off-Site Disposal

Properly characterized non-hazardous PCS may be transported to a permitted off-site disposal facility. For in-state permitted sanitary or industrial landfills, the owners/operators may have more stringent acceptance criteria and should be contacted before waste is transported to the facility. In general, PCS passing the PFLT may be disposed at the landfill's active working face. For out-of-state disposal, generators should contact the appropriate state or federal regulatory agency to insure that the waste can be managed in compliance with the applicable state or federal requirements.

5.2 Backfill

In addition to the de minimus quantity exemption described in Section 1.0, there are circumstances where PCS may be backfilled. PCS generated in conjunction with a site investigation or remediation project must be managed as approved by DEQ. PCS encountered during a construction or excavation project unrelated to an investigation or remediation project and where the person encountering the PCS is not the owner or responsible party, the person may backfill the PCS at the point of generation. Any person encountering PCS needs to prevent any

immediate threat to human health and the environment and notify the DEQ Spill Response Program that PCS was encountered.

5.3 Beneficial Use

5.3.1 Road application/road base

Properly characterized PCS may be suitable for road application or road base as a final management option. However, these options are currently only available at STP sites and certain sites overseen by the DEQ Water Quality Division (WQD).

5.3.2 Asphalt mixtures

Properly characterized non-hazardous PCS may be transported to an asphalt batch plant permitted by the DEQ Air Quality Division to incorporate PCS into their asphalt manufacturing process if all of the following additional conditions are met:

- All PCS is stockpiled in a bermed area that is lined with plastic or some other impermeable material until it is processed, and
- No more than 1000 cubic yards of unprocessed PCS are stored at any one time unless specifically authorized by SHWD, and
- No PCS is stored for more than 180 days before it is processed, and
- The storage area contains at least one (1) sign stating “Caution – Petroleum Contaminated Soils – No Smoking”, and
- Written records of the generator name, address and phone number, volume of PCS received, analytical results and date the PCS was received are maintained and available for inspection while the PCS is stockpiled on-site.

5.3.3 Landfill Cover

Properly characterized non-hazardous PCS passing the PFLT may be used as routine cover at a SHWD permitted sanitary landfill. This option is only available if the landfill has received authorization from the SHWD to accept PCS for this purpose.

5.4 Clean Fill

SHWD should be contacted prior to requesting a clean fill determination in order to ensure the appropriate analytical information is collected for the demonstration.

5.4.1 Non-STP Sites

Properly characterized and/or treated PCS may be used as “clean fill material” and is considered acceptable for “unrestricted site reuse” if all of the following conditions are met:

- The PCS meets cleanup levels for individual contaminants and for TPH GRO/DRO identified in VRP Fact Sheet #12 for unrestricted site use (i.e., the lower of the residential or migration to groundwater soil cleanup levels or levels established for background per VRP guidance) are met, and

- PCS is not placed in direct contact with seasonally high surface water or groundwater.

5.4.2 STP Sites

- The PCS meets the cleanup levels established in STP Guidance Document #7

6.0 Further Information

Further information can be obtained from the following SHWD offices:

Cheyenne: (307) 777-7752

Casper: (307) 473-3450

Lander: (307) 332-6924


7.0 Guideline Approval

I have reviewed and approved the policies and procedures described in this guidance document.

Signed



Alan Edwards
Acting Administrator
Solid and Hazardous Waste Division


Date

Attachments:

Appendix A "Petroleum Contaminated Soil Characterization"

Appendix B "RCRA Hazardous Waste Characteristics"

Appendix C "Application for One-Time, On-Site Treatment of Petroleum Contaminated Soils"

Guideline History

October 13, 1989	Original issue
April 5, 1993	1st revision: Incorporated TCLP testing requirements.
August 4, 1998	2nd revision: Recommendations for sampling and analysis updated. Reorganized and updated to reflect all current storage, treatment and disposal policies and options (SHWD, WQD and AQD). TPH criteria for disposal at permitted landfills increased. Criteria for authorization of disposal in-place clarified. Two-page application form for on-site treatment added.
June 5, 2013	3rd revision (current): Updated to reflect clean fill standards and industrial screening levels in accordance with VRP fact sheet #12, STP options, and landfill disposal options for non hazardous PCS.

Solid Waste Guideline #2: Appendix A

“Petroleum Contaminated Soil Characterization”

Constituent	Method	Gasoline ¹	Diesel ²	Refined Oil ³	Crude Oil ⁴	Condensate ⁵	Used Oil ⁶	Unknown ⁷
TPH/GRO	8015/GRO	X			X	X	X	X
TPH/DRO	8015/DRO		X	X	X		X	X
Benzene	8020/8260	X			X			
VOCs	8260					X	X	X
SVOCs	8270							X
Arsenic	7061/6010				X		X	X
Barium	7081/6010				X			X
Cadmium	7131/6010				X		X	X
Chromium	7191/6010				X		X	X
Lead	7421/6010				X		X	X
Mercury	7470/6010				X			X
Selenium	7741/6010				X			X
Silver	7761/6010				X			X
Pesticides	8081						as needed ⁸	as needed ⁸
Herbicides	8150						as needed ⁸	as needed ⁸
PCBs	8080/8270						as needed ⁸	as needed ⁸

Gasoline¹

- Benzene not required if source is a regulated underground storage tank (UST).

Diesel²

- Includes kerosene, jet fuel and fuel oil.

Refined Oil³

- Includes lubrication, mineral and hydraulic oils. MSDS information also recommended.

Crude Oil⁴

- Includes tank bottoms. Benzene and RCRA metals are not required if source is covered by exploration and production (E&P) exemption and the PCS will be disposed at a permitted landfill unless the landfill operator requires additional tests.

Condensate⁵

- VOCs not required if source is covered by E&P exemption

Used Oil⁶

- Includes motor oil. Only TPH analysis is required if the source is a DIYer or a small farm/ranch operation.

Unknown⁷

- Includes any unknown petroleum contaminants. If other non-petroleum contaminants may be present, additional tests may be needed.

As needed⁸

- Analysis for this constituent may be needed if there is insufficient information regarding the source. Contact SHWD for guidance.

Solid Waste Guideline #2: Appendix B

“RCRA Hazardous Waste Characteristics”

<u>Toxic Characteristic Leaching Procedure (TCLP) Constituent</u>	<u>Regulatory Level</u>
---	-------------------------

Metals

Arsenic	5.0 mg/l
Barium	100.0 mg/l
Cadmium	1.0 mg/l
Chromium	5.0 mg/l
Lead	5.0 mg/l
Mercury	0.2 mg/l
Selenium	1.0 mg/l
Silver	5.0 mg/l

Volatile Organics

Benzene	0.50 mg/l
Carbon tetrachloride	0.50 mg/l
Chlorobenzene	100.0 mg/l
Chloroform	6.0 mg/l
1,2-Dichloroethane	0.50 mg/l
1,1-Dichloroethylene	0.70 mg/l
Tetrachloroethylene	0.7 mg/l
Trichloroethylene	0.5 mg/l
Vinyl chloride	0.20 mg/l

Semi-Volatile Organics (Base/Neutral/Acid)

m-Cresol	200.0 mg/l
o-Cresol	200.0 mg/l
p-Cresol	200.0 mg/l
1,4-Dichlorobenzene	7.5 mg/l
2,4-Dinitrotoluene	0.13 mg/l
Hexachlorobenzene	0.13 mg/l
Hexachloro-1,3-butadiene	0.5 mg/l
Hexachloroethane	3.0 mg/l
Methyl ethyl ketone	200.0 mg/l
Nitrobenzene	2.0 mg/l
Pentachlorophenol	100.0 mg/l
Pyridine	5.0 mg/l
2,4,5-Trichlorophenol	400.0 mg/l
2,4,6-Trichlorophenol	2.0 mg/l

Herbicides and Pesticides

Endrin	0.02 mg/l
Lindane.....	0.4 mg/l
Methoxychlor	10.0 mg/l
Toxaphene	0.5 mg/l
2,4-Dichlorophenoxyacetic acid (2,4-D)	10.0 mg/l
2,4,5-Trichlorophenoxypropionic acid (2,4,5-TP Silvex)	1.0 mg/l

Organochlorine Pesticides

Chlordane	0.03 mg/l
Heptachlor (and its hydroxide).....	0.008 mg/l

Other Hazardous Waste Characteristics

Regulatory Level

Reactive Cyanide.....	250 mg HCN/kg waste
Reactive Sulfide.....	500 mg H ₂ S/kg waste
Flash Point*	< 140°F
pH*	pH < 2 or pH > 12.5

* Applicable only if the waste contains a liquid component when it is generated.

This Page Intentionally Blank

Solid Waste Guideline #2: Appendix C

"Application for One-Time, On-Site Treatment of Petroleum Contaminated Soils"

Responsible Party

Name :	Contact Person:
Address :	
City, State, Zip :	
Phone :	FAX :

Spill/Release Conditions

Location : Township _____ Range _____ Section _____
Date & Cause :
Contaminants (maximum concentration, mg/kg) :

Proposed Treatment Activity

Location : Township _____ Range _____ Section _____
Total Affected Acreage :
Meets Chapter 8, Section 5 Location Standards? YES NO N/A (circle one)
Treatment Process Description :
Treatment Objective & Lab Method :
Is there a potential for impacts to Groundwater? YES NO (circle one) If NO, describe why. If YES, describe precautions taken (e.g., liners) :
Is there a potential for impacts to Surface Water? YES NO (circle one) If NO, describe why. If YES, describe precautions taken (e.g., diversion ditches, containment berms) :
Is there a potential for impacts to Public Health? YES NO (circle one) If NO, describe why. If YES, describe precautions taken (e.g., warning signs, fences) :

Alternative Waste Management Options

Describe Option(s):

Why is option(s) not feasible?

Landowner Approval: I have read this application and consent to the operations which are described herein.

(Printed Name & Title)

(Signature & Date)

Applicant Oath: I (we) have prepared or reviewed this application and swear that the information contained in it is accurate and represents actual site conditions. I (we) understand that submission of false information subjects me (us) to a penalty for perjury in accord with W.S. § 35-11-506. I (we) shall allow the administrator or an authorized representative, upon the presentation of credentials and other documents as may be required by law to enter upon the premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the appropriate rules and regulations of the department, any substances or parameters at any location.

(Printed Name & Title)

(Signature & Date)

(Printed Name & Title)

(Signature & Date)

The forgoing applicant oath was acknowledged before me by _____, this day of _____, _____. Witness my hand and official seal.

(Notary Public Signature & Date)

My Commission Expires

SHWD Approval : This application has demonstrated compliance with and authorized under the provisions of Chapter 1, Section 5 of the Solid Waste Rules and Regulations. This authorization is valid for one (1) year from the date identified below. Special conditions **ARE ARE NOT** (circle one) attached to this authorization.

(Printed Name & Title)

(Signature & Date)