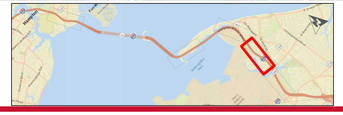
Road and Bridge Design

- Bridges
- Marine Piers
- Lane Lines
- Paved Shoulder
- SWM Basin
- ITS
- Retaining Walls
- Sound Walls

Borings

- Segment 1
- Segment 3
- Segment 4
- Segment 5



0 Feet 300

DATA SOURCE:
VGIN Aerial Imagery,
ESRI World Transportation

HDR | MOTT MACDONALD
Design Joint Venture

I-64 HAMPTON ROADS BRIDGE-TUNNEL EXPANSION PROJECT
BORING LAYOUT PLAN - ENVIRONMENTAL SAMPLING

SEGMENT 4 - NORFOLK - NAVY

Road and Bridge Design

- Bridges
- Marine Piers
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- Segment 1
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I-64 HAMPTON ROADS BRIDGE-TUNNEL EXPANSION PROJECT
BORING LAYOUT PLAN - ENVIRONMENTAL SAMPLING

SEGMENT 4/5 - NORFOLK - NAVY

ATTACHMENT A

DOCUMENT NO.:

HR-SOP-HW-03

TITLE:

Management of Excavated and Imported Soils Standard Operating Procedure (SOP)

CONTENTS

DOCUMENT OWNER: Waste Program Manager	AUTHORIZED BY: Director, HW Compliance & P2

REV. NO.	EFFECTIVE DATE	DESCRIPTION OF REVISION
A	08/23/2017	ORIGINAL ISSUE

From: NAVFAC MIDLANT Director, HW Compliance & P2
To: NAVFAC MIDLANT FEADS, Commands and Tenants at CNIC Hampton Roads Naval Installations

Subj.: Standard Operating Procedure (SOP) – Management of Excavated and Imported Soils

1. **Purpose:**
NAVFAC Mid-Atlantic's Environmental Office manages soils at Hampton Roads installations by ensuring compliance with applicable federal, state, laws, regulations, and policies.

This SOP contains guidance for the management of excavated and imported soils in the Commonwealth of Virginia through reuse at the site of excavation, off-site disposal or off-site re-use. It is preferred that excess soil be used at the project site.

Adherence to the following soil management procedures is imperative to maintain compliance. A failure to maintain compliance can result in violations and fines.

2. **References:**
-Virginia Waste Management Act
-Virginia Solid Waste Management Regulations 9 VAC 20-81 *et. seq.*
-Virginia Hazardous Waste Management Regulations 9 VAC 20-60 *et. seq*.
-Virginia Department of Environmental Quality Guidance Document #LPR-SW-02-012 Titled "Solid Waste Special Waste Disposal Request" as revised
- Virginia Department of Environmental Quality Guidance Document #LPR-SW-04-2012 Titled "Management of and Reuse of Contaminated Media Guidance and Variance" as revised
-Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

3. **Applicability:**
It is the responsibility of the activity to notify the Installation Hazardous Waste Media Manager (HWMM) of soils requiring removal from or imported to project sites. The Installation HWMM should be notified before any soils are removed or imported.

4. **Action:**
Due diligence is required to be conducted when any excavation is planned. It is imperative that the management of excess soil be considered at the earliest stages of project planning. Excess soil can be managed a number of ways: it can be used within the area of the excavation, taken for disposal to an offsite appropriately permitted facility, or re-used offsite in accordance with Virginia Department of Environmental Quality Guidance Document #LPR-SW-04-2012 Titled "Management of and Reuse of Contaminated Media Guidance and Variance" as revised.
Every reasonable precaution shall be taken, including temporary and permanent soil stabilization measures, throughout the duration of the project to control erosion and prevent siltation of adjacent lands, rivers, stream, wetlands, lakes, and storm water conveyance

systems. Soil stabilization and/or erosion control measures shall be applied to erodible materials, soil stockpiles, or denuded ground surfaces exposed by any land disturbing activity.

A. <u>Excavated Soil To Be Re-Used On-Site Only</u>

Soils that have been excavated as part of a construction project and that are used as backfill for the same excavation or excavations containing similar contaminants at the same project site, at concentrations of the same level or higher are excluded from the definition of solid waste per the Virginia Solid Waste Management Regulations 9 VAC 20-81 *et. seq.*

Therefore, soils re-used on site (project site area only) are not regulated and will not require any analytical testing provided there is no free petroleum product. If during excavation of soils any visible and/or odor/smell of contamination is encountered, excavation operations should stop and the Installation Environmental Department be contacted immediately.

B. <u>Requirements for Excavated Soil Planned For Disposal At Permitted Landfill</u>

The Resource Conservation and Recovery Act (RCRA) requires waste generators to determine if materials intended to be discarded (disposed of) meet the definition of a solid waste, and if so, whether the solid waste is a characteristic or listed hazardous waste. The Commonwealth of Virginia has adopted all the requirements set forth under RCRA for waste determinations. Therefore, to be in compliance with Federal and State regulations, all soils destined for disposal require a waste determination (includes generator knowledge and analytical testing) to be completed. The waste determination shall be made by the installation's HWMM or authorized EV Services staff.

Generator knowledge (includes but is not limited to: industrial operations, releases/spills, former contamination clean-up, etc. at the project site) should be utilized whenever possible in the waste determination process, along with analytical testing. Use of generator knowledge will be the responsibility of the Navy representatives (FEADs, PMs, CMs, OICCs, etc.) who will provide the Installation HWMM and NAVFAC MIDLANT EV Services with any historical information of the project site where soil excavation is required.

I. Excavated Soil Analytical Testing Requirements:

1) Analysis of excavated soil is required to be completed in accordance with the Virginia Department of Environmental Quality (DEQ) guidance document #LPR-SW-02-012 (Solid Waste Special Waste Disposal Request) which can be found at the link below:

http://deq.state.va.us/Portals/0/DEQ/Land/Guidance/LPR-SW-02-2012.SpecialWasteDisposalRequestGuidance.pdf.

Guidance document #LPR-SW-02-012 requires the following characteristics and constituents to be analyzed: ignitability, corrosivity, reactivity, TCLP (metals, VOCs, SVOCs, pesticides, and herbicides), PCBs, BTEX, TPH, TOX and Paint Filter.

2) All analysis, methods, sample collection and frequency, etc. shall be conducted in accordance with EPA SW-846 Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods.

   If soil is known to be contaminated with a petroleum product, sampling frequency will be one (1) sample for every 250 cubic yards (CY) of soil. For quantities greater than 2,500 CY, the sampling rates may be adjusted with approval from Virginia DEQ.

3) The receiving permitted disposal facility may require additional analytical requirements not covered by the Virginia DEQ guidance for their operational solid waste management facility permit requirements. Typically, the analytical parameters provided by the Virginia DEQ regulations will meet the requirements for the landfill's permit; however, this must be verified prior to sampling.

4) Analytical laboratories are required to be Virginia Environmental Laboratory Accreditation Program (VELAP) certified/accredited. Facilities providing Virginia DEQ with environmental laboratory data to satisfy permit and/or regulatory requirements must ensure their environmental laboratories (commercial or noncommercial) have been accredited or certified by Virginia Division of Consolidated Laboratory services DCLS.

5) All analytical results must be submitted to the Installation HWMM and NAVFAC MIDLANT EV Services for review and disposal requirements (non-hazardous vs hazardous).

II. Excavated Soil Disposal Requirements:

1) After analytical results have been reviewed and disposal requirements are determined, a waste profile (usually obtained from the permitted landfill, treatment facility, or disposal contractor) must be submitted to NAVFAC MIDLANT EV Services for review, approval, and signature. NAVFAC MIDLANT EV Services is the only authorized division/department with the authority to review, approve, and sign waste profile documentation for soil/waste disposal (non-hazardous or hazardous waste disposal) on behalf of the Navy; no other personnel (to include contractors) are authorized to sign waste profiles. Please allow up to 15 business days for analytical review and approval, and signature for waste profile.

2) Each disposal shipment (haul truck, bulk container, etc.) from the installation to the permitted landfill or treatment facility must be accompanied with the proper shipping documents (non-hazardous or hazardous waste manifests, etc.). NAVFAC MIDLANT EV Services is the only authorized division/department to sign any and all shipping documents on behalf of the Navy; no other personnel (to include contractors) are authorized to sign. Coordination must be made with NAVFAC MIDLANT EV Services at 757-341-0412 or 0460 to obtain proper generator information and signature for shipping documents.

III. Management Requirements for Excavated Soil to Be Disposed Of:

1) Soils that are determined to be non-hazardous or hazardous waste may only be accumulated for up to 90 days at the generating project site in an appropriate container without obtaining a solid waste or hazardous waste management storage permit.

    a. At a minimum, the "container" may be constructed on-site using poly sheeting plastic liner and cover that utilizes hay bales or other sediment control measures to minimize sediment discharge by storm water run-off.

    b. The soil may also be containerized in drums or roll-offs that are covered.

2) All accumulation areas (including containers) must be properly labeled. Prior to making a waste determination the container must prominently display a sign or label stating "Waste Pending Analysis" and include an accumulation start date.

3) If project site soils are determined to be hazardous, the contractor and Navy representatives are required to contact the Installation HWMM immediately for additional soil storage and handling requirements.

IV. Imported Fire Ant Quarantine:

The counties of James City and York, and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg are currently located within an Imported Fire Ant quarantine area.

Regulated articles (including soil) can be moved freely within the quarantine area; however, regulated articles may not be moved outside of the quarantine area unless they have been certified free of Imported Fire Ants by the Virginia Department of Agriculture and Consumer Affairs. More information is available at: http://www.vdacs.virginia.gov/plant-industry-services-fire-ant-suppressioneand-eradication.shtml

C. Requirements for Excavated Soil To Be Used As "Clean" Fill Outside The Original Project Site

All soils excavated from a Navy installation/facility are considered to be potentially contaminated, and proper due-diligence (to include generator knowledge and analytical testing) will be required for any excavated soil to be considered for re-use outside of a project site.

Excavated soils from a project site to be re-used at a different project site location will be required to meet the Virginia DEQ's Management and Reuse of Contaminated Media Guidance and Statewide Variance (contained under Virginia Variance #LPR-SW-04-2012). Coordination with the Installation HWMM is required for proper guidance. LPR-SW-04-2012 is enclosed as **Attachment 1**.

All contract requirements associated with the management of excavated soils on a project site must be reviewed and any changes/modifications to contract requirements must be approved by the contracting officer or his/her designee.

D. Requirements for Soils Imported From Off-Site Location For Use As "Clean" Fill Material

It is recommended that if a project site requires the importation of soils from off-site locations (e.g. borrow pits) for backfilling excavations, grading, restoration, etc., the imported soils be verified "clean" via analytical testing.

Analytical testing requirements for imported soil provided below do not apply to **Comprehensive Environmental Response, Compensation, and Liability** Act (CERCLA) remedial sites. Remediation activities at CERCLA remedial sites are overseen by EPA and Virginia DEQ; therefore, analytical requirements are pre-determined, reviewed, and approved by EPA and Virginia DEQ.

I. Imported Soil Analytical Recommendations:

1) Analytical sampling requirements should be in accordance with the Virginia DEQ's Management of and Reuse of Contaminated Media Guidance (contained under Virginia Variance #LPR-SW-04-2012) which are included as attachment 1.

    a. All constituents/parameters displayed on Table 2 (Soil: Residential and Other High Frequency Receptors) provided in Variance #LPR-SW-04-2012 are recommended for analysis.

    b. Soils should not contain concentrations of analytes above the appropriate criteria displayed in Table 2 (Soil: Residential and Other High Frequency Receptors).

2) In addition to Table 2 constituents listed above, the soil should also be analyzed for TPH, BTEX, and TOX to ensure the imported soils are not contaminated with petroleum products per Virginia regulation 9VAC20-81-660.

   Soils should not contain concentrations of analytes above the appropriate criteria set forth in Virginia regulation 9VAC20-81-660.

3) All analysis, methods, sample collection and frequency, etc. should be conducted in accordance with EPA SW-846 Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods.

4) Analytical laboratories are required to be VELAP certified/accredited. Laboratories must provide documentation (e.g. certification number) upon request.

5) All analytical results should be submitted to the Installation HWMM for review and approval prior to importing soil to the project site.

Attachment 1

HR-SOP-HW-03

COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
Solid Waste Guidance Memorandum

Subject: Division of Land Protection & Revitalization State-Wide Variance Guidance Memo No. LPR-SW-04-2012
Management and Reuse of Contaminated Media

To: Regional Land Protection & Revitalization Program Managers
Regional Water Program Managers

From: Jeffery Steers
Director, Division of Land Protection and Revitalization

Date: July 17, 2012

Copies: Richard Weeks, James Golden
Air and Water Division Directors
Regional and Deputy Regional Directors

Background: Businesses look continuously to purchase and revitalize former manufacturing facilities, residential sites, parks, and other previously used properties, and to conduct upgrades on currently occupied property. Benefits for businesses include utilization of a site with suitable structure(s) in-place, existing zoning appropriate for industrial/commercial use, lower development costs, and tax incentives. Revitalization and upgrades of these properties helps conserve land that would otherwise be developed, increases revenues for the locality and the Commonwealth, and reduces blight. Many of these properties remain undeveloped because of actual or perceived concerns of contamination or concerns about managing soils on-site with low concentrations of contaminants. Each site needs evaluation to determine if the site is safe to use as-is or if restrictions or remediation is necessary. Many times site improvements may require soil or sediment excavations that require evaluation of costs of the management of the excess media generated at the site. This "Variance" was prepared to allow owners/operators to reuse soils/sediment generated in the Commonwealth, both on-site and off-site, as one option in managing excess media from property upgrades.

Electronic Copy: An electronic copy of this variance is available on DEQ's website at http://www.deq.virginia.gov/ .

Contact Information: Please contact staff within the Division of Land Protection & Revitalization at your local DEQ regional office with any questions regarding the application of this Variance. The DEQ regional offices can be found at the following link: http://www.deq.virginia.gov/Locations.aspx.

Disclaimer: *This document is provided as guidance and, as such, sets forth standard operating*

procedures for the agency. However, it does not mandate any particular method nor does it prohibit any alternative method. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations. Nothing in this guidance shall relieve the owner or operator from conducting notifications or cleanups as required by DEQ.

I. Introduction

Summary of Management and Reuse of Contaminated Media:

Due to the increasing cost of prime land, the Commonwealth is experiencing a growing need for the redevelopment of previously used and idle properties and upgrades of existing properties. Re-vitalizing these properties frequently requires some form of soil excavation and management. Similarly, material excavated from surface waters during dredging operations is often disposed of at off-site locations, necessitating added soil evaluation procedures and management techniques. Quite often, the soil and dredge media contain contaminants that need to be evaluated for disposal or reuse. The knowledge of the nature of the contamination may be known or is newly discovered during the course of development.

The Virginia Department of Environmental Quality ("DEQ") developed this variance based upon experience with numerous separate site-specific contaminated soil/sediment use plans. Standard contaminant concentration tables are used to allow a quick determination of soil management procedures and options to owners, purchasers and developers. Owners/operators can make more expeditious determinations of media reuse for a site based upon standard considerations with the use of these tables.

Submittals generated from this Variance will not be technically reviewed by DEQ unless necessary. This Variance is meant to be self-implementing to expedite property reuse in a sound manner protective of human health and the environment. Property owners and developers can use this variance to make basic development decisions using standardized tools regarding soil/sediment management without involving DEQ in a regulatory approval process. As per current regulations, contaminated soils and sediment from legacy operations often are not regulated in-situ provided that:

- materials have not been intentionally disposed or spilled onto the soils/sediment;
- materials have not been released from handling operations that are sloppy and do not follow typical industry standards for handling;
- materials are not listed hazardous waste;
- materials are not chemicals that have been released in volumes greater than their respective reportable quantity; and
- the contaminated condition is not considered an open dump, hazard, nuisance, or a threat to public health, public safety, the environment, and natural resources.

Based on the above, DEQ developed a tier-based decision model that provides basic criteria for comparing the level of contamination in media to concentrations that have been determined to be acceptable for human health and the environment.
This variance is not to be used for remediation standards for a site being remediated under other regulatory programs such as Underground Storage Tanks, Resource Conservation and Recovery Act ("RCRA") Corrective action, Voluntary Remediation Program or other programs which have their own cleanup or remediation standards. This

variance may be used to manage excess media at a clean-up site if allowed by the particular remediation program and with any required approval.

II. Authority

Virginia Code §§10.1-1404-1405 authorizes the Department and the DEQ Director to administer the regulations promulgated by the Virginia Waste Management Board ("Board") and vests the powers of the Board with the Director when not in session. The Virginia Solid Waste Management Regulations ("VSWMR" or "Regulation") allows the Director to grant variances to the VSWMR, including 9 Virginia Administrative Code 20-81-710.

III. Definitions

Definitions in the Virginia Waste Management Act and VSWMR apply to this policy. Additional definitions are detailed below.

"Contaminated media" – This includes soil, sediment, and dredged material that that, as a result of a release or human usage, has absorbed or adsorbed physical, chemical, or radiologieal substances at concentrations above those consistent with nearby undisturbed soil or natural earth materials.

"Dredged material" means material that is excavated or dredged from surface waters (9 VAC 25-210-10).

"Environmental due diligence" – Investigative techniques, including but not limited to visual property inspection, electronie database searches, review of ownership and use history of property, Sanborn maps, environmental questionnaires, analytical testing, environmental testing and audits.

"Generator and Owner/Operator" – The generator is the owner of the property from which the contaminated media is first managed such to make the material subject to regulation. A developer or contractor may be the entity that moves the material, and thus may be a co-generator, but the owner would still be considered a generator.
"Solid waste" and "Hazardous waste" – As defined in 40 CFR 261.2 and 40 CFR 261.3 of the Federal Regulations as adopted by Virginia in 9 VAC 20-60-261. These definitions may be found at the following website:
http://www.access.gpo.gov/nara/cfr/waisidx_09/40cfr261_09.html

"Open dump" - means a site on which any solid waste is placed, discharged, deposited, injected, dumped or spilled so as to present a threat of a release of harmful substances into the environment or present a hazard to human health. A site meeting the Open Dump Criteria in 9VAC20-81-45 may be determined to be an open dump.

"Sensitive Environment" means an area that serves a critical ecological function or that overlies groundwater that is currently used or is reasonably anticipated to be used as a potable source. Sensitive environments include areas that support state or federally recognized rare, threatened, or endangered species; areas characterized by karst topography, caves, or sinkholes; a 25 year floodplain as defined by FEMA and/or local planning officials; and surface waters (streams, creeks, ponds, lakes, rivers, wetlands, springs, etc.).

"Unrestricted upland reuse" – Soils that meet the criteria in Tables 1 and 2 of this Variance.

IV. Hierarchy for Contaminated Media Management

DEQ recognizes that there are various means to manage contaminated media which may be regulated under the VSWMR or exempt under the VSWMR. Additionally, DEQ maintains a hierarchy of contaminated media management as a means to use the least expensive and resource conservative methods that maintain public and environmental health. The order of management options that should be pursued are as follows:

1) Appropriate reuse of contaminated media within the actual excavation project.
2) Appropriate reuse of the contaminated media on the site of the development as allowed under 9 VAC 20-81-95.C.7.d.
3) Reuse of the contaminated media on the site of generation or at another site with comparable contaminants (through the use of this variance).
4) Thermal or biological remediation of the contaminated media followed by reuse - using a DEQ permitted thermal or biological treatment facility.
5) Landfill burial of contaminated media – burial in a permitted sanitary, industrial, or hazardous waste landfill authorized by DEQ (or other states) to receive this material.

V. Relationship with other Regulations

The application of this Variance does not relieve the Generator or Property Owner from complying with other regulations of the Commonwealth, Federal Regulations, or local ordinances. In evaluating contaminated media for use under this Variance, the Generator should determine if the media meets the criteria of a hazardous waste, regulated medical waste, or other appropriate criteria (e.g., petroleum-regulated waste regulated under Article 11 or Article 9). This variance may be used to manage excess media at a clean-up site if allowed by the particular remediation program and with any required approval within the program.

Relation to "Sensitive Environments" – In situations where media will be placed within a sensitive environment specifically within surface waters, the Generator must comply with state regulations as described in the State Water Control Law (§62.1-44, 15:20) and

the Virginia Water Protection Permit Regulation (9 VAC 25-210), and/or applicable federal regulations associated with the Section 404 of the Clean Water Act.

Relation to "Contained-In" Situations - There are certain situations where waste chemicals are released that would classify the resulting containing media as hazardous waste. This classification is determined solely upon the classification of the released chemical and the resulting concentration in the media. In a situation where hazardous wastes have been released, cleanup would be coordinated by DEQ's Hazardous Waste permitting program.

Landfill Mining – This Variance may not be used for situations where permitted landfills are being mined. This activity would be regulated by the Solid Waste Permitting Program.

Corrective Action – This Variance may only be used for cleanup programs regulated by the RCRA Corrective Action program in coordination with the Corrective Action project manager.

VI. Management and Reuse Guidance

This Management and Reuse of Contaminated Media Variance applies to the reuse of contaminated media on-site and the movement and beneficial reuse of contaminated media on other sites. In determining whether media may require extra care during excavation and reuse, the Owner or Generator should perform environmental due diligence for the site. Environmental due diligence involves using the relevant techniques as included in the definition above. Not all of the included techniques need to be used. For example, if environmental audits (including generator knowledge of the nature of the release with appropriate testing) are sufficient to define the nature of the media (e.g. quantity of material, contaminants/concentrations, location, areal extent) then a complete site characterization may not be needed. If environmental due diligence (e.g. through file and document review and staff interviews) demonstrates the potential for contamination, the owner/developer is responsible for conducting proper testing to determine the presence and concentration of any contaminants. The results of the environmental due diligence will dictate the contaminants of concern for the subject property. Environmental due diligence may be initiated at any time during a project when the Owner, developer, or contractor notices that the media being managed appears to be contaminated in some manner. The Owner is, and still remains, responsible for the movement and management of any media generated during development on his property.

The Owner/developer should use adequate sampling and analytical techniques to fully define the contaminants and the extent of contamination. Sampling and analytical methods described in the U.S. Environmental Protection Agency ("EPA")'s SW-846 method papers would be an example of suitable methods to define the contaminants as determined from the environmental due diligence process. These methods may be accessed at http://www.epa.gov/wastes/hazard/testmethods/sw846/. Additionally,

analysis should be performed by a Virginia Environmental Laboratory Accreditation Program laboratory.

The environmental nature of these sites are infinitely variable from small areas of similar contaminant to large sites with varying mixes of different contaminants, media, and media structure (homogenous, heterogeneous, etc). It is the responsibility of the generator to contract with a qualified contractor to recommend appropriate sampling and analytical strategies to accomplish the task of defining the types and extent of contamination. This recommendation should be submitted with appropriate justification, to DEQ along with Appendix A form and accompanying information.

This Variance uses a tiered criteria for reuse. Once the contaminants and concentrations are known, the Owner/developer should utilize the following tables to determine how the media may be used. Table 1 defines media which has contaminant concentrations below which are acceptable for reuse in sensitive environments. Table 2 defines media that has contaminant concentrations below which may be used on residential or sites with other high frequency receptors. Table 3 defines media that has contaminant concentrations below which the media may be used on sites that are restricted to commercial/industrial use. The values on these tables draw from risk calculations and assessment work conducted by DEQ and EPA to calculate risk factors for each of the contaminants. The final contaminant concentrations are generated using exposure scenarios that take into account contaminant toxicity and exposure. The use of these tables is also demonstrated in the attached Figure I which is a diagrammatic flow-chart for use of the contaminated media.

This Variance is proposed as a means to effectively manage contaminated media as fill on-site and on appropriate off-site locations. As such, movement of contaminated media is more suitable and logical from one site of certain contamination to a site with a similar level and type of contamination. Thus, movement of contaminated media from one industrial site to another industrial site of similar contamination would be more favorable than trying to move contaminated media from one site to a newly established industrial location with no documented contamination.

Additionally, there are numerous sites in Virginia that have higher concentrations of metals such as arsenic and lead (e. g., background concentrations) due to natural occurrence. Again, using the discussion above and the principles in the criteria seen below, movement of media with elevated concentrations of contaminants could be moved to a "like" site with similar documented naturally-occurring contaminants and concentrations levels as demonstrated by comparing background at the receiving site. This would include naturally occurring metals that are in concentrations greater than on the attached tables – if the receiving site has similar concentrations. However, anthropogenic contaminated soil exceeding those in the attached tables should not be moved from one site to another site with anthropogenic contamination. The generator/developer may not purposefully mix (or dilute) regulated contaminated media with clean fill to achieve the concentrations as described in the fill-types below.

Table 1–Protection of Sensitive Environments

Table 1 should be used to determine whether the media in question may be used as fill in areas that constitute a sensitive environment either for ecological receptors or a groundwater resource.

A sensitive environment for ecological receptors is an area in which the primary function of the land is to support natural habitat with limited human intervention. This includes, but is not limited to: an area that serves a critical ecological function; an area that supports state or federally recognized rare, threatened, or endangered species; areas characterized by karst topography, caves, or sinkholes; a 25 year floodplain as defined by FEMA and/or local planning officials; and surface waters (streams, creeks, ponds, lakes, rivers, wetlands, etc.) It does not include landscaped and maintained areas on primarily commercial/industrial properties. Contaminants with a maximum concentration exceeding the "Beneficial Fill Ecological Screening Level" on Table 1 will be flagged as a Contaminant of Potential Concern for Ecologically Sensitive Environments. Media with concentrations exceeding these levels should not be placed in or directly adjacent to ecologically sensitive environments.

A sensitive environment for protection of groundwater resources includes areas in which groundwater (including springs) is currently used or is reasonably anticipated to be used as a potable source. For purposes of this guidance, a local ordinance that prohibits the potable use of groundwater may be used to make the "reasonably anticipated" determination. However, groundwater flow direction and velocity must be considered to insure that down gradient receptors not covered by the ordinance are protected. In addition, areas characterized by karst topography, caves or sinkholes are also considered sensitive environments for groundwater protection due to the uncertainty surrounding flow direction and the ability to rapidly transport contaminants. Contaminants with maximum concentrations exceeding the "Beneficial Fill Groundwater Protection Screening Level" on Table 1 will be flagged as a Contaminant of Potential Concern for Groundwater Resources. Media with concentrations exceeding these levels should not be placed in or directly adjacent to sensitive environments for protection of groundwater resources unless placement occurs on the same or adjacent property to where the soil was generated.

Please note that placement of media within a sensitive ecosystem may require additional permits from DEQ and/or the U.S. Army Corps of Engineers. As with any fill project, all State and Local requirements must be followed in terms of notices and Best Management Practices.

For purposes of this Variance contaminated media utilizing Table I standards should use the following setbacks:

- 200 feet separation to any wells, springs, or surface water currently used as a drinking water source.

- 50 feet separation to a cave, sinkhole, , sinking and losing streams, or large flow springs.

Table 2-Protection of Residential and Other High Exposure Frequency Receptors

Table 2 should be used to determine whether the media in question may be used as fill in areas that are currently used or reasonably anticipated to be used as residential housing or for other high exposure frequency purposes. For purposes of this guidance high exposure frequency uses include residential housing, schools, day care, parks, playgrounds, and long term health care facilities. Hotels and motels are not included in this definition. Contaminants with maximum concentrations exceeding the "Beneficial Fill Residential Screening Level" on Table 2 will be flagged as a Contaminant of Potential Concern for Residential Use. Media with concentrations exceeding these levels should not be placed on or directly adjacent to areas with high exposure frequency uses. For contaminants on Table 2 that are based solely on non-carcinogenic effects, the EPA Regional Screening Levels (RSL) have been divided by 10 to account for the potential additivity of toxic effects. For media with fewer than 10 non-carcinogenic contaminants exceeding the Table 2 level, the original RSL may be divided by the number of non-carcinogenic contaminants to derive an adjusted Table 2 level. The intent is to ensure that the hazard index for the managed media does not exceed 1 under a standard residential scenario. If contaminants are present that are not on the attached Table 2, the owner may use EPA's RSL Table that can be found at the link below. The column labeled Resident Soil should be used. RSLs that are based on non-carcinogenic effects should be divided by 10.
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm

Table 3-Protection of Commercial/Industrial Workers

Table 3 should be used to determine whether the media in question may be used as fill in areas that are restricted to use as commercial/industrial sites. Contaminants with maximum concentrations exceeding the "Beneficial Fill Industrial Screening Level" on Table 3 will be flagged as a Contaminant of Potential Concern for Commercial/Industrial Use. Media with concentrations below these levels may be used on sites that are restricted to commercial/industrial use. Media with concentrations exceeding these levels should not be used as fill but should be managed appropriately as solid or hazardous waste. For contaminants on Table 3 that are based solely on non-carcinogenic effects, the EPA RSLs have been divided by 10 to account for the potential additivity of toxic effects. For media with fewer than 10 non-carcinogenic contaminants exceeding the Table 2 level, the original RSL may be divided by the number of non-carcinogenic contaminants to derive an adjusted Table 3 level. The intent is to ensure that the hazard index for the managed media does not exceed 1 under a standard industrial scenario.

If contaminants are present that are not on the attached Table 2, the owner may use EPA's RSL Table that can be found at the link below. The column labeled Industrial Soil should be used. RSLs that are based on non-carcinogenic effects should be divided by 10.

http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm

The restrictions for use are noted below:

- The owner of the land where the Contaminated Media is deposited must file a declaration of restrictive covenants on the property to ensure that future use of the property is restricted to industrial use. The landowner may file a restriction on the entire property or file a plat identifying the area of the property with the contaminated media and a restriction on that portion of the property. The restriction must be filed regardless of the depth of placement of the media. The restriction must be filed within 90 days of first placement of the media. A template for the restriction is provided in Appendix B.
- 50 feet separation to any off-property residence, health care facility, school, recreational park area, daycare or similar public institution.

Note that some situations will require the use of more than one of these tables. For example, a potential fill site may be planned for residential use in a locality that uses groundwater for drinking. In this case, both the residential screening levels and the groundwater protection screening levels must be met. Another example is a potential industrial site directly adjacent to a surface water body. In this case, both the industrial and the ecological screening level must be met.

Also note that there are some chemicals for which naturally occurring background concentrations are above the screening levels. In this case the background concentration for the receiving site may be substituted for the risk-based screening level. The generator must collect site-specific samples from the receiving site to support the use of background concentrations.

General Restrictions for All Sites/Uses

Additionally, for each of the scenarios described above, the generator shall comply with the following:

- The media used must have been generated from property in the Commonwealth of Virginia.
- The fill material should be suitably stable and of sufficient quality to support vegetation or supplemented with such material if the fill material is to be used as topsoil.
- This material should be placed such that it does not spill or erode onto another property.
- This material should be placed such that it is not deposited into waterways (proper use of Erosion & Sediment Best Management Practices).
- Comply with local ordinances regarding movement/placement of fill soil.
- Comply with standard E&S control practices and BMPs.
- Notification to, and approval of, the landowner where the soil is to be used as fill by use of the form in Appendix A.

- Maintenance of Appendix A document in facility files and submittal of Appendix A notification to DLPR regional office.

VII. Technical Assistance and Compliance Evaluation

Technical assistance regarding use of this Variance is available from your DEQ regional office. You can find the appropriate office by going to the link below: http://www.deq.virginia.gov/Locations.aspx.

Management of any waste material, even the beneficial use of lightly contaminated fill, has the potential for problems to arise if not properly managed. The more comprehensive the environmental due diligence that is conducted prior to the project initiation, the better the chance of a positive outcome. Additionally, proper project planning, to include transportation of the fill, is important.

The intent of this Variance is to provide a self-implementing mechanism for Generators and Owner/Operators to effect proper management of contaminated media and the details to accomplish that are in this Variance. It is the Generator and Owner/operators responsibility and liability to manage this media in a manner consistent with State and Local regulations. If levels are above those identified in the tables for a proposed use, in order to still use the media for that proposed use, the Generators and Owner/Operator would need to apply for an individual variance in accordance with the VSWMR.

DEQ staff will provide an acknowledgement of the information and may complete a cursory completeness review of the submitted information. DEQ will not conduct technical reviews of the submitted Appendix A information unless necessary. Management of contaminated media under this Variance will be considered beneficial and the process will not be regulated as management of a solid waste under the VSWMR so long as these materials are handled in a manner that does not constitute a public nuisance, health hazard or open dump. DEQ retains the obligation and right to investigate any and all fill sites operating under this Variance to the extent allowed by state law, to verify that site operations are as described in the Appendix A submittal and the site operations have not created a public nuisance, open dump, or threat to human health and the environment.

The speculative accumulation provisions of the VSWMR (defined in 9VAC 20-81-10 of the VSWMR) shall apply to accumulated fill stockpiles. At least 75% of any material accumulated must be used within one year of accumulation or it will be subject to regulation in accordance with the VSWMR.

VIII. Collaboration Process

This Variance was developed by a small project team consisting of DEQ Central Office and Regional staff. Additionally, comments from VDOT staff and interested parties in the legal and environmental consulting professions, and the regulated community were solicited and considered in its preparation.

IX. Attachments

- Appendix A – Notification to Property Owner of Contaminated Media Use
- Appendix B – Sample Declaration of Restrictive Covenants
- Figure 1 – Hierarchy for Contaminated Media
- Table 1 – Protection of Ecological Receptors and Groundwater
- Table 2 – Residential and Other High Frequency Receptors
- Table 3 – Restricted (Commercial/Industrial)

APPENDIX A

Contaminated Media Use Form

I, the Generator, certify that the fill material described in the following "Fill Description" has been determined to meet the following Tier classification (circle all that apply):

Table 1 –Sensitive Ecosystem/Groundwater Resource

Table 2 – Residential

Table 3– Commercial/Industrial

FILL DESCRIPTION

Address of media origination:

Facility Name:

Facility Owner (Name and Phone number):

General description of contaminant origin including brief list of contaminants of concern (Attach analytical list of contaminants):

Specific location of media to be excavated **(attach as Figures 1 and 2):**

Quantity of media to be excavated and reused:

This fill material is to be used at the following location:

Property Name:

Current Owner of Property (include phone number):

Signature of Property Owner:

Property Address and Tax parcel:

Location of Fill use on property: **(attach as Figures 3 and 4)**

This fill material will be used solely for the purpose of property improvement, construction purposes, or general fill. A copy of the laboratory analyses that confirm the "Level" classification is included with this Appendix.

Date:

Generator Name (print):

Generator Name (signature):

Title:

Address:

Phone:

NOTE: This form is to be retained by the property owner receiving the fill material and the generator of the fill. If a property receives contaminated media as fill under this Guidance from multiple sources, a separate certification is required for each source.

Specifications for Facility Site Maps

Maps must be neat and professional; surveying is not required but recommended. Maps should be to scale and include a street address or bounding addresses and a reference to a specific, permanent, location marker. Two maps each should be submitted for both the excavation site and the deposition site:

1. **General Map**: Map 1 should show where in a locality the property is located (mark the site on the map). The map may be a topographic map or a large enough scale map from an Internet mapping site that at least shows the nearest crossroads;
2. **Specific Location Map**: Map 2 should be specific to the excavation or deposition site itself. If a site map already exists due to remediation processes or a previous environmental site assessment, that map may be used to mark the excavation/deposition area. Copies of plats are also acceptable and encouraged to supplement documentation. Map should contain:
    a. Complete and detailed site map(s) including:
        i. - Scale, north arrow, and legend
        ii. - Location of all buildings, roads, and adjacent properties
        iii. - Location of potential receptors such as drinking water wells, streams, etc.
        iv. – Location of deposition/fill area in relation to items listed in ii and iii.

Specific location of media excavated or to be excavated (attach maps and label Figure 1 – Excavation General Map and Figure 2 – Excavation Specific Location)

Specific location of media deposition (attach maps and label Figure 3 – Deposition General Map and Figure 4 – Deposition Specific Location)

Quantity of media to be excavated: _____cubic yards OR _____ tons
Quantity of media to be reused: _____ cubic yards OR _____ tons
Quantity to be disposed in Solid Waste or CDD Landfill: _____cubic yards OR _____ tons

APPENDIX B

SAMPLE-DECLARATION OF RESTRICTIVE COVENANTS

This Declaration of Restrictive Covenants made as of this ____ day of [month, year], by [owner], owner of the fee simple title to the property hereinafter described, GRANTOR, and by [add names of trustees if any], Trustee, as follows:

ALL THAT eertain traet, piece or parcel of land containing a total [amount of acres] acres, lying and being in the City of [name of city], Virginia, and [metes and bounds description of property and/or plat attached].

WHEREAS, [owner] is the fee simple owner of the said property (see deed recorded in Deed Book [Deed Book number], page [page number]); and

[*If the property is subject to a Deed of Trust*:]
WHEREAS, this property is subject to a Deed of Trust of record at Deed Book __, Page __, to _____ and _____, Trustees, to secure a note in the amount of _____ made to _____. The Trustee joins this Declaration to the end that the Deed of Trust shall be subordinate to this Declaration and its terms; and

WHEREAS, in consideration of certain allowances made by the Direetor of the Virginia Department of Environmental Quality [and consideration offered by Generator, if different], the Grantor has agreed to establish certain irrevocable restrictive covenants limiting the use of certain portions of said property in order to protect human health and the environment;

NOW THEREFORE, for the consideration referred to above, the receipt and legal sufficiency of which is hereby acknowledged by the undersigned, and in order to protect human health and the environment, the undersigned do hereby irrevocably, dedicate, declare and impose the following restrictive covenants to run with the land on the above described property as follows:

> The property shall not be used for residential purposes or for children's (under the age of 16) daycare facilities, schools or playground purposes (although hotels and motels are not prohibited).]

This Declaration of Restrictive Covenants may be modified or released only with the consent of the Director of the Department of Environmental Quality, upon a showing of changed circumstances sufficient to justify the ehange.

Given under my hand and seal at [name of city], Virginia, on the _____ day of [month, year],

_____
[Name of Owner/Corporation]
By: [Name]

State of _____, County of _____

The foregoing instrument was acknowledged before me this [date] by [name of person acknowledged].

[Notary]

[*If the Owner and Generator are not the same*]

_____

[Name of Generator]

State of _____, County of _____

The foregoing instrument was acknowledged before me this [date] by [name of person acknowledged].

[Notary]

[*If there is a deed of trust*]

_____

[Name], Trustee

State of _____, County of _____

The foregoing instrument was acknowledged before me this [date] by [name of person acknowledged].

[Notary]

[*If there are other encumbrances listed on the Certificate*]

_____

[Name]

State of _____, County of _____

The foregoing instrument was acknowledged before me this [date] by [name of person acknowledged].

[Notary]

Hierarchy for Contaminated Soils

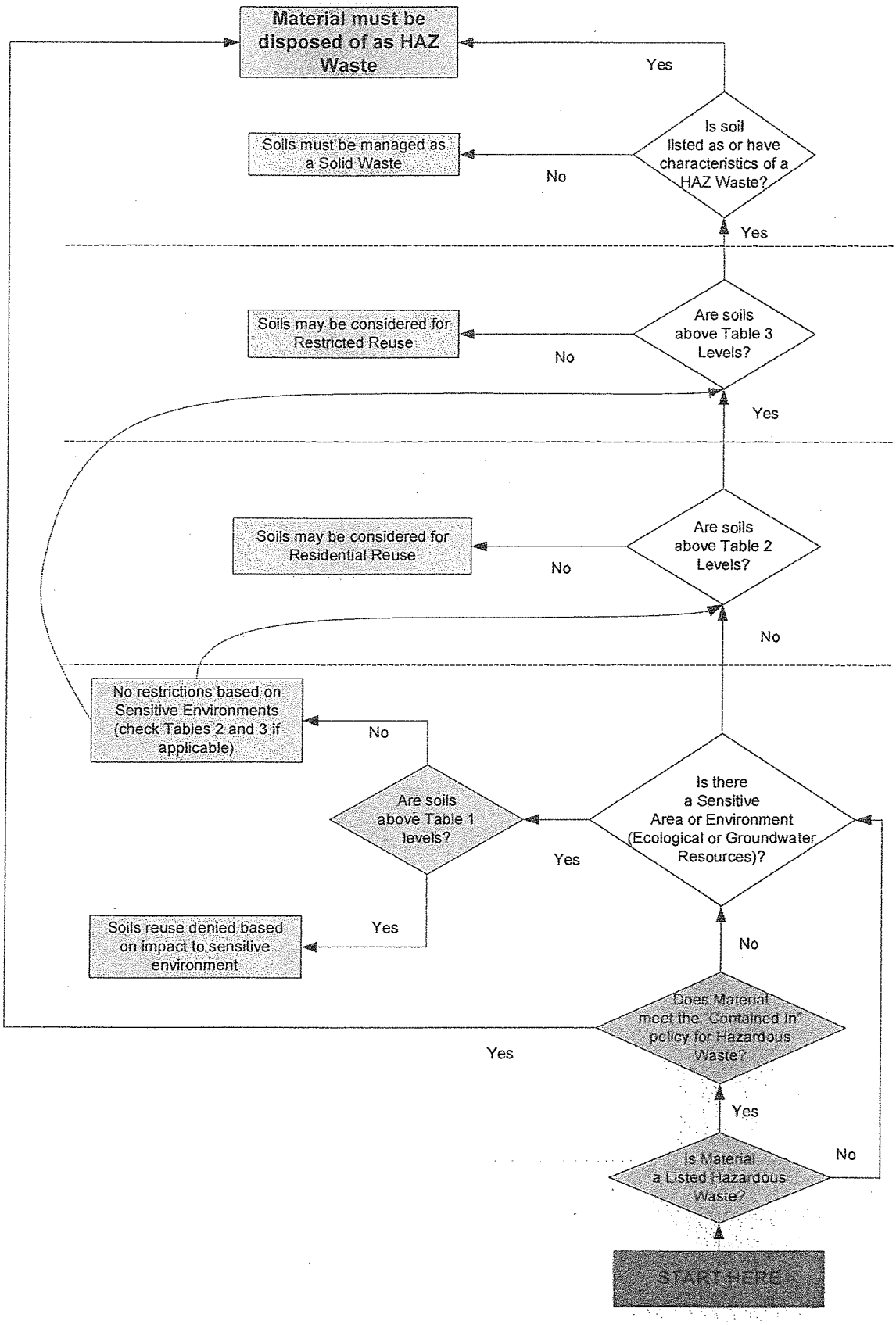

Table 1
Protection of Ecological Receptors and Groundwater

Revised 7/13/12

Table 1 Protection of Groundwater and Ecological Receptors	CAS No.	Beneficial Fill Ecological Screening Level mg/kg	Beneficial Fill Groundwater Protection Screening Level SSL (soil to groundwater) DAF 10 mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Ecologically Sensitive Environments?	Contaminant of Potential Concern for Groundwater Resources?
TAL Inorganics						
Aluminum	7429-90-5	pH dependent	2.40E+04			
Antimony	7440-36-0	0.27	2.71E+00			
Arsenic	7440-38-2	18	2.91E+00			
Barium	7440-39-3	330	8.22E+02			
Beryllium	7440-41-7	21	3.16E+01			
Cadmium	7440-43-9	0.36	3.76E+00			
Calcium	7440-70-2					
Chromium	7440-47-3	26	1.91E+01			
Cobalt	7440-48-4	13	2.12E-01			
Copper	7440-50-8	28	5.57E+03			
Cyanide	57-12-5	0.005	2.00E+01			
Iron	7439-89-6	pH dependent	2.76E+02			
Lead	7439-92-1	11	1.35E+02			
Magnesium	7439-95-4	4400				
Manganese (nonfood)	7439-96-5	220	2.08E+01			
Mercury, inorganic salts	7487-94-7	0.1				
Mercury	7439-97-6	0.058	1.04E+00			
Methylmercury	22967-92-6	0.00158				
Nickel	7440-02-0	38	1.95E+01			
Potassium	7440-09-7					
Selenium	7782-49-2	0.52	2.55E+00			
Silver	7440-22-4	4.2	5.98E-01			
Sodium	7440-23-5					
Thallium	7440-28-0	0.001	1.42E+00			
Vanadium	7440-62-2	7.8	7.80E+01			
Zinc	7440-66-6	46	2.92E+02			
Other Inorganics						
Perchlorate						
TCL Volatile Organic Compounds (VOCs)						
Acetone	67-64-1	2.5	1.25E+00			
Benzene	71-43-2	0.06	2.46E-02			
Bromochloromethane	74-97-5	3000	1.70E-02			
Bromodichloromethane	75-27-4	0.54	3.50E-01			
Bromoform	75-25-2	15.9	5.16E-01			
Bromomethane	74-83-9	0.235	1.48E-03			
2-Butanone (methyl ethyl ketone)	78-93-3	89.6	5.52E-01			
Carbon disulfide	75-15-0	0.0941	5.48E-01			
Carbon tetrachloride	56-23-5	0.3	7.94E-02			
Chlorobenzene	108-90-7	0.05	1.40E+00			
Chloroethane	75-00-3		5.58E+00			
Chloroform	67-66-3	0.001	3.11E-01			
Chloromethane	74-87-3	10.4	3.92E-02			
Cyclohexane	110-82-7	0.1	7.05E+01			
1,2-Dibromo-3-chloropropane	96-12-8	0.0352	1.09E-03			
Dibromochloromethane	124-48-1	2.05	4.20E-01			
1,2-Dibromoethane	106-93-4	1.23	1.81E-04			
1,2-Dichlorobenzene (ortho)	95-50-1	0.01	2.12E+01			
1,3-Dichlorobenzene (meta)	541-73-1	0.01	2.25E-02			
1,4-Dichlorobenzene (para)	106-46-7	0.01	3.39E+00			
Dichlorodifluoromethane	75-71-8	39.5	5.95E-01			
1,1-Dichloroethane	75-34-3	0.3	7.95E-03			
1,2-Dichloroethane	107-06-2	0.4	1.07E-02			
1,1-Dichloroethene	75-35-4	8.28	4.58E-02			
1,2-Dichloroethene (total)	540-59-0	0.3	5.18E-02			
cis-1,2-Dichloroethene	156-59-2	0.3	2.42E-01			
trans-1,2-Dichloroethene	156-60-5	0.3	4.98E-01			
1,2-Dichloropropane	78-87-5	0.3	1.99E-02			
1,3-Dichloropropene (total)	542-75-6	0.3	1.52E-03			
cis-1,3-Dichloropropene	10061-01-5	0.398	1.66E-03			
trans-1,3-Dichloropropene	10061-02-6	0.398	1.64E-03			
1,4-dioxane	123-91-1	2.05	7.10E-04			
Ethylbenzene	100-41-4	0.05	1.68E+01			
Hexane	110-54-3					
2-Hexanone	591-78-6	12.6	6.45E-03			
Isopropylbenzene (cumene)	98-82-8		5.77E+00			
4-Methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	100	1.64E-01			
Methyl acetate	79-20-9		1.77E+00			
Methyl tert-butyl ether	1634-04-4		2.08E-02			
Methylcyclohexane	108-87-2		5.44E+01			
Methylene chloride	75-09-2	0.3	9.36E-03			
Styrene	100-42-5	0.1	4.89E+00			
1,1,2,2-Tetrachloroethane	79-34-5	0.127	4.38E-04			
Tetrachloroethene	127-18-4	0.01	1.89E-01			
Toluene	108-88-3	0.05	1.19E+01			
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		3.24E+02			
1,2,3-Trichlorobenzene	87-61-6	0.01	6.08E-02			
1,2,4-Trichlorobenzene	120-82-1	0.01	7.21E+00			
1,1,1-Trichloroethane	71-55-6	0.3	1.81E+00			
1,1,2-Trichloroethane	79-00-5	0.3	2.05E-02			
Trichloroethene	79-01-6	0.001	3.86E-02			
Trichlorofluoromethane	75-69-4	16.4	1.74E+00			
Vinyl Chloride	75-01-4	0.01	7.92E-03			
Total Xylenes	1330-20-7	0.05	2.43E+02			
Other VOCs						
n-butylbenzene	104-51-8		1.67E+01			
sec-butylbenzene	135-98-8					
tert-butylbenzene	98-06-6					
Isopropyltoluene	99-87-6		8.75E+00			
n-propylbenzene	103-65-1		2.65E+00			
1,1,1,2-tetrachloroethane	630-20-6	0.3	9.99E-03			
1,2,4-trimethylbenzene	95-63-6		1.08E-01			
1,3,5-trimethylbenzene	108-67-8		3.34E-01			
m-xylene	108-38-3		2.62E+02			
o-xylene	95-47-6		2.26E+02			
p-xylene	106-42-3		2.40E+02			
TCL Semivolatile Organic Compounds (SVOCs)						
Acenaphthene	83-32-9	29	1.72E+01			
Acenaphthylene	208-96-8	29	6.63E+01			

Table 1
Protection of Ecological Receptors and Groundwater

Revised 7/13/12

Table 1 Protection of Groundwater and Ecological Receptors	CAS No.	Beneficial Fill Ecological Screening Level mg/kg	Beneficial Fill Groundwater Protection Screening Level SSL (soil to groundwater) DAF 10 mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Ecologically Sensitive Environments?	Contaminant of Potential Concern for Groundwater Resources?
Acetophenone	98-86-2	300	4.72E-01			
Anthracene	120-12-7	29	1.85E+02			
Atrazine	1912-24-9	0.00005	6.78E-02			
Benzaldehyde	100-52-7		4.07E-01			
Benzo(a)anthracene	56-55-3	1.1	6.44E-01			
Benzo(a)pyrene	50-32-8	1.1	8.87E+00			
Benzo(b)fluoranthene	205-99-2	1.1	1.82E+00			
Benzo(g,h,i)perylene	191-24-2	1.1	1.94E+04			
Benzo(k)fluoranthene	207-08-9	1.1	1.82E+01			
1,1'-Biphenyl	92-52-4		5.23E-02			
bis(2-Chloroethoxy)methane	111-91-1		6.24E-03			
bis(2-chloroethyl)ether	111-44-4	23.7	2.54E-05			
bis-(2-Ethylhexyl)phthalate	117-81-7	0.925	3.80E+01			
4-Bromophenyl-phenylether	101-55-3					
Butylbenzylphthalate	85-68-7	0.239	5.64E+01			
Caprolactam	105-60-2		8.00E-01			
Carbazole	86-74-8		9.30E-01			
4-Chloro-3-methylphenol	59-50-7	7.95	7.47E+00			
4-Chloroaniline	106-47-8	1.1	1.59E-03			
2-Chloronaphthalene	91-58-7	0.0122	7.00E+00			
2-Chlorophenol	95-57-8	0.01	1.73E-01			
4-Chlorophenyl-phenylether	7005-72-3					
Chrysene	218-01-9	1.1	6.44E+01			
Dibutyl phthalate	84-74-2	0.15	1.76E+02			
Di-n-octylphthalate	117-84-0	70.9				
Dibenzo(a,h)anthracene	53-70-3	1.1	4.27E-01			
Dibenzofuran	132-64-9		3.91E-01			
3,3'-Dichlorobenzidine	91-94-1	0.646	1.87E-02			
2,4-Dichlorophenol	120-83-2	0.003	3.45E-02			
Diethylphthalate	84-66-2	24.8	1.88E+01			
2,4-Dimethylphenol	105-67-9	0.01	3.23E-01			
Dimethylphthalate	131-11-3	200				
4,6-Dinitro-2-methylphenol	534-52-1	0.144	1.36E-04			
2,4-Dinitrophenol	51-28-5	0.0608	3.00E-03			
2,4-Dinitrotoluene	121-14-2	1.26	1.39E-03			
2,6-Dinitrotoluene	606-20-2	0.0328	5.92E-03			
Fluoranthene	206-44-0	1.1	2.78E+02			
Fluorene	86-73-7	29	1.70E+01			
Hexachlorobenzene	118-74-1	0.0025	9.96E+00			
Hexachlorobutadiene	87-68-3	0.0398	7.81E-01			
Hexachlorocyclopentadiene	77-47-4	0.755	2.70E+02			
Hexachloroethane	67-72-1	0.596	3.47E-01			
Indeno(1,2,3-cd)pyrene	193-39-5	1.1	5.16E+00			
Isophorone	78-59-1	139	2.43E-01			
2-Methylnaphthalene	91-57-6	29	1.01E+00			
2-Methylphenol	95-48-7	0.1	4.29E-01			
3-Methylphenol	108-39-4	0.5	4.37E-01			
4-Methylphenol	106-44-5	0.1	8.19E-01			
N-Nitroso-di-n-propylamine	621-64-7	0.544	2.14E-05			
N-Nitrosodiphenylamine	86-30-6	0.545	7.27E-01			
Naphthalene	91-20-3	29	1.49E-02			
2-Nitroaniline	88-74-4	74.1	7.43E-02			
3-Nitroaniline	99-09-2	3.16				
4-Nitroaniline	100-01-6	21.9	7.91E-03			
Nitrobenzene	98-95-3	1.31	5.95E-04			
2-Nitrophenol	88-75-5	1.6				
4-Nitrophenol	100-02-7	0.1				
2,2'-Oxybis(1-chloropropane)	108-60-1		5.41E-03			
Pentachlorophenol	87-86-5	2.1	3.65E-02			
Phenanthrene	85-01-8	29	1.60E+02			
Phenol	108-95-2	0.05	1.19E+00			
Pyrene	129-00-0	1.1	3.27E+01			
1,2,4,5-Tetrachlorobenzene	95-94-3	0.01	3.94E-01			
2,3,4,6-Tetrachlorophenol	58-90-2	0.001	3.05E+00			
2,4,5-Trichlorophenol	95-95-4	0.1	8.62E+00			
2,4,6-Trichlorophenol	88-06-2	0.1	8.36E-02			
Semivolatile Organic Compounds (SVOCs)						
Benzoic Acid	65-85-0		6.00E+00			
TCL Polychlorinated Biphenyls (PCBs)						
Aroclor-1016	12674-11-2		9.60E+00			
Aroclor-1221	11104-28-2		1.25E+00			
Aroclor-1232	11141-16-5		3.10E+00			
Aroclor-1242	53469-21-9		9.60E+00			
Aroclor-1248	12672-29-6		3.73E+01			
Aroclor-1254	11097-69-1		7.36E+01			
Aroclor-1260	11096-82-5		1.45E+02			
Aroclor-1262	37324-23-5		1.45E+02			
Aroclor-1268	11100-14-4		1.45E+02			
Total PCBs	1336-36-3	0.000332				
TCL Pesticides						
Aldrin	309-00-2	0.0025	3.36E-03			
alpha-BHC	319-84-6	0.0025	4.61E-04			
beta-BHC	319-85-7	0.001	1.58E-03			
delta-BHC	319-86-8	9.94	1.51E-03			
gamma-BHC (lindane)	58-89-9	0.00005	1.06E-02			
Chlordane	57-74-9	0.1	1.45E+01			
alpha-Chlordane	5103-71-9	0.1	7.85E-01			
gamma-Chlordane	5103-74-2	0.1	1.63E+00			
4,4'-DDD	72-54-8	0.021	1.39E+01			
4,4'-DDE	72-55-9	0.021	4.71E+00			
4,4'-DDT	50-29-3	0.021	2.14E+01			
Dieldrin	60-57-1	0.0049	4.34E-04			
Endosulfan	115-29-7	0.1	9.97E-01			
Endosulfan I	959-98-8	0.1	1.73E+00			
Endosulfan II	33213-65-9	0.1	1.73E+00			
Endosulfan Sulfate	1031-07-8	0.0358	1.27E+00			
Endrin	72-20-8	0.001	5.69E-01			
Endrin Aldehyde	7421-93-4	0.0105	2.31E-01			
Endrin Ketone	53494-70-5	0.1	7.08E-01			
Heptachlor	76-44-8	0.00598	4.25E-01			
Heptachlor epoxide	1024-57-3	0.1	2.44E+00			

Table 1
Protection of Ecological Receptors and Groundwater

Revised 7/13/12

Table 1 Protection of Groundwater and Ecological Receptors	CAS No.	Beneficial Fill Ecological Screening Level mg/kg	Beneficial Fill Groundwater Protection Screening Level SSL (soil to groundwater) DAF 10 mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Ecologically Sensitive Environments?	Contaminant of Potential Concern for Groundwater Resources?
Methoxychlor	72-43-5	0.0199	1.34E+02			
Toxaphene	8001-35-2	0.119	9.86E+00			
Chlorinated dioxins/dibenzofurans (CDDs/CDFs)						
2,3,7,8-TCDD	1746-01-6	1.99E-07	6.08E-03			
2,3,7,8-TCDF	51207-31-9	0.0000386				

Eco=Ecological
SSL=Soil Screening Levels
DAF=Dilution Attenuation Factor
TAL=Target Analyte List
TCL=Target Compound List

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Table 2 (a) Soil: Residential and Other High Frequency Receptors	CAS No.	Beneficial Fill Residential Screening Level (b) mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Residential Use?
TAL Inorganics				
Aluminum	7429-90-5	7.70E+03		
Antimony	7440-36-0	3.10E+00		
Arsenic	7440-38-2	3.90E-01		
Barium	7440-39-3	1.50E+03		
Beryllium	7440-41-7	1.60E+01		
Cadmium (food, soil)	7440-43-9	7.00E+00		
Calcium	7440-70-2			
Chromium (based on Chromium VI)	7440-47-3	2.90E-01		
Chromium III	16065-83-1	1.20E+04		
Cobalt	7440-48-4	2.30E+00		
Copper	7440-50-8	3.10E+02		
Cyanide	57-12-5	4.70E+00		
Iron	7439-89-6	5.50E+03		
Lead	7439-92-1	4.00E+02		
Magnesium	7439-95-4			
Manganese (nonfood)	7439-96-5	1.80E+02		
Mercury, inorganic salts	7487-94-7	2.30E+00		
Mercury	7439-97-6	1.00E+00		
Methylmercury	22967-92-6	7.80E-01		
Nickel	7440-02-0	1.50E+02		
Potassium	7440-09-7			
Selenium	7782-49-2	3.90E+01		
Silver	7440-22-4	3.90E+01		
Sodium	7440-23-5			
Thallium	7440-28-0	7.80E-02		
Vanadium	7440-62-2	3.90E+01		
Zinc	7440-66-6	2.30E+03		
Other Inorganics				
Perchlorate		5.50E+00		
TCL Volatile Organic Compounds (VOCs)				
Acetone	67-64-1	6.10E+03		
Benzene	71-43-2	1.10E+00		
Bromochloromethane (based on bromodichloromethane)	74-97-5	1.60E+01		
Bromodichloromethane	75-27-4	2.70E-01		
Bromoform	75-25-2	6.20E+01		
Bromomethane	74-83-9	7.30E-01		
2-Butanone (methyl ethyl ketone)	78-93-3	2.80E+03		
Carbon disulfide	75-15-0	8.20E+01		
Carbon tetrachloride	56-23-5	6.10E-01		
Chlorobenzene	108-90-7	2.90E+01		
Chloroethane	75-00-3	1.50E+03		
Chloroform	67-66-3	2.90E-01		
Chloromethane	74-87-3	1.20E+01		
Cyclohexane	110-82-7	7.00E+02		
1,2-Dibromo-3-chloropropane	96-12-8	5.40E-03		
Dibromochloromethane	124-48-1	6.80E-01		
1,2-Dibromoethane	106-93-4	3.40E-02		
1,2-Dichlorobenzene (ortho)	95-50-1	1.90E+02		
1,3-Dichlorobenzene (meta)(based on 1,4-dichlorobenzene)	541-73-1			
1,4-Dichlorobenzene (para)	106-46-7	2.40E+00		
Dichlorodifluoromethane	75-71-8	9.40E+00		
1,1-Dichloroethane	75-34-3	3.30E+00		
1,2-Dichloroethane	107-06-2	4.30E-01		
1,1-Dichloroethene	75-35-4	2.40E+01		
1,2-Dichloroethene (total)	540-59-0	7.00E+01		
cis-1,2-Dichloroethene	156-59-2	1.60E+01		
trans-1,2-Dichloroethene	156-60-5	1.50E+01		
1,2-Dichloropropane	78-87-5	9.40E-01		
1,3-Dichloropropene (total)	542-75-6	1.70E+00		
cis-1,3-Dichloropropene	10061-01-5	1.70E+00		
trans-1,3-Dichloropropene	10061-02-6	1.70E+00		
1,4-dioxane	123-91-1	4.90E+00		
Ethylbenzene	100-41-4	5.40E+00		
Hexane	110-54-3	5.70E+01		
2-Hexanone	591-78-6	2.10E+01		
Isopropylbenzene (cumene)	98-82-8	2.10E+02		
4-Methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	5.30E+02		
Methyl acetate	79-20-9	7.80E+03		
Methyl tert-butyl ether	1634-04-4	4.30E+01		
Methylcyclohexane (based on cyclohexane)	108-87-2			
Methylene chloride	75-09-2	5.60E+01		
Styrene	100-42-5	6.30E+02		
1,1,2,2-Tetrachloroethane	79-34-5	5.60E-01		
Tetrachloroethene	127-18-4	2.20E+01		
Toluene	108-88-3	5.00E+02		
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	4.30E+03		
1,2,3-Trichlorobenzene	87-61-6	4.90E+00		
1,2,4-Trichlorobenzene **	120-82-1	2.20E+01		
1,1,1-Trichloroethane	71-55-6	8.70E+02		

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Table 2 (a) Soil: Residential and Other High Frequency Receptors	CAS No.	Beneficial Fill Residential Screening Level (b) mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Residential Use?
1,1,2-Trichloroethane **	79-00-5	1.10E+00		
Trichloroethene **	79-01-6	9.10E-01		
Trichlorofluoromethane	75-69-4	7.90E+01		
Vinyl Chloride	75-01-4	6.00E-02		
Total Xylenes	1330-20-7	6.30E+01		
Other VOCs				
n-butylbenzene	104-51-8	3.90E+02		
sec-butylbenzene	135-98-8			
tert-butylbenzene	98-06-6			
isopropyltoluene (based on isopropylbenzene)	99-87-6			
n-propylbenzene	103-65-1	3.40E+02		
1,1,1,2-tetrachloroethane	630-20-6	1.90E+00		
1,2,4-trimethylbenzene	95-63-6	6.20E+00		
1,3,5-trimethylbenzene	108-67-8	7.80E+01		
m-xylene	108-38-3	5.90E+01		
o-xylene	95-47-6	6.90E+01		
p-xylene	106-42-3	6.00E+01		
TCL Semivolatile Organic Compounds (SVOCs)				
Acenaphthene	83-32-9	3.40E+02		
Acenaphthylene (based on pyrene)	208-96-8	1.70E+02		
Acetophenone	98-86-2	7.80E+02		
Anthracene	120-12-7	1.70E+03		
Atrazine	1912-24-9	2.10E+00		
Benzaldehyde	100-52-7	7.80E+02		
Benzo(a)anthracene	56-55-3	1.50E-01		
Benzo(a)pyrene	50-32-8	1.50E-02		
Benzo(b)fluoranthene	205-99-2	1.50E-01		
Benzo(g,h,i)perylene (based on pyrene)	191-24-2	1.70E+02		
Benzo(k)fluoranthene	207-08-9	1.50E+00		
1,1'-Biphenyl	92-52-4	5.10E+00		
bis(2-Chloroethoxy)methane	111-91-1	1.80E+01		
bis(2-chloroethyl)ether	111-44-4	2.10E-01		
bis-(2-Ethylhexyl)phthalate	117-81-7	3.50E+01		
4-Bromophenyl-phenylether	101-55-3			
Butylbenzylphthalate	85-68-7	2.60E+02		
Caprolactam	105-60-2	3.10E+03		
Carbazole	86-74-8			
4-Chloro-3-methylphenol	59-50-7	6.10E+02		
4-Chloroaniline	106-47-8	2.40E+00		
2-Chloronaphthalene	91-58-7	6.30E+02		
2-Chlorophenol	95-57-8	3.90E+01		
4-Chlorophenyl-phenylether	7005-72-3			
Chrysene	218-01-9	1.50E+01		
Dibutyl phthalate	84-74-2	6.10E+02		
Di-n-octylphthalate	117-84-0			
Dibenzo(a,h)anthracene	53-70-3	1.50E-02		
Dibenzofuran	132-64-9	7.80E+00		
3,3'-Dichlorobenzidine	91-94-1	1.10E+00		
2,4-Dichlorophenol	120-83-2	1.80E+01		
Diethylphthalate	84-66-2	4.90E+03		
2,4-Dimethylphenol	105-67-9	1.20E+02		
Dimethylphthalate	131-11-3			
4,6-Dinitro-2-methylphenol	534-52-1	4.90E-01		
2,4-Dinitrophenol	51-28-5	1.20E+01		
2,4-Dinitrotoluene	121-14-2	1.60E+00		
2,6-Dinitrotoluene	606-20-2	6.10E+00		
Fluoranthene	206-44-0	2.30E+02		
Fluorene	86-73-7	2.30E+02		
Hexachlorobenzene	118-74-1	3.00E-01		
Hexachlorobutadiene **	87-68-3	6.20E+00		
Hexachlorocyclopentadiene	77-47-4	3.70E+01		
Hexachloroethane **	67-72-1	1.20E+01		
Indeno(1,2,3-cd)pyrene	193-39-5	1.50E-01		
Isophorone	78-59-1	5.10E+02		
2-Methylnaphthalene	91-57-6	2.30E+01		
2-Methylphenol	95-48-7	3.10E+02		
3-Methylphenol	108-39-4	3.10E+02		
4-Methylphenol	106-44-5	6.10E+02		
N-Nitroso-di-n-propylamine	621-64-7	6.90E-02		
N-Nitrosodiphenylamine	86-30-6	9.90E+01		
Naphthalene	91-20-3	3.60E+00		
2-Nitroaniline	88-74-4	6.10E+01		
3-Nitroaniline	99-09-2			
4-Nitroaniline	100-01-6	2.40E+01		
Nitrobenzene	98-95-3	4.80E+00		
2-Nitrophenol	88-75-5			
4-Nitrophenol	100-02-7			
2,2'-Oxybis(1-chloropropane)	108-60-1	4.60E+00		
Pentachlorophenol	87-86-5	8.90E-01		
Phenanthrene (based on pyrene)	85-01-8	1.70E+02		
Phenol	108-95-2	1.80E+03		
Pyrene	129-00-0	1.70E+02		

Table 2 [a] Soil: Residential and Other High Frequency Receptors	CAS No.	Beneficial Fill Residential Screening Level [b] mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Residential Use?
1,2,4,5-Tetrachlorobenzene	95-94-3	1.80E+00		
2,3,4,6-Tetrachlorophenol	58-90-2	1.80E+02		
2,4,5-Trichlorophenol	95-95-4	6.10E+02		
2,4,6-Trichlorophenol **	88-06-2	4.40E+01		
Semivolatile Organic Compounds (SVOCs)				
Benzoic Acid	65-85-0	2.40E+04		
TCL Polychlorinated Biphenyls (PCBs)				
Aroclor-1016	12674-11-2	3.90E-01		
Aroclor-1221	11104-28-2	1.40E-01		
Aroclor-1232	11141-16-5	1.40E-01		
Aroclor-1242	53469-21-9	2.20E-01		
Aroclor-1248	12672-29-6	2.20E-01		
Aroclor-1254 **	11097-69-1	2.20E-01		
Aroclor-1260	11096-82-5	2.20E-01		
Aroclor-1262 (based on Aroclor 1260)	37324-23-5	2.20E-01		
Aroclor-1268 (based on Aroclor 1260)	11100-14-4	2.20E-01		
Total PCBs	1336-36-3	2.20E-01		
TCL Pesticides				
Aldrin	309-00-2	2.90E-02		
alpha-BHC	319-84-6	7.70E-02		
beta-BHC	319-85-7	2.70E-01		
delta-BHC (based on alpha-BHC)	319-86-8	7.70E-02		
gamma-BHC (lindane)	58-89-9	5.20E-01		
Chlordane	12789-03-6	1.60E+00		
alpha-Chlordane	5103-71-9	1.60E+00		
gamma-Chlordane	5103-74-2	1.60E+00		
4,4'-DDD	72-54-8	2.00E+00		
4,4'-DDE	72-55-9	1.40E+00		
4,4'-DDT	50-29-3	1.70E+00		
Dieldrin	60-57-1	3.00E-02		
Endosulfan	115-29-7	3.70E+01		
Endosulfan I (based on Endosulfan)	959-98-8	3.70E+01		
Endosulfan II (based on Endosulfan)	33213-65-9	3.70E+01		
Endosulfan Sulfate (based on Endosulfan)	1031-07-8	3.70E+01		
Endrin	72-20-8	1.80E+00		
Endrin Aldehyde (based on Endrin)	7421-93-4	1.80E+00		
Endrin Ketone (based on Endrin)	53494-70-5	1.80E+00		
Heptachlor	76-44-8	1.10E-01		
Heptachlor epoxide	1024-57-3	5.30E-02		
Methoxychlor	72-43-5	3.10E+01		
Toxaphene	8001-35-2	4.40E-01		
Chlorinated dioxins/dibenzofurans (CDDs/CDFs)				
2,3,7,8-TCDD	1746-01-6	4.50E-06		
2,3,7,8-TCDF	51207-31-9			

[a] Use this table for sites where groundwater use and ecological receptors are not a concern

[b] Based on EPA Regional Screening Level Table Residential Soil; values based on non-carcinogenic effects have been divided by 10

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Table 3 (a) Soil: Restricted (Commercial/Industrial)	CAS No.	Beneficial Fill Industrial Screening Level (b) * mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Commercial/ Industrial Use?
TAL Inorganics				
Aluminum	7429-90-5	9.90E+04		
Antimony	7440-36-0	4.10E+01		
Arsenic	7440-38-2	1.60E+00		
Barium	7440-39-3	1.90E+04		
Beryllium	7440-41-7	2.00E+02		
Cadmium (food, soil)	7440-43-9	8.00E+01		
Calcium	7440-70-2			
Chromium (based on Chromium VI)	7440-47-3	5.60E+00		
Chromium III	16065-83-1	1.50E+05		
Cobalt	7440-48-4	3.00E+01		
Copper	7440-50-8	4.10E+03		
Cyanide	57-12-5	6.10E+01		
Iron	7439-89-6	7.20E+04		
Lead	7439-92-1	8.00E+02		
Magnesium	7439-95-4			
Manganese (nonfood)	7439-96-5	2.30E+03		
Mercury (inorganic salts)	7487-94-7	3.10E+01		
Mercury	7439-97-6	4.30E+00		
Methylmercury	22967-92-6	1.00E+01		
Nickel	7440-02-0	2.00E+03		
Potassium	7440-09-7			
Selenium	7782-49-2	5.10E+02		
Silver	7440-22-4	5.10E+02		
Sodium	7440-23-5			
Thallium	7440-28-0	1.00E+00		
Vanadium	7440-62-2	5.20E+02		
Zinc	7440-66-6	3.10E+04		
Other Inorganics				
Perchlorate		7.20E+01		
TCL Volatile Organic Compounds (VOCs)				
Acetone	67-64-1	6.30E+04		
Benzene	71-43-2	5.40E+00		
Bromochloromethane	74-97-5	6.80E+01		
Bromodichloromethane	75-27-4	1.40E+00		
Bromoform	75-25-2	2.20E+02		
Bromomethane	74-83-9	3.20E+00		
2-Butanone (methyl ethyl ketone)	78-93-3	2.00E+04		
Carbon disulfide	75-15-0	3.70E+02		
Carbon tetrachloride	56-23-5	3.00E+00		
Chlorobenzene	108-90-7	1.40E+02		
Chloroethane	75-00-3	6.10E+03		
Chloroform	67-66-3	1.50E+00		
Chloromethane	74-87-3	5.00E+01		
Cyclohexane	110-82-7	2.90E+03		
1,2-Dibromo-3-chloropropane	96-12-8	6.90E-02		
Dibromochloromethane	124-48-1	3.30E+00		
1,2-Dibromoethane	106-93-4	1.70E-01		
1,2-Dichlorobenzene (ortho)	95-50-1	9.80E+02		
1,3-Dichlorobenzene (meta)(based on 1,4-dichlorobenzene)	541-73-1	1.20E+01		
1,4-Dichlorobenzene (para)	106-46-7	1.20E+01		
Dichlorodifluoromethane	75-71-8	4.00E+01		
1,1-Dichloroethane	75-34-3	1.70E+01		
1,2-Dichloroethane	107-06-2	2.20E+00		
1,1-Dichloroethene	75-35-4	1.10E+02		
1,2-Dichloroethene (total)	540-59-0	9.20E+02		
cis-1,2-Dichloroethene	156-59-2	2.00E+02		
trans-1,2-Dichloroethene	156-60-5	6.90E+01		
1,2-Dichloropropane	78-87-5	4.70E+00		
1,3-Dichloropropene (total)	542-75-6	8.30E+00		
cis-1,3-Dichloropropene	10061-01-5	8.30E+00		
trans-1,3-Dichloropropene	10061-02-6	8.30E+00		
1,4-dioxane	123-91-1	1.70E+01		
Ethylbenzene	100-41-4	2.70E+01		
Hexane	110-54-3	2.60E+02		
2-Hexanone	591-78-6	1.40E+02		
Isopropylbenzene (cumene)	98-82-8	1.10E+03		
4-Methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	5.30E+03		
Methyl acetate	79-20-9	1.00E+05		
Methyl tert-butyl ether	1634-04-4	2.20E+02		
Methylcyclohexane (based on Cyclohexane)	108-87-2	2.90E+03		
Methylene chloride	75-09-2	9.60E+02		
Styrene	100-42-5	3.60E+03		
1,1,2,2-Tetrachloroethane	79-34-5	2.80E+00		
Tetrachloroethene	127-18-4	1.10E+02		
Toluene	108-88-3	4.50E+03		
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1.80E+04		
1,2,3-Trichlorobenzene	87-61-6	4.90E+01		

Table 3 (a) Soil: Restricted (Commercial/Industrial)	CAS No.	Beneficial Fill Industrial Screening Level (b) * mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Commercial/ Industrial Use?
1,2,4-Trichlorobenzene **	120-82-1	9.90E+01		
1,1,1-Trichloroethane	71-55-6	3.80E+03		
1,1,2-Trichloroethane **	79-00-5	5.30E+00		
Trichloroethene **	79-01-6	6.40E+00		
Trichlorofluoromethane	75-69-4	3.40E+02		
Vinyl Chloride	75-01-4	1.70E+00		
Total Xylenes	1330-20-7	2.70E+02		
Other VOCs				
n-butylbenzene	104-51-8	5.10E+03		
sec-butylbenzene	135-98-8			
tert-butylbenzene	98-06-6			
isopropyltoluene (based on isopropylbenzene)	99-87-6	1.10E+03		
n-propylbenzene	103-65-1	2.10E+03		
1,1,1,2-tetrachloroethane	630-20-6	9.30E+00		
1,2,4-trimethylbenzene	95-63-6	2.60E+01		
1,3,5-trimethylbenzene	108-67-8	1.00E+03		
m-xylene	108-38-3	2.50E+02		
o-xylene	95-47-6	3.00E+02		
p-xylene	106-42-3	2.60E+02		
TCL Semivolatile Organic Compounds (SVOCs)				
Acenaphthene	83-32-9	3.30E+03		
Acenaphthylene (based on pyrene)	208-96-8	1.70E+03		
Acetophenone	98-86-2	1.00E+04		
Anthracene	120-12-7	1.70E+04		
Atrazine	1912-24-9	7.50E+00		
Benzaldehyde	100-52-7	1.00E+04		
Benzo(a)anthracene	56-55-3	2.10E+00		
Benzo(a)pyrene	50-32-8	2.10E-01		
Benzo(b)fluoranthene	205-99-2	2.10E+00		
Benzo(g,h,i)perylene (based on pyrene)	191-24-2	1.70E+03		
Benzo(k)fluoranthene	207-08-9	2.10E+01		
1,1'-Biphenyl	92-52-4	2.10E+01		
bis(2-Chloroethoxy)methane	111-91-1	1.80E+02		
bis(2-chloroethyl)ether	111-44-4	1.00E+00		
bis-(2-Ethylhexyl)phthalate	117-81-7	1.20E+02		
4-Bromophenyl-phenylether	101-55-3			
Butylbenzylphthalate	85-68-7	9.10E+02		
Caprolactam	105-60-2	3.10E+04		
Carbazole	86-74-8			
4-Chloro-3-methylphenol	59-50-7	6.20E+03		
4-Chloroaniline	106-47-8	8.60E+00		
2-Chloronaphthalene	91-58-7	8.20E+03		
2-Chlorophenol	95-57-8	5.10E+02		
4-Chlorophenyl-phenylether	7005-72-3			
Chrysene	218-01-9	2.10E+02		
Dibutyl Phthalate	84-74-2	6.20E+03		
Di-n-octylphthalate	117-84-0			
Dibenzo(a,h)anthracene	53-70-3	2.10E-01		
Dibenzofuran	132-64-9	1.00E+02		
3,3'-Dichlorobenzidine	91-94-1	3.80E+00		
2,4-Dichlorophenol	120-83-2	1.80E+02		
Diethylphthalate	84-66-2	4.90E+04		
2,4-Dimethylphenol	105-67-9	1.20E+03		
Dimethylphthalate	131-11-3			
4,6-Dinitro-2-methylphenol	534-52-1	4.90E+00		
2,4-Dinitrophenol	51-28-5	1.20E+02		
2,4-Dinitrotoluene	121-14-2	5.50E+00		
2,6-Dinitrotoluene	606-20-2	6.20E+01		
Fluoranthene	206-44-0	2.20E+03		
Fluorene	86-73-7	2.20E+03		
Hexachlorobenzene	118-74-1	1.10E+00		
Hexachlorobutadiene	87-68-3	2.20E+01		
Hexachlorocyclopentadiene	77-47-4	3.70E+02		
Hexachloroethane **	67-72-1	4.30E+01		
Indeno(1,2,3-cd)pyrene	193-39-5	2.10E+00		
Isophorone	78-59-1	1.80E+03		
2-Methylnaphthalene	91-57-6	2.20E+02		
2-Methylphenol	95-48-7	3.10E+03		
3-Methylphenol	108-39-4	3.10E+03		
4-Methylphenol	106-44-5	6.20E+03		
N-Nitroso-di-n-propylamine	621-64-7	2.50E-01		
N-Nitrosodiphenylamine	86-30-6	3.50E+02		
Naphthalene	91-20-3	1.80E+01		
2-Nitroaniline	88-74-4	6.00E+02		
3-Nitroaniline	99-09-2			
4-Nitroaniline	100-01-6	8.60E+01		
Nitrobenzene	98-95-3	2.40E+01		
2-Nitrophenol	88-75-5			
4-Nitrophenol	100-02-7			
2,2'-Oxybis(1-chloropropane)	108-60-1	2.20E+01		

Revised 10/16/12

Table 3 [a] Soil: Restricted (Commercial/Industrial)	CAS No.	Beneficial Fill Industrial Screening Level [b] * mg/kg	Maximum Soil Concentration mg/kg	Contaminant Of Potential Concern for Commercial/ Industrial Use?
Pentachlorophenol	87-86-5	2.70E+00		
Phenanthrene (based on pyrene)	85-01-8	1.70E+03		
Phenol	108-95-2	1.80E+04		
Pyrene	129-00-0	1.70E+03		
1,2,4,5-Tetrachlorobenzene	95-94-3	1.80E+01		
2,3,4,6-Tetrachlorophenol	58-90-2	1.80E+03		
2,4,5-Trichlorophenol	95-95-4	6.20E+03		
2,4,6-Trichlorophenol **	88-06-2	1.60E+02		
Other SVOCs				
Benzoic Acid	65-85-0	2.50E+05		
TCL Polychlorinated Biphenyls (PCBs)				
Aroclor-1016 **	12674-11-2	2.10E+01		
Aroclor-1221	11104-28-2	5.40E-01		
Aroclor-1232	11141-16-5	5.40E-01		
Aroclor-1242	53469-21-9	7.40E-01		
Aroclor-1248	12672-29-6	7.40E-01		
Aroclor-1254	11097-69-1	7.40E-01		
Aroclor-1260	11096-82-5	7.40E-01		
Aroclor-1262 (based on Aroclor 1260)	37324-23-5	7.40E-01		
Aroclor-1268 (based on Aroclor 1260)	11100-14-4	7.40E-01		
Total PCBs	1336-36-3	7.40E-01		
TCL Pesticides				
Aldrin	309-00-2	1.00E-01		
alpha-BHC	319-84-6	2.70E-01		
beta-BHC	319-85-7	9.60E-01		
delta-BHC (based on alpha-BHC)	319-86-8	2.70E-01		
gamma-BHC (lindane)	58-89-9	2.10E+00		
Chlordane	57-74-9	6.50E+00		
alpha-Chlordane	5103-71-9	6.50E+00		
gamma-Chlordane	5103-74-2	6.50E+00		
4,4'-DDD	72-54-8	7.20E+00		
4,4'-DDE	72-55-9	5.10E+00		
4,4'-DDT	50-29-3	7.00E+00		
Dieldrin	60-57-1	1.10E-01		
Endosulfan	115-29-7	3.70E+02		
Endosulfan I (based on Endosulfan)	959-98-8	3.70E+02		
Endosulfan II (based on Endosulfan)	33213-65-9	3.70E+02		
Endosulfan Sulfate (based on Endosulfan)	1031-07-8	3.70E+02		
Endrin	72-20-8	1.80E+01		
Endrin Aldehyde (based on Endrin)	7421-93-4	1.80E+01		
Endrin Ketone (based on Endrin)	53494-70-5	1.80E+01		
Heptachlor	76-44-8	3.80E-01		
Heptachlor epoxide	1024-57-3	1.90E-01		
Methoxychlor	72-43-5	3.10E+02		
Toxaphene	8001-35-2	1.60E+00		
Chlorinated dioxins/dibenzofurans (CDDs/CDFs)				
2,3,7,8-TCDD	1746-01-6	1.80E-05		
2,3,7,8-TCDF	51207-31-9			

[a] Use this table for sites that are restricted to commercial/industrial use (no residential, day care, schools, play areas)

[b] Based on EPA Regional Screening Level Table Residential Soil; values based on non-carcinogenic effects have been divided by 10

** non-carcinogenic RSL/10 < carcinogenic RSL

ATTACHMENT L-9: PRELIMINARY SEDIMENT STUDY ANALYTICAL RESULTS

Attachment L-9
Preliminary Sediment Study Analytical Results

Parameter	Unit	Most Stringent	B-008			B-017			B-023			B-030			B-033			B-038		
			0-10'			80-90'			88-98'			0-10'			0-10'			0-10'		
			17K0927			18A0257			18A0118			18D0178			17L0317			18C0046		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
1,1,1-Trichloroethane	µg/kg	1810	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1,1,2,2-Tetrachloroethane	µg/kg	0.44	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 2.45		2.45
1,1,2-Trichloroethane	µg/kg	29	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1,1-Dichloroethane	µg/kg	8	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1,2,4-Trichlorobenzene	µg/kg	10	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
1,2-Dichlorobenzene	µg/kg	10	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 3.07		3.07
1,2-Dichlorobenzene	µg/kg	10	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
1,2-Dichloroethane	µg/kg	--	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1,2-Dichloropropane	µg/kg	300	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 3.07		3.07
1,2-Diphenylhydrazine	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
1,3-Dichlorobenzene	µg/kg	10	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1,4-Dichlorobenzene	µg/kg	10	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
1-Methylnaphthalene	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
2,2'-Oxybis[1-Chloropropane]	µg/kg	5.41	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,3,7,8-Tcdd	ng/kg	0.199	ND		0.044	0.39	J	0.0712	ND		0.0256	0.0191	JBQ	0.0149	0.0438	JQ	0.031	0.194	JBQ	0.0297
2,3,7,8-Tcdf	ng/kg	38.5	0.0417	JQ	0.0166	NA		NA	NA		NA	0.0516	JBQ	0.0184	0.0625	JBQ	0.0261	0.0547	JQ	0.0124
2,4,6-Trichlorophenol	µg/kg	100	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,4'-Ddd	µg/kg	--	0.072	JP	0.018	ND		0.11	0.021	J P	0.048	3.6		0.054	ND		0.05	<0.11		0.11
2,4'-Dde	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	0.11		0.054	ND		0.05	<0.11		0.11
2,4'-Ddt	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	3		0.054	ND		0.05	<0.11		0.11
2,4-Dichlorophenol	µg/kg	3	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,4-Dimethylphenol	µg/kg	10	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,4-Dinitrophenol	µg/kg	3	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,4-Dinitrotoluene	µg/kg	1.39	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2,6-Dinitrotoluene	µg/kg	5.92	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2-Butanone (Mek)	µg/kg	552	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 61.3		61.3
2-Chloroethyl Vinyl Ether	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Chloronaphthalene	µg/kg	12.2	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
2-Chlorophenol	µg/kg	10	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2-Methylnaphthalene	µg/kg	20.2	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
2-Methylphenol	µg/kg	100	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
2-Nitrophenol	µg/kg	1600	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
3,3'-Dichlorobenzidine	µg/kg	18.7	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
4,4'-Ddd	µg/kg	1.22	ND		0.1	ND		0.11	ND		0.048	6.5		0.054	ND		0.05	<0.11		0.11
4,4'-Dde	µg/kg	2.07	ND		0.1	ND		0.11	ND		0.048	0.93		0.054	ND		0.05	<0.11		0.11
4,4'-Ddt	µg/kg	1.19	ND		0.1	ND		0.11	ND		0.048	32		0.054	ND		0.05	<0.11		0.11
4,6-Dinitro-2-Methylphenol	µg/kg	0.136	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
4-Bromophenyl Phenyl Ether	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
4-Chloro-3-Methylphenol	µg/kg	7470	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
4-Chlorophenyl Phenyl Ether	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
4-Nitrophenol	µg/kg	100	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Acenaphthene	µg/kg	6.7	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Acenaphthylene	µg/kg	5.9	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Acrolein	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Acrylonitrile	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Aldrin	µg/kg	2.5	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Alpha-Bhc	µg/kg	0.461	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Aluminum	mg/kg	7700	2750		29.5	NA		NA	NA		NA	457		2.97	630		2.95	9750		332
Ammonia As N	mg/kg	--	ND		12	NA		NA	NA		NA	ND		11.4	ND		12.3	23.9		12
Anthracene	µg/kg	46.9	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109

Attachment L-9
Preliminary Sediment Study Analytical Results

Parameter	Unit	Most Stringent	B-008			B-017			B-023			B-030			B-033			B-038		
			0-10'			80-90'			88-98'			0-10'			0-10'			0-10'		
			17K0927			18A0257			18A0118			18D0178			17L0317			18C0046		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Antimony	mg/kg	0.3	ND		5.91	ND		5.86	ND		9.22	ND		5.93	ND		5.89	< 6.64		6.64
Arsenic	mg/kg	0.68	1.21		1.18	4.95		1.14	3.09		1.16	1.5		1.19	ND		1.18	6.26		1.33
Barium	mg/kg	330	9.15		0.591	18.3		0.57	16.2		0.582	6.9		0.593	6.39		0.589	24.8		0.664
Benzene	µg/kg	24.6	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Benzidine	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Benzo(A)Anthracene	µg/kg	74.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(A)Pyrene	µg/kg	88.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(B)Fluoranthene	µg/kg	160	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(Ghi)Perylene	µg/kg	1100	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Benzo(K)Fluoranthene	µg/kg	1100	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzoic Acid	µg/kg	6000	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Benzyl Alcohol	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Beryllium	mg/kg	16	ND		0.236	ND		0.234	ND		0.369	ND		0.237	ND		0.236	< 0.266		0.266
Beta-Bhc	µg/kg	1	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Bis(2-Chloroethoxy)Methane	µg/kg	6.24	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bis(2-Chloroethyl)Ether	µg/kg	0.254	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bis(2-Ethylhexyl) Phthalate	µg/kg	182	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bromoform	µg/kg	516	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Bromomethane	µg/kg	1.48	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Butyl Benzyl Phthalate	µg/kg	239	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Cadmium	mg/kg	0.36	0.417		0.236	0.728		0.228	0.416		0.233	ND		0.237	ND		0.236	0.765		0.266
Calcium Carbonate Equivalence	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Calcium	mg/kg	9.6	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Carbon Tetrachloride	µg/kg	79.4	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chlordane	µg/kg	6	ND		1	ND		1.1	ND		0.48	ND		0.54	ND		0.5	<1.1		1.1
Chlorobenside	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Chlorodibromomethane	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroethane	µg/kg	5580	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chloroform	µg/kg	1	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 3.07		3.07
Chloromethane	µg/kg	39	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chromium	mg/kg	0.3	7.11		0.591	18.3		0.57	5.96		0.582	2.34		0.593	3.14		0.589	22.2		0.664
Chromium, Hexavalent	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chrysene	µg/kg	107.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Cis-1,3-Dichloropropene	µg/kg	1.66	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Cobalt	mg/kg	0.21	1.84		0.236	2.84		0.228	1.71		0.233	0.404		0.237	0.547		0.236	6.68		0.226
Conductivity (Saturated Paste)	dS/m	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Copper	mg/kg	19	ND		2.95	ND		2.93	ND		2.91	ND		2.97	ND		2.95	< 3.32		3.32
Cyanide	mg/kg	0	ND		1.21	ND		1.22	ND		1.13	ND		1.16	ND		1.24	< 1.37		1.37
Dcpa	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Delta-Bhc	µg/kg	1.51	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Dibenzo(A,H)Anthracene	µg/kg	6.2	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Dibenzofuran	µg/kg	391	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Dichlorobromomethane	µg/kg	2050	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Dichlorodifluoromethane	µg/kg	595	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Dieldrin	µg/kg	0.715	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Diethyl Phthalate	µg/kg	18800	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Dimethyl Phthalate	µg/kg	200000	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Di-N-Butyl Phthalate	µg/kg	150	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Di-N-Octyl Phthalate	µg/kg	70900	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Endosulfan I	µg/kg	100	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Endosulfan Ii	µg/kg	100	ND		0.1	ND		0.11	ND		0.048	0.021	J P	0.054	ND		0.05	<0.11		0.11

Attachment L-9
Preliminary Sediment Study Analytical Results

Parameter	Unit	Most Stringent	B-008			B-017			B-023			B-030			B-033			B-038		
			0-10'			80-90'			88-98'			0-10'			0-10'			0-10'		
			17K0927			18A0257			18A0118			18D0178			17L0317			18C0046		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Endosulfan Sulfate	µg/kg	35.8	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Endrin	µg/kg	1	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	0.26 P		0.11
Endrin Aldehyde	µg/kg	10.5	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Ethylbenzene	µg/kg	50	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Extractable Organic Halides (Eox)	µg/kg	--	ND		12.3	ND		12.4	ND		11.9	ND		11.9	ND		12.6	< 13.9		13.9
Extractable Organic Halogens	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Fizz Rating	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Flash Point	--	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Fluoranthene	µg/kg	112.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Fluorene	µg/kg	21.2	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Gamma-Bhc (Lindane)	µg/kg	0.05	0.16	P	0.036	0.22	P		ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Heptachlor	µg/kg	5.96	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Heptachlor Epoxide	µg/kg	70	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	0.076	J P	0.11
Hexachlorobenzene	µg/kg	2.5	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(A)Pyrene	µg/kg	88.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(B)Fluoranthene	µg/kg	160	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzo(Ghi)Perylene	µg/kg	1100	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Benzo(K)Fluoranthene	µg/kg	1100	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Benzoic Acid	µg/kg	6000	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Benzyl Alcohol	µg/kg	--	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Beryllium	mg/kg	16	ND		0.236	ND		0.234	ND		0.369	ND		0.237	ND		0.236	< 0.266		0.266
Beta-Bhc	µg/kg	1	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Bis(2-Chloroethoxy)Methane	µg/kg	6.24	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bis(2-Chloroethyl)Ether	µg/kg	0.254	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bis(2-Ethylhexyl) Phthalate	µg/kg	182	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Bromoform	µg/kg	516	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Bromomethane	µg/kg	1.48	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Butyl Benzyl Phthalate	µg/kg	239	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Cadmium	mg/kg	0.36	0.417		0.236	0.728		0.228	0.416		0.233	ND		0.237	ND		0.236	0.765		0.266
Calcium Carbonate Equivalence	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Calcium	mg/kg	9.6	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Carbon Tetrachloride	µg/kg	79.4	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chlordane	µg/kg	6	ND		1	ND		1.1	ND		0.48	ND		0.54	ND		0.5	<1.1		1.1
Chlorobenside	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Chlorodibromomethane	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chloroethane	µg/kg	5580	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chloroform	µg/kg	1	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 3.07		3.07
Chloromethane	µg/kg	39	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Chromium	mg/kg	0.3	7.11		0.591	18.3		0.57	5.96		0.582	2.34		0.593	3.14		0.589	22.2		0.664
Chromium, Hexavalent	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Chrysene	µg/kg	107.8	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Cis-1,3-Dichloropropene	µg/kg	1.66	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Cobalt	mg/kg	0.21	1.84		0.236	2.84		0.228	1.71		0.233	0.404		0.237	0.547		0.236	6.68		0.226
Conductivity (Saturated Paste)	dS/m	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Copper	mg/kg	19	ND		2.95	ND		2.93	ND		2.91	ND		2.97	ND		2.95	< 3.32		3.32
Cyanide	mg/kg	0	ND		1.21	ND		1.22	ND		1.13	ND		1.16	ND		1.24	< 1.37		1.37
Dcpa	µg/kg	--	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Delta-Bhc	µg/kg	1.51	ND		0.1	ND		0.11	ND		0.048	ND		0.054	ND		0.05	<0.11		0.11
Dibenzo(A,H)Anthracene	µg/kg	6.2	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Dibenzofuran	µg/kg	391	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Dichlorobromomethane	µg/kg	2050	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA

Attachment L-9
Preliminary Sediment Study Analytical Results

Parameter	Unit	Most Stringent	B-008			B-017			B-023			B-030			B-033			B-038		
			0-10'			80-90'			88-98'			0-10'			0-10'			0-10'		
			17K0927			18A0257			18A0118			18D0178			17L0317			18C0046		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
PCB 126 (BZ)	ng/kg	36	ND		2.11	NA		NA	NA		NA	ND		1.87	ND		1.86	<2.15		2.15
PCB 128 (BZ)	ng/kg	480	ND		3.83	NA		NA	NA		NA	ND		3.38	ND		3.37	<3.89		3.89
PCB 138 (BZ)	ng/kg	480	ND		8.33	NA		NA	NA		NA	8.48	J	7.34	ND		7.32	<8.45		8.45
PCB 153 (BZ)	ng/kg	480	5.11	J	3.97	NA		NA	NA		NA	10.8	J	3.5	ND		3.48	<4.02		4.02
PCB 156 (BZ)	ng/kg	480	ND		3.04	NA		NA	NA		NA	ND		2.68	ND		2.67	<3.09		3.09
PCB 169 (BZ)	ng/kg	51	ND		1.98	NA		NA	NA		NA	ND		1.75	ND		1.74	<2.01		2.01
PCB 170 (BZ)	ng/kg	480	ND		1.59	NA		NA	NA		NA	1.82	J	1.4	ND		1.39	<1.61		1.61
PCB 18 (BZ)	ng/kg	480	ND		2.11	NA		NA	NA		NA	ND		1.87	ND		1.86	<2.15		2.15
PCB 180 (BZ)	ng/kg	480	ND		3.97	NA		NA	NA		NA	4.15	J	3.5	ND		3.48	<4.02		4.02
PCB 183 (BZ)	ng/kg	480	ND		3.7	NA		NA	NA		NA	ND		3.26	ND		3.25	<3.76		3.76
PCB 184 (BZ)	ng/kg	480	ND		1.85	NA		NA	NA		NA	ND		1.63	ND		1.63	<1.88		1.88
PCB 187 (BZ)	ng/kg	480	ND		2.25	NA		NA	NA		NA	4.3	J	1.98	ND		1.97	<2.28		2.28
PCB 195 (BZ)	ng/kg	480	ND		2.91	NA		NA	NA		NA	ND		2.56	ND		2.56	<2.95		2.95
PCB 28 (BZ)	ng/kg	480	ND		2.91	NA		NA	NA		NA	6.91		2.56	ND		2.56	<2.95		2.95
PCB 44 (BZ)	ng/kg	480	ND		5.29	NA		NA	NA		NA	5.16	J	4.66	ND		4.65	<5.37		5.37
PCB 49 (BZ)	ng/kg	480	ND		3.44	NA		NA	NA		NA	4.59	J	3.03	ND		3.02	<3.49		3.49
PCB 52 (BZ)	ng/kg	480	4.72	J	1.98	NA		NA	NA		NA	5.59	J	1.75	ND		1.74	<2.01		2.01
PCB 66 (BZ)	ng/kg	480	2.78	J	2.25	NA		NA	NA		NA	5.31	J	1.98	ND		1.97	<2.28		2.28
PCB 77 (BZ)	ng/kg	480	ND		1.85	NA		NA	NA		NA	ND		1.63	ND		1.63	<1.88		1.88
PCB 8 (BZ)	ng/kg	480	ND		1.98	NA		NA	NA		NA	3.05	J	1.75	ND		1.74	<2.01		2.01
PCB 87 (BZ)	ng/kg	480	13.2	J	9.78	NA		NA	NA		NA	ND		8.63	ND		8.59	<9.93		9.93
PCB-206 (BZ)	ng/kg	480	ND		2.11	NA		NA	NA		NA	ND		1.87	ND		1.86	<2.15		2.15
PCB-209 (BZ)	ng/kg	480	28.9	B	2.11	NA		NA	NA		NA	3.5	J	1.87	2.92	JB	1.86	5.76	JB	2.15
TOTAL PCBs	mg/kg	21.6	ND		0.784	ND		0.791	ND		0.763	ND		0.812	ND		0.826	<0.847		0.847
Pentachlorophenol	µg/kg	36.5	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Percent Solids	%	--	81.3		0.1	80.8		0.1	84.4		0.1	84.2		0.1	79.4		0.1	72.1		0.1
Ph	µg/kg	--	8.3		0	8.7		0	8		0	8.3		0	8.1		0	8.6		0
Ph (Saturated Paste)	s.u.	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Phenanthrene	µg/kg	86.7	ND		101	NA		NA	NA		NA	ND		89.7	ND		103	< 109		109
Phenol	µg/kg	50	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Phosphorus, Total	mg/kg	--	67.1		2.3	NA		NA	NA		NA	16.6		2.1	18.8		2.4	194		11.1
Potassium	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Pyrene	µg/kg	152.7	ND		101	ND		99.5	ND		95.5	ND		89.7	ND		103	< 109		109
Pyritic Sulfur	%	< 0.25	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Selenium	mg/kg	2.55	ND		2.95	ND		2.93	ND		4.61	ND		2.97	ND		2.95	< 3.32		3.32
Silver	mg/kg	0.596	ND		0.591	ND		0.586	ND		0.922	ND		0.593	ND		0.589	< 0.664		0.664
Sodium	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Sulfide	mg/kg	--	ND		466	NA		NA	NA		NA	949		475	ND		453	876		525
Tetrachloroethene	µg/kg	10	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Thallium	mg/kg	0.001	ND		2.95	ND		2.93	ND		4.61	ND		2.97	ND		2.95	< 3.32		3.32
Tin		--	ND		5.91	NA		NA	ND		9.22	ND		5.93	ND		5.89	< 6.64		6.64
Tkn As N	mg/kg	--	ND		61.5	NA		NA	NA		NA	ND		59.3	ND		60.7	496		66.5
Toluene	µg/kg	50	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Total Organic Carbon	%	< 5%	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Diesel)	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Petroleum Hydrocarbons (As Gasoline)	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Solids (Ts)	µg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Total Sulfur	mg/kg	--	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA
Toxaphene	µg/kg	100	ND		4.2	ND		4.4	ND		1.9	ND		2.1	ND		2	<4.6		4.6
Tph-Semi-Volatiles (Dro)	mg/kg	--	ND		11.6	ND		11.3	ND		11.6	ND		11.6	ND		11.9	< 13.6		13.6
Tph-Volatiles (Gro)	mg/kg	--	ND		0.12	ND		0.46	ND		0.12	ND		0.12	ND		0.13	< 0.61		0.61

Attachment L-9
Preliminary Sediment Study Analytical Results

Parameter	Unit	Most Stringent	B-008			B-017			B-023			B-030			B-033			B-038		
			0-10'			80-90'			88-98'			0-10'			0-10'			0-10'		
			17K0927			18A0257			18A0118			18D0178			17L0317			18C0046		
			Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
Trans-1,2-Dichloroethene	µg/kg	300	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Trans-1,3-Dichloropropene	µg/kg	1.6	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Trichloroethene	µg/kg	1	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Trichlorofluoromethane	µg/kg	1740	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 6.13		6.13
Tributyiltin	mg/kg	1.8	ND		3.6	ND		2.9	ND		2.9	ND		3.6	ND		3.7	<4.1		4.1
Vanadium	mg/kg	7.8	6.58		0.591	15.8		0.57	6.77		0.582	1.68		0.593	2.1		0.589	28.6		0.664
Vinyl Chloride	µg/kg	7.92	ND		30.7	ND		6.18	ND		5.93	ND		29.1	ND		30	< 3.07		3.07
Xylenes, Total		--	ND		92.2	ND		18.5	ND		17.8	ND		87.3	ND		89.9	< 18.4		18.4
Zinc	mg/kg	46	7.4		0.591	18.4		0.57	8.82		0.582	3.67		0.593	2.88		0.589	29.7		0.641