Parker Environmental Corporation

Creative Solutions for a Complicated Environment

MAPLEWOOD FARMS
FILL MANAGEMENT PLAN
24 BALL HILL ROAD
BERLIN, MASSACHUSETTS

OCTOBER 2018

Prepared by:
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Prepared for:
Maplewood Farms
Tamara and Archibald Johnston
24 Ball Hill Road
Berlin, MA

October 2018

Scott Parker, LSP
President

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24 Ball Hill Road
Berlin, MA

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1.0 General Background

1.1 Introduction

This "Fill Management Plan", (FMP) has been prepared to obtain an Administrative Consent Order from MassDEP to allow for the importation of fill material to a portion of the property identified as 24 Ball Hill Road Berlin, MA (See Figure 1 Site Locus and Figure 2 Site Map included in Appendix A).

The "Notice of Intent Plan at 24 Ball Hill Road" (Sheet 3 of 4), (NOI Plan) prepared by Thomas Land Surveyors and dated February 6, 2012, (revision date 4/2/12) is also included in Appendix A and was prepared in support of the planned use of a 4-acre portion of a parcel of land known as the Maplewood Farms Site ("the Site") for farming purposes located off of 24 Ball Hill Road in Berlin, Massachusetts. The area proposed for soil fill is shown on the NOI Plan as the eastern portion of the property and is located east of Ball Hill Road on Berlin Assessors Map 9 Lot 57 and identified on Worcester County Registry of Deeds in Plan Book 739, Plan 6 as Lot A, Parcels B-2 and B-3.

The Property Owner is:
Tamara and Archibald Johnston (individually)
24 Ball Hill Road
Berlin, MA

Site Operator:
Lighthouse Environmental Management LLC.
184 Stone Street
Clinton MA 01510

Operations Manager:
Kevin Francis Gervais
Lighthouse Environmental Management, LLC.
(617-699-5245).

The Site is currently a horse paddock and open vegetated land that has been used for farming and agricultural purposes in the past and is proposed by the owner to continue to be used for the same purposes (General Farming and Raising of Livestock). Although the clearing of land may be greater than one acre, any amount of clearing for agricultural purposes is not considered an industrial activity under the storm water regulations. Section 402(l) (1) of the 1987 Water Quality Act exempts agricultural storm water discharges from NPDES permitting requirements including storm water permitting. This exemption only applies, however, if the clearing of land is solely for agricultural purposes.

The portion of this parcel that is planned for clearing, leveling, and construction of a new horse paddock through import of soil is shown on the NOI Plan in Appendix A. This Area is located outside of currently delineated wetland areas and buffer zones also shown on the NOI Plan. This area will utilize the existing access road for placement of the soil from an average elevation of 575' to a planned elevation of Elevation 610' as shown on the NOI Plan. A Stormwater Pollution Prevention Plan (SWPPP) filing for discharges from construction activities (such as clearing, grading, excavating, and stockpiling) that disturb one or more acres, are regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater program. Prior to discharging stormwater, construction operators must obtain coverage under an NPDES permit, which is administered by either the State (if it has been authorized to operate the NPDES stormwater program) or EPA, depending on where the construction site is located. According to the Operator, a SWPPP filing is not necessary due to agricultural exemptions. Dust and storm water will be controlled by the Operator. Import of fill at the Site has occurred under a previous Fill Management Plan from approximately 2012 through 2018.

Certain management practices will be exercised by the Owner, Operator, and Operations Manager (Mr. Kevin Gervais) to prevent changes in runoff patterns toward the wetland areas and buffer zones located to the south.

The period of time expected to import the necessary soils is 48 months. It is expected that approximately 225,000 cubic yards of soil will be required in the placement area to allow for the continued use of the property for agricultural purposes by the owner.

This FMP provides information for the specific placement of soil at this portion of the Site that meet certain physical and chemical criteria. These documents provide the status of applicable land use regulations, areas to be cleared to some degree and leveled, and a discussion of applicable MCP regulations. The information utilized to develop these documents was obtained from the owner, information on file at the Berlin Town Offices, and other publicly available information as well as testing and surveys conducted on the Site.

Re-use of soils on the Site from outside sources is necessary to create a level surface for horse farming. The soil must also abide by certain physical acceptance requirements and not significantly alter the drainage patterns in the area. Soil may not contain free draining liquids. Soils may contain naturally deposited silts and clay with minor amounts of naturally occurring, organic material and moisture levels that would be expected to evaporate quickly while being worked and spread rather than move through the soil to groundwater. Dredge spoils, slurry, and any material delivered in a tanker truck or vacuum truck are prohibited.

Lighthouse and the Owner are responsible through their contractual arrangements for ensuring that only soils approved under this plan are brought to the Site. This FMP has been prepared to provide MassDEP oversight regarding the chemical acceptability of fill brought to the Site under an Administrative Consent Order. The physical suitability of the soil will be determined by Lighthouse and the Owner.

The final goal of this plan is to formalize the soil management process and the soils acceptance policy at the Site in order to meet re-use requirements and to give generators a sufficient level of comfort that their material is being handled appropriately.

The Owner and Lighthouse intend to conduct the soil management operations with approved fill and natural soils from off-site locations that meet the criteria established in this Fill Management Plan.

Site and Surrounding Area Description

The Property located at 24 Ball Hill Road is the location of the proposed fill area and is bounded to the west by Ball Hill Road and to the north and east by undeveloped property owned by the Town of Berlin. The property located to the south of 24 Ball Hill Road is 32 Ball Hill Road and is the location of a single family residential building.

Proposed Fill Area Use

It has been determined that soil of sufficient chemical and physical quality is necessary to be imported for the project to bring certain areas to the required grade for farming. Lighthouse Environmental Management, LLC. has entered into agreement with owner to manage soil import activities. The soil re-use activities and all other construction-related activities will be conducted in accordance with this plan. It is the Owner's and Lighthouse's indication that the filling will be conducted in the specified area as shown on the NOI Plan which depicts current and planned grade. The owner and Lighthouse have indicated they have discussed with the municipality, its boards and commissions the nature of the planned Site use and necessary import of material to obtain elevations shown on the NOI Plan.

There are no buildings proposed for construction in the proposed Fill Area, as it is planned for a horse paddock and raising of livestock. The unpaved road will be used for access by machinery. The road condition will be maintained by the Owner such that visible dust will be kept to a minimum. Soil from the Site will not be tracked onto Ball Hill Road. At this time, no additional water supply wells are anticipated to be drilled on the Site.

There will also be no athletic fields or areas of high intensive children activity in the area to be filled under this plan. There are also no planned communal vegetable gardens or generation of produce for sale on the Site.

Nearby Receptors

Three potable have been identified within 500 feet of the proposed fill area. The approximate locations of these wells are shown on Figure 2 included in Appendix A. Available information regarding these wells is summarized as follows:

- 24 Ball Hill Road: Two potable wells are located on this property. One well is located along the northern property boundary and provides potable water to the residence and to the original barn located east of XXX Brook. A second well is located northwest of the intersection of the driveway and XXX Brook and provides water to the barns located west of the Brook. According the owners, the original well requires treatment for iron. Information regarding the depths of these wells was not available.
- 32 Ball Hill Road: One well provides potable water to the residence located at 32 Ball Hill Road. According to the owner, this well was installed at the time of the construction of the house (circa mid-1980s) and is understood to be around 650 feet deep.

A review of MassDEP's list of MCP Disposal Sites indicate that there were no release sites located in the vicinity of the Site.

The Site is classified as "RCS-1" under the MCP since the Site is located within 500 feet of a residence. The MCP groundwater classification in the area is classified as "GW-1" due to the proximity to the potable wells on the 24 Ball Hill Road Property and the adjacent property at 32 Ball Hill Road to the south. While the specific depth to water is unknown, the presence of a stream between the residence and the barn indicates that groundwater is likely less than 15 feet below ground surface, therefore groundwater within 30 feet of an occupied building would be considered GW-2. All groundwater is categorized as GW-3.

Site Geology

The geological conditions on the Site consist of an overburden veneer of thin to absent glacial till over bedrock as mapped on the MassDEP GIS Surficial Geology map for Berlin (Dec. 2009). The bedrock consists of gray, medium-grained schist and gneiss.

1.2 Site Environmental Background

The Site does not contain sensitive environmental receptors but groundwater is used for drinking water and by residents and animals. The Owners live on parcels where soil will be imported. Surface water exists in a natural brook to the east of the proposed Fill Area.

1.3 Names and Addresses of Parties Involved

The owner of the property is:

- Tamara and Archibald Johnston, 24 Ball Hill Road, Berlin, MA

The Operator of the Site is:

- Lighthouse Environmental Management, LLC 184 Stone Street, Clinton MA 01510

The operations Manager of the Site for soil placement operations is:

- Mr. Kevin Francis Gervais (617-699-5245)

The "Site LSP" reviewing candidate soil packages is:
Mr. Scott Parker
Parker Environmental Corporation
97 Walnut Street
Clinton, MA 01564
Cell Phone: (978) 273-4263.

1.4 Overview of Screening and Testing Requirements for Soil Acceptance

Soil to be placed at the Site, will require field screening and analytical testing in accordance with the requirements of the Administrative Consent Order and to demonstrate that the material is chemically suitable for the project. The physical suitability will be reviewed and approved by Lighthouse and the Owner.

Site Specific Soil Acceptance Criteria are included in Appendix B. Soil Profile Package information for the approval candidate soils is provided in Appendix D.

Screening Criteria

Lighthouse or a specified representative may conduct periodic screening of soils that will be shipped to the Site to make sure soils are as represented. Candidate soil must be evaluated by the generator for the following screening criteria and these results must be addressed in the soil profiling package prepared by the generator. Candidate soil being placed in the Site shall not exceed the following field screening/visual criteria:

- Soil must be field screened for Total Volatile Organic vapors following the MassDEP Jar Headspace Screening Procedure (MassDEP Policy # WSC-94-400) Attachment 2, modified to be based upon an isobutylene response factor), at the time of sample collection from the borings, test pits, stockpiles or other locations. Soil must also be field screened at the time of excavation and load out to Maplewood Farms at a minimum frequency of one field screening per 50 cubic yards. Soil must contain less than five (5) parts per million volume (ppmv) TOV above ambient background by the jar headspace screening procedure to meet Acceptance Criteria. Natural organic soils which exhibit TOV screening levels above 5 ppmv may be considered for acceptance on a case-by-case basis provided the following:

    a) Results of the analytical testing, particularly VOC analysis identifies no exceedance of acceptance criteria; and
    b) The sources of the elevated TOV screening levels can be attributed to a source other than oil or hazardous material (such as hydrogen sulfide).

- Visually, the soil must not exhibit any staining, odors, or other discolorations indicative of oil and hazardous material (OHM) releases.
- Soil and fill materials approved for use and brought to the property may contain only incidental randomly dispersed, de minimus quantities of ash and/or Solid Waste (e.g. Municipal Solid Waste and/or Construction or Demolition Waste) as defined in 310 CMR 16.00 and 310 CMR 19.000 which collectively shall comprise less than 1% by volume of the soil and fill materials. Soil mixed with bentonite or other slurry must contain less than 1% by volume of bentonite or other slurry material. The pH of slurry spoils/soil mixtures must be tested after the mixing occurs and at a rate of one test per 50 cubic yards. The acceptance of remediation waste as defined in 310 CMR 40.0000, is prohibited.
- Soil may not contain free draining liquids. Soils may contain naturally deposited silts and clay with minor amounts of naturally occurring organic material and moisture levels that would be expected to evaporate quickly while being worked and spread rather than move through the soil to groundwater. Dredge spoils, slurry, and any material delivered in a tanker truck or vacuum truck are prohibited.
- Upon arrival of the trucks at the Site, soils will be visually inspected and field screened from representative loads by Lighthouse or another designated party and discrete soil samples may be collected from a representative number of loads to prepare a composite sample from the candidate property for confirmatory analysis by the owner or Lighthouse at their discretion.

Rationale for Development of Analytical Acceptance Criteria

The Acceptance Criteria (AC) for the Site were established based on the MassDEP Similar Soil Provision Guidance (SSPG) (WSC#13-500).

All laboratory results must meet these criteria. A copy of the "Similar Soils Provision Guidance Policy (WSC#13-500)", and "Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (May, 2002)" are included in Appendix C for reference.

2.0 Soil Testing Requirements

The majority of the soil that is scheduled to be placed in the Site is contemplated to originate from large construction projects where the soils have either been pre- characterized during the engineering phase of the development or characterized from stockpiled soil. All soils to be placed in the Site will be pre-characterized by the generator. All analytical testing must report a laboratory detection limit that is less than applicable Acceptance Criteria for a given constituent. Consistent with the Compendium of Analytical Methods and 310 CMR 40.000, the use of routine volatile organic compound test methods with typical reporting limits is sufficient as long as technical justification is provided by the LSP-of-Record that the soil being tested is unlikely to contain the less common compounds such as 1,4 dioxane based on Site history and other relevant site-specific information.

Prior to placement of material in the Site, the Site LSP will review the pre- characterization data packages of all potential candidate soils prior to acceptance of the materials. This will be done to demonstrate that the soils from the generator's property are in compliance with Acceptance Criteria and other provisions of this plan.

The Site LSP, Owner or Lighthouse may also request to review any environmental investigative reports regarding potential OHM release(s) and soil quality at the originating property.
For acceptance of soils, the generator shall provide a soil profile package including laboratory analytical data for the parameters listed in Section 3.0. The sampling frequency shall be a minimum of one composite soil sample per every 500 cubic yards of soil to be delivered, as described in various MassDEP's policies for due diligence assessments. If sufficient analytical data is not available from the generator, the owner, Lighthouse or the Site LSP, will require that the generator of the soils collect additional samples. This will ensure that, at a minimum, the material is less than the Acceptance Criteria set forth in this plan and the equivalent frequency of testing requirements have been met. This will enable Lighthouse to provide the necessary background information to verify that material deposited in the Site is acceptable.

In some cases, crushed bedrock may also be accepted and physical/chemical analysis of the rock will be determined on a case-by-case basis for its intended use.

Soil Category	General Source/Origin Description	Minimum Test Profile Frequency
1	Naturally Deposited Soil: Not from an area of known or suspected high background levels of constituents (i.e., arsenic belt, Boston Blue clay); not proximate to urban fill soil; no MCP disposal sites nearby; and no industrial or manufacturing history.	1 test profile per 500 cubic yards (750 tons) for initial review. Supplemental testing of specific areas for specific contaminants that exceed any Soil Acceptance Criteria (SAC) to define/confirm limits of acceptable soil at 1 test per 100 cu. yd.
2	Naturally Deposited Soil: In proximity to urban fill or an MCP disposal site.	1 test profile per 500 cubic yards (750 tons) for initial review. Supplemental testing of specific areas for specific contaminants that exceed any SAC to define/confirm limits of acceptable soil at 1 test per 100 cu. yd.
3	Naturally Deposited Marine Soils and Boston Blue Clay: From areas of known or Suspected naturally occurring high background levels of constituents or otherwise regulated soil.	1 test profile per 500 cubic yards (750 tons) for initial review. Test Profile must include MCP-14 metals. Supplemental testing of specific areas for specific contaminants that exceed any SAC to define/confirm limits of acceptable soil at 1 test per 100 cu. yd.
4	Urban Fill Soil	1 test profile per 500 cubic yards (750-850 tons) for initial review. Test Profile must include MCP-14 metals. Supplemental testing of specific areas for specific contaminants that exceed any SAC to define/confirm limits of acceptable soil at 1 test per 100 cu. yd. Additional test parameters such as cyanide and asbestos may be required.
5	Soil from Industrial, Commercial or Manufacturing site with history of any of the following: tannery, textiles, chemical/paint production, circuit board manufacturing, plating/metal finishing, foundry operations, coal gasification, dry cleaning, salvage yards, pesticide/herbicide use, storage or distribution. A LSP, LSRP or LEP must provide a report detailing why such soils conform to the SAC.	1 test profile per 500 cubic yards (750-850 tons) for initial review. Test Profile must include MCP-14 metals. Supplemental testing of specific areas for specific contaminants that exceed any SAC to define/confirm limits of acceptable soil at 1 test per 100 cu. yd. Additional test parameters such as cyanide may be required.
6	Soil from sources not otherwise described above where historic test data indicate potential exceedance of any SAC or where past use or storage of OHM at more than household quantities.	1 test profile per 500 cubic yards (750-850 tons) for initial review. Supplemental testing of specific areas for specific contaminants that exceed any SAC to define/confirm limits of acceptable soil at 1 test per 100 cu. yd. Additional test parameters based on historic test data may be required.

2.1 Laboratory Environmental Analyses

Samples requiring environmental analysis shall be submitted to a laboratory certified by MassDEP for the chemical analyses required.

Environmental samples shall be collected, labeled, and preserved in accordance with established protocols for the respective analysis, and submitted to the analytical laboratory under chain-of-custody procedures.
Laboratory environmental analyses for the following parameters shall be in accordance with the latest version of the specified test method:

Parameter	EPA Test Method
Total Petroleum Hydrocarbons (GC- FID)(TPH)	ASTM D 3328
Ignitibility	SW-846 1030 or equivalent
Volatile Organic Compounds (VOCs)	8260
Semi-Volatile Organic Compounds (SVOCs)	8270
Polychlorinated Biphenyls (PCBs),	8082
MCP-14 Metals	6010/7000
Pesticides/herbicides	8081B
Reactive sulfide and reactive cyanide	SW-846 9030A/ SW-846 9014 or equivalent
Specific conductance	SM21-22 2510B Modified
Total Extractable Petroleum Hydrocarbons (EPH) (may be used as a substitute for TPH)	MassDEP
pH/corrosivity	SW-846 9045C or equivalent

Sampling and QA/QC procedures acceptable to MassDEP will be adhered to and QA/QC results will be considered by the generating facility in determining if the soil profiling is acceptable. Only soil that complies with the Site Specific Soil Acceptance Criteria (SAC) specified in the Summary Table included in Appendix B will be brought to the Site.

Laboratory analytical data sheets, chain-of-custody's, and laboratory QA/QC reports will be provided with the soil profiling packages along with pertinent maps/sketches and field testing results for review by Lighthouse and the LSP.

2.2 Soil Approval

Once the generator's representative (Massachusetts Licensed Site Professional (LSP), or otherwise acknowledged Qualified Environmental Professional, (QEP)) has reviewed the analytical results and determined that the soil quality meets the criteria defined as described in this plan, a generator representative should forward a complete LSP/QEP Opinion package to Lighthouse. Lighthouse will then provide initial feedback on the potential acceptance of the proposed material.

A complete LSP/QEP Opinion package should include the following information:

- Description of generating Site including:
  - Address;
  - current use of the property;
  - history of known uses of the property;
  - description of surrounding area;
- Site Plan showing location(s) of excavation(s) and sample locations;
- Description of material proposed to be shipped including observations of soil quality and type, boring or well logs or test pit logs if appropriate;
- Description of representative sampling process including:
  - Number and location of composite sample subsample locations; for stockpile sampling, a 5-8 subset sample composite is recommended;
  - field PID screening results;
  - method of selection of VOC sample for laboratory analysis;
- Tabulated analytical results with comparison to Maplewood Farm SAC;
- Laboratory analytical results;
- Completed and signed Material Shipping Record;
- Completed and signed Lighthouse Profile form;
- A specific declaration/Opinion that the material proposed to be sent to Maplewood Farm meets the requirements described herein;
- Other considerations:
  - Based on Generator/LSP/QEP knowledge, any other testing or considerations that are appropriate to characterize the material such as dioxins, asbestos, herbicides and pesticides, (if herbicides and pesticides are not deemed necessary, the text of the opinion should state this and why)

After initial approval is gained, the package will be sent to the Site LSP for review. Characterization results from each candidate property will be reviewed to confirm that the soil meets the requirements set forth in this plan.

The Site LSP will then prepare an acknowledgement and approval letter to the owner and Lighthouse confirming the acceptance of the soil for confirmatory signature by Lighthouse. The letter will specify the approved quantity, the quantity to be shipped, dates, restrictions (if any), and other pertinent items. The letter will be forwarded by Lighthouse to the generator.

2.3 Soil Placement and Tracking

Once the analytical data from the proposed generator's property has been reviewed and approved by the owner, Lighthouse, and the Site LSP, the soils will be designated to a specific area which will be logged into the facility's database, with the estimated quantity. All soils being placed in the applicable area will require a MassDEP Material Shipping Record (MSR) or Bill-of-Lading (BOL) to accompany each truckload. The designated area will be placed on all MSRs or BOLs. The Site LSP will periodically inspect the Site and records on file at the Site for conformance with this plan.

The trucks may be weighed at the Site or another location as specified by Lighthouse. Scaling will be at Berlin Stone Co, 322 Sawyer Hill Road, Berlin MA. Once the truck has been weighed on a certified scale it will be directed to place the material into a specific area. The appropriate paperwork will be left with the on-site personnel. The Soil piles will be placed within the designated area to be filled and will be spread out by the Site earth-works contractor until the desired grade is met. Then the area will be noted and coded in the files.

If the on-site personnel deem the material to be suspect after dumping, the truck will be rejected and sent back to the generator for additional testing, or returned at the generator's expense. If loads are received that contain large pieces of solid waste, the pieces will be segregated and stockpiled for re-loading and transport back to the site of origin at the generator's expense.

2.4 On-Site QA/QC Procedures

All loads will be inspected by Lighthouse personnel upon arrival for the presence of unacceptable materials as well as odors. In the event that material is identified that does not meet the acceptance criteria and has already been off-loaded, this material will be quarantined at an inactive location on the Site and covered with polyethylene pending removal by the sending party.

2.5 Other Considerations

The Site is located about 40 miles west of Boston in Berlin.
After exiting Rt 495, take RT 62W exit towards Berlin.

For scaling
After 0.5 mile turn right onto Sawyer Hill Road
Follow Sawyer Hill Road to 322 Sawyer Hill Road at Berlin Stone Co to do the scaling and then return to 62W

After scaling:
Follow Rt 62W to the blinking yellow light and turn left onto Barnes Hill Road,
Then turn left onto Linden Ave;
Then turn right on Ball Hill Road
Maplewood Farms is at 24 Ball Hill Road.

When leaving Maplewood Farm:
Exit right on Ball Hill Road to Linden Ave, take right on Linden Ave to 62E.

Please note while coming in you have to go through Barnes Hill Road and not Linden Ave as there is a low weight bridge on Linden Ave.

Prior to shipment, trucks will be weighed at a certified scale. Access will be through the access road into the Site and to the given phase area as directed by Lighthouse.
Roadways will be maintained for truck access. Hours of operation are 7:00 am to 3:30 pm from Monday to Friday and some Saturdays.

The owner maintains the appropriate equipment year-round to spread, dry, and compact the soils.

3.0 Proposed Groundwater Monitoring Plan

Groundwater monitoring of groundwater quality in the vicinity of the proposed fil area will be performed by the following:

Upon MassDEP approval of the proposed groundwater monitoring plan (GMP), groundwater monitoring wells will be installed using hollow-stem auger drilling technology. Wells will be installed to a minimum depth of 10 feet into the observed groundwater table or to the observed bedrock surface whichever is encountered first. Wells will be constructed using 2-inch diameter pvc machine slotted screens and solid casing. Wells will be screened a minimum of 10 feet into the observed water table and five above the water table. Wells will be completed with either a flush mounted road box in driving areas or a standpipe in areas that allow for standpipe access. Proposed monitoring well locations are shown on the NOI Plan included in Appendix A. In addition, the three private water supply servicing the 24 Ball Hill Road and 32 Ball Hill Road properties will be monitored.

3.1 Proposed Groundwater Monitoring Well sampling schedule:

Groundwater samples will be collected from each of the monitoring wells within seven days of installation, and annually thereafter in April. Sampling methodology will consist of one of several industry standard sample collection methodologies including:

- purging with disposable polyethylene bailers,
- low-flow sampling using a peristaltic pump,
- positive displacement using polythylene tubing and check valves

Whenever possible, wells will be purged of a minimum of three standing volumes of water prior to collecting the samples. In the event that the wells do not produce sufficient water to meet the sampling volume requirements, reduced purge volumes will be accepted.

Analysis of samples collected from the proposed groundwater monitoring wells will consist of the following:

- EPA Method 8260 - low level - Volatile Organic Compounds;
- EPA Method 8270 – full list – semi-Volatile organic compounds;
- Dissolved MCP 14 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc);
- PCBs;
- Herbicides and pesticides;
- pH;
- Amenable cyanide;
- Extractable petroleum hydrocarbons (fraction ranges only)

3.2 Private Well Monitoring

Groundwater monitoring of the two potable water supply wells located on the 24 Ball Hill Road property and the potable well providing water to the 32 Ball Hill Road residence will also be monitored in conjunction with the annual sampling of the above referenced groundwater monitoring wells. The two potable wells located on the 24 Ball Hill Road property provide water to the residence and the barn. The approximate locations of these wells are shown on Figure 2 included in Appendix B.

Samples will be submitted for laboratory analysis for the following analyses:

- EPA Method 524.2 - Volatile Organic Compounds;
- EPA Method 8270 – full list – semi-Volatile organic compounds;
- Total MCP 14 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc) via 6020A/7470A;
- Synthetic Organic Compounds – as defined in 310 CMR 22.07A (1), and MassDEP Guidelines and Policies for Public Water Supplies, Appendix A;
- Amenable cyanide;
- pH;

3.3 Soil quality monitoring

During the installation of the groundwater monitoring wells, a soil boring will be advanced through the previously filled area to monitor soil quality. Samples will be collected continuously from existing grade to the bottom of the fill material. A minimum of three soil samples will be collected for laboratory analysis. Each sample will be submitted to a laboratory for analysis for the following parameters:

- EPA Method 8260 - low level - Volatile Organic Compounds;
- EPA Method 8270 – full list – semi-Volatile organic compounds;
- MCP 14 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc);
- PCBs;
- Herbicides and pesticides;
- pH;
- Extractable petroleum hydrocarbons (fraction ranges only)

4.0 Dust and Odor Control Plan

4.1 Dust Control

During dry periods dust may become an issue requiring management practices to minimize fugitive dust as well track-out dust. On-site personnel will monitor conditions daily and determine the need to Implement dust control measures, as needed.
At this time, dust control is proposed to be consist of using a water truck to spray necessary areas to control fugitive dust. In the event that this method becomes infeasible due to high water volume usage, alternative measure of dust control such as the application of calcium will be implemented. Street sweeping on Ball Hill Road will be performed on an as-needed basis.

4.2 Odor Control

Material exhibiting noticeable odors associated with petroleum or other potential contaminants are not permitted for use at the Maplewood Farm location. In the event that material is deposited and is determine to exhibit unacceptable odors the material will place in a quarantine area on and beneath layers of polyethylene sheeting. The operator will be responsible for maintaining a sufficient quantity of rolled polyethylene sheeting in the event the use of cover is determined. Following identification of the material, the party responsible for depositing the material will be notified and the material will be returned to its point of origin.

5.0 Overweight Trucks

Patterns of overweight trucks will be addressed as follows:

- A warning will be issued to the truck driver following the first overweight load;
- A driver with an overweight load following a warning will receive a one hour delay prior to approval to off-load;
- A driver with a second overweight load following a warning will receive a two hour delay prior to approval to off-load;
- A driver with a third overweight load following a warning will be banned from future deliveries;

APPENDIX A
FIGURES

N
W E
S

0 1,000 2,000 4,000
Feet

Parker Environmental
Creative Solutions for a Complicated Environment

LOCUS MAP
24 BALL HILL ROAD
BERLIN, MASSACHUSETTS

Ref: Parker\Berlin\24BallHillRd\LocusMap.mxd
Drafted By: JAF | Date: 08/06/18
Source: MassGIS

FIGURE 1

080-001-000
Map-Parcel-ID

040-012-000
Map-Parcel-ID

090-056-001
Map-Parcel-ID

090-050-000
Map-Parcel-ID

090-056-000
Map-Parcel-ID

090-050-002
Map-Parcel-ID

080-001-004
Map-Parcel-ID

080-001-003
Map-Parcel-ID

040-009-000
Map-Parcel-ID

040-010-000
Map-Parcel-ID

040-011-000
Map-Parcel-ID

24 Ball Hill Road
House Well

090-057-000
Map-Parcel-ID

24 Ball Hill Road
Barn Well

040-005-000
Map-Parcel-ID

BALL HILL ROAD

050-002-000
Map-Parcel-ID

32 Ball Hill Road
Well

050-003-000
Map-Parcel-ID

040-004-000
Map-Parcel-ID

CAPTIVA ROAD

050-004-000
Map-Parcel-ID

050-001-000
Map-Parcel-ID

050-005-000
Map-Parcel-ID

050-015-000
Map-Parcel-ID

040-008-000
Map-Parcel-ID

050-007-000
Map-Parcel-ID

050-006-000
Map-Parcel-ID

050-008-000
Map-Parcel-ID

040-007-000
Map-Parcel-ID

040-006-000
Map-Parcel-ID

050-009-000
Map-Parcel-ID

040-012-000
Map-Parcel-ID

040-003-000
Map-Parcel-ID

050-009-002
Map-Parcel-ID

W PRIVATE WELL

ASSESSORS PARCELS

PARCELS OF INTEREST

N
W E
S

0 40 80 160 240
Feet

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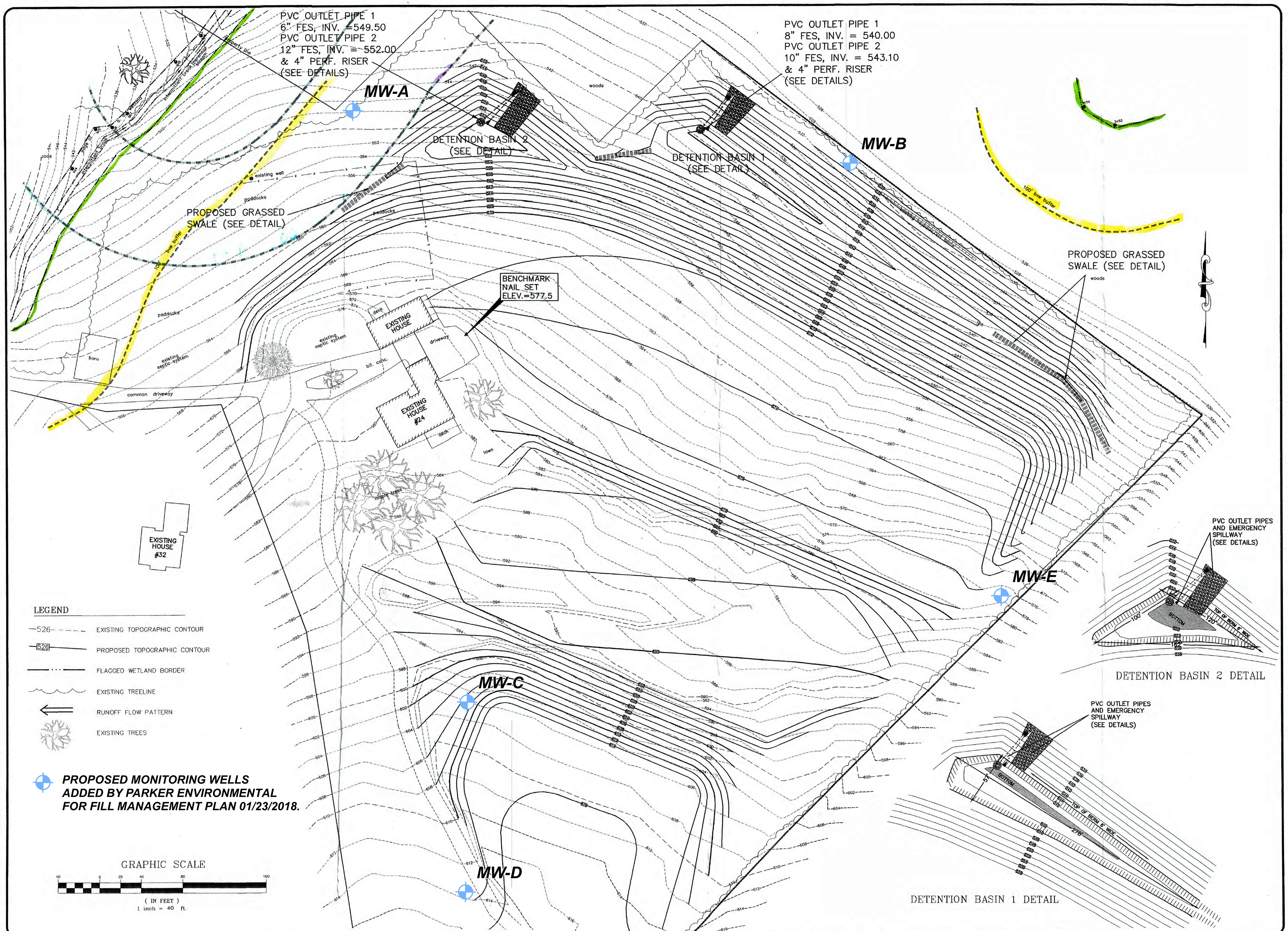
SITE MAP
MAPLEWOOD FARM
24 BALL HILL ROAD
BERLIN, MASSACHUSETTS

NGI REF:

Drafted By: JAF | Date: 08/06/18

Source: MassGIS, ArcGIS, USGS

FIGURE 2


PVC OUTLET PIPE 1
6" FES, INV. =549.50
PVC OUTLET PIPE 2
12" FES, INV. = 552.00
& 4" PERF. RISER
(SEE DETAILS)
MW-A
DETENTION BASIN 2
(SEE DETAIL)
PVC OUTLET PIPE 1
8" FES, INV. = 540.00
PVC OUTLET PIPE 2
10" FES, INV. = 543.10
& 4" PERF. RISER
(SEE DETAILS)
MW-B
DETENTION BASIN 1
(SEE DETAIL)
PROPOSED GRASSED
SWALE (SEE DETAIL)
PROPOSED GRASSED
SWALE (SEE DETAIL)
BENCHMARK
NAIL SET
ELEV.=577.5
EXISTING HOUSE
EXISTING HOUSE #24
EXISTING HOUSE #32
MW-E
MW-C
MW-D
PVC OUTLET PIPES
AND EMERGENCY
SPILLWAY
(SEE DETAILS)
DETENTION BASIN 2 DETAIL
PVC OUTLET PIPES
AND EMERGENCY
SPILLWAY
(SEE DETAILS)
DETENTION BASIN 1 DETAIL
LEGEND
526 EXISTING TOPOGRAPHIC CONTOUR
526 PROPOSED TOPOGRAPHIC CONTOUR
FLAGGED WETLAND BORDER
EXISTING TREELINE
RUNOFF FLOW PATTERN
EXISTING TREES
PROPOSED MONITORING WELLS
ADDED BY PARKER ENVIRONMENTAL
FOR FILL MANAGEMENT PLAN 01/23/2018.
GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

THOMAS DIPERSIO JR., P.E
LICENSE #40077

THOMAS DIPERSIO, P.L.S
LICENSE #29864

PHASE II PROPOSED SITE PLAN

No.	Date	Description
1	4/2/12	Con Com comments

Revisions

Prepared for:
MAPLE WOOD FARM
24 BALL HILL ROAD
BERLIN, MA

Owned by:
ARCHIBALD AND TAMARA JOHNSTON
24 BALL HILL ROAD
BERLIN, MA

Prepared By:
THOMAS LAND SURVEYORS
& Engineering Consultants, Inc.

Title:
NOTICE OF INTENT PLAN AT 24 BALL HILL ROAD IN BERLIN, MA

SCALE	1" = 40'
DRAWN	TD
CHECKED	TD
FILE NAME	\2458\dwg\site plan.dwg
PLOTTED	
ISSUE DATE	FEBRUARY 6, 2012
JOB NO.	2458

SHEET 3 OF 4

APPENDIX B
SITE SPECIFIC SOIL ACCEPTANCE CONCENTRATIONS

Lighthouse Environmental Management, LLC
184 Stone Street, Clinton, MA
(617) 699-5245

Parker Environmental Corporation
97 Walnut Street, Clinton, MA
(978) 272-4263

Summary of Site Specific Soil Acceptance Criteria
Maplewood Farm
24 Ball Hill Road
Berlin, MA

Constituent	Units	MA-SSPG-RCS1	RCS-1-14	Acceptance Criteria	Basis for SAC
MCP Polychlorinated Biphenyls					
Aroclor 1016	mg/kg	NE	1	<RL/0.1 mg/kg	Laboratory Reporting Limit at or below 10% of RCS-1 concentration (<0.1 mg/kg)
Aroclor 1221	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1232	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1242	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1248	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1254	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1260	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1262	mg/kg	NE	1	<RL/0.1 mg/kg	
Aroclor 1268	mg/kg	NE	1	<RL/0.1 mg/kg	
PCBs, Total	mg/kg	NE	1	<RL/0.1 mg/kg	
Petroleum Hydrocarbon Quantitation					
TPH	mg/kg		1000	500	RCS-1
OR - Total EPH Fractions					
C9-C18 Aliphatic - EPH	mg/kg	NE	1000	<500	RCS-1 or <10% of RCS-1
C19-C36 Aliphatic - EPH	mg/kg	NE	3000		
C11-C22 Aromatic - EPH	mg/kg	NE	1000		
C5-C8 Aliphatic - VPH	mg/kg	NE	100	<10	
C9-C12 Aliphatic - VPH	mg/kg	NE	1000	<100	
C9-C10 Aromatic - VPH	mg/kg	NE	100	<10	
General Chemistry					
Specific Conductance	umhos/cm	NE	NE	2,000	
pH (H)	SU	NE	NE	5-9	None
Flash Point	deg F	NE	>200	NI	Haz Waste
Cyanide, Reactive	mg/kg	NE	NE	<250	
Sulfide, Reactive	mg/kg	NE	NE	<500	
Asbestos fibers		NE	Not Detected	Not detected	MassDEP
Amenable Cyanide	mg/kg	NE	30	<3	MassDEP
Dioxins	mg/kg	NE	0.00002	<0.00002	MassDEP
PID Headspace Screening	ppm/v	NE	NE	<5	MassDEP

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Constituent	Units	MA-SSPG-RCS1	RCS-1-14	Acceptance Criteria	Basis for SAC
MCP Semivolatile Organics					
1,1-Biphenyl	mg/kg	0.05	0.05	<0.005	All SVOC concentrations must be below laboratory reporting limit or less than 10% of applicable RCS-1 concentration with the exception of highlighted compounds as defined in SSPG
Acenaphthene	mg/kg	4	4	<4	
1,2,4-Trichlorobenzene	mg/kg	NE	2	<0.2	
Hexachlorobenzene	mg/kg	NE	0.7	<0.07	
Bis(2-chloroethyl)ether	mg/kg	NE	0.7	<0.07	
2-Chloronaphthalene	mg/kg	NE	1000	<100	
1,2-Dichlorobenzene	mg/kg	NE	9	<0.09	
1,3-Dichlorobenzene	mg/kg	NE	3	<0.3	
1,4-Dichlorobenzene	mg/kg	NE	0.7	<0.07	
3,3'-Dichlorobenzidine	mg/kg	NE	3	<0.3	
2,4-Dinitrotoluene	mg/kg	NE	0.7	<0.07	
2,6-Dinitrotoluene	mg/kg	NE	100	10	
Azobenzene	mg/kg	NE	50	5	
Fluoranthene	mg/kg	40	1000	<40	
4-Bromophenyl phenyl ether	mg/kg	NE	100	10	
Bis(2-chloroisopropyl)ether	mg/kg	NE	0.7	0.07	
Bis(2-chloroethoxy)methane	mg/kg	NE	500	50	
Hexachlorobutadiene	mg/kg	NE	30	3	
Hexachloroethane	mg/kg	NE	0.7	0.07	
Isophorone	mg/kg	NE	100	10	
Naphthalene	mg/kg	4	4	<4	
Nitrobenzene	mg/kg	NE	500	50	
Bis(2-ethylhexyl)phthalate	mg/kg	NE	90	9	
Butyl benzyl phthalate	mg/kg	NE	100	10	
Di-n-butylphthalate	mg/kg	NE	50	5	
Di-n-octylphthalate	mg/kg	NE	1000	100	
Diethyl phthalate	mg/kg	NE	10	1	
Dimethyl phthalate	mg/kg	NE	0.7	0.07	
Benzo(a)anthracene	mg/kg	7	7	7	
Benzo(a)pyrene	mg/kg	2	2	2	
Benzo(b)fluoranthene	mg/kg	7	7	7	
Benzo(k)fluoranthene	mg/kg	10	70	10	
Chrysene	mg/kg	20	70	20	
Acenaphthylene	mg/kg	1	1	1	
Anthracene	mg/kg	10	1000	10	
Benzo(ghi)perylene	mg/kg	10	1000	10	
Fluorene	mg/kg	10	1000	10	
Phenanthrene	mg/kg	10	10	10	
Dibenzo(a,h)anthracene	mg/kg	0.7	0.7	0.7	
Indeno(1,2,3-cd)pyrene	mg/kg	7	7	7	
Pyrene	mg/kg	40	1000	40	
Aniline	mg/kg	NE	1000	100	
4-Chloroaniline	mg/kg	NE	1	0.1	
Dibenzofuran	mg/kg	NE	100	10	
2-Methylnaphthalene	mg/kg	0.7	0.7	0.7	
Acetophenone	mg/kg	NE	1000	100	
2,4,6-Trichlorophenol	mg/kg	NE	0.7	0.07	
2-Chlorophenol	mg/kg	NE	0.7	0.07	
2,4-Dichlorophenol	mg/kg	NE	0.7	0.07	
2,4-Dimethylphenol	mg/kg	NE	0.7	0.07	
2-Nitrophenol	mg/kg	NE	100	10	
4-Nitrophenol	mg/kg	NE	100	10	
2,4-Dinitrophenol	mg/kg	NE	3	0.3	
Pentachlorophenol	mg/kg	NE	3	0.3	
Phenol	mg/kg	NE	1	0.1	
2-Methylphenol	mg/kg	NE	500	50	
3-Methylphenol/4-Methylphenol	mg/kg	NE	500	50	
2,4,5-Trichlorophenol	mg/kg	NE	4	0.4	

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Constituent	Units	MA-SSPG-RCS1	RCS-1-14	Acceptance Criteria	Basis for SAC
MCP Total Metals					
Antimony	mg/kg	10	20	<10	RCS-1 or SSPG Value
Arsenic, Total	mg/kg	20	20	<20	
Barium, Total	mg/kg	375	1000	<375	
Beryllium	mg/kg	NE	NE	<4	
Cadmium, Total	mg/kg	20	70	<20	
Chromium, Total	mg/kg	100	100	100	
Chromium, (Tri)	mg/kg	225	1000	<225	
Chromium, (Hex)	mg/kg	100	100	<100	
Copper	mg/kg	40	NE	<40	
Lead, Total	mg/kg	200	200	<200	
Mercury, Total	mg/kg	3	20	<3	
Nickel	mg/kg	150	600	<150	
Selenium, Total	mg/kg	5	400	<5	
Silver, Total	mg/kg	6	100	<6	
Thallium	mg/kg	6	8	<6	
Vanadium	mg/kg	225	400	<225	
Zinc	mg/kg	500	1000	<500	

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Berlin, MA

Constituent	Units	MA-SSPG-RCS1	RCS-1-14	Acceptance Criteria	Basis for SAC
MCP Volatile Organics by 8260/5035					
Methylene chloride	mg/kg	NE	0.1	<0.01	All VOC concentrations must be below laboratory reporting limit or less than 10% of applicable RCS-1 concentration
1,1-Dichloroethane	mg/kg	NE	0.4	<0.04	
Chloroform	mg/kg	NE	0.2	<0.02	
Carbon tetrachloride	mg/kg	NE	5	<0.5	
1,2-Dichloropropane	mg/kg	NE	0.1	<0.01	
Dibromochloromethane	mg/kg	NE	0.005	<0.0005	
1,1,2-Trichloroethane	mg/kg	NE	0.1	<0.01	
Tetrachloroethene	mg/kg	NE	1	<0.1	
Chlorobenzene	mg/kg	NE	1	<0.1	
Trichlorofluoromethane	mg/kg	NE	1000	<100	
1,2-Dichloroethane	mg/kg	NE	0.1	<0.01	
1,1,1-Trichloroethane	mg/kg	NE	30	<3	
Bromodichloromethane	mg/kg	NE	0.1	<0.01	
trans-1,3-Dichloropropene	mg/kg	NE	0.01	<0.001	
cis-1,3-Dichloropropene	mg/kg	NE	0.01	<0.001	
1,3-Dichloropropene, Total	mg/kg	NE	0.01	<0.001	
1,1-Dichloropropene	mg/kg	NE	0.01	<0.001	
Bromoform	mg/kg	NE	0.01	<0.001	
1,1,2,2-Tetrachloroethane	mg/kg	NE	0.005	<0.0005	
Benzene	mg/kg	NE	2	<0.2	
Toluene	mg/kg	NE	30	<3	
Ethylbenzene	mg/kg	NE	40	<4	
Chloromethane	mg/kg	NE	100	<10	
Bromomethane	mg/kg	NE	0.5	<0.05	
Vinyl chloride	mg/kg	NE	0.7	<0.07	
Chloroethane	mg/kg	NE	100	10	
1,1-Dichloroethene	mg/kg	NE	3	<0.3	
trans-1,2-Dichloroethene	mg/kg	NE	1	<0.1	
Trichloroethene	mg/kg	NE	0.3	<0.03	
1,2-Dichlorobenzene	mg/kg	NE	9	<0.9	
1,3-Dichlorobenzene	mg/kg	NE	3	<0.3	
1,4-Dichlorobenzene	mg/kg	NE	0.7	<0.07	
Methyl tert butyl ether	mg/kg	NE	0.1	<0.01	
p/m-Xylene	mg/kg	NE	100	<10	
o-Xylene	mg/kg	NE	100	<10	
Xylenes, Total	mg/kg	NE	100	<10	
cis-1,2-Dichloroethene	mg/kg	NE	0.1	<0.01	
1,2-Dichloroethene, Total	mg/kg	NE		<0.03	
Dibromomethane	mg/kg	NE	500	<50	
1,2,3-Trichloropropane	mg/kg	NE	100	<10	
Styrene	mg/kg	NE	3	<0.3	
Dichlorodifluoromethane	mg/kg	NE	1000	<100	
Acetone	mg/kg	NE	6	<0.6	
Carbon disulfide	mg/kg	NE	100	<10	
Methyl ethyl ketone	mg/kg	NE	4	<0.4	
Methyl isobutyl ketone	mg/kg	NE	0.4	<0.04	
2-Hexanone	mg/kg	NE	100	<10	
Bromochloromethane	mg/kg	NE	0.005	<0.0005	
Tetrahydrofuran	mg/kg	NE	500	<50	
2,2-Dichloropropane	mg/kg	NE	0.1	<0.01	
1,2-Dibromoethane	mg/kg	NE	0.1	<0.01	
1,3-Dichloropropane	mg/kg	NE	500	<50	
1,1,1,2-Tetrachloroethane	mg/kg	NE	0.1	<0.01	
Bromobenzene	mg/kg	NE	100	10	
n-Butylbenzene	mg/kg	NE	NA	NA	
sec-Butylbenzene	mg/kg	NE	NA	NA	
tert-Butylbenzene	mg/kg	NE	100	10	
o-Chlorotoluene	mg/kg	NE	100	<10	

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24 Ball Hill Road
Berlin, MA

Constituent	Units	MA-SSPG-RCS1	RCS-1-14	Acceptance Criteria	Basis for SAC
p-Chlorotoluene	mg/kg	NE	100	<10	All VOC concentrations must be below laboratory reporting limit or less than 10% of applicable RCS-1 concentration
1,2-Dibromo-3-chloropropane	mg/kg	NE	10	<1	
Hexachlorobutadiene	mg/kg	NE	30	<3	
Isopropylbenzene	mg/kg	NE	1000	<100	
p-Isopropyltoluene	mg/kg	NE	100	<10	
Naphthalene	mg/kg	4	4	<0.4	
n-Propylbenzene	mg/kg	NE	100	<10	
1,2,3-Trichlorobenzene	mg/kg	NE	NA	NA	
1,2,4-Trichlorobenzene	mg/kg	NE	2	<0.2	
1,3,5-Trimethylbenzene	mg/kg	NE	10	<1	
1,2,4-Trimethylbenzene	mg/kg	NE	1000	<100	
Diethyl ether	mg/kg	NE	100	<10	
Diisopropyl Ether	mg/kg	NE	100	<10	
Ethyl-Tert-Butyl-Ether	mg/kg	NE	NA	NA	
Tertiary-Amyl Methyl Ether	mg/kg	NE	NA	NA	
1,4-Dioxane	mg/kg	NE	0.2	<0.02	
Herbicides and Pesticides					
Testing for herbicides and pesticides must be performed if Source Site is known to have stored or used herbicides or pesticides. All Acceptance Criteria are based on 10% of RCS-1					
Herbicides					
MCPP	mg/kg	NE	NA	NA	Laboratory Reporting Limit at or below 10% of RCS-1 concentration (<0.1 mg/kg)
MCPA	mg/kg	NE	100	<10	
Dalapon	mg/kg	NE	NA	NA	
Dicamba	mg/kg	NE	500	<50	
Dichloroprop	mg/kg	NE	NA	NA	
2,4-D	mg/kg	NE	100	<10	
2,4-DB	mg/kg	NE	100	<10	
2,4,5-T	mg/kg	NE	100	<10	
2,4,5-TP (Silvex)	mg/kg	NE	100	<10	
Dinoseb	mg/kg	NE	50	<5	
Pesticides					
Delta-BHC	mg/kg	NE	10	<1	Laboratory Reporting Limit at or below 10% of RCS-1 concentration (<0.1 mg/kg)
Lindane	mg/kg	NE	0.003	<0.0003	
Alpha-BHC	mg/kg	NE	50	<5	
Beta-BHC	mg/kg	NE	10	<1	
Heptachlor	mg/kg	NE	0.001	<0.0001	
Aldrin	mg/kg	NE	0.08	<0.008	
Heptachlor epoxide	mg/kg	NE	0.1	<0.01	
Endrin	mg/kg	NE	10	<1	
Endrin ketone	mg/kg	NE	NA	NA	
Dieldrin	mg/kg	NE	0.08	<0.008	
4,4'-DDE	mg/kg	NE	6	<0.6	
4,4'-DDD	mg/kg	NE	8	<0.8	
4,4'-DDT	mg/kg	NE	6	<0.6	
Endosulfan I	mg/kg	NE	0.5	<0.05	
Endosulfan II	mg/kg	NE	0.5	<0.05	
Endosulfan sulfate	mg/kg	NE	NA	NA	
Methoxychlor	mg/kg	NE	200	<20	
Chlordane	mg/kg	NE	0.7	<0.07	
Hexachlorobenzene	mg/kg	NE	0.7	<0.07	

APPENDIX C
REGULATORY GUIDANCE DOCUMENTS

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK
Governor

MAEVE VALLELY BARTLETT
Secretary

DAVID W. CASH
Commissioner

Similar Soils Provision Guidance

Guidance for Identifying When Soil Concentrations at a Receiving Location Are "Not Significantly Lower Than" Managed Soil Concentrations Pursuant to 310 CMR 40.0032(3)

September 4, 2014[1]
(Originally published October 2, 2013 and revised April 25, 2014[2])

WSC#-13-500

The information contained in this document is intended solely as guidance. This guidance does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. Parties using this guidance should be aware that there may be other acceptable alternatives for achieving and documenting compliance with the applicable regulatory requirements and performance standards of the Massachusetts Contingency Plan.

I. Purpose and Scope

The Massachusetts Contingency Plan ("MCP", 310 CMR 40.0000) establishes conditions and requirements for the management of soil excavated at a disposal site. This guidance addresses the specific requirements of 310 CMR 40.0032(3) and the criteria by which a Licensed Site Professional ("LSP") may determine that soil may be moved without prior notice to or approval from the Department. Soil managed pursuant to 310 CMR 40.0032(3) may be transported using a Bill of Lading ("BOL"), but a BOL is not required. Attachment 1 provides a flowchart depiction of the Similar Soil regulations and guidance.

This guidance is not applicable to the excavation and movement of soil from locations other than M.G.L. Chapter 21E disposal sites, nor to the management of soils considered Remediation Waste under the MCP.

[1] Updated to revise an inaccurate RCS-1 concentration for lead in Table 2 and an inaccurate RCS-2 concentration for selenium in Table 3.
[2] Updated to reflect the 2014 revisions to the Massachusetts Contingency Plan, 310 CMR 40.0000

II. Relationship to Other Local, State or Federal Requirements

This guidance is intended to clarify and more fully describe regulatory requirements contained within the MCP. Nothing in this guidance eliminates, supersedes or otherwise modifies any local, state or federal requirements that apply to the management of soil, including any local, state or federal permits or approvals necessary before placing the soil at the receiving location, including, *but not limited to,* those related to placement of fill, noise, traffic, dust control, wetlands, groundwater or drinking water source protection.

III. Requirements of 310 CMR 40.0032(3)

The requirements specified in 310 CMR 40.0032(3) are:

> (3) Soils containing oil or waste oil at concentrations less than an otherwise applicable Reportable Concentration and that are not otherwise a hazardous waste, and soils that contain one or more hazardous materials at concentrations less than an otherwise applicable Reportable Concentration and that are not a hazardous waste, may be transported from a disposal site without notice to or approval from the Department under the provisions of this Contingency Plan, provided that such soils:
>
> (a) are not disposed or reused at locations where the concentrations of oil or hazardous materials in the soil would be in excess of a release notification threshold applicable at the receiving site, as delineated in 310 CMR 40.0300 and 40.1600; and
>
> (b) are not disposed or reused at locations where existing concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and/or hazardous materials present in the soil being disposed or reused.

There are therefore four requirements that must be met before the managed soil can be moved to and re-used (or disposed) at a new location without notice to or approval from MassDEP. Each requirement (A. through D.) is addressed below.

A. The Managed Soil Must Not Be a Hazardous Waste

310 CMR 40.0032(3) applies to soils containing oil or waste oil that are not otherwise a hazardous waste, and to soils containing hazardous materials that are not a hazardous waste. The MCP definition of hazardous waste (310 CMR 40.0006) refers to the definitions promulgated in the Massachusetts Hazardous Waste Regulations, 310 CMR 30.000.

Under the federal Resource Conservation and Recovery Act of 1976 ("RCRA", 42 U.S.C. §§6901 *et. seq.*), the Massachusetts Hazardous Waste Management Act (M.G.L. c.21C), and the Massachusetts Hazardous Waste Regulations (310 CMR 30.000), soil is considered to contain a hazardous waste (hazardous waste soil) if, when generated, it meets either or both of the following two conditions:

- the soil exhibits one or more of the characteristics of a hazardous waste pursuant to 310 CMR 30.120 [such as exhibiting a characteristic of toxicity under 310 CMR 30.125 and 30.155 (Toxicity Characteristic Leaching Procedure, or TCLP)]; or
- the soil contains hazardous constituents from a listed hazardous waste identified in 310 CMR 30.130 or Title 40, Chapter I, Part 261 (Identification and Listing of Hazardous Waste) of the Code of Federal Regulations.

MassDEP has published a Technical Update entitled: *Considerations for Managing Contaminated Soil: RCRA Land Disposal Restrictions and Contained-In Determinations* (August 2010, http://www.mass.gov/eea/docs/dep/cleanup/laws/contain.pdf) that focuses on the determination of whether contaminated soil must be managed as a hazardous waste subject to RCRA requirements, and the presumptive approval process an LSP/PRP can use to document such a determination.

B. The Managed Soil Must Be Less Than Reportable Concentrations (RCs).

This requirement is intended to ensure that the soil being excavated and relocated from a disposal site is not "Contaminated Soil" and therefore neither "Contaminated Media" nor "Remediation Waste" as those terms are defined in 310 CMR 40.0006[3].

310 CMR 40.0361 sets forth two reporting categories for soil (RCS-1 and RCS-2). Reporting Category RCS-1 applies to locations with the highest potential for exposure, such as residences, playgrounds and schools, and to locations within the boundaries of a groundwater resource area. Reporting Category RCS-2 applies to all other locations.

Note that the "applicable Reportable Concentrations" referred to in 310 CMR 40.0032(3) may be the RCS-1 or RCS-2 criteria, depending upon which category would apply to the soils being excavated *at the original disposal site location*, not the RCs applicable to the soils at the receiving location (see Section III.C. below).

> **EXAMPLE:** If soil is being excavated from a disposal site at an RCS-2 location and the soil contaminant concentrations are found to be less than the RCS-2 criteria, then the soil is not "Contaminated Soil" since the soil is less than the release notification threshold established for RCS-2 soil by 310 CMR 40.0300 and 40.1600. The RCS-2 soil in this example is not "Contaminated Soil" even if one or more constituent concentration is greater than an RCS-1 value.

Also, the language at 310 CMR 40.0032(3) specifies the *applicable* RCs. If a notification exemption (listed at 310 CMR 40.0317) applies to the OHM in soil at its original location, then the corresponding Reportable Concentration is not *applicable*. Thus 310 CMR 40.0032(3) should be read to apply to soils containing concentrations of oil or hazardous material ("OHM") less than the applicable RCs *or* covered by a notification exemption. This interpretation of the requirement is consistent with the definition of Contaminated Soil, which uses the term "notification threshold" rather than "Reportable Concentration."

---

[3] Contaminated Soil - means soil containing oil and/or hazardous material at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600.

Contaminated Media - means Contaminated Groundwater, Contaminated Sediment, Contaminated Soil, and/or Contaminated Surface Water.

Remediation Waste - means any Uncontainerized Waste, Contaminated Media, and/or Contaminated Debris that is managed pursuant to 310 CMR 40.0030. The term "Remediation Waste" does not include Containerized Waste.

C. The Managed Soil Must Not Create a Notifiable Condition at the Receiving Location.

This requirement is intended to prevent the creation of new reportable releases that must be subsequently assessed and remediated.

If the contaminant concentrations in the soil being relocated are less than the RCS-1 criteria, then placement of the soil in any RCS-1 location would not create a new notifiable condition. There are, however, conditions that could result in a notifiable condition.

First, if the soil is excavated from an RCS-2 location (as described in the example in Section III.B. above) with contaminant concentrations ***between*** the RCS-1 and RCS-2 criteria, then the placement of that soil at an RCS-1 receiving location would create a notifiable condition since one or more concentrations of OHM would then exceed the RCS-1 criteria in the RCS-1 receiving location.

Second, a notification exemption that applies to the original location of the soil may not apply to the receiving location. (For example, the lead paint exemption at 310 CMR 40.0317(8) is specific to "the point of application.") In cases where a notification exemption applies only to the original location, the managed soil must be evaluated solely based on whether its OHM concentrations exceed the applicable RCs at the receiving location.

D. The Managed Soil Must Not Be Significantly More Contaminated Than the Soil at the Receiving Location.

This requirement has been referred to as the "anti-degradation provision" although it is more accurately described as the "Similar Soils Provision." 310 CMR 40.00032(3)(b) requires that the concentrations of OHM at the receiving location not be "significantly lower" than the relocated soil OHM concentrations. One could also say that the provision requires that "there is no significant difference between the relocated soil and the soil at the receiving location," or that "the soils being brought to the receiving location are similar to what is already there." This requirement embodies several considerations.

First, as a general principle, M.G.L. c.21E is intended to clean up contaminated properties and leave them better than they started -- even to clean sites to background conditions, if feasible. It would be inconsistent with this principle to then raise the ambient levels of contamination in the environment as a consequence of a response action conducted under the MCP.

Second, despite the three other requirements (A. through C. above) of 310 CMR 40.0032(3), decisions about the movement of the managed soil will be based upon sampling of soil that is likely to have significant heterogeneity. The Similar Soils Provision is an additional measure to minimize the adverse effects of soil characterization that may not be representative of such heterogeneity.

Third, none of the criteria of 310 CMR 40.0032(3) address the question of whether the soil poses a ***risk*** in its original or receiving location, although the hazardous waste- and notification-related requirements seem to *imply* risk-based decision making. Put simply, soil that is not a hazardous waste and does not require notification may still pose incremental risk at the receiving location. The Similar Soils Provision is intended to ensure that the managed soil does not increase risk of harm to health, safety, public welfare or the environment at the receiving location, since it will be similar to what is already there.

The "not… significantly lower" language of 310 CMR 40.0032(3)(b) can be interpreted to mean either a quantitative "not statistically different" analysis, or a semi-quantitative, albeit somewhat subjective, approach. MassDEP does not believe that a statistics-driven quantitative approach is necessary when comparing managed soil to known or assumed background conditions, given (a) the relatively low concentrations at issue and (b) the cost of such an analysis, driven by the quantity of sampling needed to show a statistical difference.

The regulations imply that the LSP must have knowledge about the concentrations of OHM in the soil at the receiving location in order to apply the Similar Soils Provision. The regulations also imply that the new soil may contain concentrations of OHM that are *somewhat* higher than those levels at the receiving location – just not "significantly" higher.

MassDEP recognizes that there may be several approaches to address this "knowledge" issue when implementing the Similar Soils Provision of the MCP.

- **Assume the soils at the receiving location are natural background**. Sampling of the soil at the receiving location is not necessary if it is assumed that the concentrations of OHM there are consistent with natural background conditions. MassDEP acknowledges that there is a range of background levels, and that the concentrations at any given location may be lower than the statewide levels published by the Department[4], but the costs associated with determining site-specific background are not justified by likely differences. Further, the published "natural background" levels are similarly used in several areas of the MCP as an acceptable endpoint, including site delineation and the development of the MCP cleanup standards.

  Of course, routine due diligence about the receiving location may still reveal factors that would make the location inappropriate to receive the proposed fill material. Nothing in this guidance relieves any party of the obligation to conduct such due diligence and appropriately consider and act on information thereby obtained.

[4] *See* Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (May, 2002) http://www.mass.gov/eea/docs/dep/cleanup/laws/backtu.pdf

- **Sample the soils at the receiving location**.
  The sampling plan should include a sufficient number of samples taken at locations selected to provide an understanding of the concentrations of OHM present and the distribution of OHM throughout the receiving location. In order to provide data appropriate for the Similar Soils comparison, the soil at the receiving location should be analyzed for constituents that are likely to be present there (e.g., naturally occurring metals) as well as any OHM known or likely to be present in the soil brought from the disposal site. If a receiving location has been adequately and comprehensively characterized, that data may then be used for comparison to the OHM concentrations in any subsequent soil deliveries - additional sampling is not required.

- **Provide Technical Justification for an Alternative Approach**
  There may be situations for which a different combination of analytical and non-analytical information available for both the source and receiving locations is sufficient to conclude that the nature and concentrations of OHM in the soils are not significantly different. Guidance on recognizing such conditions and the level of documentation that would be necessary to support such a technical justification is beyond the scope of this guidance.

Once the concentrations of OHM in the soils are known (or assumed consistent with this guidance), the LSP must compare the concentrations of the source and receiving locations and determine whether the concentrations at the receiving location are "significantly lower" than those in the soil proposed to be relocated from the disposal site. This comparison may be conducted in several ways, including analyses with appropriate statistical power and confidence. MassDEP has also developed a *rule-of-thumb* comparison to simplify this determination, as described in Section IV.

IV. Determining whether soils at the receiving location are "significantly lower" using a simplified approach

The simplified comparison shall be made using the ***maximum*** values of the OHM concentrations in both the soil at the receiving location and the soil proposed to be disposed of or reused.

Use of the maximum values is appropriate for several reasons. First, the provisions of 310 CMR 40.0032(3) include comparisons to Reportable Concentrations, and notification is triggered by any single value (i.e., maximum value) exceeding the RC. Second, soil is by its nature heterogeneous, and the use of maximum values is a means of minimizing sampling costs while addressing the expected variability of results. Third, if natural background levels are assumed at the receiving location, the MassDEP published background concentrations are upper percentile levels that are only appropriately compared to similar (e.g., maximum) values of the soil data set.

Note also that when using the maximum reported concentrations for comparison purposes, the typical or average concentration will be lower. This is important to recognize if/when the question of the risk posed by the soil is raised. For example, the RCS-1 and the Method 1 S-1 standard for arsenic are both 20 mg/kg. The Reportable Concentration is applied as a not-to-be-exceeded value, triggering the need to report the release and investigate further. However the S-1 standard is applied as an average value, considering exposure over time. At a location where the highest arsenic value found is less than 20 mg/kg, the average concentration would be well below the Method 1 S-1 standard.

The maximum concentration in the soil at the receiving location may be less than that in the proposed disposed/reused soil by some amount and not be considered "significantly lower." The question is how much lower is "significantly lower"? In this guidance, MassDEP establishes a multiplying factor to be applied to the concentration in the soil at the receiving location. The multiplying factor varies depending upon the concentration in the soil at the receiving location, as shown in Table 1.

Table 1. Receiving Soil Concentration Multiplying Factors

If the concentration in soil at the receiving location for a given OHM is:	Then use a multiplying factor of:
< 10 mg/kg	10
10 mg/kg ≤ *x* <100 mg/kg	7.5
100 mg/kg ≤ *x* <1,000 mg/kg	5
≥ 1,000 mg/kg	2.5

EXAMPLE: The soil at a receiving location that is considered RCS-1 is appropriately sampled and the maximum concentration of silver is found to be 6 mg/kg. Using Table 1, the concentration of silver at the receiving location would not be considered "significantly lower" than *10 x 6 mg/kg = 60 mg/kg*. Since 60 mg/kg is less than the silver RCS-1 value of 100 mg/kg, soil containing a maximum concentration that is less than 60 mg/kg silver could be reused at this location.

EXAMPLE: The soil at a receiving location that is considered RCS-1 is assumed to be consistent with natural background. The MassDEP published natural background level for arsenic is 20 mg/kg. Using Table 1, the concentration of arsenic at the receiving location would not be considered "significantly lower" than *7.5 x 20 mg/kg = 150 mg/kg*. However, since 150 mg/kg is greater than the arsenic RCS-1 value of 20 mg/kg, only soil containing a maximum concentration that is less than 20 mg/kg arsenic could be reused at this location. [The managed soil must not create a notifiable condition at the receiving location, see Section III.C. above.]

> **EXAMPLE:** The soil at a receiving location that is considered RCS-2 is assumed to be consistent with natural background. The MassDEP published natural background level for benzo[a]anthracene is 2 mg/kg. Using Table 1, the concentration of benzo[a]anthracene at the receiving location would not be considered "significantly lower" than *10 x 2 mg/kg = 20 mg/kg*. Since 20 mg/kg is less than the benzo[a]anthracene RCS-2 value of 40 mg/kg, soil containing a maximum concentration that is less than 20 mg/kg benzo[a]anthracene could be reused at this location. [Note that due to the lower reportable concentration, RCS-1 receiving locations could only accept soil containing less than 7 mg/kg benzo[a]anthracene.]

The multiplying factors in Table 1 and the MassDEP published natural background levels can be used to establish concentrations of OHM in soil that would be acceptable for reuse at an RCS-1 receiving location, consistent with the requirements of 310 CMR 40.0032(3). Table 2 lists such concentrations. Note that soil that meets the criteria in Table 2 could be re-used at *any* location (RCS-1 or RCS-2). Similarly, Table 3 lists concentrations of OHM in soil that would be acceptable for reuse at an RCS-2 receiving location (but *not* RCS-1 locations).

If a chemical is not listed on these tables, then MassDEP has not established a natural background concentration[5]. This guidance is limited to the use of only MassDEP-published statewide background concentrations. Therefore an alternative approach, such as sampling the receiving location and comparing maximum reported concentrations, would be appropriate to meet the requirements of 310 CMR 40.0032(3).

[5] For example, MassDEP has not established natural background levels for PCBs, volatile organic compounds (VOCs) or petroleum-related constituents.

Table 2.
Limits to the Concentration of OHM In Soil for Re-Use
Assuming Natural Background Conditions at an RCS-1 Receiving Location

OIL OR HAZARDOUS MATERIAL	Concentration In "Natural" Soil mg/kg	Rule-of-Thumb Multiplier	Multiplied Value mg/kg	RCS-1 mg/kg	Limiting[1] Soil Concentration mg/kg	
ACENAPHTHENE	0.5	10	5	4	<	4
ACENAPHTHYLENE	0.5	10	5	1	<	1
ALUMINUM	10,000	2.5	25000		<	25000
ANTHRACENE	1	10	10	1000	<	10
ANTIMONY	1	10	10	20	<	10
ARSENIC	20	7.5	150	20	<	20
BARIUM	50	7.5	375	1000	<	375
BENZO(a)ANTHRACENE	2	10	20	7	<	7
BENZO(a)PYRENE	2	10	20	2	<	2
BENZO(b)FLUORANTHENE	2	10	20	7	<	7
BENZO(g,h,i)PERYLENE	1	10	10	1000	<	10
BENZO(k)FLUORANTHENE	1	10	10	70	<	10
BERYLLIUM	0.4	10	4	90	<	4
CADMIUM	2	10	20	70	<	20
CHROMIUM (TOTAL)	30	7.5	225	100	<	100
CHROMIUM(III)	30	7.5	225	1000	<	225
CHROMIUM(VI)	30	7.5	225	100	<	100
CHRYSENE	2	10	20	70	<	20
COBALT	4	10	40		<	40
COPPER	40	7.5	300		<	300
DIBENZO(a,h)ANTHRACENE	0.5	10	5	0.7	<	0.7
FLUORANTHENE	4	10	40	1000	<	40
FLUORENE	1	10	10	1000	<	10
INDENO(1,2,3-cd)PYRENE	1	10	10	7	<	7
IRON	20,000	2.5	50000		<	50000
LEAD	100	5	500	200	<	200
MAGNESIUM	5,000	2.5	12500		<	12500
MANGANESE	300	5	1500		<	1500
MERCURY	0.3	10	3	20	<	3
METHYLNAPHTHALENE, 2-	0.5	10	5	0.7	<	0.7
NAPHTHALENE	0.5	10	5	4	<	4
NICKEL	20	7.5	150	600	<	150
PHENANTHRENE	3	10	30	10	<	10
PYRENE	4	10	40	1000	<	40
SELENIUM	0.5	10	5	400	<	5
SILVER	0.6	10	6	100	<	6
THALLIUM	0.6	10	6	8	<	6
VANADIUM	30	7.5	225	400	<	225
ZINC	100	5	500	1000	<	500

[1] Concentration of OHM in soil must be LESS THAN (not equal or greater than) this value.

Table 3.
Limits to the Concentration of OHM In Soil for Re-Use
Assuming Natural Background Conditions at an RCS-2 Receiving Location

OIL OR HAZARDOUS MATERIAL	Concentration In "Natural" Soil mg/kg	Rule-of-Thumb Multiplier	Multiplied Value mg/kg	RCS-2 mg/kg	Limiting[1] Soil Concentration mg/kg	
ACENAPHTHENE	0.5	10	5	3000	<	5
ACENAPHTHYLENE	0.5	10	5	10	<	5
ALUMINUM	10,000	2.5	25000		<	25000
ANTHRACENE	1	10	10	3000	<	10
ANTIMONY	1	10	10	30	<	10
ARSENIC	20	7.5	150	20	<	20
BARIUM	50	7.5	375	3000	<	375
BENZO(a)ANTHRACENE	2	10	20	40	<	20
BENZO(a)PYRENE	2	10	20	7	<	7
BENZO(b)FLUORANTHENE	2	10	20	40	<	20
BENZO(g,h,i)PERYLENE	1	10	10	3000	<	10
BENZO(k)FLUORANTHENE	1	10	10	400	<	10
BERYLLIUM	0.4	10	4	200	<	4
CADMIUM	2	10	20	100	<	20
CHROMIUM (TOTAL)	30	7.5	225	200	<	200
CHROMIUM(III)	30	7.5	225	3000	<	225
CHROMIUM(VI)	30	7.5	225	200	<	200
CHRYSENE	2	10	20	400	<	20
COBALT	4	10	40		<	40
COPPER	40	7.5	300		<	300
DIBENZO(a,h)ANTHRACENE	0.5	10	5	4	<	4
FLUORANTHENE	4	10	40	3000	<	40
FLUORENE	1	10	10	3000	<	10
INDENO(1,2,3-cd)PYRENE	1	10	10	40	<	10
IRON	20,000	2.5	50000		<	50000
LEAD	100	5	500	600	<	500
MAGNESIUM	5,000	2.5	12500		<	12500
MANGANESE	300	5	1500		<	1500
MERCURY	0.3	10	3	30	<	3
METHYLNAPHTHALENE, 2-	0.5	10	5	80	<	5
NAPHTHALENE	0.5	10	5	20	<	5
NICKEL	20	7.5	150	1000	<	150
PHENANTHRENE	3	10	30	1000	<	30
PYRENE	4	10	40	3000	<	40
SELENIUM	0.5	10	5	700	<	5
SILVER	0.6	10	6	200	<	6
THALLIUM	0.6	10	6	60	<	6
VANADIUM	30	7.5	225	700	<	225
ZINC	100	5	500	3000	<	500

[1] Concentration of OHM in soil must be LESS THAN (not equal or greater than) this value.

V. Sampling Considerations

The soil proposed for disposal/re-use should be sampled at sufficient and adequately distributed locations so that the concentrations of the contaminants of concern in the soil are adequately characterized. This includes sampling for the purpose of MCP site assessment and sampling to characterize the soil in any given stockpile/shipment leaving the site. The factors listed below should be considered when developing and implementing such a sampling plan. Evaluation of release, source, and site specific conditions assist in developing the basis for the selection of field screening techniques, sampling methodologies, sampling frequencies, and the contaminants of concern (e.g., analytical parameters) used to characterize the soil. These include, but are not necessarily limited to the following:

- the type(s) and likely constituents known or suspected to be in the soil;
- current and former site uses, past incidents involving the spill or release of OHM, and past and present management practices of OHM at the site;
- the potential for the soil to contain listed hazardous waste or to be a characteristic hazardous waste;
- the presence or likelihood of any other OHM (e.g., chlorinated solvents, metals, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs) , halogenated volatile organic compounds (VOCs));
- visual/olfactory observations, field screening, analytical data, and/or in-situ pre-characterization data;
- soil matrix type - naturally occurring soil or fill/soil mixtures (e.g., homogeneous or heterogeneous soil conditions);
- the identification and segregation of discrete "hot spots";
- the concentration variability in the soil;
- the volume of soil;
- the current and likely future exposure potential at the receiving location, including the potential for sensitive receptors, such as young children, to contact the soil (for example, more extensive sampling of the stockpiles would be warranted for soil slated to be moved to a residential setting than for soil being moved to a secure, low-exposure potential regulated receiving facility); and
- any sampling requirements stipulated by the receiving location.

The assessment of the soil, including the nature and concentrations of OHM therein, is a component of the MCP site assessment and therefore must meet all applicable performance standards, including those for environmental sample collection, analysis and data usability[6]. The assessment should address the precision, accuracy, completeness, representativeness, and comparability of the sampling and analytical results used to determine whether the soil

[6] Additional guidance on data usability is available in Policy #WSC-07-350, MCP Representativeness Evaluations and Data Usability Assessments. http://www.mass.gov/eea/docs/dep/cleanup/laws/07-350.pdf

stockpiles meet the Similar Soils Provision requirements. The representativeness of any site assessment sampling data if used to characterize contaminant concentrations in soil to be moved and reused offsite should be carefully evaluated. Additional guidance on soil sampling considerations is available from U.S. EPA and other state environmental agencies.[7]

VI. Segregation and Management of Soils of Different Known Quality

Soil containing concentrations of OHM equal to or greater than the values listed in Table 3 cannot be managed using the streamlined approach described in this guidance. Such soil must be managed in a manner consistent with its regulatory classification, which may include management as a hazardous waste, as a remediation waste, or under a case-specific Similar Soils determination.

Segregation of soil of different quality should occur based upon *in-situ* pre-characterization sampling results. Stockpiles of soil are mixtures that would require more extensive sampling to document the effectiveness of any attempted post-excavation segregation.

The known presence of soil that exceeds the Table 3 concentrations and the subsequent segregation of soil is one factor that would indicate the need for more frequent sampling (at least in that area of soil excavation) as described in Section V.

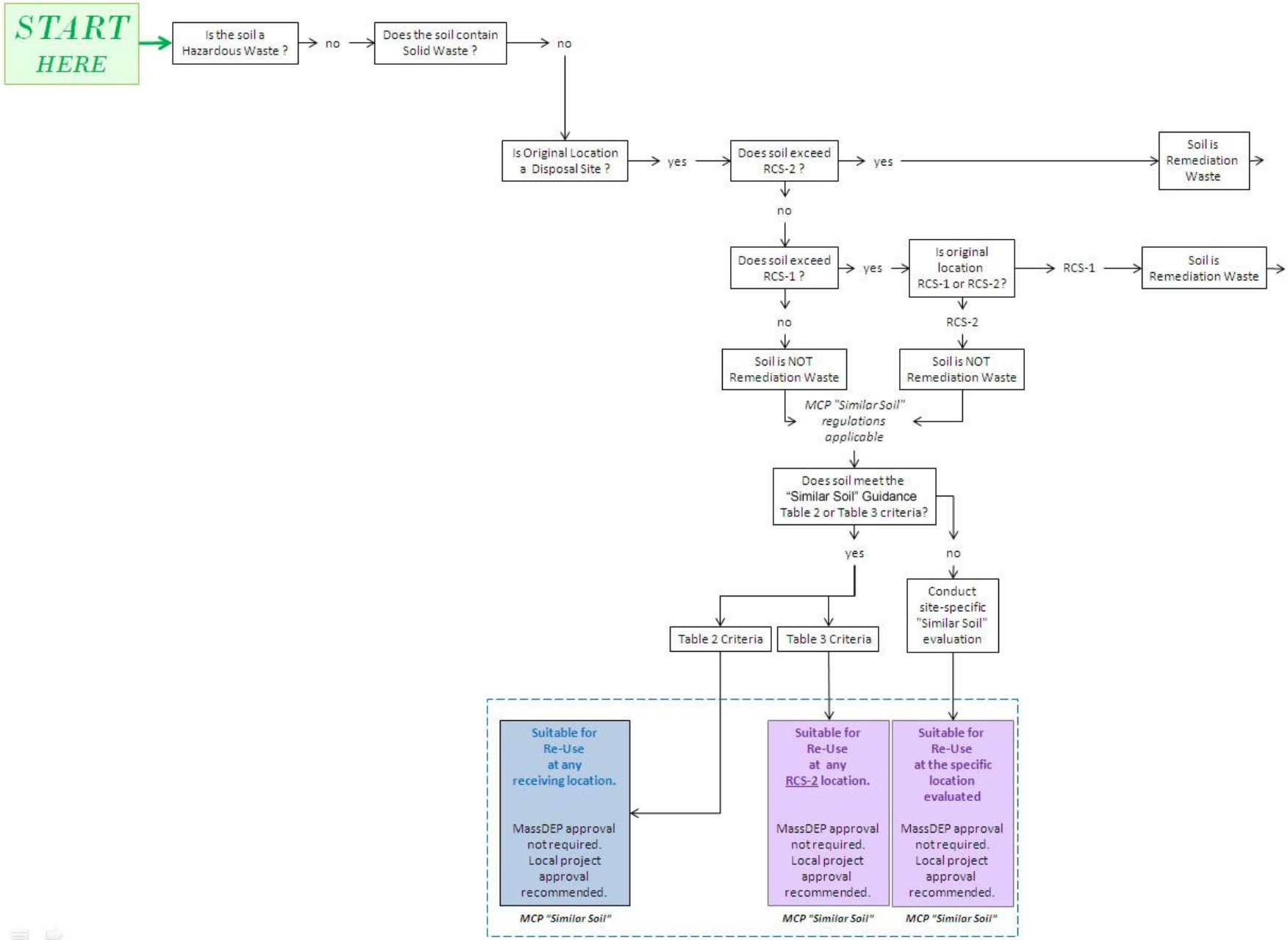
[7] Note that the guidance below are not specific to MGL Chapter 21E disposal sites and may not reflect MCP-specific considerations to determine the suitability of soils for offsite transport and use, such as for residential and other S-1 locations.

NJDEP. 2011. Alternative and Clean Fill Guidance for SRP Sites.
New Jersey Department of Environmental Protection Site Remediation Program
http://www.state.nj.us/dep/srp/guidance/srra/fill_protocol.pdf

USEPA. 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term.
Office of Solid Waste and Emergency Response (OSWER), Washington, DC
http://www.epa.gov/oswer/riskassessment/pdf/1992_0622_concentrationterm.pdf

USEPA. 1995. Superfund Program Representative Sampling Guidance Volume 1: Soil.
OSWER. Washington, DC.
(Note that guidance for determining the number of samples for statistical analysis is addressed in Section 5.4.1).
http://www.epa.gov/tio/download/char/sf_rep_samp_guid_soil.pdf

Attachment 1 – Similar Soil Flowchart



Massachusetts Department of ENVIRONMENTAL PROTECTION

t e c h n i c a l u p d a t e

Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil

Updates: Section 2.3 *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1992)

Discussion

Polycyclic Aromatic Hydrocarbons ("PAHs") are ubiquitous and consistently present in the environment and are typically formed during the incomplete burning of organic material including wood, coal, oil, gasoline and garbage. PAHs are also found in crude oil, coal tar, creosote and asphalt. Historically, PAHs have been associated with human activities such as cooking, heating homes and industries and fuel for operating automobiles, although low levels of PAHs are also present in the environment from natural sources, such as forest fires. Their presence in the environment at higher concentrations is an artifact of habitation and is due to the widespread practice of emptying fireplaces, stoves, boilers, garbage, etc. in rural and urban areas over the past several hundred years. As a result, it is very common to detect "background" levels of PAHs in soils. Metals are both naturally occurring and found in man-made materials (such as paint, fuel, fertilizers and pesticides) widely distributed in the environment. Naturally occurring metals present in wood and coal are often found concentrated in ash residue.

DEP has obtained background data from various sources documenting the concentrations of PAHs and metals in soil affected by human activities, particularly soil associated with wood ash and coal ash. These levels are representative of typical concentrations found in areas with fill material, *not* pristine conditions. DEP has also compiled background soil data for metals that are representative of undisturbed, natural conditions.

The identification of generic values for PAHs and metals in soil is intended to streamline the risk characterization process (310 CMR 40.0900) and determination of applicable Response Action Outcome Category (310 CMR 40.1000). Nothing in this Technical Update obviates the need to establish location-specific background conditions for other purposes, such as compliance with the anti-degradation provisions of the Massachusetts Contingency Plan ("MCP") described at 310 CMR 40.0032(3).

Definition of Background (310 CMR 40.0006)

Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

(a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecological conditions, or atmospheric deposition of industrial process or engine emissions;
(b) attributable to coal ash or wood ash associated with fill material;
(c) releases to groundwater from a public water supply system; or
(d) petroleum residues that are incidental to the normal operation of motor vehicles.

Basis of the Background Levels for Soil

The background levels were selected following an analysis of several datasets, including:

- Data (30-140 samples) collected to represent background at c.21E sites located in non-urban areas, gathered from a review of DEP files,
- Site-specific background samples generated for locations in Worcester (68 samples) and Watertown (17 samples),
- Data (750-1,000 samples) collected by Mass Highway Department as part of the Central Artery/Tunnel (CA/T) project and presented in a draft document *Background Soil Contaminant Assessment* (CDM, April 1996),
- Data (590 natural soil samples from depths of 10 to 70 feet) collected by Haley & Aldrich, Inc. in the Boston Area
- Preliminary data compiled by the Massachusetts Licensed Site professional Association from background data submitted by its members,
- Published data (62 samples) from ENSR, Inc. from 3 New England locations, and
- Generic background data published by the Agency for Toxic Substances and Disease Registry (ATSDR).

There is not one concentration of a chemical, of course, which can correctly be labeled ***the*** background level. Hundreds of years of human activities have only broadened the naturally occurring range of concentrations reported as "background", and this range is best thought of as a statistical distribution. In the evaluation of environmental contamination, we often select point values from the range of background levels, and consider these to be representative of background. The use of such point-value "background" levels is essentially a short-cut method that allows consideration of background in the absence of site-specific information. The intent of DEP policy is to protect public health while minimizing the routine site-specific determinations at sites in the statewide cleanup program.

"Natural" Soil

- Generally, the 90th percentile value from the MA DEP 1995 dataset was the point-value identified as background.
- In the absence of data in the MA DEP 1995 dataset, a lower percentile value from the CDM 1996 dataset was chosen as background.

Soil Containing Fill Material

- Generally, the 90th percentile value from the CDM 1996 dataset was point-value identified as background.
- In the absence of data in the CDM 1996 dataset, the 90th percentile value from the "natural" soil (MA DEP, 1995) dataset was chosen as background.

Applicability of the Values Listed in Table 1

Table 1 presents two lists of background concentrations: one for use with natural soils, and the second for use with soils containing either coal ash or wood ash associated with fill material, or other material consistent with the regulatory definition of background. The list for use with natural soils may be compared to site soil concentrations with no site-specific justification. The use of the list for soil containing fill material must be accompanied by documentation that the soil at the site does, in fact, contain coal ash or wood ash associated with fill material (or other material consistent with the regulatory definition of background). Such documentation may include information about the site history, soil strata, physical evidence or visual observations (including microscopic).

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Elevated chemical concentrations and/or and urban setting are not, *per se*, sufficient evidence to justify use of the higher background levels.

Comparison of Site Concentrations to the Background Levels for Soil

Section 2.3 of the DEP's *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1995) describes the use of DEP-published generic background values. If the site investigation indicates the presence of fill material in the soil, and *all* reported concentrations of an oil or hazardous material ("OHM") fall below the applicable value published in Table 1, then it may concluded that the OHM is present at background concentrations. In other words, the values published in Table 1 are to be compared to the maximum reported concentration at the site. This Technical Update does not modify or change this comparison.

Table 1 lists background levels for "natural" soil and for soil containing coal ash and wood ash associated with fill material. A detailed summary of the data is attached in Appendix A. The applicability of these background concentrations to a site should be determined based upon the presence or absence of fill material containing coal ash or wood ash. If all contaminant concentrations are found to be equal to or less than the applicable background concentrations, a Class A-1 Response Action Outcome may be an option at the site, and no Activity and Use Limitation is required.

Background Concentrations Different Than The MADEP-Published Values

Appendix A describes the wide ranges seen in the distributions of background concentrations. MADEP's choice of point values within these ranges balances the need to eliminate background chemicals from the risk assessment with the need to retain for evaluation those chemicals whose presence is related to the disposal practices at the site.

It is inevitable that at some sites the use of the values listed in Table 1 will incorrectly require the assessment of some "true" background concentrations of OHM at the high end of the background range. Conversely, some chemicals that *are* related to the disposal practices at a site (and are not background) will be screened out of the risk assessment by the use of the Table 1 concentrations. The goal is to minimize **both** kinds of error.

In many cases, additional information about the location of the site, the nature of the soils or the known or suspected disposal practices may be used to justify the application of different literature values or site-specific background information. DEP's adoption of the generic, statewide values presented in this Technical Update does not negate the validity of site-specific background information, when such information is available and of appropriate data quality. The level of effort necessary for such a justification will depend on the specific circumstances. For example, such a justification would be straightforward for elevated arsenic concentrations in soil at a gasoline-release site in an area of the state known to have geological formations rich in arsenic. The level of effort would be significantly higher at a tannery site in the same area due to the facility's historic use of arsenic. Similarly, the presence of elevated chromium or barium concentrations in marine clay deposits could generally be attributable to natural background absent known or suspected sources of the chemical at the site.

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Minimizing Exposure to Soils Containing Elevated Background Material and/or Material Exempt from M.G.L. c.21E

As discussed in this Technical Update, M.G.L. Chapter 21E and the Massachusetts Contingency Plan (the statute and regulations) do not require remediation of chemicals present at levels consistent with background, even if such concentrations would otherwise pose a significant risk of harm to health, safety, public welfare or the environment. The statute also exempts several other environmental conditions (such as lead from lead paint or gasoline and pesticides applied according to their label) that could pose a Significant Risk.

While such conditions are not subject to regulation by DEP, the Department encourages parties to mitigate potential exposures whenever possible. Such mitigation measures could include:

- providing clean soil (down to a depth of 3 feet) in residential settings, and
- providing clean corridors for utility lines.

For Further Information

For further information about this Technical Update, please contact Paul W. Locke, Massachusetts Department of Environmental Protection, One Winter Street, Boston, MA 02108, telephone: (617) 556-1052, email: Paul.Locke@state.ma.us.

References

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Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108-4746

Commonwealth of Massachusetts
Jane Swift, Governor

Executive Office of Environmental Affairs
Bob Durand, Secretary

Department of Environmental Protection
Lauren A. Liss, Commissioner

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Table 1.

MADEP Identified Background Levels in Soil

OIL OR HAZARDOUS MATERIAL	Concentration in "Natural" Soil mg/kg	Concentration in Soil Containing Coal Ash or Wood Ash Associated With Fill Material mg/kg
ACENAPHTHENE[2]	0.5	2
ACENAPHTHYLENE[2]	0.5	1
ANTHRACENE[2]	1	4
ALUMINUM[1]	10,000	10,000
ANTIMONY	1	7
ARSENIC	20	20
BARIUM[1]	50	50
BENZO(a)ANTHRACENE[2]	2	9
BENZO(a)PYRENE[2]	2	7
BENZO(b)FLUORANTHENE[2]	2	8
BENZO(g,h,i)PERYLENE[2]	1	3
BENZO(k)FLUORANTHENE[2]	1	4
BERYLLIUM	0.4	0.9
CADMIUM	2	3
CHROMIUM (TOTAL)	30	40
CHROMIUM(III)	30	40
CHROMIUM(VI)	30	40
CHRYSENE[2]	2	7
COBALT[1]	4	4
COPPER	40	200
DIBENZO(a,h)ANTHRACENE[2]	0.5	1
FLUORANTHENE[2]	4	10
FLUORENE[2]	1	2
INDENO(1,2,3-cd)PYRENE[2]	1	3
IRON[1]	20,000	20,000
LEAD	100	600
MAGNESIUM[1]	5,000	5,000
MANGANESE[1]	300	300
MERCURY	0.3	1
METHYLNAPHTHALENE, 2-[2]	0.5	1
NAPHTHALENE[2]	0.5	1
NICKEL	20	30
PHENANTHRENE[2]	3	20
PYRENE[2]	4	20
SELENIUM	0.5	1
SILVER	0.6	5
THALLIUM	0.6	5
VANADIUM[1]	30	30
ZINC	100	300

(Values rounded to one significant figure.)

[1] In the absence of fill-specific data, the "natural" soil value has been adopted.

[2] In the absence of data specific to "natural" soil, a lower percentile value from the fill data set has been adopted.

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Levels of PAHs and Metals in Soil from Various Datasets
Appendix A - Detailed Data Summary

	Number of Samples	Geometric Mean or Median mg/kg	Minimum mg/kg	50th mg/kg	90th mg/kg	95th mg/kg	Maximum mg/kg
			<---------- PERCENTILES ---------->				
Total PAHs							
CA/T Project	873	2.7	0.08	2.6	92	230	3000
ENSR - Urban Soils	62	10.97	2.292				167
Total Carcingenic PAHs							
CA/T Project	873	1.5	0.022	1.1	42	95	1200
ENSR - Urban Soils	62	4.86	0.68				78
Total Noncarcinogenic PAHs							
CA/T Project	873	1.9	0.08	1.6	54	140	1900
ENSR - Urban Soils	62	6.11	1.612				89
Acenaphthene							
CA/T Project	868	0.18	0.024	0.18	1.9	4.1	42
Med City/Mill Brook	67	NC	ND (64)	NC	NC	NC	1.7
ENSR - Urban Soils	62	0.128	ND (32)				3.4
Acenaphthylene							
CA/T Project	869	0.17	0.037	0.17	1	1.9	10
Med City/Mill Brook	67	NC	ND (65)	NC	NC	NC	0.76
ENSR - Urban Soils	62	0.133	ND (38)				1.1
Anthracene							
CA/T Project	872	0.2	0.033	0.2	3.8	10	130
Med City/Mill Brook	68	NC	ND (52)	NC	0.592	1.2	3.4
ENSR - Urban Soils	62	0.184	ND (8)				5.7
Benzo[a]pyrene							
CA/T Project	873	0.3	0.031	0.3	7.4	17	230
LSPA Project	489	0.44	ND (220)	0.44	15.3	NC	222
Watertown	17	0.95	0.6	NC	3.39	4.77	6.08
Med City/Mill Brook	67	NC	ND (43)	NC	2.02	3.3	9.7
ENSR - Urban Soils	62	0.686	ND (5)				13
ATSDR Range:			0.165				0.22
Benzo[a]anthracene							
CA/T Project	872	0.33	0.045	0.33	8.5	19	250
LSPA Project	490	0.563	ND (206)	0.563	17.6	NC	796
Watertown	17	0.411	0.021	0.48	2.52	6.04	6.05
Med City/Mill Brook	68	NC	ND (38)	NC	2.39	3.8	15
ENSR - Urban Soils	62	0.672	ND (4)				15
ATSDR Range:			0.169				59
Benzo[b]fluoranthene							
CA/T Project	873	0.68	0.045	0.4	8.4	18	270
LSPA Project	486	NC	ND (258)	NC	11	NC	250
Watertown	17	1.4	0.6	0.6	6.78	6.79	7.08
ENSR - Urban Soil	62	0.722	ND (7)				12
ATSDR Range:			15				62

Levels of PAHs and Metals in Soil from Various Datasets
Appendix A - Detailed Data Summary

	Number of Samples	Geometric Mean or Median mg/kg	Minimum mg/kg	50th mg/kg	90th mg/kg	95th mg/kg	Maximum mg/kg
			<---------- PERCENTILES ---------->				
Benzo[g,h,i]perylene							
CA/T Project	871	0.2	0.045	0.2	3.1	7.7	77
Med City/Mill Brook	67	NC	ND (52)	NC	1.2	1.41	5.2
ENSR - Urban Soil	62	0.461	ND (26)				5.9
ATSDR Range:			0.9				47
Benzo[k]fluoranthene							
CA/T Project	869	0.21	0.045	0.21	4	9.7	150
LSPA Project	475	NC	ND (289)	NC	11.4	NC	110
Watertown	17	0.502	0.065	0.406	3.35	4.47	5.13
ENSR - Urban Soil	62	0.834	ND (3)				25
ATSDR Range:			0.3				26
Chrysene							
CA/T Project	873	0.35	0.022	0.35	7.3	18	240
LSPA Project	490	0.59	ND (204)	0.59	20.3	NC	420
Watertown	17	0.32	0.016	0.404	4.55	5.06	6.6
Med City/Mill Brook	68	NC	ND (42)	NC	2.1	3.6	14
ENSR - Urban Soil	62	0.844	ND (2)				21
ATSDR Range:			0.251				0.64
Dibenzo[a,h]anthracene							
CA/T Project	866	0.17	0.045	0.17	1.1	2.1	39
Watertown	17	0.195	0.155	NC	0.494	0.604	0.64
Med City/Mill Brook	68	NC	ND (65)	NC	NC	NC	1.6
ENSR - Urban Soils	62	0.245	ND (30)				2.9
Fluoranthene							
CA/T Project	873	0.89	0.035	0.61	14	33	490
Med City/Mill Brook	68	NC	ND (32)	0.376	4.2	11	40
ENSR - Urban Soils	62	1.38	ND (2)				39
ATSDR Range:			0.2				166
Fluorene							
CA/T Project	873	0.18	0.028	0.18	2.3	5.5	79
Med City/Mill Brook	68	NC	ND (65)	NC	NC	NC	2
ENSR - Urban Soils	62	0.141	ND (27)				3.3
Indeno[1,2,3-cd]pyrene							
CA/T Project	871	0.2	0.022	0.2	2.8	7	100
LSPA Project	475	NC	ND (304)	NC	6.3	NC	130
Watertown	17	1.752	1.2	NC	5.64	6.2	7.2
Med City/Mill Brook	68	NC	ND (50)	NC	1.5	2	6
ENSR - Urban Soil	62	0.532	ND (19)				6
ATSDR Range:			8				61
2-Methylnaphthalene							
CA/T Project	789	0.15	0.03	0.15	0.96	2.2	13
Med City/Mill Brook	68		ND (67)	NC	NC	NC	0.77
ENSR - Urban Soil	62	0.121	ND (43)				0.64

Levels of PAHs and Metals in Soil from Various Datasets
Appendix A - Detailed Data Summary

	Number of Samples	Geometric Mean or Median mg/kg	Minimum mg/kg	50th mg/kg	90th mg/kg	95th mg/kg	Maximum mg/kg
			<---------- PERCENTILES ---------->				
Naphthalene							
CA/T Project	867	0.17	0.016	0.17	1.4	3	28
Med City/Mill Brook	68	NC	ND (65)	NC	NC	NC	1.9
ENSR - Urban Soils	62	0.0917	ND (27)				0.66
Phenanthrene							
CA/T Project	873	0.8	0.029	0.47	15	38	480
Med City/Mill Brook	68	NC	ND (38)	NC	2.7	5.6	16
ENSR - Urban Soils	62	0.788	ND (1)				36
Pyrene							
CA/T Project	873	0.89	0.034	0.61	16	35	440
Med City/Mill Brook	68	NC	ND (32)	0.343	4.29	9	30
ENSR - Urban Soil	62	1.54	ND (1)				11
ATSDR Range:			0.145				147
Aluminum							
DEP 1995	30	5536	387	7800	13000	16000	24000
Antimony							
DEP 1995	90	0.2	ND (0.002)	0.34	1.4	4.8	22
CA/T Project	746	NC	0.25	1	7	12	160
Arsenic							
DEP 1995	139	4.7	ND (0.1)	4.8	16.7	24.5	99
CA/T Project	754	5.3	0.25	5.4	14	21	99
H&A 2001	589	5.5	ND	5.57	11	12.9	23
Barium							
DEP 1995	64	15	0.42	15.7	45.2	52.8	104
H&A 2001	490	35	ND	35.7	80.9	89.3	680
Beryllium							
DEP 1995	103	0.21	0.03	0.23	0.39	0.53	1.6
CA/T Project	746	0.5	0.03	0.5	0.88	2	7.5
H&A 2001	22	0.5	ND	0.63	1.15	1.2	1.3
Cadmium							
DEP 1995	127	0.43	ND (0.01)	0.29	2.06	3.4	5.9
CA/T Project	756	0.5	0.1	0.5	3	5	25
H&A 2001	572	1.8	ND	1.26	1.63	1.63	3
Chromium							
DEP 1995	147	10.3	0.02	10.6	28.6	38.8	105
CA/T Project	756	13	1	15	39	50	530
H&A 2001	589	22	ND	22	43.9	49.6	94
Cobalt							
DEP 1995	10	0.8	ND (0.5)	NC	4.4	4.5	4.7
Copper							
DEP 1995	103	7.7	ND (0.5)	7.3	37.7	56.1	160
CA/T Project	742	34	1	30	170	320	5300
H&A 2001	22	26	6	27	47.5	64.5	130

Levels of PAHs and Metals in Soil from Various Datasets
Appendix A - Detailed Data Summary

	Number of Samples	Geometric Mean or Median mg/kg	Minimum mg/kg	50th mg/kg	90th mg/kg	95th mg/kg	Maximum mg/kg
			<---------- PERCENTILES ---------->				
Iron							
DEP 1995	30	6031	444	7200	17000	22500	50000
Lead							
DEP 1995	141	19.5	1	19.1	98.7	158	326
CA/T Project	850	51	0.05	53	570	1100	11000
LSPA Project	457	83	ND (5)	83	640	NC	10600
H&A 2001	583	15	ND	24.4	78.9	112	300
Magnesium							
DEP 1995	30	1028	ND (250)	1300	4900	6700	11000
Manganese							
DEP 1995	30	81.5	ND (3)	110	300	365	460
Mercury							
DEP 1995	107	0.043	ND (0.0002)	0.066	0.28	0.43	1.4
CA/T Project	785	0.15	0.001	0.15	1.4	2.6	23
H&A 2001	583	0.2	ND	0.19	0.74	1.1	2.5
Nickel							
DEP 1995	103	4.6	ND (0.5)	5.1	16.6	22.7	48
CA/T Project	740	14	1	14	31	41	220
H&A 2001	22	34.5	5	35	67.5	70	101
Selenium							
DEP 1995	93	0.1	ND (0.0005)	0.17	0.5	1	4.6
CA/T Project	756	0.5	0.1	0.5	1	2.1	57
H&A 2001	426	0.84	ND	0.74	1.36	1.58	2.8
Silver							
DEP 1995	117	0.09	ND (0.003)	0.07	0.58	0.91	82
CA/T Project	756	1	0.19	1	5	7.3	81
H&A 2001	335	0.64	ND	NC	NC	NC	0.64
Thallium							
DEP 1995	71	0.1	ND (0.005)	NC	0.6	1.65	5
CA/T Project	734	NC	0.035	1	5	5	50
Vanadium							
DEP 1995	30	7.6	ND (1)	10.3	28.5	38.5	46.6
Zinc							
DEP 1995	112	29.3	3.52	27.7	116.4	131.2	190
CA/T Project	746	84	5.8	73	340	590	5000
H&A 2001	22	67	15	58.5	103	106	120

APPENDIX D
SOIL DISPOSAL PROFILE PACKAGE INFORMATION

LIGHTHOUSE
ENVIRONMENTAL
MANAGEMENT LLC

THE GREEN BUILDING
184 Stone Street, Clinton, MA 01510

SOIL REUSE SUBMITTAL FORM

PROFILE NUMBER _____
(LIGHTHOUSE USE)

A. SITE INFORMATION:

Name:	Contact:
Address:	Phone:
City:	State, Zip:
Release Tracking No. or Site ID No. (if applicable):	

B. GENERATOR INFORMATION:

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

C. CONSULTANT INFORMATION:

Company:	Contact:
Address:	Phone:
City:	State, Zip:

D. ESTIMATED SOIL QUANTITY:

Tons:	or	Cubic Yards:

C. 617.699.5245 | Ph. 978.706.1782 | Fx. 978.706.1784 | kevin@lighthousemgmt.com | www.lighthousemgmt.com

LIGHTHOUSE
ENVIRONMENTAL
MANAGEMENT LLC

THE GREEN BUILDING
184 Stone Street, Clinton, MA 01510

E. LABORATORY ANALYSIS

Check the following laboratory analysis performed on the material to be reused (check all that apply)

☐ VOCs, SVOCs, TPH, PCBs
☐ MCP14 Metals
☐ TCLP (if required by total levels)
☐ Conductivity
☐ Ignitability/Flash Point
☐ Pesticides
☐ pH
☐ Reactivity
☐ Herbicides
☐ Other laboratory analysis performed:

_____

☐ Field screening performed (describe below)

_____

☐ Attach data summary tables for all soil from source and laboratory reports for only applicable samples

F. SITE HISTORY:

☐ Check if extra sheet attached

Current Use(s):
Past Use(s):

Check additional site history/uses below. Provide additional description as needed:

Tannery Yes ___ No ___
Textiles Yes ___ No ___
Foundry Yes ___ No ___
Dry Cleaning Yes ___ No ___
Coal Gasification Yes ___ No ___
Machine Shop Yes ___ No ___
Salvage/Junk Yard Yes ___ No ___
Petroleum Storage Yes ___ No ___
Plating/metal finishing Yes ___ No ___
Chemical Production Yes ___ No ___
Circuit Board Manufacturer Yes ___ No ___
Herbicide or Pesticide use, storage, or disposal Yes ___ No ___
Historic Urban Fill Soil present Yes ___ No ___
Boston Blue Clay present Yes ___ No ___
Soil with elevated natural background of Arsenic or other constituents Yes ___ No ___
Dumping Ground for dredge spoils, fill soil, ash waste, or other waste Yes ___ No ___
Source of soil is on an MCP Disposal Site RTN _____
Source of soil is adjacent/near to an MCP Disposal Site RTNs _____

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184 Stone Street, Clinton, MA 01510

G. PHYSICAL SOIL DESCRIPTION:

Physical Description (sand, gravel, silt, peat, fill, clay etc.):

Check if the following materials are present (check all that apply):

☐ Clay ☐ Coal ☐ Ash
☐ Construction Debris ☐ Vegetative Matter ☐ Other Material: _____

H. SOIL SAMPLING METHODOLOGY:

Sampling Methods (check all that apply):

☐ Grab ☐ Composite (Acceptance criteria based on grab samples)
☐ Headspace Screened ☐ Visually Contaminated ☐ Olfactory Contaminated
☐ Other: _____

I. SOIL CHARACTERIZATION METHODOLOGY:

Soil Characterization (check all that apply):

☐ Stockpile ☐ In-situ ☐ Other: _____

No. of Samples Collected:	
"Hotspots" identified (material not suitable for reuse at SITE :	
Describe how "hotspots" were segregated (if applicable):	

J. CERTIFICATION

I, the generator, having used due diligence and determined that the soil described within this Soil Submittal Package and intended for reuse at
Project meets the acceptance criteria, screening procedures, and due diligence described within the Fill Management Plan. There is no reason to suspect or believe soil intended for reuse at this SITE has been impacted by any releases of oil or hazardous materials or contains any other contaminants than those at levels described herein.
I agree to promptly remove any soil delivered to the site that is determined by LIGHTHOUSE ENV MGMT to not meet acceptance criteria. Should LIGHTHOUSE ENV MGMT take action and remove such soil from the site and manage that material elsewhere, LIGHTHOUSE will seek payment from the Generator for all costs including damages.

Signature of Generator:	Date:
Generator - Printed Name:	

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MANAGEMENT LLC

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184 Stone Street, Clinton, MA 01510

K. SITE DIAGRAM:

A site diagram is required indicating any major structures, roads, excavation areas, soil origin, sample locations, and stockpile locations. All sampling locations must be noted:

☐Check if Diagram is Attached

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