

Harbor Point – Parcel 4 Mixed Use
MATERIAL HANDLING AND MANAGEMENT PLAN

*Honeywell Baltimore Works Site
Baltimore, Maryland*

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1.0 INTRODUCTION

Harbor Point Parcel 4 Development, LLC (Developer) and its consultants have prepared this Material Handling and Management Plan (MHMP) in support of the Detailed Development Plan (DDP) for the Harbor Point – Parcel 4 Mixed Use project (or “Project”), on the former AlliedSignal Baltimore Works Site (or “Site”), located in Baltimore, Maryland. This MHMP pertains to the construction of the Harbor Point – Parcel 4 Mixed Use project, consisting of Phase 1: an 8-story podium on the western portion of the Project, containing a 1,292-car parking garage, retail spaces, and apartment units, with a 17-story apartment tower atop the southwestern portion of the podium. Phase 1 will also include a linear park constructed adjacently east of the garage/apartment building. In future Phase 2, an 8-story hotel will be built on the eastern portion of the Project, east of the linear park.

1.1 PURPOSE

The MHMP addresses the handling and management of solids (asphalt, stone aggregates, concrete, wood debris, and soil) and liquids (stormwater, decontamination water, and groundwater) that may be encountered during the intrusive activities at the Project, including the methods to be utilized for material handling, segregating, storing, waste profiling, transporting, and disposing waste. For the purposes of the DDP, “intrusive activities” are defined as the initiation of ground surface penetration, continuing to the completion of all intrusive activities, restoration of the caps, removal of controlled soil and debris, and completion of surface cleanup activities following the removal of controlled materials from the Project.

1.2 CONSISTENCY WITH OTHER PLANS

This MHMP serves as an Environmental Control Document, as a component of the DDP for the Project. Other Environmental Control Documents include the following.

- The Construction Air Monitoring Plan (CAMP) and Health and Safety Plan (HASP) specifies air monitoring and response actions to ensure the safety of workers and the public during construction related to potential airborne contaminants.
- The Spill Prevention and Response Plan (SPRP) is intended prevent hazardous material and petroleum product discharges (i.e., spills) from occurring, and mitigate the effects of a discharge, should one occur.
- The Health and Safety Plan (HASP) Guidance is intended to address worker safety related to potential exposure to environmental constituents of concern and can be used, as appropriate, by Contractors engaged in preparing bids and contractor-specific HASPs.
- The Stormwater Pollution Prevention Plan (SWPPP) provides an evaluation of potential pollution sources at the Project that could come in contact with stormwater and specifies appropriate measures to mitigate or control the discharge of pollutants in stormwater runoff.

1.3 BACKGROUND

The Site is located on a peninsula on the northeast shore of the Patapsco River of the Inner Harbor in the Fells Point section of Baltimore City. The Site consists of three Areas. Area 1 is the principal site of

Honeywell's (formerly AlliedSignal) Baltimore Works Facility which included chromium processing production and support buildings on an area that covered approximately 16 acres. Prior to acquisition by Honeywell, Areas 2 and 3 were used for various industrial and warehousing operations, including chrome ore storage (Area 2) and brass foundry casting, oil blending and storage, coating/plastics production, lumber storage, and foundry (Area 3).

The principal contaminant of concern in Area 1 is hexavalent chromium (CrVI). An Environmental Remediation System (ERS) is maintained and operated by Honeywell International Inc. (Honeywell) to contain CrVI-impacted groundwater in Area 1 pursuant to the requirements of the Consent Decree by and between Honeywell, the U.S. Department of Justice, the United States Environmental Protection Agency (USEPA), and the Maryland Department of the Environment (MDE). The ERS consists of a Multimedia Cap (MMC), Hydraulic Barrier (HB), Head Maintenance System (HMS), a groundwater storage and transfer system, and the Outboard Embankment in Area 1; the layered soil cap (LSC) in Area 2; and the soil cap on the former Silver North and Silver South parcels in Area 3.

Historical sampling and analysis data from the Project area (Area 3 and non-designated areas) have identified elevated concentrations of some parameters, mainly including metals (lead and chromium), petroleum, and some polycyclic aromatic hydrocarbons (PAHs). The more significant soil contamination was found on the eastern portion of the Project, which necessitated the Area 3 cap. Some groundwater sampling has also identified elevated total chromium concentrations, although the primary area with chromium impacts is west of the Project, on Area 1.

In September 2019, additional environmental sampling and analysis were performed relevant to the Project footprint, resulting in additional data for the Project. These results are summarized in a report titled *Groundwater Evaluation and Soil Waste Characterization Summary*, dated September 6, 2019. The evaluation included groundwater samples collected from four soil borings. The results indicated total chromium concentrations ranging from 870 micrograms per liter ($\mu\text{g/L}$) to 47,000 $\mu\text{g/L}$. No detectable hexavalent chromium concentrations were reported.

1.4 EXISTING CONDITIONS

The Project contains an asphalt paved parking lot that was constructed in 2003 for Cirque de Soleil and is currently used for temporary surface parking for nearby developments. Several temporary trailers are located along the western site of the Project, and a stormwater management basin is located on the northern portion of the Project. The southeastern portion of the Project contains a sanitary sewer pump station, situated on the former 950 South Caroline Street parcel. The C-Series DDP Drawings show the Project. Drawing EN1.01 shows including Area 1, Area 3, the existing Environmental Remediation System (ERS), and other pertinent Site features.

2.0 ENVIRONMENTAL REQUIREMENTS

The overall Site development must not interfere with the efficacy of the corrective measures or Honeywell's ability to comply with the performance standards defined in the Consent Decree; the Groundwater Gradient Monitoring Plan; the Surface Water Monitoring Plan; and the Environmental

Media Monitoring Plan. The DDP describes the redevelopment improvements and the means and methods that will be implemented to meet the requirements established in the Consent Decree and its Work Plans, as amended, as well as the Owner/Developer covenants. Honeywell retains responsibility for operating the ERS and monitoring environmental media to demonstrate continued attainment of Consent Decree performance criteria.

The Developer must protect the existing ERS. The Developer's design, construction, and finished improvements shall conform to the requirements of the Consent Decree. Specific requirements include, but are not limited to:

- Environmental controls shall be instituted once the surface is penetrated or removed, including perimeter air monitoring and dust suppression.
- All cap components must be repaired or replaced in any disrupted or penetrated area of the cap, unless otherwise noted on the approved DDP for that development. All repairs must be initiated immediately upon completion of work or discovery of damage.
- All imported material must meet MDE residential standards for materials, e.g., imported soil, topsoil, and stone (See Appendix A, MDE Fact Sheet, "VCP - Clean Imported Fill Material"). Copies of all imported fill analyses will be provided to MDE for review, consultation, and approval prior to importing fill.

Excavated soil can only be reused in accordance with the procedures presented in this MHMP and the DDP.

3.0 SOIL AND DEBRIS HANDLING AND MANAGEMENT

3.1 EXCAVATION

The majority of Phase 1 of this Project will not involve disturbance of Area 3, aside from limited areas of utilities and a small portion of the linear park. Phase 2 of the Project will more directly affect Area 3. The procedures presented in this MHMP will apply to both Phase 1 and Phase 2 of the Project; however, if warranted by the specific construction details that will be established once the hotel design work is completed, this MHMP may be modified or amended in the future.

Excavations will be performed to construct the lowest building level, to construct pile caps, and to install utilities. Excavations will be performed with machine and labor methods in a controlled manner to appropriately manage and segregate clean soils from potentially environmentally impacted soils, to the extent such differences are apparent in the field. Excavated soils that exhibit evidence of suspected contamination (e.g., with staining, discoloration, odors, etc.), will be segregated. These identification and segregation tasks will be directed by an environmental technician, with prior experience and site-specified training for the types of contamination that may be encountered. Excavated soils will be managed pursuant to Section 3.0 of this MHMP, including temporary stockpiling procedures in the Controlled Staging Areas (CSAs).

The initial excavations will be for pile caps and grade beams, which typically entail excavations of up to 6 to 8 feet below existing grades. Utility excavations will occur mainly on the eastern and southern Project perimeters, and will generally range from approximately 6 to 15 feet below existing grades.

The construction of the Project constitutes a net export project with regard to cut and fill. Establishing sub-grade for the Project will initially involve cutting 5,000 to 6,000 cubic yards of soil to construct a tower crane pad, the pile caps, the grade beams, and the underground stormwater management structures. Roughly half of that cut soil volume will then be needed to backfill around pile caps and grade beams, and establish subgrade for the building and linear park. The estimated net export volume for the Project is 2,700 cubic yards, assuming cut materials are suitable for reuse.

The majority of the planned excavations will not extend below the historical high water table (as high as Elevation +3.0). Therefore, the Project will not require significant dewatering. The deepest excavation for the garage/apartment building foundation is for the north elevator pile cap, which will require excavation as deep as Elevation -1 to -2. The deepest utility excavation within the Project limits will be to Elevation -5, and the deepest utility excavation outside the Project limits (in Caroline Street) will be to Elevation -8.

For construction activities that involve dewatering, the dewatering duration will be kept to a minimum duration in order to minimize the effects on the HMS in Area 1. In these situations, groundwater elevations across the HB will be closely monitored to determine if additional measures are warranted to limit effects on the HMS, such as installation of temporary sheet piles. Past construction activities in areas near Caroline Street that involved excavating below the water table did not significantly affect the HMS.

Water collected in excavations, whether resulting from groundwater infiltration or rainfall events, will be containerized and tested to determine if it meets discharge criteria pursuant to the applicable MDE discharge permit, or must be managed as a waste requiring off-site transport and disposal. Surface water runoff will be diverted away from the excavations using diversion berms during construction, to minimize dewatering quantities. MDE-approved erosion and sediment control procedures will be followed in areas of open excavations. Groundwater and stormwater that is encountered during excavations will be handled in accordance with Section 4.0 of this MHMP.

3.1.1 AREA 3

In Area 3, the overlying clean cover soils will be segregated from the underlying potentially environmentally impacted soils. Temporary stockpiling of excavated soils in the CSAs is discussed in Section 3.3. Excess soils will be transported and appropriately disposed off-site. The criteria for handling and managing excavated soils in Area 3 is presented below.

1. Soils excavated from the planned development depths in Area 3 (either above or below the warning layer) may be reused as fill under a capped area of the Project without further testing.
2. Soils excavated from Area 3 that are suspected of being contaminated will be stored in the CSAs, pursuant to the MHMP, for characterization and proper off-site disposal, if needed.

3.1.2 NON-DESIGNATED AREAS

The criteria for handling and managing excavated soils in non-designated areas is presented below.

1. Soils excavated from the planned development depths in the non-designated areas may be reused as fill under the garage/residential building, the linear park, or the hotel without further testing (unless suspect contamination is identified).
2. Soils excavated from non-designated areas that are suspected of being contaminated will be stored in the controlled staging areas, pursuant to the MHMP, for characterization and proper off-site disposal, if needed.

3.2 BENEFICIAL REUSE OF SOIL

Materials generated from excavations for the Project will include asphalt, CR-6, No. 57 stone, clean soil, and potentially contaminated soil and debris. Deleterious materials, such as organics, wood, debris, etc., will be segregated and disposed off-site. Materials may be considered for beneficial reuse on the Project (subject to the guidelines of this MHMP). When possible, soil will be placed directly as backfill in locations where fill is required, subject to the sequences for Area 2 and non-designated areas presented in Section 3.1. Otherwise, excavated materials will be either temporarily stockpiled in the CSAs or transported off-site for proper disposal.

Specifications regarding the reuse of these materials and the placement procedures (e.g., geotechnical characteristics, such as moisture content, gradation, lift thicknesses, compaction, etc.) will be assessed by the geotechnical field representative. The environmental characteristics of the materials will be assessed by the environmental technician, including field screening and laboratory analysis, if necessary.

3.3 TEMPORARY STOCKPILING

Any soil and aggregates that are being considered for reuse and are not immediately placed as backfill will be temporarily stockpiled in a designated Controlled Staging Area (CSA). The likely CSA areas are on the eastern portion of the Project footprint, as shown on Drawing EN1.01; however, these areas may be relocated during construction, due to the tight spatial constraints on the Project. The storage area will either be on existing asphalt pavement or will be on a newly installed 3-inch thick asphalt pad. Additionally, an asphalt berm will be installed around the staging areas, and temporary sump pumps will be used in the downslope portion of the bermed areas if precipitation run-off accumulates.

3.4 SUSPECTED CONTAMINATED SOIL TESTING AND DISPOSAL

Soils excavated from below the visual warning layer in Area 3 are suspected of being contaminated and will be stored in lined roll-off containers in the CSA for characterization and proper management. Additionally, any soils or other materials that are excavated from other areas of the Project (other than those discussed above) and exhibit evidence of suspected contamination (e.g., with staining, discoloration, odors, etc.) will also be stored in lined roll-off containers in the CSA for characterization and proper management. Roll-off containers will be covered when wastes are not being added or removed.

The soils will be sampled and analyzed as described in the MDE Voluntary Cleanup Program (VCP) *Innovative Reuse and Beneficial Use of Dredged Material Guidance Document* and *Fill Material and Soil Management Fact Sheet* (the latter is included as Appendix A). The results will be used to determine whether the materials can be beneficially reused on-site or elsewhere or must be transported for off-site disposal at an appropriate disposal facility, such as a non-hazardous waste landfill.

Any excavated debris or removed obstructions will be evaluated for potential contaminants. The object will first be visually assessed, any soil adhering to the object will be removed and segregated, and then suitable waste characterization methods will be followed based on the nature of the item.

The Developer will be responsible for making the appropriate waste profile determination as well as ensuring that all activities associated with waste disposal comply with Federal, State, and local regulations. Waste disposal documentation, including laboratory analyses (if any), waste profiles, and waste acceptance, will be forwarded to USEPA and MDE at the completion of intrusive activities.

In accordance with COMAR 26.13.03.05E, if hazardous waste is generated, it shall be shipped off-site within 90 days of generation of the waste to an approved, permitted facility. Specific provisions, e.g., container labeling, secondary containment, inspection, and recordkeeping, will be followed.

3.5 IMPORTED SOIL AND AGGREGATES

In order to minimize the potential of introducing unacceptable materials onto the Project, it will be necessary to verify through documentation that the material source is appropriate and/or to have the material analyzed for potential contaminants based on the location and history of the source area. It is anticipated that imported materials will be provided by commercial suppliers, only. Commercial suppliers shall provide a certification letter stating the environmentally acceptable historical use(s) of the material source property. Note that a clean fill certification letter will not be sufficient documentation from a soil recycler or broker. For material originating from a soil recycler or broker, sampling and analysis must be performed to determine suitability, unless the original source can be determined and approved as a suitable source without additional sampling. In that case, the soil recycler or broker must also confirm via affidavit that the soil pile consists of soil from that original sole source, with no additional material from another source.

Stone/aggregates that are needed for the construction activities, such as for utility backfill, pavement or building subgrades, etc., will be acquired from standard commercial providers using local quarry sources. A clean fill certification will be obtained for any such materials and provided to MDE for approval prior to being transported to the site.

If any imported soils are needed for construction, they will be sourced from known MDE-approved clean fill sources, or they will be sampled and analyzed based on the requirements of the MDE VCP *Clean Imported Fill Material* guidance document. All sampling plans and data for potential clean fill shall be submitted to MDE for approval prior to use on-site. All imported material must meet MDE Residential Cleanup Standards (RCS) or comparable/acceptable risk-based thresholds approved by MDE.

If the selected commercial supplier maintains records of the source of the selected materials and has implemented a testing program meeting the requirements of the MDE VCP *Clean Imported Fill Material* guidance document, a description of the sampling plan and analytical results may be used to meet the imported material requirements of this plan.

3.6 DUST CONTROL

A Construction Air Monitoring Plan (CAMP) is included in the DDP and specifies methods and procedures for dust control, dust suppression, real-time particulate monitoring, weather data collection, notifications regarding particulate levels, and reporting to demonstrate the effectiveness of the dust control measures implemented during intrusive activities. When particulate levels are elevated, response actions will include stopping dust-generating activities and initiating dust suppression, such as misting with potable water.

Specifically in Area 3, excavation surfaces during intrusive activities will be covered by geotextile as soon as practical during the excavation sequence to limit wind-blown caused dust emissions. Other soil sealing materials such as polyethylene plastic sheeting or foam spray-applied to the slopes of excavation zones may also be utilized. The bottom of the excavation zone will be further sealed by installing either a clean aggregate layer or a mudmat, thereby allowing general construction trade workers to perform work in a clean zone.

3.7 EROSION AND SEDIMENT CONTROLS

Erosion and sediment control at the Project and during construction will be addressed with conventional best management practices, which include silt fence/super silt fence, perimeter berms/swales, stabilized construction entrances, and inlet protection as detailed in the DDP Drawings. Prior to the initiation of any intrusive activities, the erosion and sediment controls and stormwater management features will be installed in accordance with the permit drawings to be prepared and submitted to the City of Baltimore under separate cover, and in accordance with the General Permit to Discharge Stormwater associated with Construction Activities, to be submitted to MDE Water Management Division under separate cover.

Materials brought on-site for the construction entrance and truck wash must meet clean fill requirements (i.e., no recycled material).

Erosion and sediment controls as detailed on the C-Series Drawings will be applied to individual excavations made for pipe pile, clean utility corridor, and pile cap and slab installation, including stormwater diversion berms to reduce or limit run-on into open excavations.

Runoff water collected in sumps will be pumped to nearby portable 21,000-gallon Frac tanks. Further discussion on water handling is provided in Section 4.0.

4.0 WATER MANAGEMENT

As discussed in Section 3.7, erosion and sediment controls will be applied to excavations made for pile cap construction, mass grading, road construction, and utility construction. Two categories of water,

“Contact Water” and “Non-Contact Water”, are anticipated to be managed during intrusive work, as summarized in the following sections.

To minimize the quantity of water to be actively managed and treated off-site, stormwater will be diverted from excavation zones by installing the required erosion and sediment controls as shown on the C-series drawings. This diverted stormwater will be managed through the Erosion and Sediment Control Plan and will not be collected or require management other than as normal, uncontaminated stormwater.

4.1 CONTACT WATER

Groundwater will presumably be encountered in the deepest excavations for the Project (e.g., certain pile caps and utilities). Groundwater may also be encountered in other areas. All groundwater that is managed from excavations will be collected and managed as Contact Water. Stormwater that collects in excavations where groundwater is also present will also be collected and managed as Contact Water. If stormwater is collected in Controlled Staging Areas, and if equipment decontamination water is generated, these liquids will be designated Contact Water. Contact Water will be transferred to a designated double-walled Frac tank. Sump pumps will be operated as needed to convey the collected water. Sumps and conveyance lines will be pumped “dry” to the dedicated Frac tanks for Contact Water. Contact Water will be transferred in double-walled pipes.

It is anticipated that Contact Water will be profiled as RCRA characteristic hazardous waste D007-Chromium for proper off-site disposal. This Contact Water will be held for analytical testing results to ensure proper off-site disposal, presumably at the Honeywell-approved Environmental Quality (EQ) facility (York, PA). In accordance with COMAR 23.13.03.05E, hazardous waste shall be shipped off-site within 90 days of generating the wastes to an approved, permitted facility. Specific provisions (e.g., container labeling, secondary containment, inspection, and record-keeping) will be followed.

To determine the necessary storage capacities for water management, both the 25-year storm event and the 100-year storm event were examined. However, the storage requirements were determined based primarily on the 25-year storm event. When a storm event occurs, the entire footprint of the excavation, including the sloped portions, is considered to receive stormwater. The pump(s) required to dewater the excavation zone(s) will be adequately sized to manage stormwater during the peak intensity rainfall rate of a 25-year storm event.

The maximum area open to stormwater, potentially generating Contact Water, was previously the Area 1 sheet pile reinforcement excavation. This Area 1 sheet pile reinforcement excavation is still being used for this stormwater calculation, because it represents a worst-case scenario for potentially generating Contact Water. The assumed area open to stormwater is 4,000 square feet (a typical area of two large pile caps). The 24-hour rainfall during a 25-year storm event is 5.5 inches, yielding a total volume of 13,700 gallons for these excavations. The 24-hour rainfall during a 100-year storm event is 7.1 inches, yielding a total volume of 17,700 gallons. One Frac tank rated at 21,000 gallons will handle the volume generated by more than one 25-year storm events or one 100-year storm event for such an excavation. In order to provide sufficient storage and redundancy, two Frac tanks (#1 and #2) will be designated for storage of

Contact Water. The Frac tanks for both Contact Water and Non-Contact Water (see Section 4.2 below) will be situated in the CSAs.

4.2 NON-CONTACT WATER

Stormwater that is collected in excavations other than those described for Contact Water, above, will be collected and managed as Non-Contact Water. This will include stormwater that collects and requires management in excavations where groundwater is not present. Sumps and portable pumps will be used to dewater the excavations on an as-needed basis.

Non-Contact Water will be pumped to a designated double-walled Frac tank. Contact Water and Non-Contact Water will not be commingled. Non-Contact Water will be held for analytical testing results to determine proper disposal (Section 4.4). This Non-Contact Water may be discharged to the Baltimore City storm sewer system if, and only if, the laboratory analysis results justify this option when compared to discharge limits as presented in the appropriate MDE discharge Permit. All requirements of the permit for monitoring and discharge limits will be followed. No Contact Water or Non-Contact Water will be discharged to Baltimore City sanitary sewers.

Using the same volumetric calculations as those presented in Section 4.1, and in order to provide sufficient storage and redundancy, two Frac tanks (#3 and #4) will be designated for storage of Non-Contact Water.

4.3 SNOW AND ICE

Snow or ice that collects or is formed consistent with the above parameters for Contact Water and Non-Contact Water will be handled in the manner provided above for the respective Contact or Non-Contact situation. Snow and/or ice will be removed from the area and temporarily stored in lined, sealed containers so that the snow and/or ice can melt. Melted snow and/or ice will be pumped (using double-walled pipes) from the lined containers to the Contact Water or Non-Contact Water Frac tanks for testing to determine the appropriate disposal action.

4.4 WATER TESTING

Contact Water will be tested for characterization and disposal purposes. No Contact Water will be discharged to Baltimore City sanitary or storm sewers. Contact water will be properly disposed off-site at EQ.

Non-Contact Water will be test pursuant to the requirements of the appropriate MDE discharge permit (potentially an MDE NPDES HT Permit). The MDE permit is expected to cite the maximum allowable effluent concentrations (the MDE surface water discharge criteria) and other pertinent criteria for management and discharge of Non-Contact Water to the storm system. No discharge will be allowed to Baltimore City sanitary sewers. Non-Contact Water will be properly disposed off-site at EQ should the Permit's effluent discharge limits be exceeded.

5.0 FUTURE MAINTENANCE

The Harbor Point – Parcel 4 Mixed Use structures will supplant the function of the existing protective cover. As described in the DDP, the environmental capping that previously existed on the Project will be restored to an equal or more protective condition.

This section pertains to the Harbor Point – Parcel 4 Mixed Use property, and the provisions are consistent with the future maintenance requirements in the current NFRD for the property. The property owner will maintain the integrity of the cap surface at all times to prevent exposure to contaminated soil by any person on the property at any time. The MDE will be notified within 10 business days after discovery of any needed repairs to the cap surface that exceed one foot in diameter or one foot in depth below grade. The property owner will maintain written records documenting all maintenance of the cap surface. All necessary repairs to the cap surface will be completed within 5 business days of discovery of the needed repairs.

The property owner will conduct an annual inspection of the cap surface including a visual survey evaluating cracks, settlement, slumping, containment, seepage, or damage. The property owner will maintain the inspection records in perpetuity and provide the inspection records to the MDE upon request.

The property owner will maintain written records of documenting all maintenance of the cap surface covering the property. Significant disturbances and failures noted in the cap surfaces shall be repaired or sealed within 5 business days of discovery of the needed repairs. Persistent ponding on exterior cap surfaces shall be remedied within 5 business days of discovery of the needed repairs.

The property will submit written notification to the MDE a minimum of 30 days prior to construction of any on-site building, disturbing the existing cap surface, and/or performing subsurface excavation greater than one foot in depth on the property. As part of this notification, the property owner will submit a written plan to the MDE outlining the proposed work activities, the personal protective measures that will be used to ensure construction worker safety, and contaminated soil and groundwater handling and disposal procedures.

In the event of an unplanned, emergency excavation on the property, the property owner will verbally or electronically notify the MDE within 24 hours following initiation of the emergency excavation activities. Within 10 days following completion of the unplanned emergency excavation, the property owner will file a written report with the MDE that includes a summary of the work activities completed, the personal protective measures and soil and groundwater handling and disposal procedures that were taken to ensure construction worker safety, and sampling and disposal procedures and locations for any soil or groundwater removed from the property.

MHMP APPENDIX A

Fill Material and Soil Management Fact Sheet



Fill Material and Soil Management

What You Need to Know

The purpose of this fact sheet is to describe how fill material and excess soil can be reused properly during the cleanup and redevelopment of properties throughout Maryland. In many cases, excess soil is generated and fill material is necessary during the cleanup and development phases of a project. To assure that all projects are addressed consistently, the Land and Materials Administration (LMA) has prepared this guidance document for assisting parties that generate or need soil or fill material at sites under the purview of LMA's regulatory programs. This document does not, however, substitute for Maryland Department of the Environment (MDE) regulations, nor is it a regulation itself and does not impose legally binding requirements, and may not apply to a particular situation based upon the circumstances. MDE retains the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular site will be made based on the applicable statutes and regulations.

Introduction

The LMA has created this fact sheet to assist property owners with the management and reuse of fill material and excess soils generated or used at properties under LMA oversight. This fact sheet is to be used in conjunction with the Voluntary Cleanup Program's (VCP) Clean Imported Fill fact sheet and the Innovative Reuse and Beneficial Use of Dredged Material Guidance Document.

What Soils and Fill Material are Subject to this Fact Sheet?

This document lays out guidelines for persons that generate or import soil or fill material for reuse at LMA regulated sites. The fact sheet applies to soil and fill material that is impacted or potentially impacted by polluting substances. These pollutants may include petroleum or hazardous substances listed in the current MDE Soil and Groundwater Cleanup Standards (Cleanup Standards) document or the current U.S. Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs) table. The guidance does not apply to soils or fill material that are subject to federal and state hazardous waste regulations (see 40 Code of Federal Regulations [CFR] Part 260 and the Code of Maryland Regulations [COMAR] 26.13 for requirements and applicability). Soils subject to hazardous waste regulations are any soils contaminated by a listed hazardous waste, or that display a characteristic of a hazardous waste. LMA maintains enforcement authority over soils or fill material when it is used in a manner that creates a threat to human health or the environment, in accordance with Environment Article, § 7-201 *et seq.*

Definitions

The following terms are defined for the purpose of this fact sheet.

Background Level means the level of a substance occurring naturally at the site prior to any manmade spill or release, as defined by § 7-501 of the Environment Article, Annotated Code of Maryland.

Category 1 - Residential Unrestricted Use Soil and Fill Material means a soil or fill material that is impacted by a hazardous substance or oil at concentrations less than or equal to the current residential EPA soil

RSLs (residential soil, <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>) for non-carcinogens set at a HQ of 0.1 and carcinogens at a lifetime cancer risk of 1×10^{-6} . The Category 1 screening levels incorporate the most common human exposure pathways (ingestion, dermal contact, and inhalation of contaminants from soil in outdoor air) using generic exposure assumptions and are protective of acute and chronic health effects for residential populations, including young children. If the soil or fill material background level contains naturally occurring substances at concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which all other substances are less than or equal to the residential standards, such soils and fill material are considered "Residential Unrestricted Use Soil and Fill Material."

Category 2 - Non-Residential Restricted Use Soil and Fill Material means a soil or fill material that is impacted by a hazardous substance or oil at concentrations less than or equal to the current industrial EPA soil RSLs for non-carcinogens set at a hazard quotient (HQ) of 0.1 and carcinogens at a lifetime cancer risk of 1×10^{-6} . The Category 2 screening levels incorporate the most common human exposure pathways (ingestion, dermal contact, and inhalation of contaminants from soil in outdoor air) using generic exposure assumptions and are protective of acute and chronic health effects for commercial and industrial populations. If the soil or fill material background level contains naturally occurring substances at concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which all other substances are less than or equal to the non-residential standards (industrial soil, <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>), such soils and fill material are considered "Non-Residential Restricted Use Soil and Fill Material."

Category 3 - Restricted Use Soil and Fill Material, Cap Required means any soil or fill material that is impacted by a hazardous substance or oil at concentrations meeting the restricted use screening criteria for soil and fill material in the Innovative and Beneficial Use of Dredged Material Guidance Document (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>). Category 3 means soil or fill material that is impacted by any hazardous substance or oil at concentrations less than or equal to the current industrial EPA soil RSLs for non-carcinogens set at a HQ of 1 and carcinogens at a lifetime cancer risk of 1×10^{-5} .

Category 4 - Ineligible Soil and Fill Material means a soil or fill material that is impacted by any hazardous substance or oil at concentrations exceeding the restricted use screening criteria for soil and fill material in the Innovative and Beneficial Use of Dredged Material Guidance Document (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>) but does not display a characteristic of a hazardous waste; has not been contaminated by a listed hazardous waste; and does not exceed the regional emergency removal management levels used by the EPA (<https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>).

Disposal Facility means a facility permitted to accept solid wastes by the State of Maryland or other State. In Maryland, such facilities must be permitted in accordance with Title 9 of the Environment Article and the regulations promulgated in COMAR 26.04 or COMAR 26.10.13.

Dredged Material means material excavated or dredged from the waters of State.

Dredged Material Containment Facility means an artificial confinement structure, site or area used for the dewatering of dredged material from the interstitial or carriage water.

Earthen Materials means any mixture of soil, stones or rocks that have been excavated or extracted from a quarry, borrow pit, earthen bank, gravel pit, or mine and have not been affected by a release of oil products, oils, chemicals or by any other polluting substance.

Eligible Property means property that is contaminated or perceived to be contaminated but does not include a site on the National Priority List, a site that is subject to a controlled hazardous substance permit, or a site that is subject to an enforcement action.

Engineered Cap means a system composed of a layer or several layers of natural and synthetic materials used to reduce the infiltration of water into the subsurface and/or to limit the possibility of human exposure to buried materials. A typical cap may consist of a vegetated or otherwise stabilized protective layer of clean soil on the surface, which overlies one or more additional layers that are intended to act as a barrier to infiltration of water; a drainage layer; a capillary break; a gas collection layer; a load dispersion layer; or other purpose depending on the design and intended purpose for the cap. Maryland and federal regulations include specific design requirements for caps depending on the purpose (e.g., solid waste or hazardous waste landfills, etc.).

Engineering Controls means remedial actions directed toward containing or controlling the migration of contaminants through the environment. These include, but are not limited to, storm water conveyance systems, slurry walls, liner systems, caps, leachate collection systems, pump and treat systems, and groundwater recovery systems.

Excess Soil means any soil or earthen material generated as a result of excavation, grading, or other activity that results in soil or earthen material that cannot be reused beneficially onsite.

Fill Material (construction) means soil or dewatered dredged material used to create a foundation for the construction of a structure, such as a road or building, to reclaim lost land such as gullies or mines, to raise the grade on a property, or to provide final cover material for a property.

Hazard Quotient means the ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a similar exposure period.

Hazardous Substance means any substance that is defined as a hazardous substance under § 101(14) of the federal act (the Comprehensive Environmental Response, Compensation and Liability Act or CERCLA); or is identified as a controlled hazardous substance by the Department under COMAR 26.14.01.02.

Impervious Surface means a synthetic material with a minimum thickness of 20 mil and a maximum permeability of 1×10^{-10} centimeters/second, or a minimum of 1 foot of clay or other natural fine-grained material having an in-place permeability less than or equal to 1×10^{-5} centimeters/second. *Innovative Reuse* means utilizing excess soil and fill material as resource materials in productive ways as a substitute for other materials subject to certain land use controls. For dredged material, innovative reuse includes use of dredge material in the development or manufacturing of commercial, industrial, horticultural, agricultural, or other products.

Institutional Controls means legal or administrative tools designed to prevent or reduce human exposure to remaining contamination and to prevent activities that may result in increased exposure to or spread of such contamination, including the use of an environmental covenant in accordance with Maryland's Uniform Environmental Covenant Act, Environment Article, § 1-801 *et seq.*

Land Use Controls means any restriction or control that serves to protect human health and the environment by limiting use of or exposure to any portion of the property, including water resources.

Natural Soil means a soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substances occurring naturally in the environment and in which no other polluting substance is analytically detectable. *Oil* has the same meaning stated in § 4-401(h) of the Environment Article, Annotated Code of Maryland and COMAR 26.10.01.01 and includes petroleum, petroleum by-products, kerosene, and other compounds. *Risk Assessment* means the process to estimate the nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future. Human health risk assessments are based on the populations and land uses of the property in question and may include residential and non-residential scenarios.

Soil means unconsolidated geologic and organic materials overlying bedrock, if present.

Soil and Fill Material Management Guidelines

The following guidelines apply to management of soil and fill material received at eligible properties. These guidelines are also illustrated in Figure 1.

- Soil or fill material may not be placed where it is subject to intrusion by groundwater or surface water. It must be placed at least three (3) feet above the maximum expected groundwater elevations at all locations of placement or other sufficient protective measures must be implemented to ensure soil and fill material do not adversely impact groundwater or surface water resources;
- Soil and fill material placed in groundwater use areas may be subject to additional environmental measures and evaluations to ensure placement of soil or fill material will not adversely impact groundwater or surface water resources.
- Soil or fill material shall conform with all appropriate sediment and erosion control regulations during placement and construction.
- Impervious surfaces placed over soil or fill material shall be continuous in all areas that overlie the soil or fill material.

Land use controls may include, but are not limited to, engineering controls and institutional controls.

Residential Unrestricted Use Soil and Fill Material (Category 1)

Soil or fill material with concentrations of hazardous substances or oil less than or equal to the residential unrestricted use screening criteria may be innovatively reused at all sites without restriction. If potential contaminant concentrations in soil or fill material exceed the Category 1 screening criteria, then a more detailed soil or fill material residential risk assessment (considering factors such as magnitude and frequency of detections, land use, exposure parameters and factors, and toxicity values) may be performed that meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens. When the residential risk assessment is performed and meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens the soil or fill material may be innovatively reused at all sites without soil exposure restrictions and will be considered Category 1 soil and fill material. For soil or fill material that meets the Residential Unrestricted Use Soil and Fill Material definition, a person may send such soil or fill material to any offsite location. The owner or operator of the receiving site may be required to submit written acknowledgement regarding the volume and nature of such soil or fill material to LMA prior to transporting and accepting the materials at the receiving location. Additional documentation from a person placing or transporting the soil or fill material may be required by the LMA program regulating the receiving site, if applicable. Please contact the appropriate regulatory program for additional details.

Non-Residential Restricted Use Soil and Fill Material (Category 2)

Soil or fill material with concentrations of hazardous substances or oil less than or equal to the non-residential restricted use screening criteria may be innovatively reused at all non-residential and non-recreational sites without restriction. If potential contaminant concentrations in the soil or fill material exceed the Category 2 screening criteria, then a more detailed soil or fill material non-residential risk assessment may be performed that meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens. When a non-residential risk assessment on soil or fill material is performed and meets a HQ of 1 for non-carcinogens and a lifetime cancer risk of 1×10^{-5} for carcinogens, the soil or fill material may be innovatively reused at non-residential and non-recreational sites. The owner or operator of the receiving site may be required to submit written acknowledgement regarding the volume and nature of such soil or fill material to the LMA prior to the transport and acceptance of the material. Additional documentation from a person who places or transports the soil and fill material may be required by the LMA program regulating the receiving site, if applicable. Please contact the appropriate regulatory

program for additional details. The receiving site may also be required to encumber the property with land use controls to ensure that exposure to the soil or fill material meeting the Non-Residential Restricted Use Soil and Fill Material definition is appropriately managed. The land use controls may include a recorded environmental covenant that complies with the Maryland Uniform Environmental Covenants Act (UECA). The environmental covenant shall include a map drawn to scale identifying where the soil or fill material has been placed and copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material. The Department may sign on to the environmental covenant as agency and holder of the environmental covenant.

Restricted Use Soil and Fill Material, Cap Required (Category 3)

If the soil or fill material concentrations of hazardous substances or oil are less than or equal to the Category 3 -- Restricted Use Soil and Fill Material, Cap Required screening criteria (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>), a person may transport such soil or fill material for innovative reuse to a commercial or industrial property with existing soil and fill material containing hazardous substances or oil at concentrations within or less than the same Category 3 parameters for placement beneath an environmental cap. The receiving site may be required to submit a written acknowledgement regarding the volume and nature of the soil or fill material to the LMA prior to transporting the material to the receiving location. The program regulating the receiving site may require additional documentation from a person who places or transports material at Category 3 sites. The receiving site must also agree to encumber the property with land use controls to ensure that exposure to the soil or fill material meeting the Category 3 definition is appropriately managed. The land use controls may include a recorded environmental covenant that complies with the Maryland's UECA. The environmental covenant shall include a map drawn to scale identifying where the soil or fill material has been placed and copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material. The Department may sign on to the environmental covenant as agency and holder of the environmental covenant.

Ineligible Soil and Fill Material (Category 4)

For soil or fill material that exceeds the Category 3 -- Restricted Use Soil and Fill Material, Cap Required screening criteria (<http://mde.maryland.gov/programs/Marylander/Pages/dredging.aspx>), a person may not use the material for an innovative reuse. Any soil or fill material that exceeds the Category 3 screening levels must be disposed of at either (1) an offsite disposal facility or dredge material containment facility that is permitted by the State of Maryland or another state to accept solid wastes; (2) for dredged material, to a dredged material containment facility; or (3) remain in place with appropriate land use controls. The owner or operator of the receiving site shall provide the Department with appropriate documentation, including but not limited to copies of the manifests, bill of lading, or other documentation demonstrating the transport and acceptance of soil or fill material.

Criteria for Total Petroleum Hydrocarbon

In addition to the criteria described above for each category, the following screening criteria apply for total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO). These criteria are based upon the residential and non-residential soil cleanup standards set at a HQ equal to 0.1 for TPH published in the MDE Cleanup Standards for Soil and Groundwater, June 2008: Interim Final Guidance (Update No. 2.1).

- Category 1 TPH screening criteria: 230 mg/kg for TPH, DRO and 230 mg/kg for TPH, GRO
- Category 2 TPH screening criteria: 620 mg/kg for TPH, DRO and 620 mg/kg for TPH, GRO

- Category 3 TPH screening criteria: 620 mg/kg for TPH, DRO and 620 mg/kg for TPH, GRO
- Category 4 TPH screening criteria: exceeds Category 3 standard

Additional Resources

Cleanup Standards for Soil and Groundwater, June 2008: Interim Final Guidance (Update No. 2.1), Maryland Department of the Environment.

Facts About...VCP Clean Imported Fill Material, Maryland Department of the Environment.

Innovative and Beneficial Use of Dredge Material Guidance Document, August 2017, Maryland Department of the Environment in collaboration with Maryland Department of Transportation's Port Administration.

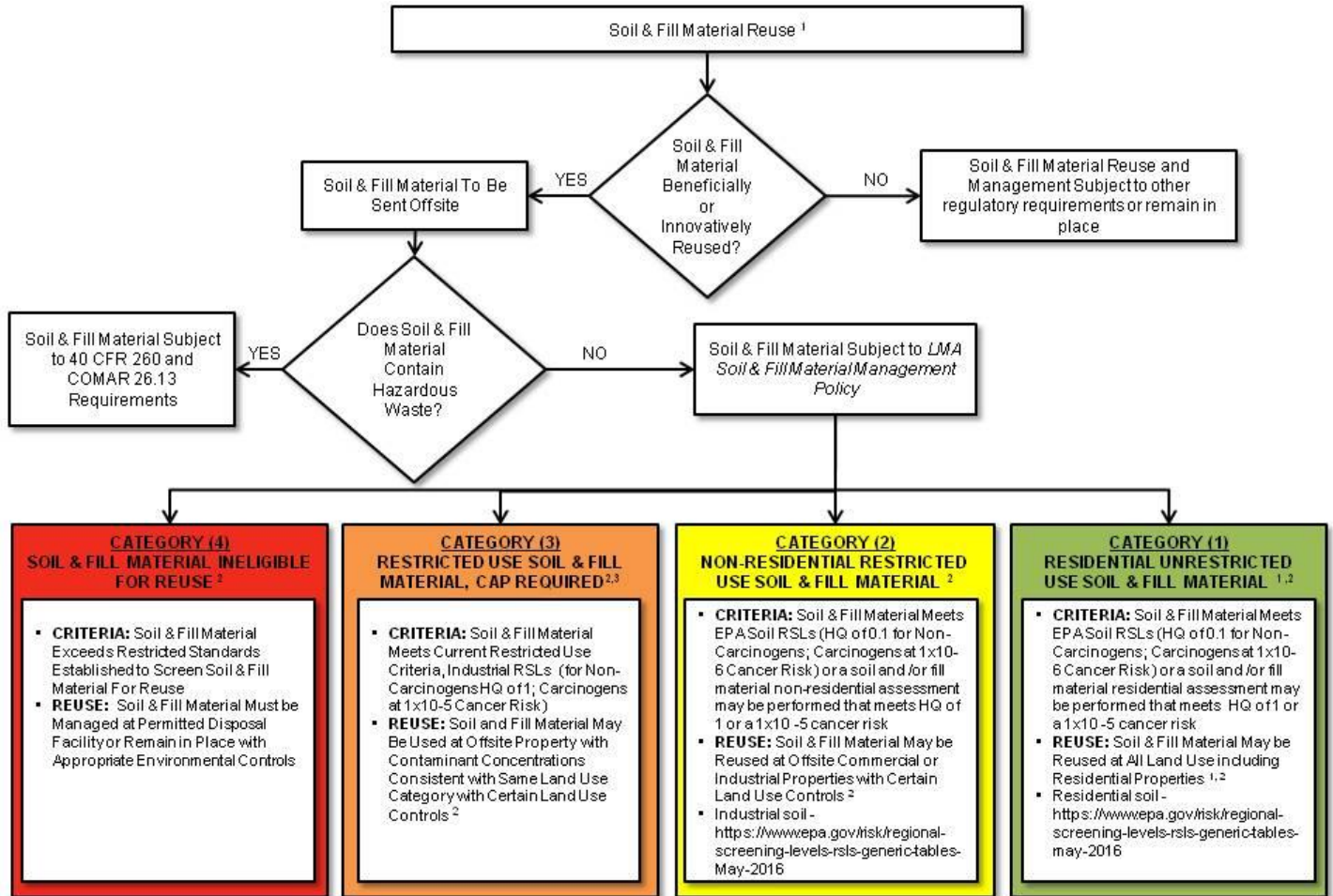
United States Environmental Protection Agency. Regional Screening Levels (RSLs) - Generic Tables (June 2017). <https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-june-2017>.



Fill Material and Soil Management

What You Need to Know

Figure 1: Soil & Fill Material Management Flow Chart



Footnotes:

- (1) Placement of soil or fill material within groundwater use area may be subject to additional environmental measures and evaluations to ensure placement of soil or fill material will not adversely impact groundwater resources.
- (2) Site-specific factors may be considered for reuse of Category 3: Restricted Use Soil and Fill Material Cap as fill in excess of the Category 3 criteria.

- (2) Soil and fill material transfer is limited to transfers only to a site having existing soils meeting the same or less stringent cleanup standard or within the same land use category as defined in the VCP. The VCP land use categories are: Industrial; Commercial; Recreational; and Residential.