Construction Contingency Plan

Southwest Light Rail Transit

Hennepin County, Minnesota

SEH No. MCTO0 129451
VP31670/PBP4648

January 21, 2016

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January 21, 2016

RE: Southwest Light Rail Transit
Construction Contingency Plan
Hennepin County, Minnesota
SEH No. MCTO0 129451

James DeLuca
Environmental Mitigation Specialist
Metro Transit
Southwest Light Rail Transit Project Office
6465 Wayzata Boulevard, Suite 500
Saint Louis Park, Minnesota 55426

Dear Mr. DeLuca:

Please find enclosed the Construction Contingency Plan for the Southwest Light Rail Transit located in Hennepin County, Minnesota. Please feel free to contact me directly at 651.490.2135 if you have any questions or comments.

Sincerely,

Allen H. Sunderman, PG
Project Manager

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January 21, 2016

Short Elliott Hendrickson Inc.
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Construction Contingency Plan

Southwest Light Rail Transit

Prepared for Metropolitan Council

1.0 Introduction and Background

The Metropolitan Council (Met Council) is currently finalizing the design for the proposed Southwest Light Rail Transit (SWLRT) Project (hereinafter referred to as the "Project"). The Project will operate as an extension of the existing METRO Green Line that opened in June 2014. The Project will be constructed in a 14.5-mile long corridor that runs through several southwestern suburban cities, starting from Eden Prairie on the west, through Minnetonka, Hopkins, and Saint Louis Park, passing in close proximity to Edina, and ending in downtown Minneapolis at Target Field Station. The Project corridor is presented on **Figure 1**.

This Construction Contingency Plan (CCP) sets forth procedures to be followed by all Project personnel, contractors and subcontractors in the event that previously unidentified unexpected contaminated soil, groundwater or regulated materials are encountered during any subsurface Project activities. This CCP is not intended to be applied to planned response action activities addressing known releases within the Project limits. Those releases are addressed under separate Response Action Plans (RAPs) listed in **Section 1.2**.

1.1 Project Location

The Project corridor is divided into an East Segment and West Segment. The Project also includes an approximately 16 acre property where an Operations and Maintenance Facility (OMF) will be constructed. The East and West Segments are each further subdivided into subsegments that are numbered from the western project terminus in Eden Prairie to downtown Minneapolis (Segments W1A (removed), W1, W2, W3, E1, E2, E3, and E4).

The East Segment of the project corridor runs from Hopkins through Saint Louis Park to downtown Minneapolis (terminating at the existing Target Field Station). It is aligned on historic railroad corridor for most of its length (currently Hennepin County Regional Railroad Authority (HCRRA) right-of-way) that also supports an active Freight Line railroad and recreational trails (Cedar Lake Regional Trail and Kenilworth Trail). It veers from existing rail corridor at 12th Street N. in Minneapolis where it runs along Royalston Avenue N. and 5th Avenue N. for approximately 0.4 miles before terminating at the existing Target Field Station.

The West Segment of the project corridor runs from Eden Prairie and Minnetonka to near the Shady Oak Station in Hopkins. It parallels existing roadways and intersects or is adjacent to a number of historic and current commercial and retail business properties except at the far eastern end where it is aligned with a historic rail corridor.

The OMF is located in Hopkins near the Segment W3/Segment E1 boundary south of the Shady Oak Station. It is located on properties occupied by historic and current commercial and industrial businesses.

1.2 Previous Investigations

Short Elliott Hendrickson Inc. (SEH®) was retained by the Metropolitan Council (Met Council) from 2013 to 2016 to complete Phase I and Phase II Environmental Site Assessments (ESA) of the proposed Project corridor, and to develop RAPs and a CCP for the Project. The results of the Phase I and Phase II ESAs are summarized in the following RAPs:

- West Segment
  - Construction Response Action Plan, Southwest Light Rail Transit – West Segment, Hennepin County, Minnesota (SEH, 2015)
- East Segment
  - Construction Response Action Plan, Southwest Light Rail Transit – East Segment, Hennepin County, Minnesota (SEH, 2015)
- OMF
  - Construction Response Action Plan, Southwest Light Rail Transit – Operations and Maintenance Facility, Hennepin County, Minnesota (SEH, 2016)

Met Council has applied to the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup (VIC) program and the Brownfields Program (PBP) for the project, and has been assigned VIC site identification number VP31670 and PBP site identification number PBP4648. This CCP is being completed to satisfy VIC and PBP program guidelines.

1.3 Proposed Project Development

The Project will include, but not be limited to the following activities:

- Construction of a base and a ballasted and embedded double track system for the SWLRT eastbound and westbound track alignments (guideways).
- Excavation and filling for subgrade preparation in the SWLRT corridor in areas adjacent to historic and current industrial, commercial and retail business properties, existing roadways and historic and active rail corridors, to facilitate installation of SWLRT components; and clearing, grubbing and restoration of vegetation as needed.
- Removal, relocation and replacement of utilities.
- Construction of system-wide electrical components needed to operate the SWLRT such as traction power substations (TPSS), overhead catenary system (OCS), signal system (including platform/crossing houses, signal bungalows, train control and traction power duct banks, switches and pedestrian and grade crossing signals).
- New and realigned existing pedestrian and vehicle access.
- Acquisition of new right-of-way and building demolition.
- Construction of fifteen stations, twenty-nine bridges, seven tunnels/underpasses, several miles of retaining walls, stormwater features and a number of parking structures/features.

1.4 Scope and Objectives

The Met Council plans to construct a major addition to the existing LRT public infrastructure in the Twin Cities metro area. The CCP describes the procedures that will be implemented in the event unexpected contamination-related environmental conditions are encountered

during construction. Actions taken in accordance with the CCP will be completed in a manner that protects human health, welfare and the environment from releases or threatened releases of hazardous substances, pollutants, or contaminants.

The objective of the Project is not to clean up or remediate the Project area (although, as with any large construction project, beneficial remediation will occur through the excavation of contaminated materials during the construction process for reuse or disposal), but to properly manage all contaminated materials encountered during the Project in accordance with the RAP(s) and CCP. The known/identified contaminated materials in the Project area will be managed in accordance with the RAPs in a manner consistent with all applicable MPCA guidance documents (listed in **Appendix A**) and state and federal requirements. Contaminated materials will be managed using methods appropriate for the current and anticipated future use of the Project area as a transportation corridor and an LRT maintenance facility. Any unanticipated and/or previously unidentified contaminated materials encountered during construction will be evaluated using the MPCA's risk-based approach, and will be managed in accordance with the CCP. Any contaminated materials removed from Project construction limits will be removed solely for construction or geotechnical purposes. Contaminated materials that are not disturbed by the Project because they are outside Project excavation areas, and/or underneath Project fill areas, will remain in place.

1.5 Project Contacts

The Project contacts are as follows:

- Owner:

  Metro Transit, Southwest Light Rail Transit Project Office, Environmental and Agreements
  6465 Wayzata Boulevard, Suite 500
  Saint Louis Park, Minnesota 55426
  Contact: Nani Jacobson – Assistant Director (612-373-3800)
  Contact: James DeLuca - Environmental Mitigation Specialist (612-373-3800)

- Project partner:

  Minnesota Department of Transportation (MnDOT), Office of Environmental Stewardship
  395 John Ireland Boulevard
  Saint Paul, Minnesota 55155
  Contact: James DeLuca – Hydrogeologist (651-366-3600)

- Minnesota Pollution Control Agency

  520 Lafayette Road
  Saint Paul, Minnesota 55155
  Contact: Andrew Nichols (651-757-2612)
  Contact: Brittney Schuller (651-757-2444)

- Environmental Consultant for Phase I ESA, Phase II ESA, RAP and CCP:

  Short Elliott Hendrickson, Inc.
  3535 Vadnais Center Drive
  Vadnais Heights, Minnesota 55110
  Contact: Allen Sunderman – Project Manager (651-490-2135)
  Contact: Christine Carlson – Assistant Project Manager (651-490-2070)

- Environmental Consultant for Construction Oversight:

To be determined

- General Contractor:
  To be determined
- State Duty Officer (651-649-5451)
- Local Emergency (911)

2.0 Site Health and Safety

Prior to the start of the project, the environmental consultant will prepare a Site Health and Safety Plan (HASP) for use by their personnel. The HASP will assign responsibilities, establish personal protection standards and safety practices and procedures, and provide for contingencies that may arise during site operations. The HASP procedures will be based on the site conditions and chemical hazards known or expected to be present using site data available at the time it is written. It is subject to revision when deemed necessary by actual site conditions encountered during field activities.

The HASP will not supersede, direct the actions of, or in any way relieve other Project contractors/subcontractors of their obligations under any applicable OSHA regulation including, but not limited to: 29 CFR 1910, Occupational Safety and Health Standards; MN Stats. 5206 Department of Labor and Industry, Hazardous Substances: Employee Right-to-Know and MN Stats. 5207 Department of Labor and Industry; Standards for Construction and 29 CFR 1926, Health and Safety Regulations for Construction. All contractors and subcontractors will develop individual company-specific HASPs prior to commencing field activities. All contractor/subcontractor HASPs will be posted at the Project field office.

3.0 Contamination Indicators

This CCP will be implemented in the event indications of contamination or regulated waste are unexpectedly encountered during construction. Indicators of potentially contaminated soil, groundwater or surface water include, but are not limited to the following:

- Odor including gasoline, diesel, creosote (odor of railroad ties), mothballs, or other chemical-like odors in soil excavation areas or groundwater.
- Soil with unusual staining (such as black or green staining not associated with organic content), or with an oily appearance, or any unusual soil texture or color.
- A rainbow sheen on the surface of water (groundwater or ponded rainwater) or soil.
- Indications of a release through the use of a photo ionization detector (PID) or other field screening instrument.

Indicators of regulated wastes include, but are not limited to the following:

- Cans, bottles, scrap metal, wood, glass (indicates dumping/burial of solid waste and a possible dump with associated chemical contamination)
- Asphalt and concrete rubble (indicates dumping/burial of demolition waste with associated chemical contamination)
- Shingles, roofing materials, vermiculite, transite siding, floor tiles, insulation, or any fibrous material (demolition debris that could be associated with asbestos containing material (ACM) or associated contamination)

- In-place intact active or inactive transite pipes (steam or water pipes) or conduit (contains ACM)
- Culverts or other pipes with tar-like coating (potentially contains ACM)
- Wood Ash (potentially contains lead, asbestos or other chemicals) or Coal Ash or Slag (potentially contains metals)
- Sandblast or Foundry Sand residue (potentially contains lead or other metals)
- Treated wood, including, but not limited to products referred to as brown-or green-treat, and creosote (potentially contains arsenic, chromium, copper or PAHs)
- Chemical containers such as drums and other containers (potential source of chemical contaminants within intact containers, or surrounding damaged containers)
- Underground and above ground storage tanks (USTs/ASTs) (potential source of petroleum or other chemical contaminants within intact USTs/ASTs, or surrounding damaged USTs/ASTs)
- Intact filled-in basement or buried concrete slab from demolished building with insulation or intact floor tiles (potential ACM), waste traps (potentially contains oily waste), cesspools (potentially contains chemical or oil wastes) and sumps (potentially contains chemical waste)

4.0 Incident Response

In the event that unexpected contaminated soil, water, debris or potentially contaminated waste materials are encountered during construction, the Construction Contractor will immediately stop work in the vicinity and notify the Project Engineer.

The Construction Contractor will not resume work in the suspect area until approved by the Project Engineer. Work outside of the vicinity of the suspect area may continue if the Project Engineer and Environmental Consultant determine that the areal extent of the contamination has been defined and work can continue around the area.

4.1 Notification

The Project Engineer and/or the Environmental Consultant will proceed with the following notifications in the order listed:

Contact #1: 911 (if the incident/release represents an immediate danger to life or health)

Contact #2: Environmental Consultant (to conduct and document a detailed inspection and evaluation of the unexpected material)

Contact #3: Project Owner/Project Partner

Contact #4: Minnesota State Duty Officer (in the event of a reportable release in accordance with Minnesota Statute §115.061)

Contact #5: MPCA Project Managers (notifications made by the Project Owner/Partner or by Environmental Consultant as delegated by Project Owner/Partner)

4.2 Contaminated Soil, Water, and/or Regulated Materials

The Environmental Consultant will investigate and characterize all unexpected contaminated soil, water or regulated waste materials. The Environmental Consultant will gather information from the Project Engineer and Construction Contractor regarding the suspect contamination (i.e. location of impacts, visual or olfactory observations, extent of contamination, depth of

contamination, types of debris, etc.). Visual and indirect olfactory indications of contamination will be documented. Samples of the potentially impacted soil or regulated materials will be collected from excavation base and sidewalls (if accessible) or stockpiles for PID screening and laboratory analysis. Potential impacted water will be collected from excavations. Soil, water and/or regulated material sample analytical parameters will be determined based on field observations, site history, and MPCA guidelines. Field screening activities will not proceed until the situation is analyzed, and health and safety considerations resolved in accordance with the Project's HASPs.

The results of the preliminary screening will be evaluated by the Environmental Consultant and the Project Owner/Partner. The Construction Contractor will not be allowed to continue work in the area until the type, extent and magnitude of contamination is documented, and an appropriate response action is determined in accordance with the Project RAP. If a situation is encountered that is not covered by the Project RAP, the response action will be determined in consultation with, and as approved by the MPCA.

4.3 Asbestos

Asbestos may be encountered in three different forms: 1) Isolated ACM. The ACM occurs as isolated fragments that can be segregated by hand and containerized (such as a fragment of roofing paper), 2) Asbestos Containing Waste Material (ACWM). The ACM occurs in larger quantities that cannot be segregated by hand (such as numerous fragments of transite buried with other demolition material), and 3) Inactive Intact ACM. The ACM is still intact as part of an inactive utility (such as asbestos-wrapped steam pipe, an asbestos water pipe or asbestos conduit).

All ACM/ACWM will be abated by a licensed asbestos contractor who will complete all required notifications and obtain all required approvals from the MPCA and/or the Department of Health prior to completing ACM/ACWM abatement. The asbestos abatement contractor will manage removal (excavation/disposal/abatement) of all ACM and ACWM such that all removal activities will result in no visible dust emissions. Excavation, containerization, loading and hauling of ACM/ACWM will be completed in accordance with all applicable laws, rules and regulations. Prior to abatement, an Emission Control Plan will be prepared.

4.4 Underground Storage Tanks

In the event a petroleum underground storage tank is encountered, the following actions will be taken:

- An MPCA-certified underground storage tank supervisor that is also a certified contractor or in the employ of a certified contractor will oversee the removal of the tank.
- The MPCA tank removal forms will be submitted.
- The tank removal will be completed in accordance with all safety and environmental protection precautions as required by law including, but not limited to: drain all connecting pipes, remove fuel and fuel/water mixture from the tank to the extent practicable, purge all explosive vapors from the tank, inspect the removed tank for evidence of leaks, and document the condition of the tank.
- Soil samples in the tank excavation cavity will be screened with a PID, and soil samples (and groundwater samples if encountered) collected for laboratory analysis in accordance with the MPCA requirements.
- Metal tanks dismantled on-site will be disposed by recycling them as metal scrap; fiberglass tanks will be disposed in a permitted solid waste or industrial landfill.

- Removed petroleum product will be recycled at a permitted facility, and removed tank bottom/sludge will be managed as a hazardous waste for disposal/recycling at a permitted fuel recycling facility.

4.5 Drums

In the event that drums or other storage containers are unearthed during earthwork activities, they will be removed and their condition evaluated by appropriately trained personnel. If the containers are established to be in poor condition, the contents will be transferred to DOT approved overpack drums. The drums will be placed in a secure location. The contents of the containers will be sampled and characterized for disposal in accordance with appropriate state and federal requirements.

Soil from the area around the container will be screened for indications of contamination and potentially impacted soil will be managed in accordance with the RAP.

5.0 Schedule

Construction is anticipated to begin 2016 and will extend through 2019.

6.0 Reporting

Any incidents managed in accordance with the CCP will be documented as part of the Project RAP Implementation Reports. These reports will be submitted as biannual (2016-2017 and 2018-2019) reports as detailed in the Project RAPs.

7.0 Summary

SEH has prepared this CCP for Metro Transit. On behalf of Metro Transit, SEH requests that the MPCA review and approve this CCP. Please also provide a written response to this CCP that is addressed to Metro Transit.

Figures

East Segment

OMF

West Segment

Legend

- East Segment
- Operations and Maintenance Facility
- West Segment

2014 Preliminary Design Segments

- E1
- E2
- E3
- E4
- W1
- W1A
- W2
- W3

0 0.5 1

Miles

SOUTHWEST
Green Line LRT Extension

SOUTHWEST LRT - PROJECT LOCATION MAP

Construction Contingency Plan
Southwest LRT
Hennepin County, Minnesota

Figure 1

File: RAP_WestSeg_Fig1_ProjLocMap.mxd Date: 09/18/2015

Appendix A

MPCA Guidance Documents

A-1 – Risk-Based Site Characterization and Sampling Guidance (1998)

A-2 – Guidance Document 5-01, Managing Petroleum Contaminated Soil at Public Works Projects (2008)

A-3 – Asbestos Guidance on Excavation Projects (2013)

A-4 – Guidance Document 4-04, Soil Sample Collection and Analysis Procedures (2008)

A-5 – Guidance Document 3-01, Excavation of Petroleum Contaminated Soil and Tank Removal Sampling (2008)

A-1 – Risk-Based Site Characterization and Sampling Guidance (1998)

Risk-Based Site Characterization and Sampling Guidance

a Fact Sheet prepared by the Minnesota Pollution Control Agency
September 1998

The Site Remediation Section (SRS) of the Minnesota Pollution Control Agency (MPCA) developed this Risk Based Site Characterization and Sampling Guidance as part of a program wide guidance development effort. The document is intended to be used for developing sampling and analysis plans at Voluntary Investigation and Cleanup (VIC) and Superfund sites.

The overall objective of this document is to provide guidance on the sampling and analysis requirements for site activities from investigation through closure at sites under the MPCA jurisdiction. This document is organized by media (soil, ground water, air, and sediments), with media-independent topics such as Quality Assurance/Quality Control (QA/QC) and target analytes discussed separately.

This document presents guidelines for collecting data of sufficient quality and quantity to facilitate risk-based site evaluation and remedy selection, as well as remedy verification. The emphasis is on collecting adequate data, while keeping in mind cost effectiveness and rapid progress in site investigation. Since sites vary widely in their size and complexity, it is not possible to present a cookbook on how to sample every site. This guidance is general and is intended to be used, with some flexibility, by competent environmental professionals in their evaluation of sites.

Generally, it is desirable to identify the overall objectives of any environmental investigation prior to collecting samples. Identifying these objectives makes it possible to design a sample plan tailored to the specific needs of a site, resulting in more efficient and cost effective investigations. The data quality objectives (DQOs) should reflect the overall sampling objectives.

In order to make appropriate remedial action decisions, it is usually necessary to evaluate the nature and extent of soil, ground water, and sediment contamination attributable to releases at the site. In addition, the air pathway may need to be evaluated, data for all chemicals of potential concern collected, and hydrogeologic conditions at the site established. The evaluation of all media should include a discussion of the concentrations of contaminants, the physical and chemical nature of the contaminants, and the lateral and vertical distribution of contaminants at the site.

Large amounts of data can be generated at relatively low cost by field screening and field analytical methods. As a result, data produced through field screening and field analytical techniques are becoming increasingly significant in many site decisions. Therefore, it is critical to implement consistent and appropriate QA/QC measures for field techniques. Many of these field methods can be supplemented with laboratory analyses to achieve higher DQOs. In the interest of cost-effectiveness and timeliness, the MPCA is now advocating the use of field labs where appropriate and where an adequate level of QA/QC can be attained. Mobile labs must have a current QA/QC plan on file with the MPCA.

The three main reasons for conducting soil sampling are to evaluate potential human health and ecological risks on the site and in the vicinity of the property in question, to determine the potential for soil contaminants to leach into ground water, and to assess the need and extent of potential remedial actions. The choice of a soil sampling method is based on many factors, including accessibility, cost, soil conditions, and type of data desired.

Verification sampling strategies for soil remediation depend on the type of remediation -- excavation or in-situ treatment. The minimum number of samples and sampling locations are different for each type. While the minimum number of samples required is easily determined for both situations, determining the sampling locations is more complex and requires some professional judgment. The sampling strategies are outlined in the guidance document.

Ground water quality data have traditionally been obtained at permanent monitoring wells constructed to MDH well code specifications. Properly constructed permanent wells produce the highest quality data, and multiple sampling events from the same sampling point are the best way to track temporal changes in water quality. However, ground water monitoring using direct-push techniques may be more appropriate than permanent monitoring wells at some sites. Regardless of the method used, two rounds of ground water samples will generally be required. Detailed guidance on tools and methods for sampling wells is given in the MPCA Example Ground Water Sampling Protocol, which is an Appendix to this guidance document.

Sampling to demonstrate aerobic or anaerobic natural attenuation of contaminants can be accomplished through laboratory and field data collection. Field collection of many parameters can be accomplished without laboratory analysis using field titration or colorimetric kits. The conditions that must be demonstrated before approval of a natural attenuation remedy for ground water are a stable plume, and an appropriate aquifer environment for (bio)chemical degradation. Natural attenuation must be clearly demonstrated on a site-by site basis.

To assure that air sampling efforts provide adequate data for the risk assessment, the sampling and analysis plan should be developed in consultation with the MPCA Risk Assessor. It is recommended that air sampling be planned and conducted by specialists who have a thorough understanding of air sampling theory and technology.

When conducting sediment sampling, the top two- to six inches of sediment is generally considered to be the portion of the sediment column which is available for exposure to ecological receptors. Samples from deeper in the sediment column are also collected for estimates of contaminant volume for remediation or sediment management.

Draft Document Availability

All draft guidelines are to be used with assistance from Minnesota Pollution Control Agency staff assigned to a specific site. Draft sections of the site evaluation manual will be available for public comment as they are completed. A photocopy fee of approximately $0.20 per page will be charged for pages in excess of 20. To receive copies of the current and future documents or to be placed on a mailing list to receive notices regarding the guidance development efforts please send written requests to:

Trudy Cramlet
Minnesota Pollution Control Agency
Ground Water and Solid Waste Division
520 Lafayette Road
St. Paul, MN 55155-4194
FAX (651) 296-9707

Written comments regarding the guidelines may be sent to the *SRS Guidance Coordination Team* at the same address.

A-2 – Guidance Document 5-01, Managing Petroleum Contaminated Soil at Public Works Projects (2008)

Minnesota Pollution Control Agency

Managing Petroleum Contaminated Soil at Public Works Projects

Guidance Document 5-01
Petroleum Remediation Program

Public works projects often encounter petroleum contaminated soil that originated from storage tanks. Potential risks associated with encountering petroleum contaminated soil at public works projects include human exposure to contaminants, impacts to the environment, and in severe situations, fire and explosions. This document provides guidance on managing petroleum contaminated soil when it is encountered during public works projects.

Definitions:

Public Works Project – For Petrofund purposes, a Public Works Project is a project that involves the new construction or maintenance of an existing public utility infrastructure that is staged within a utility easement, or in right-of-way owned and/or managed by the State, an agency of the state, or a political subdivision. Some common examples of public works projects are water and sewer projects, underground telephone or electric utilities projects, natural gas projects, and stormwater drainage system projects.

Development projects are not covered under this guidance document. Some common examples of development projects would be trenching for building construction and site reworking, service connections from the main utility infrastructure to private homes or businesses, street re-paving, public facility construction, and other utility work by private entities as part of a development project. Road work independent of other public utility infrastructure is also not covered under this policy.

Project Sponsor – A Project Sponsor can be a public works owner, the state, an agency of the state, or a political subdivision that holds the access permit for a utility or other public works project, or has a principal stake in scoping and completing such a project.

It is the responsibility of the Project Sponsor to complete the project safely through the areas of contamination, and to properly manage petroleum contaminated soil that is excavated during the project**.** In most cases, a Project Sponsor will not be required to remove the contamination outside planned project excavation limits, or to define the extent of the contamination**.**

1. Pre-Project Startup/Planning Ahead

Plan ahead to avoid project delays in the event that petroleum contamination is encountered.

a) Identify Potential Sources of Contamination. Prior to construction, try to determine if and where petroleum contamination may exist along the planned route. For instance:

- Take an inventory of the active petroleum retail businesses that are located along the route. Talk with people who are knowledgeable about old gas stations or businesses that may have used petroleum storage tanks on their property.
- Complete a driving or, if possible, a walking reconnaissance of properties adjacent to the project area to check for evidence of former tanks such as patched concrete, old pump islands, fill pipes or vent pipes.
- Search the Minnesota Pollution Control Agency (MPCA) Leak Site Database to identify all open or closed petroleum leak site(s) located along the project route: http://www.pca.state.mn.us/programs/lust_pSearch.cfm.

b) Hire an environmental consultant. If petroleum contamination will likely be encountered during the project, hire an environmental consultant familiar with and experienced in contaminated site work, and arrange for them to be present or on-call during construction through the areas of suspected contamination. Consultants who perform Petrofund-reimbursable work must be registered with the Petrofund. A list of Petrofund-registered consultants is available at: http://www.state.mn.us/cgi-bin/portal/mn/jsp/content.do?id=-536881377&agency=Commerce.

Minnesota Pollution Control Agency • 520 Lafayette Rd. N., St. Paul, MN 55155-4194 • www.pca.state.mn.us
651-296-6300 • 800-657-3864 • TTY 651-282-5332 or 800-657-3864 • Available in alternative formats

c) **Work with the MPCA.** If petroleum contamination will likely be encountered during the project, contact the MPCA's Petroleum Remediation Program Public Works Coordinator, at 651-296-6300 or 800-657-3864, prior to project start up. Request that the MPCA Public Works Coordinator issue you a *"Request to Take Corrective Action"* letter. **A MPCA *"Request to Take Corrective Action"* letter is required in order to be eligible for Petrofund reimbursement.** For a *"Request to Take Corrective Action"* letter to be issued, the following information must be submitted to the MPCA Public Works Coordinator:

- Project Sponsor contact information
- project location plan sheets and description of public works project work
- identification of the potential contamination sources on the project plan sheets (include MPCA leak number if source is a known open or closed leaksite)
- volume estimate of petroleum contaminated soil that may be excavated to complete the public works project (this may include trench dimensions, or some other estimate of excavation dimensions)
- volume estimate of petroleum contaminated soil that can not be re-used on the site and will therefore need to be disposed off-site

It is understood that some projects may encounter petroleum contaminated soil which could not have been foreseen. In those cases, to ensure Petrofund reimbursement, the Project Sponsor must be prepared to temporarily stop work in the contaminated areas. Contact MPCA's Public Works Coordinator (see above) to discuss the project and provide the information necessary for the MPCA to issue the *"Request to Take Corrective Action"* letter. Be aware that the Public Works Coordinator will not be available at all times, and that the MPCA will not issue a *"Request to Take Corrective Action"* letter after the contaminated soil has been excavated.

2. Excavating Petroleum Contaminated Soil/ "Request to Take Corrective Action"

a) **Report contamination and assess vapor risks.** A Project Sponsor must immediately report contamination to the State Duty Officer at 651-649-5451 or 800-422-0798. Inform the Duty Officer of emergency or high priority situations such as free product, or strong or explosive levels of petroleum vapors. The Duty Officer will notify the appropriate state agencies and other units of governments. When reporting the discovery of petroleum contamination to the State Duty Officer, clearly indicate that you are working on a public works project. After reporting the discovery of petroleum contamination to the State Duty Officer, call the MPCA's Petroleum Remediation Program Public Works Coordinator, at 651-296-6300 or 800-657-3864.

b) **Have an environmental consultant oversee the work performed in the areas of contamination.** Determine if the contamination encountered presents a potentially dangerous situation (free product, high or explosive levels of vapors), and complete the work requested by the MPCA in accordance with applicable MPCA guidance documents. (If a potentially dangerous situation is found, the project may be delayed because the MPCA may require an emergency response.) Work must not be performed in areas of contamination without an environmental consultant present to ensure completion of the MPCA-requested work.

c) **Separate soil during excavation.** Contaminated soil that registers at or above 10 parts per million (ppm) on a photoionization detector (PID) using field headspace analysis must be separated from soil that registers below 10 ppm on a PID. Separate petroleum saturated soil regardless of PID levels. Excavate only the minimum volume of contaminated soil necessary to safely complete the public works project through the areas of contamination. Keep all excavated soil that registers at or above 10 ppm PID in a separate stockpile from soil that registers below 10 ppm PID. In order to minimize human health risk and secondary environmental impacts, contaminated soil must be stockpiled on a bituminous or concrete surface or minimum 10-mil plastic, and covered at the end of each day with minimum 10-mil reinforced plastic. The stockpile cover must be securely anchored. The stockpile should be surrounded by fencing if the Project Sponsor determines that additional security measures are necessary. The stockpile cover must be maintained until the soil can be re-used on the project or disposed of off-site, as described below.

d) **Re-use soil on the project.** Soil that registers below 10 ppm PID can be backfilled with minimal vapor impact or otherwise re-used on the project. Soil that registers at or above 10 ppm PID and less than 200 ppm PID can be re-used on the project as road base, or in embankments (at a minimum 200 feet from surface waters). Soil re-used in

embankments must be covered with 2 feet of clean cover soil. Soil can also be re-used as backfill, if it can be effectively mixed to 10 ppm PID or less. Soil that registers at or above 200 ppm PID, or that is petroleum saturated, must be properly managed at a MPCA approved off-site disposal facility. Soil that registers at or above 10 ppm PID and less than 200 ppm PID that is not re-used on-site as road base or in embankments also must be properly managed at a MPCA approved off-site disposal facility. Soil registering at or above 10 ppm PID can be utilized only in the specific ways and means stated within this paragraph.

e) **Sample and dispose of soil that can not be re-used on the project.** Collect representative soil samples from the soil stockpile(s) and analyze for the required laboratory parameters based on the recommended disposal option. Off-site disposal options include: thermal treatment; land treatment; composting; or landfilling.

f) **Obtain all necessary permits and comply with permit conditions if dewatering is required.**

g) **Identify potential source(s) of petroleum contamination.**

h) **Submit a report to the MPCA's Petroleum Remediation Program Public Works Coordinator.** The report must include the following:

- plan sheets of the public works project showing the areas where contamination was encountered, PID sample locations of all screening data, and sources of the contamination
- PID headspace soils screening data, including PID results, depth, and PID ID correlated to the PID sample locations on the plan sheets or figures
- volume of soil from each individual source area identified by Leak #, and total volume of petroleum contaminated soil excavated for the public works project
- documentation of soil re-use on the project
- stockpile analytical data, volume of soil disposed off-site, and treatment method and location

3. Petrofund Reimbursement

The Project Sponsor may apply to the Petrofund for reimbursement of reasonable costs incurred for the purpose of meeting the MPCA *"Request to Take Corrective Action."* The costs for performing work beyond the scope of the MPCA *"Request to Take Corrective Action"* are not eligible for Petrofund reimbursement unless the MPCA provides written approval to exceed the original scope of work. Any costs for work that is performed without a written *"Request to Take Corrective Action"* by the MPCA are ineligible for reimbursement.

For questions about Petrofund reimbursement requirements, including getting competitive bids, call Petrofund staff at the Department of Commerce at 651-215-1775 or 800-638-0418 (greater Minnesota only).

A-3 – Asbestos Guidance on Excavation Projects (2013)

Asbestos guidance on excavation projects

Solid Waste/Asbestos Program

This guidance document is for excavation/construction projects that involve demolition debris, solid waste or other materials (debris) contaminated with asbestos-containing materials (ACM) and/or asbestos-containing waste materials (ACWM) that are excavated or otherwise disturbed during the project. This document does not address those activities that are related to a demolition project. If you want information related to building or structure demolition please contact the Minnesota Pollution Control Agency (MPCA) Asbestos Program 651-296-6300 or 1-800-657-3864.

The excavation of any debris that is contaminated with ACM/ACWM is governed by 40 Code of Federal Regulations (CFR) pt. 61, subp. M, also known as the asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP).

The regulatory framework of the asbestos NESHAP for excavations is as follows:

1. The definition of a "Facility" includes Inactive Waste Disposal Sites.
2. An Inactive Waste Disposal Site is defined as a site where no additional ACM/ACWM has been deposited (i.e. disposed of) for one year or more.
3. Renovation means the altering of a "Facility" in any way, which includes the excavation of an inactive waste disposal site.
4. Projects that involve excavation or disturbance of debris with ACM and/or ACWM contamination are renovations and are subject to the asbestos NESHAP.

   For excavations with ACM/ACWM contamination, the owner(s) and operator(s) of the property and the project should determine the extent of the contamination in relation to the material to be excavated or disturbed in order to assure that the project is conducted in compliance with the asbestos NESHAP. To determine the extent of the contamination:

   a. Conduct a thorough inspection of the area to be excavated or disturbed for the presence of ACM/ACWM. In an excavation, this usually means digging test pits since soil borings are too limited as an investigative tool. If possible, determine what quantity and to what extent of debris is contaminated with ACM/ACWM. This determination can be made from the test pits or other information in connection with physical observations. The sampling and testing of suspect ACM must be performed by a Minnesota Department of Health (MDH) licensed asbestos inspector. Soil testing for asbestos may need to be performed if friable ACM materials are identified in an area.
   b. Determine the extent of contamination – until investigated, all demolition debris and suspect ACM are considered Regulated Asbestos-Containing Materials (RACM). The contamination may be limited to specific areas of the excavation or of the demolition debris. This will have a significant impact on the controls needed throughout the project and is critical information. Non-contaminated areas could potentially be handled much differently than contaminated areas.
   c. Use Phase I, As-builts, Sanborn Insurance Maps, aerial photographs, city utility or inspection records, etc. in determining the type of structure disposed of at the site, the timeline of the filling operation, the location of foundations, and other information.

5. If the project is subject to 40 CFR 61.145, you must hire a MDH licensed asbestos contractor and follow the asbestos NESHAP renovation regulations as follows:
    a. Submit a Notification of Asbestos-related Work (Notice) to the MPCA and MDH. The Notice must include facility information, owner/operator information, emission control procedures, disposal location, and other information. The Notice includes a ten-working day notification period for MPCA review and processing.
    b. Emission control requirements of 40 CFR 61.145 must be met, including the adequate wetting of the excavated material and preventing visible emissions from the RACM. The area where RACM abatement is being performed must be cordoned off and asbestos warning signs must be clearly visible at all entrances or exits.
    c. Waste handling provisions of 40 CFR 61.150 must be met. It includes the following:
        - adequately wet
        - polyethylene lined and covered trucks or containers
        - proper manifesting, waste generator label, and warning signs used
    d. Disposal at a site operated in accordance with 40 CFR 61.154. If the landfill is operated in the State of Minnesota, ensure it is a MPCA approved solid waste facility permitted to accept the waste.
6. The RACM removal project is completed after all the RACM is removed and a visual inspection is performed by the MDH licensed asbestos contractor or an MDH licensed inspector. In an excavation, this would be for the affected area where RACM was removed. Any RACM not disturbed will not need to be inspected.

If RACM is identified and is not scheduled for excavation, then other portions of the asbestos NESHAP may apply regarding deed recording or cover requirements depending on the information supplied regarding the project and the potential for future RACM exposure. The ability to rework the excavation project to disturb as little RACM as possible will help with disposal and handling costs, avoid the potential for airborne asbestos fibers, and avoid any additional liability of handling or off-site disposal. In some instances, institutional controls for the RACM being left in place may be sufficient. These controls may include deed notification or restrictions.

The owner/operator definition of the asbestos NESHAP includes anyone who "...owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition operation or both." This means that any party or person that meets the above definition is potentially liable (responsible) for compliance with the asbestos NESHAP throughout the excavation. On an excavation project an operator could include the general contractor, environmental specialists, or excavation contractor and the property owner.

Often buildings that were demolished years ago did not perform pre-demolition asbestos abatement or conduct asbestos surveys. Therefore, there is an increased likelihood that ACM/ACWM is intermixed with the demolition debris. The efforts that you make in examining and delineating the extent of the contamination will facilitate your development of an acceptable work plan for proper handling of the contamination in your excavation or development project.

As part of the MPCA's and the asbestos NESHAP's risk-based, environmental impact approach to site cleanup and remediation, minimizing the potential for asbestos fibers to become airborne during the project should be the guiding factor in deciding which remediation method is used. The project should utilize the least intrusive means to handle the RACM and the best control methods available. These principles should guide you in determining the best remediation approach to your project.

Some examples of work practices used to remediate RACM contamination on excavation projects include:

1. Use of a staging area to place suspect contaminated materials for later sorting or disposal which allows the excavation to proceed without constant mobilization for off-site disposal and other asbestos NESHAP requirements.
2. Reworking the project to avoid to the greatest extent possible the disturbance of materials thought to potentially contain RACM.
3. Screening of RACM depending on the use of the screened material, types of RACM, screening test results, condition of the material, etc.
4. Dynamic compaction to get desired engineering of the area for building footings. This would require a deed restriction but avoids any handling and off-site disposal costs.

As a policy, the MPCA wants to avoid wherever possible the creation of inactive asbestos waste disposal sites. The disposal sites would require deed notation and restrictions and are not always a final solution. Alternatives to standard off-site disposal of the RACM must be approved by the MPCA on a case-by-case basis.

This guidance document is not intended as a substitute for reading the rules or regulations and making your own independent determination of its applicability to your excavation project. Examples in this guidance document do not represent an exhaustive listing of types of materials or projects to which the rules or regulations might apply. Visit the MPCA's website at http://www.pca.state.mn.us.

A-4 – Guidance Document 4-04, Soil Sample Collection and Analysis Procedures (2008)

Minnesota Pollution Control Agency

Soil Sample Collection and Analysis Procedures

Guidance Document 4-04

Petroleum Remediation Program

This document describes the procedures for field screening of petroleum contaminated soil and collection of soil samples for laboratory analysis.

The Minnesota Pollution Control Agency (MPCA) Petroleum Remediation Program (PRP) conducts random on-site audits of field work. The PRP must be given at least 48 hours notice prior to conducting field work at sites under program oversight. Information on the field work notification process can be found at http://www.pca.state.mn.us/programs/prp-fieldwork.html. The prior notification of field work is mandatory and will be verified upon submittal of the results.

To assure data quality, the United States Environmental Protection Agency (EPA) has required MPCA to develop a Quality Assurance Program Plan (QAPP) for the PRP. The objective of the QAPP is to define the Quality Assurance and Quality Control (QA/QC) procedures to be followed for the collection and analysis of environmental samples. This ensures sufficient precision and accuracy of samples used in the PRP. The PRP QAPP can be found at http://www.pca.state.mn.us/publications/p-eao2-04.pdf.

I. Field Screening Procedures

A. Headspace Analysis

Use the polyethylene bag headspace method described below to characterize soil contamination at petroleum release sites.

1. Use photoionization detectors (PIDs) with a 10.2 eV (+/-) or greater lamp source, oxide semiconductor total hydrocarbon detectors, or flame ionization detectors (FIDs). Perform PID or FID instrument calibration on site and at least daily to yield "total organic vapors" in volume parts per million (ppm) of a benzene equivalent. Follow the manufacturer's instructions for operation, maintenance, and calibration of the instrument. Keep calibration records in a bound book. MPCA staff reserve the right to request these records.
2. Use a self-sealing quart-size polyethylene freezer bag. Half-fill the bag with sample (the volume ratio of soil to air is equal), then immediately seal it. Manually break up the soil clumps within the bag. *Note:* Immediately after opening the split spoon sampler or soil sample liner, transfer soil to field screening bags. Collect soil samples from excavations or soil stockpiles from freshly exposed surfaces.
3. Allow headspace development for at least ten minutes at approximate room temperature. Vigorously shake bags for 15 seconds at the beginning and end of the headspace development period. Headspace development decreases with temperature. When temperatures are below the operating range of the instrument, perform headspace development and analysis in a heated vehicle or building. Record the ambient temperature during headspace screening. **Complete headspace analysis within approximately 20 minutes of sample collection.**
4. After headspace development, introduce the instrument sampling probe through a small opening in the bag to a point about one-half of the headspace depth. Keep the probe free of water droplets and soil particles.
5. Record the highest meter response on a sampling form. Maximum response usually occurs within about two seconds. Erratic meter response may occur if high organic vapor concentrations or moisture is present. Note any erratic headspace data in the sampling form. Do not collect analytical samples from the polyethylene bag.

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651-296-6300 • 800-657-3864 • TTY 651-282-5332 or 800-657-3864 • Available in alternative formats

B. Petroleum Sheen Test:

The petroleum sheen test is a quick and easy field method that can be used to determine if a soil sample is considered petroleum saturated.

1. Place a small quantity of petroleum contaminated soil in a jar or on a large spoon.
2. Add enough water to break apart and submerge the soil particles.
3. If droplets of product or rainbow sheen are present on the water surface, the soil is considered saturated with petroleum.

II. Soil Sampling Procedures

A. Soil Sampling – Site characterization for investigation purposes

1. Minimize the possibility of cross-contamination by using disposable sampling equipment that is certified as clean for each sample collected. If disposable sampling tools are not available, specify the cleaning procedures used. Wear clean sampling gloves at each sampling point. When using a split-spoon or similar sampler, wash it with a detergent solution (e.g., Liquinox or equivalent), rinse, and dry it before each use.
2. When sampling excavation sidewalls or floors, remove at least one foot of exposed soil prior to collecting the sample to ensure collection of a fresh sample. See Guidance Document 3-01 *Excavation of Petroleum Contaminated Soil and Tank Removal Sampling* for sampling requirements.
3. Collect samples from split-spoon samplers or soil sample liners using a procedure that will minimize losses due to volatilization. Document the procedure in the *Investigation Report Form*. See Guidance Document 4-01 *Soil and Ground Water Investigations Performed during Remedial Investigations* for sampling requirements.
4. Method 5035 is required when sampling soil for volatile contaminants (see MPCA QA Web page, http://www.pca.state.mn.us/programs/qa_p.html). Collect soil samples using coring devices (e.g., cut syringe, EnCore™ , or US Analytical's Eazydraw Syringe™ sampler, or other approved coring device) and either put the "cored" soil directly into containers provided by the analytical laboratory (verify that the laboratory has pre-weighed these containers) or place the sealed coring device (for an EnCore™ type sampler) containing the soil in a cooler containing ice/coolants. The correct volume of soil to use in the coring device is established by weighing a similar soil sample before coring the analytical sample. Do not weigh analytical sample into the sample container because doing so can undesirably aerate the soil sample. The holding time is 14 days for soil samples preserved by methanol or frozen in an approved coring device. Samples in a coring device that are not frozen must be extracted within seven days. **Do *not* retain soil previously used for field screening or soil classification for analytical samples.**

    a) GRO and VOC samples: Collect total petroleum hydrocarbons Gasoline Range Organic (GRO) and volatile organic compounds (VOCs) according to the Wisconsin Department of Natural Resources Modified GRO method, EPA Method 5035 (per EPA SW-846), and the MPCA Policy on EPA Method 5035. These methods require the use of methanol as a preservative for most sampling. When methanol is used as the preservative, GRO and VOC results can be obtained from the same sample. Approximately 25 grams of soil is commonly preserved with 25 ml of methanol in a tared 60-ml vial. A maximum of 35 grams of soil is allowed to enable a 1:1 ratio of soil to extraction solvent in the sample container. Other sample sizes, such as 5 grams of soil and 5 ml of methanol in a 40-ml VOC vial, can be utilized if the 1: 1 ratio is maintained. An approved sampler (e.g., EnCore™ or similar certified sampler) can also be utilized to hold the samples for 7 days from the date of sampling when held at 4^{o} Celsius, or 14 days from the date of collection when frozen below -12^{o} Celsius before methanol preservation following these protocols. A dry weight vial without methanol preservation is also required for every sample. Clean the vial threads to assure a good seal with the cap provided.

b) DRO samples: Collect total petroleum hydrocarbons Diesel Range Organic (DRO) samples according to the Wisconsin Department of Natural Resources Modified DRO method. Approximately 25 grams of soil is commonly placed in a tared 60-ml vial without preservative. A maximum of 35 grams of soil is allowed to enable a 1:1 ratio of soil to extraction solvent in the sample container. An approved sampler can also be utilized to hold the sample until it is extracted following the Wisconsin DRO protocols. Collect another vial for dry weight determination on the sample. Clean the vial threads to assure a good seal with the cap provided. DRO samples must be extracted within 10 days and analyzed by the laboratory within 47 days of collection.

5. Label all vials, place in a covered cooler with ice, and transport to the laboratory for analysis. Samples should be kept at a stable temperature near four (4) degrees Celsius. Include a container of water for sample temperature verification (temperature blank). The labels should indicate:
   a) type of analysis
   b) name of facility
   c) monitoring point identification
   d) name of person collecting sample
   e) time and date the sample was collected
   f) name of preservative added, if applicable
6. Samples must be collected, transported, and delivered under chain of custody.
7. Samples not transported or analyzed within the accepted holding time will be considered invalid.

B. Soil Sampling – Characterization for off-site treatment/disposal

1. Analysis for VOCs, GRO, and DRO requires collection of grab samples from representative portions of the excavated soil pile or from soil borings conducted in locations which are representative of soil contaminated by the release. Use the sampling procedures described in Section A above. Base the number of soil samples on Table A.

Table A. Number of grab samples required from contaminated soil stockpiles.

Cubic yards of soil in pile	Number of grab samples
Less than 50	1
51-500	2
501-1,000	3
1,001-2,000	4
2,001-4,000	5
Each additional 2,000	One additional sample

Analysis of soil samples is not normally necessary if less than ten cubic yards of contaminated soil will be land treated, unless the soil could potentially be considered a hazardous waste.

2. Analysis for metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and polychlorinated biphenyls (PCBs) requires collection of separate **composite samples**. To take a composite sample from a stockpile, collect 15 samples from randomly selected locations within the stockpile and place in a clean container, mix thoroughly and remove a single subsample. To take a composite sample from soil borings, collect 15 samples from randomly selected locations in borings that represent soil that will be excavated and place in a clean container, mix thoroughly and remove a single subsample.

III. Soil Analysis

The MPCA requires (see http://www.pca.state.mn.us/programs/qa_p.html) Minnesota Department of Health (MDH) certification of fixed based and mobile laboratories reporting data to MPCA programs. Laboratories reporting data will be required to include the MDH certification number on analytical reports. Certification is currently required for fixed based and mobile laboratories analyzing volatile organic compounds (VOCs). Certification for mobile labs must meet the same requirements established by MDH for fixed based laboratories.

If a non-certified mobile laboratory is used for sample screening, ten percent of samples must be split with a certified fixed base laboratory. Data supporting site closure must be generated by a Minnesota certified laboratory. In appendices and tables, clearly label data generated by mobile laboratories and fixed base laboratories. For all sample analyses, unless otherwise noted in this document, use an EPA-approved method or equivalent. Laboratories will submit chromatograms in support of GRO/DRO analyses indicating contamination is present.

Table B lists the analyses for the different types of petroleum compounds.

Table B. Required analyses and laboratory procedures.

Petroleum product	Parameters
Regular Gasoline, Aviation Gasoline	A, B, D
Unleaded Gasoline	A, B
Unused Petroleum Products: Fuel Oil, Motor Oil, Diesel Fuel, Kerosene, Jet Fuels, Mineral Oil/Spirits, Crude Oil, Stoddard Solvents	A, C, G**
Used Oil (e.g., Motor Oil, Other Used Petroleum Products). See Notes 1, 2, and the section on used oil special considerations below.	A, C, E, F, G**
Unknown Petroleum or Hydrocarbons Mixture	A, B, C, E, F, G**
Other Petroleum Products	Site Specific
Hydraulic Fluids	A, C, F*, G**

A. Volatile Organic Compounds (VOCs) by the most recent MDH-certified version of EPA method 8260 (see Note 5). A target analyte list can be found in Appendix A. If ground water at the site will be analyzed for VOCs, then analyze soil for BTEX/MTBE (only).

B. Wisconsin Department of Natural Resources Modified Gasoline Range Organics (GRO) Method (see Note 3)

C. Wisconsin Department of Natural Resources Modified Diesel Range Organics (DRO) Method (see Note 4)

D. Lead (see Note 6)

E. Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver (see Note 2)

F. Polychlorinated Biphenyls (PCBs) using the most recent MDH-certified version of EPA method 8082 by the Arochlor method (see Note 2). See Appendix B for specific Arochlors.

*Analyses for PCBs should be completed for hydraulic fluids used in elevators and other hydraulic fluids subject to high heat prior to the 1980s.

G. Polyaromatic Hydrocarbons (PAHs) by the most recent MDH-certified version of EPA method 8270, modified to include the Appendix C list of target analytes.

** Note that the MPCA Project Manager (PM) will determine the need for PAH analysis. Contact the MPCA PM if a drinking water aquifer is impacted by fuel oil or heavy petroleum.

Notes:

1. Do not confuse used oil with waste oil. **Used oil** means any oil that (as a result of use) has become contaminated by physical or chemical impurities. Examples of used oil include, but are not limited to, motor oils, metal cutting oils, and hydraulic fluids. **Waste oil** means oil that is discarded/spilled before use.
2. During investigation at used oil sites, collect samples for VOCs, DRO, metals, and PCBs, but direct your laboratory to analyze only the VOC and DRO samples initially. If any of these compounds are detected, proceed with analysis of the metals and PCB samples. *Note*: If you are sampling to fulfill soil disposal requirements, analyze samples for all required parameters (VOCs, DRO, metals, and PCBs). See below for special considerations for soil contaminated with used oil.
3. This is a purge-and-trap, gas chromatography (GC) procedure that utilizes a ten component blend of gasoline compounds for the quantification standard. Approximately 25 grams (20-35 gram acceptable range) of soil is collected using a zero headspace method and placed into a tared 60-ml vial containing 25 ml of methanol followed by measuring the total weight in the laboratory. The sample must be cooled to 4 $\pm 2^{o}$ C and must be received by the laboratory within four days (EnCore™ samplers can be held seven days) and analyzed within 21 days of collection. To ensure the extraction of the volatiles, the soil must be sonicated for 20 minutes (ensure the temperature does not exceed room temperature) before samples are analyzed. A methanol trip blank is recommended when using methanol as a preservative as this ensures no contamination is present in the methanol. The method detection limit shall be no more than 10 mg/kg dry weight.
4. This is a solvent extraction, direct injection, GC procedure that includes a ten component blend of typical diesel oil components for a quantification standard. Approximately 25 grams (25-35 gram acceptable range) of soil is collected using a zero headspace method and placed into a tared 60-ml vial followed by measuring the total weight in the laboratory. The samples must be cooled to four degrees Celsius, received by the laboratory and preserved in solvent within ten days, and analyzed within 47 days of collection. The method detection limit shall be no more than 10 mg/kg dry weight. Separate samples are required for GRO and DRO analyses.
5. This is a purge-and-trap, gas chromatography method. Sampling is similar to GRO, see note 3. The reporting limits and quality assurance for all parameters should be based on the most recent MDH-certified version of EPA method 8260. Note that BTEX/MTBE holding time is 14 days and must be sampled using EPA method 5035. If a mobile laboratory is being used for the analysis of soil samples, the mobile laboratory must follow the method specified calibration and quality control procedures required by the referenced method.
6. Sampling for lead is required for fulfilling soil disposal requirements. Specifically, soil that will be treated after its removal that is actually or potentially contaminated with leaded gasoline must be analyzed to determine if it exhibits the toxicity characteristic for lead. If a total lead analysis indicates a level equal to or greater than 100 mg/kg, a Toxicity Characteristic Leaching Procedure (TCLP) must be performed. If the TCLP level exceeds 5 mg/L the soil must be managed as a hazardous waste in accordance with Minn. R. ch. 7045.

Special considerations for soil contaminated with used oil:

This section outlines additional procedures for testing used oil contaminated soil to determine if the soil is considered a hazardous waste. If the soil is considered to be a hazardous waste, the soil must be managed in accordance with Minn. R. ch. 7045.

1. Soil with a PCB concentration above 50 mg/kg is considered to be a hazardous waste.
2. Soil is considered to be a hazardous waste if it is contaminated with any hazardous waste listed in Minn. R. 7045.0135. If the generator of the soil can certify to the satisfaction of the MPCA staff, by previous knowledge or chemical analysis, that the soil is not contaminated with waste listed in Minn. R. 7045.0135 the soil need not be managed as a hazardous waste.
3. If the concentration of total halogenated compounds determined by VOC analysis is greater than 1,000 mg/kg, the soil is presumed to be hazardous waste unless the generator can rebut this presumption to the satisfaction of the MPCA staff, through previous knowledge or chemical analysis.

4. Soil is considered hazardous if it exhibits the toxicity characteristic of any of the following contaminants: *arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, endrin, lindane, methoxychlor, toxaphene, 2,4-dichlorophenoxyacetic acid, and 2,4,5-trichlorophenoxypropionic acid*. Contaminants known not to be present, such as pesticides and herbicides, need not be tested for if the generator certifies to the satisfaction of MPCA staff that the contaminants are not present. Contaminants exceeding levels in Table C are considered to *potentially* exhibit the toxicity characteristic and a complete TCLP must be performed:

Table C. Levels at which TCLP will be required

Contaminant	Soil Concentration (mg/kg)
Arsenic	100
Barium	2,000
Cadmium	20
Chromium	100
Lead	100
Mercury	4.0
Selenium	20
Silver	100
Endrin	0.40
Lindane	8.0
Methoxychlor	200
Toxaphene	10
2,4-Dichlorophenoxyacetic Acid	200
2,4,5-Trichlorophenoxypropionic Acid	20

If soil exhibits the toxicity characteristic, it is considered to be a hazardous waste.

Appendix A: Target Analyte List for Volatile Organic Compounds (VOCs)

Chemical Name	CAS #	Report Level (mg/kg dry weight)
1,1,1,2-Tetrachloroethane	630-20-6	1.0
1,1,1-Trichloroethane	71-55-6	1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0
1,1,2-Trichloroethane	79-00-5	1.0
1,1,2-Trichlorotrifluoroethane	76-13-1	1.0
1,1-Dichloroethane	75-34-3	1.0
1,1-Dichloroethene	75-35-4	1.0
1,1-Dichloropropene	563-58-6	1.0
1,2,3-Trichlorobenzene	87-61-6	1.0
1,2,3-Trichloropropane	96-18-4	1.0
1,2,4-Trichlorobenzene	120-82-1	1.0
1,2,4-Trimethylbenzene	95-63-6	1.0
1,2-Dibromo-3-chloropropane	96-12-8	5.0
1,2-Dibromoethane	106-93-4	1.0
1,2-Dichlorobenzene	95-50-1	1.0
1,2-Dichloroethane	107-06-2	1.0
1,2-Dichloropropane	78-87-5	1.0
1,3,5-Trimethylbenzene	108-67-8	1.0
1,3-Dichlorobenzene	541-73-1	1.0
1,3-Dichloropropane	142-28-9	1.0
1,4-Dichlorobenzene	106-46-7	1.0
2,2-Dichloropropane	594-20-7	1.0
2-Chlorotoluene	95-49-8	1.0
4-Chlorotoluene	106-43-4	1.0
Acetone	67-64-1	20
Allyl chloride	107-05-1	1.0
Benzene	71-43-2	1.0
Bromobenzene	108-86-1	1.0
Bromochloromethane	74-97-5	1.0
Bromodichloromethane	75-27-4	1.0
Bromoform	75-25-2	1.0
Bromomethane	74-83-9	2.0
n-Butylbenzene	104-51-8	1.0
sec-Butylbenzene	135-98-8	1.0

Chemical Name	CAS #	Report Level (mg/kg dry weight)
tert-Butylbenzene	98-06-6	1.0
Carbon tetrachloride	56-23-5	1.0
Chlorobenzene	108-90-7	1.0
Chlorodibromomethane	124-48-1	1.0
Chloroethane	75-00-3	1.0
Chloroform	67-66-3	1.0
Chloromethane	74-87-3	1.0
cis-1,2-Dichloroethene	156-59-2	1.0
cis-1,3-Dichloropropene	10061-01-5	1.0
Dibromomethane	74-95-3	1.0
Dichlorodifluoromethane	75-71-8	1.0
Dichlorofluoromethane	75-43-4	1.0
Ethylbenzene	100-41-4	1.0
Ethyl ether	60-29-7	1.0
Hexachlorobutadiene	87-68-3	1.0
Isopropylbenzene	98-82-8	1.0
p-Isopropyltoluene	99-87-6	1.0
Methyl ethyl ketone (2-butanone)	78-93-3	10
Methyl isobutyl ketone (4-methyl-2-pentanone)	108-10-1	5.0
Methyl *tertiary*-butyl ether	1634-04-4	2.0
Methylene chloride	75-09-2	2.0
Naphthalene	91-20-3	1.0
n-Propylbenzene	103-65-1	1.0
Styrene	100-42-5	1.0
Tetrachloroethene	127-18-4	1.0
Tetrahydrofuran	109-99-9	10
Toluene	108-88-3	1.0
trans-1,2-Dichloroethene	156-60-5	1.0
trans-1,3-Dichloropropene	10061-02-6	1.0
Trichloroethene	79-01-6	1.0
Trichlorofluoromethane	75-69-4	1.0
Vinyl chloride	75-01-4	1.0
m&p-Xylene	179601-23-1	1.0
o-Xylene	95-47-6	1.0

Appendix B: Target Analyte List for Polychlorinated Biphenyls (PCBs)

Chemical Name	CAS #	Report Level (mg/kg dry weight)
Arochlor 1016	12674-11-2	0.050
Arochlor 1221	11104-28-2	0.100
Arochlor 1232	11141-16-5	0.050
Arochlor 1242	53469-21-9	0.050
Arochlor 1248	12672-29-6	0.050
Arochlor 1254	11097-69-1	0.050
Arochlor 1260	11096-82-5	0.050

Appendix C: Target Analyte List for Polycyclic Aromatic Hydrocarbons (PAHs)

Chemical Name	CAS #	Report Level (mg/kg dry weight)
Acenaphthene	83-32-9	0.001
Acenaphthylene	208-96-8	0.001
Anthracene	120-12-7	0.001
Benzo(a)anthracene	56-55-3	0.001
Benzo(b)fluoranthene	205-99-2	0.001
Benzo(j)fluoranthene	205-82-3	0.001
Benzo(k)fluoranthene	207-08-9	0.001
Benzo(g,h,i)perylene	191-24-2	0.001
Benzo(a)pyrene	50-32-8	0.001
Chrysene	218-01-9	0.001
Dibenz(a,h)acridine	226-36-8	0.001
Dibenz(a,j)acridine	224-42-0	0.001
Dibenz(a,h)anthracene	53-70-3	0.001
7H-Dibenzo(c,g)carbazole	194-59-2	0.001
Dibenzo(a,e)pyrene	192-65-4	0.005
Dibenzo(a,h)pyrene	189-64-0	0.005
Dibenzo(a,i)pyrene	189-55-9	0.005
Dibenzo(a,l)pyrene	191-30-0	0.005
7,12-Dimethylbenz(a)anthreacene	57-97-6	0.001
1,6-Dinitropyrene	42397-64-8	0.100
1,8-Dinitropyrene	42397-65-9	0.100
Fluoranthene	206-44-0	0.001
Fluorene	86-73-7	0.001
Indeno(1,2,3-cd)pyrene	193-39-5	0.001

Chemical Name	CAS #	Report Level (mg/kg dry weight)
3-Methylcholanthrene	56-49-5	0.001
5-Methylchrysene	3351-31-3	0.001
2-Methylnaphthalene	91-57-6	0.005
Naphthalene	91-20-3	0.005
5-Nitroacenaphthene	602-87-9	0.010
6-Nitrochrysene	2/8/7496	0.020
2-Nitrofluorene	607-57-8	0.010
1-Nitropyrene	5522-43-0	0.010
4-Nitropyrene	57835-92-4	0.010
Phenanthrene	85-01-8	0.001
Pyrene	129-00-0	0.001
Quinoline	91-22-5	0.001

Web pages and phone numbers:

MPCA staff:	http://www.pca.state.mn.us/pca/staff/index.cfm
MPCA phone:	**651-296-6300 or 1-800-657-3864**
Petroleum Remediation Program Web page:	http://www.pca.state.mn.us/programs/lust_p.html
MPCA Info. Request:	http://www.pca.state.mn.us/about/inforequest.html
MPCA VIC Program:	http://www.pca.state.mn.us/cleanup/vic.html
MPCA Petroleum Brownfields Program:	http://www.pca.state.mn.us/programs/vpic_p.html
Petrofund Web page:	http://www.state.mn.us/cgi-bin/portal/mn/jsp/content.do?id=-536881377&agency=Commerce
Petrofund phone:	**651-215-1775 or 1-800-638-0418**
State Duty Officer:	**651-649-5451 or 1-800-422-0798**

A-5 - Guidance Document 3-01, Excavation of Petroleum Contaminated Soil and Tank Removal Sampling (2008)

Minnesota Pollution Control Agency

Excavation of Petroleum Contaminated Soil and Tank Removal Sampling

Guidance Document 3-01

Petroleum Remediation Program

Excavation of petroleum contaminated soil may be necessary at some petroleum release sites. Excavation removes contaminated soil that poses environmental or health threats. Excavation may also be necessary when storage tanks are installed, removed, or when construction occurs in zones where contamination is present. However, at most sites, petroleum contaminated soil is left in place to degrade over time where risks to potential receptors is determined to be low. This document provides guidance on determining when excavation of petroleum contaminated soil is necessary as a corrective action, sampling requirements, and other related information.

Emergency conditions: If there are vapor impacts, drinking water impacts, the release was a recent spill, or there is a potential unstable condition, immediately contact the State Duty Officer at **651-649-5451 or 1-800-422-0798**.

Reporting requirements: Detection of any amount of contamination in soil or ground water must be reported to the State Duty Officer at **651-649-5451 or 1-800-422-0798** (even if contaminant levels are lower than the action levels shown below).

How to use this document:

- Section I. – provides the requirements for soil sample collection and analysis during underground storage tanks (USTs) removal, whether or not soil excavation will occur.
- Section II. – provides general guidance for excavation of petroleum contaminated soil, whether or not USTs or above ground storage tanks (ASTs) have been installed or removed.
- Section III. – provides specific guidance for management of petroleum contaminated soil during the installation or removal of USTs or ASTs.
- Section IV. – provides guidance when excavating petroleum contaminated soil as a corrective action.

I. Sampling Requirements during UST Removal

Refer to Table 1 for the number and location of samples to be collected.

A. No evidence of contamination is present or further investigation is required during tank removal (no soil removed for treatment)

Samples collected during the removal of tanks that contained gasoline should be analyzed for benzene, ethylbenzene, toluene, total xylenes, and gasoline range organics using the Wisconsin Department of Natural Resources Modified Gasoline Range Organics (GRO) Method. Samples collected during the removal of tanks that contained other petroleum products should be analyzed for diesel range organics using the Wisconsin Department of Natural Resources Modified Diesel Range Organics (DRO) Method.

B. Possible site closure after tank removal with evidence of contamination

Analyze soil samples following the procedures described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures.* All analysis requirements in Guidance Document 4-04 must be completed before closure will be considered. If soil is removed for treatment, refer to Section II Part E.

Table 1 – Sampling requirements at UST sites

One tank, any size, in individual tank basin	two samples; one from directly below each end of the tank
More than one tank, less than 10,000 gallons, in a single tank basin	one sample directly below the center of each tank
More than one tank, 10,000 gallons or larger, in a single tank basin	two samples from below each tank; one from directly below each end of the tank
Leaking lines	one sample from below each suspected point of release, or every 20 feet
Dispensers	one sample from below each dispenser which is removed

Any additional samples needed to adequately characterize the excavation.

Minnesota Pollution Control Agency • 520 Lafayette Rd. N., St. Paul, MN 55155-4194 • www.pca.state.mn.us
651-296-6300 • 800-657-3864 • TTY 651-282-5332 or 800-657-3864 • Available in alternative formats

II. General Excavation Requirements

A. Excavation prior to a Limited Site Investigation

Except for site-specific situations, contaminated soil should remain in place until a Limited Site Investigation (LSI) has been completed. The identification of risk receptors and the definition of the extent and magnitude of contamination will determine if excavation is appropriate for a site.

Excavation prior to the completion of an LSI is considered a corrective action if any of the following circumstances exists:

1. All contaminated soil (above action levels using Table 2) can be excavated within a maximum of 150 cubic yards of soil providing that ground water is not impacted or likely to become impacted (obtain prior Minnesota Pollution Control Agency (MPCA) approval if you wish to excavate more than 150 cubic yards of soil). See Section B. below for more details.
2. Petroleum saturated soil is present. Use the petroleum sheen test described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures* to determine if soil is petroleum saturated.
3. A recent release has occurred. Quick removal of contamination can prevent the expansion of the contamination plume. Obtain MPCA prior approval before proceeding.
4. An obvious high risk situation or the release has occurred in a hydrogeologically sensitive area such as a karst area or a Drinking Water Supply Management Area. Contact the MPCA for site specific guidance. Refer to MPCA Guidance Document 1-01 for more information.
5. Excavation is necessary to facilitate UST or AST installations (see Section III below).

Use the Table 2 below for field excavation criteria.

Table 2 – Headspace (PID) results

Fuel Type in Soil	Field Screening Level
Gasoline and aviation gasoline	Above 40 parts per million (ppm)
Diesel fuel, fuel oil, used or waste oils, jet fuel, kerosene	Visual evidence of contamination, or field screening above 10 ppm.

B. An LSI is necessary if any of the following situations exist

1. Contamination cannot be addressed by the excavation 150 cubic yards or less of soil.
2. Ground water is present in the excavation and has been in contact with either petroleum product or petroleum contaminated soil or ground water contamination is suspected.
3. Contamination intercepts a seasonally high water table (indicated by mottling on the excavation sidewalls) or bedrock.
4. Other impacts are known or suspected (such as discharge of contaminated water to surface waters or utilities, vapor impacts to buildings or utilities, etc.).
5. Situation present in Table 3:

Table 3 – LSI requirements when residual soil contamination remains

Soil Type	Perform LSI if:
Sand/gravel	a. soil above field screening level in Table 2 remains, or b. water table is within 25 feet of the surface and soil analytical result is greater than 1 milligrams/kilograms (mg/kg) GRO/DRO, * or c. soil analytical result greater than 50 mg/kg GRO/DRO remains.
Silt/clay	d. soil above field screening level in Table 2 remains; or e. soil analytical result greater than 100 mg/kg GRO/DRO remains.

* A soil boring is necessary at sites with sandy or silty sand soil (Unified Soil Classification System/American Society for Testing Materials) and where the water table is within 25 feet of the ground surface. The purpose of this boring is to determine whether or not an LSI is necessary. Advance a soil boring directly through each suspected source area (e.g., former tank locations, pump islands, product transfer areas), in the following situations:

- Contamination in soil from the suspected source area excavation is between 1 and 50 mg/kg GRO/DRO; or
- Visual or other evidence of contamination remains in the suspected source area.

Analyze soil samples in accordance with Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*. If the boring(s) encounters contaminated ground water, an LSI is necessary.

If the boring encounters old contamination that does not intersect the water table and the ground water sample is not contaminated, an LSI may not be necessary.

When an LSI is necessary, the contaminated soil is usually returned to the excavation basin, unless prior MPCA approval has been obtained. MPCA staff may allow exceptions to these situations on a site-specific basis. See Guidance Document 1-01 *Petroleum Remediation Program General Policy* and Guidance Document 4-01 *Soil and Ground Water Assessments Performed during Site Investigations* for additional information.

C. Petroleum saturated soil

In most situations, petroleum saturated soil must be removed. Contact the MPCA for prior written approval to remove and properly manage the petroleum saturated soil. Use the petroleum sheen test described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures* to determine if soil is petroleum saturated.

D. Field screening during excavations

All soil samples collected for field screening must be labeled so as to designate type of sample, location of sample, and depth of sample (see below). All excavation soil sample locations must be shown on a map of the excavation.

Use a properly calibrated field instrument to screen excavated soils in accordance with Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*. As excavation proceeds, collect and field screen soil samples frequently enough to verify the need for soil removal (at least one soil vapor analysis for each 10 cubic yards of soil removed). Label these soil samples with the prefix "R", for "removed" along with the sample depth, and carefully note the sample locations on a scaled map. The field technician should carefully document successive soil vapor readings vertically below the source of release, indicating the location and depth of each sample on a map of the excavation. *Example*: R-1(2'), R-1(4'), R-1 (6'), R-2(4'), etc. Note: R-1 samples are from the same location but successively deeper).

After excavation is complete, screen soil samples from the bottom and sidewalls of the excavation, along removed pipe runs, and beneath removed dispensers. Collect and label sidewall and bottom samples for field screening as discussed in the next section.

E. Sampling requirements following soil removal

After the excavation is complete but before returning any soil to the excavation, collect soil samples for laboratory analysis to document the contamination remaining in place. Also, in order to document the contamination removed, stockpile soils samples must be collected (see Part F, below). All soil samples collected for laboratory analysis must be labeled so as to designate type of sample, location of sample, and depth of sample (see below). All soil sample locations must be shown on a map of the excavation. The map of the excavation must show site features and the two dimensional extent of the final excavation footprint at the ground surface along with final excavation depth contours (using a contour interval of 1 to 2 feet). Collect and analyze soil samples following procedures described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*, according to the following schedule:

1. **Sidewall samples**. Remove at least one foot of exposed soil prior to collecting the sample to ensure the collection of a representative sample. Sidewall samples should be collected at a rate of one sample per 25 lineal feet of sidewall; however, a minimum of 4 sidewall samples (i.e., one from each side) must be collected to document the levels of contamination remaining in place. The sidewall samples should be collected at the depth interval where the highest level of contamination was detected in the removed soil (i.e., "R" samples), typically near the bottom of the excavation. Label all sidewall samples with the prefix "S" for "sidewall", location number, and sample depth (e.g., S1(6'), S2(8'), S3(5'), etc.) and carefully note the sample locations on a map of the excavation.
2. **Bottom samples**. Remove at least one foot of exposed soil prior to collecting the sample to ensure the collection of a representative sample. Collect samples from the bottom of the excavation (i.e., floor of the excavation) at a rate of 1 bottom sample per 100 ft^2 of bottom area, and beneath removed dispensers. Label all bottom samples with the prefix "B", for "bottom", sample location number, and sample depth (e.g., B-1(7'), B-2(14'), B-3(10'), etc.).

   Note: Follow-up laboratory sampling to document remaining contamination is *not* generally required after removing contaminated surface soil as a corrective action (See Section IV, Excavation as Corrective Action).

F. Storage and treatment of petroleum contaminated soil

Store excavated contaminated soil on an impermeable surface, covered with plastic. Anchor the plastic covering in place with clean soil or other suitable material. Remember to obtain local government and MPCA staff approval prior to moving contaminated soil for off-site storage. Storage at land treatment sites must be in accordance with Minn. R. ch. 7037. Improper storage of contaminated soil may result in additional releases to the environment, and a corresponding reduction in Petrofund reimbursement.

Procedures for proper treatment of petroleum contaminated soil are discussed in Guidance Documents 3-03 *Land Treatment of Petroleum Contaminated Soil*, 3-10 *Thermal Treatment of Petroleum Contaminated Soil*, 3-13 *Composting of Petroleum Contaminated Soil*, and 3-17 *Thin Spreading Small Quantities of Petroleum Contaminated Soil*.

1. If less than ten cubic yards of contaminated soil is removed for treatment, soil samples will normally not be necessary if the soil will be land treated (unless the soil is a potential hazardous waste).
2. **Sampling the contaminated soil stockpiles.** Collect and analyze soil samples (grab samples) from representative portions of the excavated soil pile, using the methods described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*. Label these samples with the prefix "SP" for "Stockpile" and location number (e.g., SP-1, SP-2, etc.).

G. Karst conditions

Refer to Guidance Document 4-09 to determine if your site is located in a karst region of the state and for guidance specific to karst terrains.

H. Excavation worksheet

Complete Guidance Document 3-02 *General Excavation Report Worksheet* in all cases where petroleum contamination is encountered during an excavation completed prior to the site investigation [LSI or Remedial Investigation(RI)], even if no soil is removed for off site treatment. If a site investigation is not being performed, promptly submit the *General Excavation Report Worksheet* for MPCA review. If a site investigation is being completed, include the *General Excavation Report Worksheet* as an appendix of Guidance Document 4-06 *Investigation Report Form*. The reporting deadline is ten months from the date you receive the MPCA "Petroleum Storage Tank Release Investigation and Corrective Action" letter. MPCA staff may establish a shorter deadline for high priority sites.

I. Endangering structures

Do not allow excavations to endanger structures, including buildings, roads, utility lines, etc. Excavations must comply with Occupational Safety and Health Administration (OSHA) standards.

J. Soil excavated during development

Petroleum contaminated soil which is excavated during construction or other development activities must be treated and disposed of in accordance with MPCA guidelines (see part F. above). Soil excavated for the sole purpose of development (including the proper management of that soil) is not eligible for Petrofund reimbursement under Minn. Stat. ch. 115C. Contact the MPCA's Petroleum Brownfields Program for assistance in development at petroleum release sites.

If you plan to excavate a site that was previously closed and soil contamination remains, refer to Guidance Document 3-16 *Assessment of Petroleum Contamination at Closed Sites When There is No New Release.*

III. Excavation during Tank Removals or Installations

A. Planning ahead

It is in your best interest to obtain at least two bids on the work before you hire a contractor. By doing this, you will have met the Petrofund bidding requirement should contaminated soil be encountered. Bid forms are available from the Department of Commerce (call 651-215-1775, 1-800-638-0418 or http://www.state.mn.us/portal/mn/jsp/content.do?subchannel=-536883856&id=-536881377&agency=Commerce).

Note: Regulated USTs must be removed by an MPCA-Certified Contractor.

Prior to tank removal, plan ahead for storage of contaminated soil during site work, and treatment of contaminated soil (see Guidance Documents 3-03 *Land Treatment of Petroleum Contaminated Soil*, 3-10 *Thermal Treatment of Petroleum Contaminated Soil,* and 3-13 *Composting of Petroleum Contaminated Soil*). Remember to obtain local government and MPCA staff approval prior to moving contaminated soil for off-site storage.

Arrange for an environmental consultant with an appropriate field instrument to screen and collect soil samples for laboratory analysis during excavation (see Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures*).

B. Installation or removal of underground storage tanks (USTs)

Refer to Attachment A below for a flow chart on managing petroleum contaminated soil during UST removals or installations.

1. **Excavation when new tank systems are being installed.** If the site is **not** a closed petroleum leak site, remove and separate contaminated soil above the field screening levels from those below the screening levels (Table 2), up to the volume allowed by Tables 4A and 4B. Screen soils from around the tanks, removed piping and dispensers. If excavation removed all contamination above the field screening levels listed in Table 2 and ground water is not likely to be impacted, collect analytical sidewall and bottom samples from the tank basin, piping, and dispenser areas.

   Note: If the project site is a closed leak site, refer to Guidance Document 3-16 *Assessment of Petroleum Contamination at Closed Sites.*

   If test pits indicate the volume of contaminated soil exceeds 150 cubic yards, an LSI is necessary. Additional soil removal beyond the volume allowed for the tank install is not necessary at this phase of work.

Table 4 – Allowable contaminated soil removal during new UST installation

Table 4A		Table 4B	
New tank size (gallons)	For each tank to be installed add (yards)	Old tank size (gallons)	For each tank to be removed subtract (yards)
550	30	550	3
1,000	40	1,000	5
2,000	70	2,000	10
3,000	90	3,000	15
4,000	110	4,000	20
5,000	130	5,000	25
6,000	140	6,000	30
8,000	170	8,000	40
10,000	210	10,000	50
12,000	240	12,000	60
15,000	260	15,000	75
20,000	320	20,000	100
25,000	400	25,000	125

Note: For new pipe trenching allow one-third (0.33) cubic yard for every one (1) linear foot of contaminated trench.

Example 1: Two 10,000 gallon tanks are to be installed in the old tank basin, where one 4,000 gallon tank and one 6,000 gallon tank will be removed.

(210 + 210) - (20 + 30) = 370
Up to 370 cubic yards of contaminated soil may be removed.

Example 2: Two 10,000 gallon tanks are to be installed in the old tank basin, where one 4,000 gallon tank and one 6,000 gallon tank will be removed. Test Pits indicate the removal of an additional 130 cubic yards of petroleum contaminated soil would remove all the soil contamination above the soil screening levels in Table 6.1.

(210 + 210) - (20 + 30) + 130 = 500
Up to 500 cubic yards of contaminated soil may be removed.

2. Excavation of soil at sites where USTs are removed but new tank installation will not occur.

If the project site is a closed petroleum leak site, refer to Guidance Document 3-16 *Assessment of Petroleum Contamination at Closed Sites.* For open petroleum leak sites please refer to Section II of this document.

C. Excavation when upgrading, installing, or removing above ground storage tanks (ASTs)

Excavation requirements at AST sites are similar to those required at UST sites. The main difference is that contaminated surface soil at AST sites often occurs at loading and transfer areas, valve locations, piping runs, and from tank releases. Contaminated surface soil can pose a risk to surface water, ground water, and to humans through direct exposure and requires corrective action. Except for site-specific situations, contaminated soil should remain in place until an LSI has been completed. Refer to Section I, Part A. above for exceptions.

This guidance pertains only to AST systems with total capacity of less than 1 million gallons. Facilities with capacities over one million gallons are regulated with site specific permits.

For additional guidance, refer to Guidance Document 4-17 *Frequently Asked Questions (FAQs) about Investigation and Remediation of Above Ground Storage Tank Facilities*.

1. Excavation when installing or upgrading AST systems.

If contaminated soil must be displaced to install or upgrade AST systems, soil must be disposed of in accordance with MPCA regulations.

If contaminated soil (exceeding action levels shown on Table 2 above) must be removed to complete an AST upgrade or to install a new AST system, you may remove up to two (2) feet of contaminated soil in the following areas:

a. below the footprint of the new AST containment berm
b. below pipes, dispenser areas, or loading and transfer areas

If the contaminated soil encountered during your AST installation or upgrading work appears to pose a human or environmental threat and installation of a new AST system will make these soils inaccessible, removal may be appropriate prior to the completion of an LSI. Obtain prior written approval by the MPCA.

If contaminated surface soil exists in other areas of the site, removal or other corrective actions will probably be necessary but should wait until an LSI has been conducted. Soil removal prior an LSI may be approved if excavating up to 150 cubic yards completely addresses the release and eliminates the need for an investigation at the site.

2. Excavation of soil at AST sites at the time of decommissioning.

Refer to Section I to determine if excavation alone will adequately address the release, or if an LSI will be required.

D. Sampling requirements during AST upgrades or decommission

1. **Upgrades**: During a tank facility upgrade when there is no visible contamination, verification samples are not required but highly recommended. If removing or moving a tank to a different location on your tank facility as part of your upgrade **sampling is required**, see Table 5 below for sampling requirements.

   Sampling is required if a petroleum release has occurred or visible contamination is present at the tank facility. See Table 5 below for sampling guidance.

2. **Decommissioning:** AST owners and operators must take verification samples when permanently decommissioning a tank(s) and the tank appurtenances to determine if contamination is present, per Minn. R. ch. 7151.8400. See table below for sampling requirements.

Table 5 – AST sampling requirements

Tank size and type	Number of samples	Sample location
Vertical tank less than or equal to 12' diameter	1 sample	2 feet below the tank
Vertical tank greater than 12' diameter	Divide tank diameter by 12' and round up to nearest whole number (**see example**)	2 feet below the tank
Horizontal tank 10,000 gallons or less	1 sample	2 feet below the center of tank
Horizontal tank greater than 10,000 gallons	2 samples	2 feet below each end of the tank
Transfer Area(s)	1 sample in each area if there is more than one transfer area	2 feet below the loading rack
Piping or Areas of Visible Contamination	Take soil headspace samples 2 feet under the following areas: pipe fittings, joints and any other area where contamination is present or likely to be present. Submit soil samples with a headspace reading greater than zero for laboratory analyses.	
Collect any additional samples that may be needed to adequately characterize the excavation(s).		
Example: *27 foot diameter tank: 27/12 = 2.25. Round up 2.25 to nearest whole number equals 3. 3 soil samples are required.*		
Soil Analytical Requirements		
For samples collected from areas with visible or known contamination:	Refer to Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures* for the required analyses.	
For verification samples collected from areas with no visible contamination:	Perform the following analyses based on tank content and/or sample location: • Gasoline tank samples must be analyzed for GRO (Gasoline Range Organics) and BTEX (benzene, toluene, ethyl benzene and xylenes). • Other petroleum tank samples must be analyzed for DRO (Diesel Rang organics). • Transfer area samples must be analyzed for GRO, DRO, and BTEX unless gasoline was never stored at the facility, then only DRO is required.	

IV. Excavation as Corrective Action

At most sites, contaminated soil is left to degrade in place. However, soil excavation is occasionally appropriate as part of the corrective action (e.g., addressing actual or potential impacts to drinking water, surface waters, vapor impacts, or dermal contact). Excavation is also used as a method to remove petroleum saturated soil. Excavation as a corrective action is typically conducted after a site investigation (LSI or RI) has been completed and Guidance Document 4-06 has been submitted. When soil is excavated as a corrective action after the Site Investigation phase, complete Guidance Document 3-02a *Corrective Action Excavation Report Worksheet*.

A. Excavation to address free product. Excavation is sometimes used to address free product in ground water when the product is trapped in the pore spaces of tight sediments. Use the petroleum sheen test described in Guidance Document 4-04 *Soil Sample Collection and Analysis Procedures* to determine if soil is petroleum saturated.

B. Excavation of contaminated surface soil. Contaminated surface soil can pose an unacceptable risk because of the potential for dermal contact and for contaminated runoff to surface waters. Surface soil, as defined for this policy, is the uppermost two feet of soil (0-2 feet) that is not covered by an impervious surface. Corrective action is necessary at sites where contaminated surface soil exists.

If excavation is chosen as the corrective action option, contamination from the surface to a depth of two feet should be removed if any of the following criteria is met:

1. soil is visibly contaminated
2. field headspace screening with a photoionization detector (PID) indicate levels of ten ppm or greater
3. petroleum saturated soil exists (as determined using the petroleum sheen test described in Guidance Document 4-04)

For the latter two criteria above, borings should be advanced, as needed, to define the extent of contaminated surface soil. These borings can be completed with a drill rig, portable auger, hand auger, soil probe, or can be hand dug. A sufficient number of soil samples within the upper two feet should be collected to provide an accurate estimate of the volume of soil to be removed. Samples should be screened for organic vapors and petroleum saturation.

Post-excavation soil sampling is not generally required to document contamination remaining in place after contaminated surface soil removal because the extent and magnitude of contamination should have already been defined during the Site Investigation. The area excavated should be backfilled with clean fill. Other options may be considered based on recommendations made in the *Investigation Report Form* or *Corrective Action Design Report*. Please note that soil sampling of the stockpile will likely be required prior to soil treatment approval.

At an active AST facility, site-specific cleanup criteria may be approved if adequate operational controls are in place to manage the risks.

C. Excavation to address other risk factors. Excavation of contaminated soil is sometimes used to address risks such as vapors to building or utilities, or as a means of addressing surface water impacts or drinking water impacts. Excavation criteria, such as screening levels or volume of soil removed, will be site specific and should be addressed in the *Corrective Action Design Report*.

Web pages and phone numbers

MPCA staff:	http://www.pca.state.mn.us/pca/staff/index.cfm
MPCA phone:	**651-296-6300 or 1-800-657-3864**
Petroleum Remediation Program Web page:	http://www.pca.state.mn.us/programs/lust_p.html
MPCA Info. Request:	http://www.pca.state.mn.us/about/inforequest.html
MPCA VIC Program:	http://www.pca.state.mn.us/cleanup/vic.html
MPCA Petroleum Brownfields Program:	http://www.pca.state.mn.us/programs/vpic_p.html
Petrofund Web page:	http://www.state.mn.us/cgi-bin/portal/mn/jsp/content.do?id=-536881377&agency=Commerce
Petrofund phone:	**651-215-1775 or 1-800-638-0418**
State Duty Officer:	**651-649-5451 or 1-800-422-0798**

Attachment A
(UST Excavation)