CONTAMINATED MATERIALS MANAGEMENT PLAN FOR OPERABLE UNITS TWO, THREE FOUR, FIVE, AND NINE (OU-2, OU-3, OU-4, OU-5, AND OU-9) OF THE SCIENCE, TECHNOLOGY, AND ADVANCED RESEARCH CAMPUS (FORMER CHRYSLER ASSEMBLY PLANT) NEWARK, DELAWARE DE-0105

November 2012
(Revised March 2014)

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I. INTRODUCTION

This Contaminated Materials Management Plan (CMMP) has been prepared to guide management of soil and groundwater that may contain substances of environmental concern, if encountered during site redevelopment or maintenance activities within Operable Units Two, Three, Four, Five, and Nine (OU-2, OU-3, OU-4, OU-5, and OU-9) of the Science, Technology and Advanced Research (STAR) Campus (see Figure 1). Examples of foreseeable redevelopment activities that may disturb site soils or encounter groundwater include: building foundation removals or installations, site grading, road construction, subsurface utility installations, utility system repairs, storm water management basin construction, and landscaping. This revised CMMP for OU-2, OU-3, OU-4, OU-5, and OU-9 supersedes all prior versions once it is approved by the State of Delaware, Department of Natural Resources and Environmental Control, Site Investigation and Restoration Section (DNREC-SIRS).

The STAR Campus is also identified as the Former Chrysler Newark Assembly Plant, DE-0105. The STAR Campus is located at 550 South College Avenue, Newark, Delaware, and is comprised of New Castle County Tax Parcel Nos. 18-039.00-002 and 18-036.00-002.

Environmental conditions at the STAR Campus are being managed under the State of Delaware Brownfield Program. The approximately 270-acre property was divided into nine operable units (OU) to facilitate investigation of environmental conditions (see Figure 2). The bounds of each OU were established on the basis of the demolition schedule for the former assembly plant and are not linked to environmental conditions or environmental matrices.

DNREC-SIRS has issued Final Plans of Remedial Action (FPRA) for OU-2, OU-3, OU-4, OU-5, and OU-9. The FPRA require development of a CMMP to guide redevelopment activities that may encounter substances of concern in a manner that protects human health and the environment.

This CMMP should be incorporated into construction contracts and maintenance contracts that include earth disturbing activities, typified by excavating, soil grading or soil filling work, within OU-2, OU-3, OU-4, OU-5, or OU-9 of the STAR Campus. Similarly, the CMMP should be incorporated into all lease agreements for parcels of land located within these operable units where the lessee may engage in construction or maintenance activities that would disturb soils or encounter groundwater. Copies of this CMMP should be provided by 1743 Holdings, LLC to lease holders, site operators, and contractors upon request.

CMMP procedures are not required for certain previously anticipated activities. Such activities include, but are not limited to: foundation and/or pavement removal that does not require excavation of the soil; filling activities that use soils that were characterized at the time of excavation; or filling activities that use borrow obtained from a DNREC-SIRS approved source.

This plan does not address consumptive use of groundwater. Consumptive use of groundwater is prohibited within the bounds of STAR Campus as stated in the FPRA for the above-mentioned operable units.

March 2014 Revision

This March 2014 revision to the CMMP was necessary to accommodate the following:

- An amendment to the FPRA for OU-2 that removed the designation of two areas within OU-2 that were previously identified as areas of interest absent proposed redevelopment plans;
- An amendment to the FPRA for OU-2 that removed the requirement for maintenance of a physical barrier (e.g., pavement, building slab, etc.) when earth-disturbing activities are performed;
- An amendment to the FPRA for OU-2 that replaced the requirement for written approval from DNREC prior to land-disturbing activities with a requirement that states future excavation work will be performed in accordance with the CMMP for OU-2; and
- Completion of a remedy for the Former Repair Garage Area of Concern (AOC) within OU-5.

Proposed redevelopment plans for OU-2 had yet to be established at the time the January 2011 Brownfield Investigation (BFI) Report was issued and subsequently approved by DNREC-SIRS. As such, it was indicated in the report that a remedy would be recommended once redevelopment plans were established. Redevelopment plans for OU-2 have since been established and will consist of non-residential uses. Accordingly, the FPRA for OU-2 has been amended to appropriately reflect the proposed use of the land and health risks relating to those uses, which are commercial/transportation-oriented redevelopment associated with the expansion of the railroad station located adjacent to OU-2. Since the proposed redevelopment plans are considered commercial (i.e., restricted) land use and the substances reported in both surface and subsurface soil do not pose an unacceptable cumulative risk to human health for all non-residential scenarios (as indicated in the BFI Report), the two areas previously identified as areas of interest were eliminated. Further, removing the requirement for a physical barrier covering soils in OU-2 was warranted. The administrative change requiring that future excavation work be performed in accordance with the CMMP was appropriate given that the CMMP has been approved by DNREC and notification requirements are specified in that document.

In response to a requirement set forth in the FPRA for OU-5, building demolition debris was removed from the Former Repair Garage AOC and was disposed in a managed, permitted facility. The removal and subsequent disposal remedied potential risks to human health and the environment and thereby eliminated this AOC. DNREC-SIRS concurred and noted in their closure approval letter (dated January 15, 2014) that the

excavation was back-filled with material that meets residential use standards. Therefore, the restriction on excavation in this area without prior written approval from DNREC was removed.

II. SUMMARY OF ENVIRONMENTAL CONDITIONS

Duffield Associates, Inc. (Duffield Associates) conducted environmental assessments as part of the Brownfield Program process. The results of those assessments indicate that the environmental quality of soils and groundwater in much of the land area encompassed by OU-2, OU-3, OU-4, OU-5, and OU-9 is satisfactory for non-residential uses as no specific conditions of concern have been identified in those areas and accordingly, are not considered areas of environmental concern. Additionally, risk assessment results indicate that the general environmental condition of soil and groundwater in these areas of the site pose little risk to excavation workers. Section III of this CMMP addresses work practices and materials management appropriate for earth disturbing activities in these, low-risk portions of the site.

Several specific areas were identified as areas of environmental interest or AOCs in the Brownfield Investigation Reports (BFIR), due to potentially harmful concentrations of substances in soil and/or groundwater samples collected in those areas. The Final Plans of Remedial Action for OU-3, OU-4, OU-5, and OU-9 require specific remedial actions to address environmental conditions in these areas. Summaries of those conditions and requirements pertinent to construction or maintenance activities are provided below. Additional precautionary measures for construction or maintenance worker protection and additional management procedures for handling the earth materials located in those areas of interest or concern are presented in Section IV of this CMMP.

The specific areas of concern or interest are listed in Table 1. The substances of concern in those areas are discussed in the following paragraphs. Several AOCs extend through multiple operable units as indicated in Table 1. The approximate size of each AOC listed in Table 1 is specific to the identified operable unit. See Figure 2 for the locations of the areas of concern or interest listed in Table 1.

Table 1: Operable Units -3, -4, -5, and -9 Site Information

Operable Unit	Reference Reports	Areas of Concern (AOC) or Areas of Interest
OU-3	May, 2011 Brownfield Investigation Report	AOC-3-1 (19 acres)
	May and June 2012 Executive Garage Assessment Reports	AOC-3-2 (3.8 acres)
OU-4	April, 2012 Brownfield Investigation Report	AOC-3-1(1 acre) AOC-4-1 (2.8 acres)
OU-5	November, 2010 Brownfield Investigation Report	Incinerator Pit Area

Operable Unit	Reference Reports	Areas of Concern (AOC) or Areas of Interest
OU-9	April, 2012 Brownfield Investigation Report	AOC-3-1 (14 acres) AOC-3-2 (3.3 acres) AOC-4-1 (1.2 acres)
	May and June 2012 Executive Garage Assessment Reports	

A. AREA OF CONCERN-3-1 (AOC-3-1)

AOC-3-1, totaling approximately 34 acres, extends through portions of OU-3, OU-4, and OU-9 (see Figure 2). As characterized in the BFIR for these operable units, AOC-3-1 contains fill that was deposited in the former stream valley of Silver Brook during construction of the former assembly plant. The fill materials include coal and coal by-products (slag and ash). Generally, the coal and coal by-products are encountered more than 2 feet below the ground surface, but not always. Groundwater generally was encountered 7 to 17 feet below the ground surface during the BFIs.

The substances of concern in soil and groundwater associated with coal and coal by-products include metals, primarily arsenic and lead, and polynuclear aromatic hydrocarbons (PAH). Releases of liquids from former USTs and piping at the Former North Tank Farm, the Former Tank 11 Area, and the Former Powerhouse, as well as from activities along a railroad siding (Former Shipping Yard) in the northern portion of OU-3 added other substances of concern to the fill matrix and groundwater within the bounds of AOC-3-1.

The concentrations of the substances listed below for AOC-3-1 generally were in excess of the Unrestricted Use Uniform Risk-Based Standards (URS) values published by DNREC in the December 1999 *Remediation Standards Guidance under the Delaware Hazardous Substance Cleanup Act*. The identified substances of concern in AOC-3-1 include:

SOIL	**GROUNDWATER**
benzo(a)anthracene	benzene
benzo(a)pyrene	methyl tertiary-butyl ether (MTBE)
benzo(b)fluoroanthene	2-methylnaphthalene
dibenz(a)anthracene	naphthalene
indeno[1,2,3-cd]pyrene	dieldrin
bis(2-chloroethyl)ether	aluminum
dichlorodiphenyltrichloroethane (DDT)	antimony
dieldrin	arsenic
polychlorinated biphenyl (PCB) 1254	barium
aluminum	cobalt
antimony	iron
arsenic	manganese

SOIL	GROUNDWATER
cadmium	thallium
copper	zinc
iron	
lead	
manganese	
nickel	
selenium	
vanadium	
zinc	

Pavements and buildings currently cover most of AOC-3-1 and minimize the potential for human contact with the substances of concern. The FPRA for OU-3 and for OU-9 require that cover be maintained over AOC-3-1 following future redevelopment activities. The cover can include new buildings, new pavements, or a 1-foot thickness of clean[1] soil and a marker fabric placed between the AOC-3-1 soils and the clean soils. A vapor barrier system is required beneath any enclosed, continuously-occupied structures constructed on OU-3 within the boundaries of AOC-3-1 or within a 100-foot radius of the boundary of AOC-3-1. The design and installation of the vapor barrier system must be approved by DNREC-SIRS. A low permeability cap, such as bituminous concrete pavement, is required over soils that contain elevated concentrations of polychlorinated biphenyls (PCB) in the OU-3 PCB Region shown on Figure 2. A specific description of this PCB region is provided in Appendix A.

B. AREA OF CONCERN-3-2 (AOC-3-2)

AOC-3-2 comprises approximately 7.1 acres and extends through the southeastern portion of OU-3 and the northeastern portion of OU-9 (see Figure 2). The environmental quality of soil and shallow groundwater within AOC-3-2 have been impacted by petroleum products apparently released from a former UST system associated with the Former Executive Garage. Several solvents also have been detected in groundwater in excess of groundwater URS values. Soils containing petroleum were encountered 4 feet or more below the ground surface in the northeastern corner of OU-9 (the suspected source area), and generally were encountered more than 16 feet below the ground surface within AOC-3-2. During the assessments of this area, groundwater commonly was encountered between approximately 6 and 8 feet below the ground surface.

Based on conditions encountered during the environmental assessments of AOC-3-2, groundwater covering the deep petroleum-bearing soils apparently was suppressing vaporization of volatile and semi-volatile organic compounds.

[1] For the purposes of this Contaminated Materials Management Plan, clean soil is defined as meeting, at a minimum, the criteria for Restricted Use as demonstrated by analytic testing results for samples of the soil and approval of the use of the soil by the DNREC-SIRS.

However, the observed site conditions and historical information suggest that the groundwater table at the time of the petroleum release was much deeper (likely 20 feet or more below the ground surface). Modeling results have indicated vapors from the petroleum could potentially infiltrate future buildings at concentrations exceeding applicable regulatory levels, if the groundwater table is lowered to expose the impacted soil in the future.

The concentrations of following substances were indicated to exceed the Unrestricted Use URS values for soil and/or groundwater within the bounds of AOC-3-2:

SOIL	**GROUNDWATER**
benzene	acetone
aluminum	benzene
iron	1,2-dichloroethane
manganese	ethylbenzene
barium	toluene
vanadium	benzo(a)anthracene
	2-methylnaphthalene
	naphthalene
	barium
	managanese

Pavements and buildings currently cover most of AOC-3-2 and minimize the potential for contact with the substances of concern. The FPRA for OU-3 and for OU-9 require that cover be maintained over AOC-3-2 following future redevelopment activities. The cover may consist of new buildings, new pavements, or a 1-foot thickness of clean soil with a marker fabric placed between the AOC-3-2 soils and the clean soils. A vapor barrier system will be required beneath any enclosed, continuously-occupied structures constructed within the boundaries of AOC-3-2 or within a 100-foot radius of the boundary of AOC-3-2.

C. AREA OF CONCERN-4-1 (AOC-4-1)

AOC-4-1, also known as the Former Paint Mix Area, comprises approximately 4 acres and is located in the north-central portion of OU-4 and south-central portion of OU-9 (see Figure 2). Based on the findings of the BFIR for OU-4 and OU-9, both soil and groundwater have been impacted by past site activities.

Conditions in AOC-4-1 are believed to have resulted from the historical release of paint purge solvent from an UST system. The BFIR and preceding Limited Current Conditions Assessment (LCCA) report indicated that volatile and semi-volatile organic compounds are present in the soil at concentrations in excess of Restricted Use URS values and in groundwater at concentrations in excess of Groundwater URS values. At certain locations, free-phase purge solvent, referenced as Light

Non-Aqueous Phase Liquid (LNAPL) in the reports, is present on the surface of groundwater. Impacted soil predominately is located within an approximate 10-foot thick band centered on the groundwater table. At the time of the assessments, groundwater typically was encountered at approximately 8 to 9 feet below the ground surface to the north of a retaining wall that bisects the area and approximately 2 to 5 feet below the ground surface to the south of the retaining wall. In the northern portion of the area (north of a retaining wall), the top of the soil band is more than 2 feet below the ground surface. However, immediately south of the retaining wall, impacted soils have been encountered immediately below the pavement section.

The following substances are present in groundwater within AOC-4-1at concentrations in excess of Groundwater URS values. Based on screening results for soil samples collected in AOC-4-1, the concentrations of these substances in the band of impacted soils should be considered in excess of Unrestricted Use URS values, unless proven otherwise through analytic testing of soil samples.

GROUNDWATER

acetone	2-methylnaphthalene
aluminum	4-methyl-2-pentanone (MIBK)
benzene	4-methylphenol
cis-1,2-dichloroethene (DCE)	naphthalene
cumene	perchloroethene (PCE)
ethylbenzene	toluene
iron	vinyl chloride (VC)
manganese	xylene

The ground surface within AOC-4-1 currently is covered by pavements and former building slabs that effectively mitigate exposure pathways. A soil vapor extraction and groundwater air sparging system is operating in AOC-4-1 to reduce LNAPL thickness, as well as concentrations of volatile and semi-volatile organic substances in soil, soil vapor, and groundwater, as required by the FPRA for OU-4 and OU-9. The FPRAs also require that cover be maintained over AOC-4-1 following future redevelopment activities. The cover may consist of new buildings, new pavements, or a 1-foot thickness of clean soil with a marker fabric placed between the AOC-4-1 soils and the clean soils. A vapor barrier system is required beneath any enclosed, continuously-occupied structures constructed within the boundaries of AOC-4-1 or within a 100-foot radius of the boundary of AOC-4-1.

D. OU-5 AREA OF INTEREST

One area of environmental interest was identified in OU-5 (see Figure 2) during the performance of the BFI. The area, identified as the Incinerator Pit Area, apparently was used to burn debris. Within the Incinerator Pit Area, substances of concern may be encountered in soils immediately below the pavement to a depth of approximately seven feet. Based on the information gathered during the BFIR for OU-5, groundwater quality does not appear to be impacted by conditions in this area of interest. Substances detected in soil within this area of environmental interest at concentrations exceeding Unrestricted Use URS values are as follows:

INCINERATOR PIT SOILS

benzene
xylenes
4,4-DDD
4,4-DDT
dieldrin
PCB-1254
PCB-1260

The area of interest was referenced as a “hot spot” in the BFIR and FPRA for OU-5. The Incinerator Pit Area currently is covered by pavement that mitigates the potential for exposure to substances of concern, as long as the cover is maintained. In this condition, the Incinerator Pit Area is only suitable for low occupancy uses, such as a parking lot. If disturbance of the Incinerator Pit Area soils becomes necessary, the FPRA for OU-5 requires removal of impacted soil in the identified "hot spot" area to prevent human exposure and requires excavations to be backfilled with DNREC-approved fill material that meets environmental criteria consistent with Restricted site use. The FPRA also requires installation of a low permeability cap (e.g., asphalt) to prevent future mobility of contaminants, if impacted material remains in-situ after excavation activities. Under such post remedial circumstances, the Incinerator Pit Area will remain suitable for low occupancy uses, such as a parking lot.

III. GENERAL PRECAUTIONS AND PROCEDURES

This section of the CMMP provides precautions and procedures that are applicable to general environmental conditions and requirements for areas not identified as areas of concern or areas of interest within OU-2, OU-3, OU-4, OU-5, and OU-9. The precautions and procedures described in this section are adequate for addressing soil excavation, transportation, and disposal for work being conducted outside of areas of concern and/or areas of interest. If work is being conducted within an area of concern and/or an area of interest, additional requirements will apply and are described in Section IV.

While environmental conditions and potential chemical hazards have been assessed in these operable units, the property is a State of Delaware certified Brownfield Site and is being addressed through the Brownfield Program. Several Brownfield Program considerations are applicable to all intrusive soil disturbing work at the site:

- Employers of people engaged in intrusive earth disturbing activities, such as excavation and grading activities, shall comply with the provisions of Occupational Health and Safety Administration (OSHA), Hazardous Materials, Hazardous Waste Operations and Emergency Response requirements published in Title 29 of the Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120 for general industry or Title 29 of the Code of Federal Regulations, Part 1926.65 (29 CFR 1926.65) for construction industry, as well as all other applicable Federal, State of Delaware and local regulations. Employers are encouraged to read the available BFIR applicable to the work area and inform their employees regarding indicated site conditions described in those documents. Under this CMMP, intrusive activities within OU-2, OU-3, OU-4, OU-5, and OU-9 will be initiated using a minimum of OSHA Level D personal protective equipment (PPE).
- Intrusive earth disturbing activities shall be reviewed by a consultant certified by the State of Delaware for providing services at sites governed by the Hazardous Substance Cleanup Act (HSCA). The HSCA consultant shall screen exposed site materials for conditions of potential concern, and provide recommendations to the property owner or site operator who is sponsoring the work, and DNREC-SIRS regarding handling of excavated materials. The HSCA consultant shall monitor for the presence of volatile organic vapors, combustible gases, and visibly impacted soil when earth-disturbing activities are occurring. The HSCA consultant shall be equipped with a photoionization detector (PID) and a combustible gas meter. Should conditions of potential concern become evident, the consultant shall notify the supervisor of the site workers performing the intrusive work, the property owner or the operator sponsoring the work, and the DNREC-SIRS Case Manager. After consulting with the property owner, the HSCA consultant shall designate a location for stockpiling apparently impacted materials while characterization of the material occurs.
- DNREC shall approve erosion and sediment control plans, as well as storm water management plans, when these plans are required, rather than the City of Newark.
- Excavated earth materials shall be characterized through sampling and testing before the materials can be removed from the property. Characterization requirements will vary and will be adjusted appropriately, with the concurrence of DNREC-SIRS, to meet the requirements for the intended use of the soil. Reuse of excavated materials at off-site locations or on unrestricted operable units (OU-6 and OU-8) of the STAR Campus requires DNREC-SIRS approval. For reuse, the material shall be characterized in accordance with the current DNREC-SIRS Soil/Material Re-use Policy at HSCA Regulated Sites [and herein referred to as “Soil Re-use Policy” (see Appendix A)]. At the time of writing, the current policy is dated May 19, 2010.

- Fill materials that will be imported to the site shall be characterized and approved in advance by DNREC-SIRS in accordance with Soil Re-use Policy.

- Soil that will be removed offsite for treatment and/or disposal shall be sampled and characterized according to federal and state regulations so as to make an appropriate waste determination, as well as, in accordance with the treatment and/or disposal facility operating permit requirements. All records associated with the off-site treatment and/or disposal of soil will be maintained according to the applicable regulations.

A. SOIL EXCAVATION, TRANSPORTATION, AND DISPOSAL

Before starting intrusive earth disturbing activities, the contractor or maintenance workers will:

- Provide a health and safety representative to conduct a health and safety briefing. The representative shall conduct a pre-construction safety meeting including personnel involved in proposed excavation activities;
- Install and maintain sediment and erosion controls described in DNREC-approved Erosion and Sediment Control Plans;
- Be prepared to provide personnel, equipment, and supplies to excavate and stage apparently impacted soils at a location designated by the HSCA consultant; and
- Be prepared to decontaminate equipment appropriately at the completion of soil or groundwater disturbing activities.

In the event there are indications of potential environmental concern, such as soil discoloration, presence of debris, atypical odors, sustained PID readings 20 deflection units or more above ambient atmospheric readings at the soil/atmosphere interface, or indications of combustible gases are encountered at sustained readings of 10% of the lower explosive limit (LEL) or more in the excavation, the soils will be excavated, stockpiled, and managed as described below:

1. A temporary staging area for the stockpiled soils shall be designated, preferably on an area where pavement is present. The selected staging area shall not impede site work. The temporary staging area shall be constructed and maintained in compliance with the approved erosion and sediment control requirements for the project. The stockpile area shall be prepared by placing polyethylene sheeting on the ground surface to minimize the potential for impact to underlying soils or pavement. Soil shall be staged on top of the sheeting. The soil pile shall be covered with polyethylene sheeting at the end of each work day and secured by weights to minimize the potential for removal of the cover by wind.

2. During excavation of apparently impacted soils, the activity shall be monitored by the HSCA consultant using a PID and combustible gas meter. Should sustained readings of 20 deflection units or greater be registered by the PID in the breathing zone or sustained combustible gas meter readings greater than 10% of the LEL be registered in the excavation, the work shall cease temporarily and workers shall leave the disturbed earth area. The area shall be ventilated and then re-evaluated for indications of volatile organic compounds and/or combustible gas. Continued sustained PID readings above 20 deflection units in the breathing zone or continued sustained combustible gas meter readings above 10% LEL in the excavation shall require re-evaluation of the work practices.

3. In the event debris (e.g., concrete, timbers, etc.) is encountered during excavation, the debris shall be segregated and managed in accordance with applicable solid waste regulations.

4. Should the stockpiled soils be slated for off-site disposal, treatment or reuse, the HSCA consultant shall be responsible for coordinating the characterization of soils. The HSCA consultant shall also coordinate excavation, removal, and proper disposal/treatment/reuse of impacted soil after DNREC-SIRS review and approval of the work plan for those activities.

5. The contractor or maintenance personnel shall prepare manifests (hazardous and non-hazardous wastes) for waste shipments of soils and/or groundwater transported off-site for treatment, disposal, or recycling. Copies of completed manifests shall be provided to the owner or the operator responsible for the shipment and the HSCA consultant. The HSCA consultant shall provide copies of completed waste manifests in a report to DNREC-SIRS after the work is concluded.

6. The contractor or maintenance personnel shall secure the construction site and the equipment being used. The contractor or maintenance personnel shall provide adequate protective measures to limit potential public exposure to environmentally impacted materials.

B. UNDERGROUND STORAGE TANKS AND PIPING

Should underground storage tanks and associated piping be encountered during future site redevelopment activities, DNREC-SIRS and DNREC-Tank Management Section (DNREC-TMS) shall be notified by the HSCA consultant. Work will be temporarily halted pending coordination and agreement with DNREC-TMS on how best to address the encountered condition. The USTs and associated piping shall be drained of liquids, cleaned, removed, and disposed of off-site in accordance with the applicable Delaware Regulations Governing Underground Storage Tank Systems.

C. GROUNDWATER

Based on the information gathered during the BFIR, groundwater is anticipated to be encountered at the following depths below the ground surface:

- Approximately 8 to 16 feet within OU-2;
- Approximately 6 to 17 feet within OU-3;
- Approximately 2 to 10 feet within OU-4;
- Approximately 7 to 23 feet within OU-5; and
- Approximately 6 to 11 feet within OU-9.

Results for groundwater samples collected during the BFIR within OU-2, OU-3, OU-4, and OU-9 indicate the presence of pesticides, petroleum hydrocarbons, chlorinated hydrocarbons, and certain metals at concentrations in excess of Groundwater URS values at locations outside of the bounds of the identified areas of concern or interest. The environmental quality of groundwater within the bounds of OU-5 apparently has not been impaired by historic site activities, based on sample results reported during the BFIR.

Construction and maintenance planning should include an assessment of the likelihood that work activities will or will not require management of groundwater. If groundwater management likely will be necessary, such as removal of water from excavations or installation of a dewatering system, provisions for environmentally sound disposal of the water should be established before the start of construction or maintenance to avoid project completion delays and cost increases associated with change orders and expedited services. In certain cases, groundwater disposal may be arranged on a contingent basis using groundwater quality data provided in the BFIR or monitoring data generated during implementation of the Long-Term Stewardship (LTS) Plan for the STAR Campus. If the available data is not sufficient to facilitate disposal arrangements, groundwater samples shall be collected from within the work area and analyzed for the parameters required by likely disposal facilities (e.g., Newark and New Castle County sanitary sewers, oily wastewater treatment facilities, industrial wastewater treatment facilities).

Should groundwater be encountered during intrusive earth disturbing work, the following guidelines will be followed:

1. If separate-phase product, sheens, odors, discoloration, or other indications of environmental impact are observed on groundwater present in or entering an active excavation, any groundwater requiring removal from the excavation shall be contained (e.g., pools, tanks, trucks, or equivalent) and characterized by sampling and analyses for proper disposal management.

2. Groundwater entering or present in active excavations where the soils in contact with groundwater exhibit separate-phase product, sheens, odors, discoloration, or other indications of environmental impact, to the extent it requires removal, shall be handled in the same way groundwater is addressed in Item 1, above.

3. Saturated soils removed from excavations described in Item 1, above, shall be contained in a secure storage/staging area that provides for the collection and containment of runoff, leachate or seepage from the soils and such runoff, leachate or seepage shall be handled in the same way groundwater is addressed in Item 1, above.

4. Groundwater entering or present in active excavations, to the extent that immediate removal is required and the groundwater does not exhibit separate-phase product, sheens, odors, discoloration or other indicia of environmental impact, shall be discharged to a sanitary sewer, following receipt of approval from the appropriate authorities (City of Newark and New Castle County).

IV. PRECAUTIONS AND PROCEDURES FOR IDENTIFIED AREAS OF INTEREST OR CONCERN

In addition to the procedures described in Section III, the following precautions and procedures apply to work being conducted within areas of concern or areas of interest. Written approval from DNREC is required prior to earth disturbing activities within:

- AOC-3-1;
- AOC-3-2;
- AOC-4-1; and
- Below the pavement that covers the Incinerator Pit Area within OU-5.

A physical barrier, such as pavement, building slab, or one foot clean soil with marker fabric, must be installed upon completion of earth disturbing activities in these areas.

A low-permeability cap, such as bituminous concrete (asphalt) must be placed over the PCB area in the former Shipping Yard in AOC-3-1 and over the Incinerator Pit Area in OU-5. No occupied structures can be constructed over these PCB areas unless materials containing PCB are removed, DNREC-SIRS concurs that the hazard has been removed, and the Environmental Covenant filed with the property deed is modified to reflect the changed condition. This process shall require an amendment to the FPRA for the operable unit where the work will occur, including the recorded public notification and comment period.

Within the bounds of AOC-3-2 and AOC-4-1 or within 100 feet of the bounds of those areas of concern, a vapor intrusion barrier must be installed beneath any building that will be occupied continuously. The design of the vapor intrusion barrier shall be approved by DNREC-SIRS prior to installation. The HSCA consultant shall review and document the installation of the vapor barrier system. The HSCA consultant shall prepare a completion report for the vapor barrier system and submit the report to DNREC-SIRS for review and approval. Alternatively, if feasible, the underlying vapor intrusion hazard may be remedied with the approval of DNREC-SIRS. An amendment of the FPRA for the operable unit where the work will occur shall be required before such a remedy is implemented.

In the event that development plans would trigger the need to change the approved remedy for an operable unit addressed by this CMMP, several regulatory procedures must be completed before the revised remedy can be implemented. These procedures include:

- Issuance of an amended Proposed Plan of Remedial Action (PPRA) by DNREC-SIRS with a subsequent 20-day public comment period;
- Issuance of an amended FPRA (assuming no public comments or requests for a public hearing were received on the amended PPRA); and
- Submittal of a remedial action work plan by the HSCA-certified consultant to DNREC-SIRS for review and approval.

Once the remedial action work plan has been approved by DNREC-SIRS, implementation of the revised remedy can be performed in accordance with the approved work plan. If the revised remedy includes impacted media removal, the HSCA-certified consultant will perform confirmatory sampling in accordance with DNREC-SIRS requirements.

V. TRANSPORTATION OF MATERIALS TO OFF-SITE LOCATIONS

This section details the procedures to be followed should off-site reuse, treatment, or disposal of excavated materials be required. As described in Section III, excavated materials that yield indications of environmental impact shall be stockpiled temporarily pending characterization and evaluation of appropriate options for long-term management. Should off-site recycling, disposal of these materials be necessary and characterization of the materials confirms that conditions of concern to human health or the environment are present; the following precautions shall be implemented:

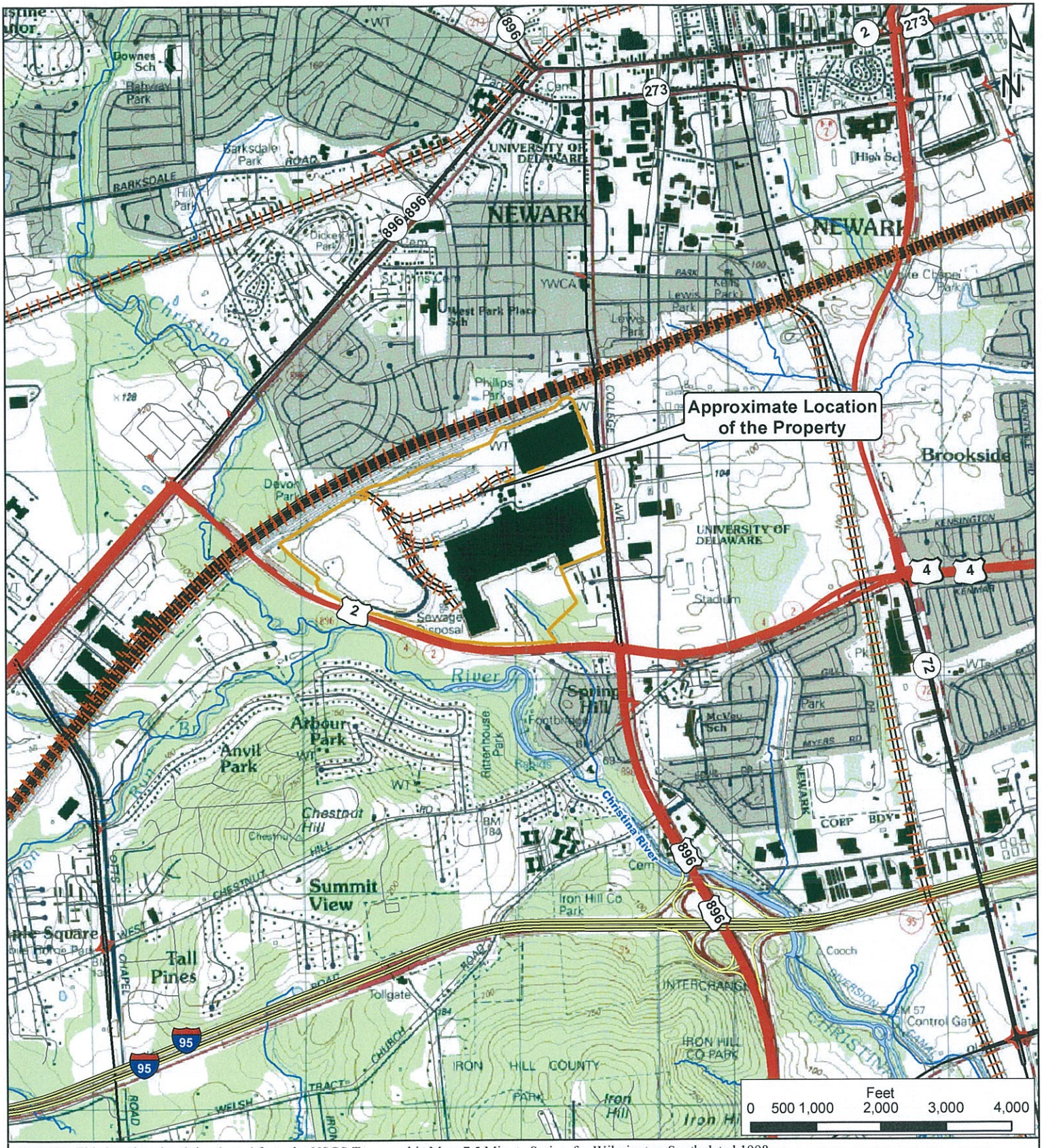
- The trucks shall be covered during transportation;
- No free liquids shall be present in the soil or leaking from trucks during the transportation of soil. The contractor or maintenance workers shall ensure that the excavated materials comply with the requirements of the disposal facility;

- In the event that the materials should spill outside the designated loading area, the site workers shall collect the spilled materials and place them in the stockpile (or transport container). This response shall include public or private roadways as well as the site;
- Soils shall be transported under appropriate manifest or shipping documents to the receiving facility; and
- Manifests shall be signed by an authorized agent of the owner or the operator responsible for the shipment prior to the materials leaving the site.

This plan is based on Duffield Associates' current understanding of the site conditions and currently anticipated redevelopment plans. Modifications to this plan require DNREC-SIRS approval.

WORD\7333EY.0314-CMMP OU-2,3,4,5,9.RPT REV

FIGURES



NOTES: This location sketch is adapted from the USGS Topographic Map, 7.5 Minute Series, for Wilmington-South dated 1998.

DATE: JANUARY 2011	Site Location Sketch	BASEMAP: USGS Digital Raster Graphic
SCALE: 1 inch = 2,000 feet	**BROWNFIELD INVESTIGATION**	DRAWN BY: MPN
PROJECT NO. 7333.EL	OPERABLE UNIT NO. 3 - 1743 HOLDINGS, LLC PROPERTY SCIENCE AND TECHNOLOGY CAMPUS FORMER CHRYLSER ASSEMBLY PLANT	CHECKED BY: MRB
SHEET: FIGURE 1	NEWARK-NEW CASTLE COUNTY-DELAWARE	FILE: 7333EL_Figure1_SiteLocation.mxd

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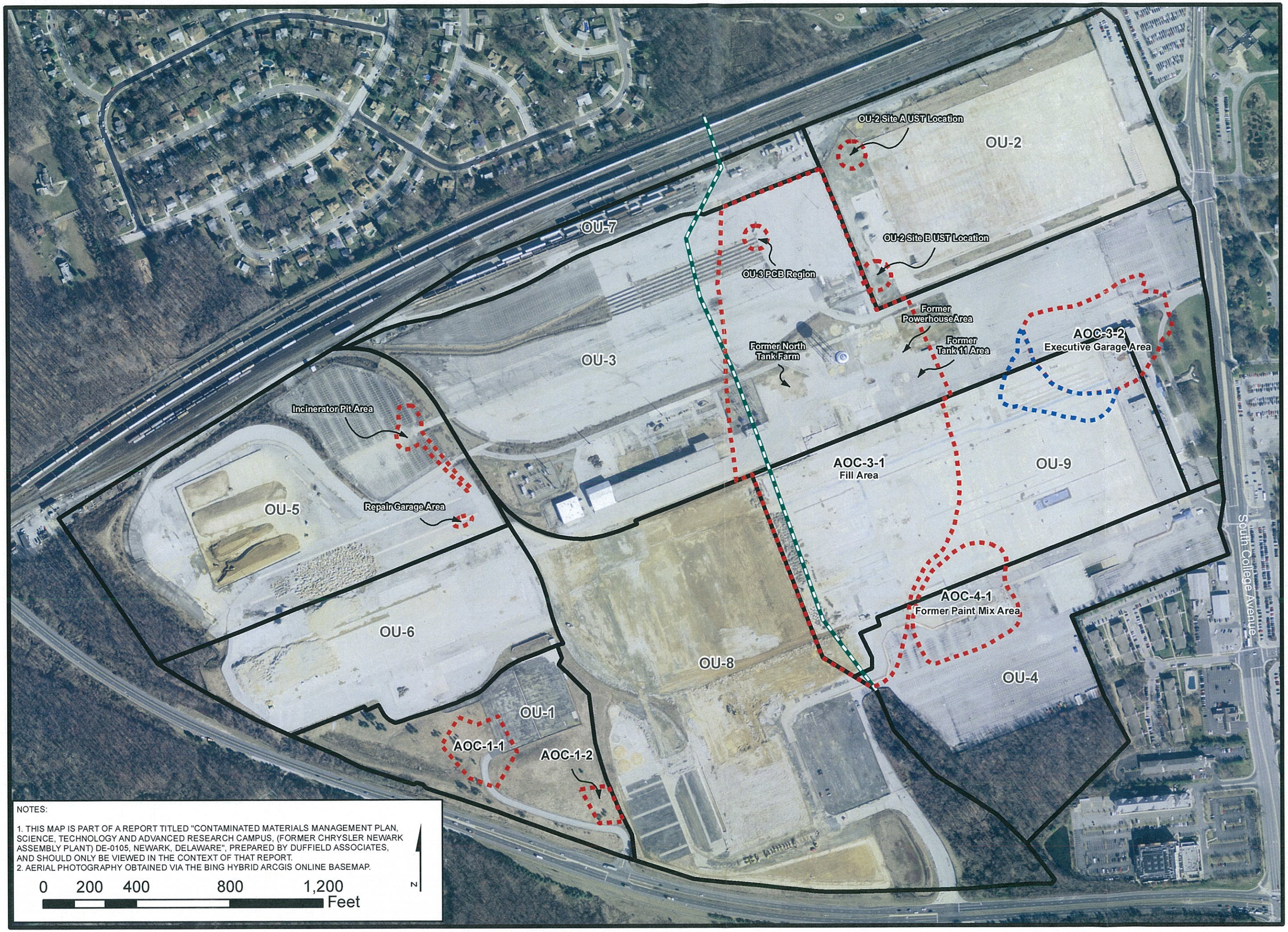

NOTES:

1. THIS MAP IS PART OF A REPORT TITLED "CONTAMINATED MATERIALS MANAGEMENT PLAN, SCIENCE, TECHNOLOGY AND ADVANCED RESEARCH CAMPUS, (FORMER CHRYSLER NEWARK ASSEMBLY PLANT) DE-0105, NEWARK, DELAWARE", PREPARED BY DUFFIELD ASSOCIATES, AND SHOULD ONLY BE VIEWED IN THE CONTEXT OF THAT REPORT.
2. AERIAL PHOTOGRAPHY OBTAINED VIA THE BING HYBRID ARCGIS ONLINE BASEMAP.

0 200 400 800 1,200 Feet

N

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Legend

Concern

- Areas of Concern or Interest
- Groundwater Impact Only
- Silver Brook Culvert
- Operable Unit Boundaries

UST: Underground Storage Tank
PCB: Polychlorinated Biphenyl

BASEMAP:
BING MAPS AERIAL PHOTO

DRAWN BY:
KAS

CHECKED BY:

FILE:
7333EY_Sitewide AOCs_r2.mxd

Areas of Concern

1743 HOLDINGS, LLC PROPERTY
SCIENCE, TECHNOLOGY AND ADVANCED RESEARCH CAMPUS
FORMER CHRYSLER ASSEMBLY PLANT
NEWARK-NEW CASTLE COUNTY-DELAWARE

DATE:
JULY 2012

SCALE:
AS SHOWN

PROJECT NO.
7333.EY

SHEET:
FIGURE 2

APPENDIX A

DESCRIPTION OF OU-3 PCB REGION

Celebrating 75 Years of Quality Services and Innovation

McCRONE

ENGINEERS ▪ SURVEYORS ▪ PLANNERS

July 31, 2012
D3100116

DESCRIPTION OF 7,854 SQUARE FEET OF LAND, MORE OR LESS, A PCB COVER AREA
ON PART OF AREA OU-3, PART OF THE LANDS OF 1743 HOLDINGS, LLC,
CITY OF NEWARK, NEW CASTLE COUNTY, DELAWARE

BEGINNING for the same at a 50' radius point of a circle defining the PCB Cover Area on part of the Area OU-3 of the lands of 1743 Holdings, LLC, said 50' radius point further being located the three following courses and distances from a point on the westernmost right-of-way line of South College Avenue (Delaware Route 896) and at the intersection of the division line between the herein described Area OU-3 and other lands of 1743 Holdings, LLC;

1. **South 68° 25' 12" West 1,403.22 feet,** to a point, thence;
2. **North 21° 36' 41" West 653.34 feet,** to a point on the southernmost outline of other lands of 1743 Holdings, LLC, and thence;
3. Binding on a tie line **South 43° 19' 45" West 407.86 feet,** to the 50' radius point;

CONTAINING in all 7,854 square feet of land, more or less, as described by McCrone, Inc. Registered Professional Engineers and Land Surveyors in July of 2012.

THIS description prepared with the benefit of a title search.

MICHAEL W BURCHAM REGISTERED No. 688 PROFESSIONAL LAND SURVEYOR DELAWARE

Michael W. Burcham, Professional Land Surveyor #688 — Date 8/1/12

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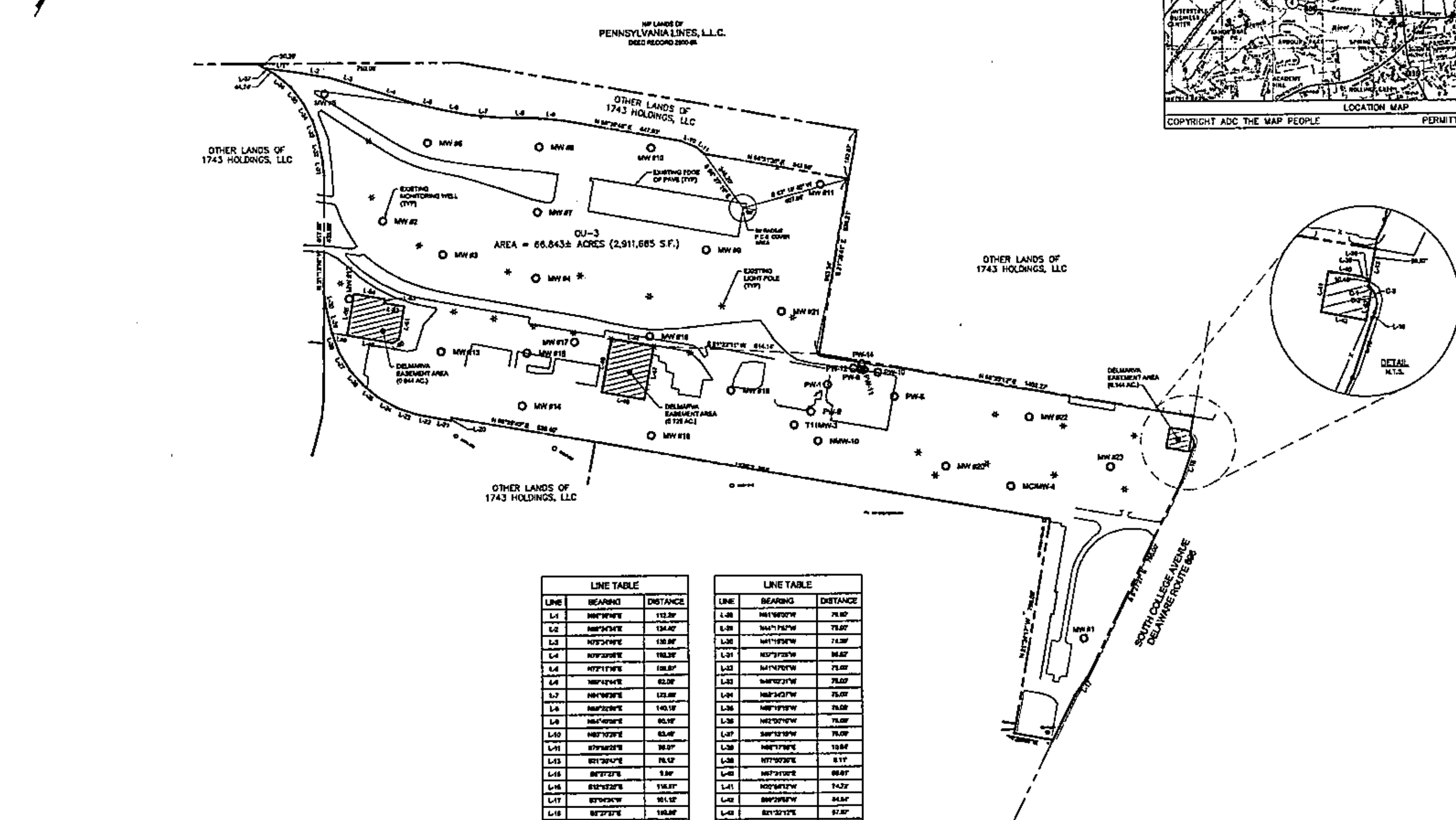

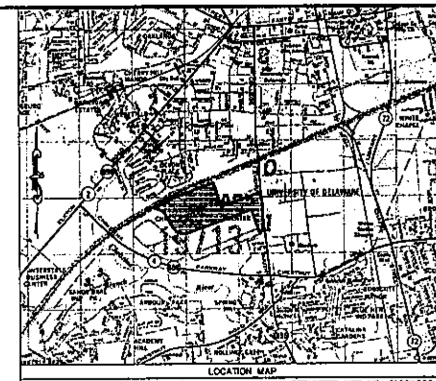

COPYRIGHT ADC THE MAP PEOPLE PERMITTED USE NO. 21006232

LINE TABLE		
LINE	BEARING	DISTANCE
L-1	[illegible]	112.39'
L-2	[illegible]	134.40'
L-3	N75°34'[illegible]"E	130.98'
L-4	[illegible]	192.39'
L-5	N72°11'[illegible]"E	109.87'
L-6	[illegible]	62.08'
L-7	[illegible]	123.69'
L-8	[illegible]	140.15'
L-9	[illegible]	60.16'
L-10	N80°10'[illegible]"E	63.46'
L-11	[illegible]	30.07'
L-13	[illegible]	76.12'
L-15	[illegible]	9.96'
L-16	[illegible]	116.17'
L-17	[illegible]	101.12'
L-18	[illegible]	109.86'
L-19	[illegible]	146.13'
L-20	[illegible]	16.73'
L-21	[illegible]	57.62'
L-22	[illegible]	75.02'
L-23	[illegible]	75.07'
L-24	[illegible]	75.02'
L-25	[illegible]	75.08'
L-26	N72°22'42"W	75.02'
L-27	[illegible]	75.08'

LINE TABLE		
LINE	BEARING	DISTANCE
L-28	N61°[illegible]	75.02'
L-29	N44°[illegible]	75.07'
L-30	N41°[illegible]	74.39'
L-31	N37°[illegible]	86.67'
L-32	N41°[illegible]	75.02'
L-33	[illegible]	75.02'
L-34	[illegible]	75.07'
L-35	[illegible]	75.08'
L-36	N62°[illegible]	75.02'
L-37	[illegible]	75.09'
L-38	[illegible]	10.84'
L-39	N77°[illegible]	8.11'
L-40	[illegible]	66.61'
L-41	N20°[illegible]	74.73'
L-42	[illegible]	84.84'
L-43	[illegible]	97.87'
L-44	[illegible]	130.36'
L-45	N21°[illegible]	168.86'
L-46	[illegible]	140.08'
L-47	[illegible]	198.75'
L-48	[illegible]	170.02'
L-49	S30°[illegible]	27.81'
L-51	[illegible]	121.86'
L-52	[illegible]	74.86'
L-53	S22°[illegible]	15.04'
L-54	[illegible]	115.23'
L-55	[illegible]	153.71'

THE PROPERTY LINES SHOWN ALONG SOUTH COLLEGE AVENUE (RTE. 896) WERE TAKEN FROM A SURVEY PLAT ENTITLED "ALTA / ASCM LAND TITLE SURVEY FOR LANDS OF OLD CARGO LLC" AND ARE NOT THE RESULT OF A BOUNDARY SURVEY BY McCRONE, INC. AT THIS TIME.

REVISIONS

McCRONE

PLAN TO ACCOMPANY THE BROWNFIELD INVESTIGATION FOR OU-3 OF THE SCIENCE AND TECHNOLOGY CAMPUS PROPERTY

PART OF THE LANDS OF

1743 HOLDINGS, LLC

CITY OF NEWARK, NEW CASTLE COUNTY, DELAWARE

DATE: JANUARY 2011

SHEET NO.: 1 OF 1

FILE NO.: 1462-B

APPENDIX B

DNREC-SIRS SOIL/MATERIAL REUSE POLICY AT HSCA REGULATED SITES

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF AIR AND WASTE MANAGEMENT
SITE INVESTIGATION & RESTORATION BRANCH

MEMORANDUM

TO: Kathleen Stiller, SIRB Branch Manager 5/25/10

THROUGH: Paul Will, Program Manager I, SIRB 5/24/10
Qazi Salahuddin, Program Manager I, SIRB 5/24/10
Timothy Ratsep, Program Manager I, SIRB 5/25/10

FROM: Todd Keyser, Project Officer - SIRB
John Cargill, Project Officer - SIRB
Rick Galloway, Project Officer - SIRB
Lindsay Hall, Project Officer - SIRB
Steve Johnson, Project Officer - SIRB
Krystal Stanley, Project Officers - SIRB

DATE: May 19, 2010

RE: **Policy Soil/ Material Re-use Policy at HSCA Regulated Sites**

The Department of Natural Resources and Environmental Control – Division of Air and Waste Management – Site Investigation and Restoration Branch (DNREC-SIRB) adopts this Policy to guide the re-use of soil/material from regulated (HSCA, RCRA) sites (sites) and non-regulated properties (properties) at HSCA regulated sites. The intent of this policy is to provide a mechanism for the safe and efficient re-use of suitable soils/materials that does not create an unacceptable risk to human health or the environment. Soil/material eligible for re-use under this policy is soil/material that will be removed from a regulated site or non-regulated property and transported to a HSCA-regulated site for use as a fill material (surface and/or subsurface applications). This policy specifically *excludes* soil/material excavated at a HSCA-site that is re-used at the *same* HSCA site as part of a DNREC-SIRB approved remedial action.

As mentioned above, this policy will address two (2) categories of re-use:

A) Soil/material removed from a regulated site for use at a HSCA regulated site either as surface or sub-surface material. Regulated refers to HSCA or other State or Federally regulated environmental program or guidance.

B) Soil/material removed from a non-regulated property for re-use at a HSCA regulated site as surface or subsurface material. Non-regulated properties may be commercial borrow pits, construction sites, or any other property not currently regulated under the HSCA program.

The soil/material that will be considered may come from several different types of sources. The following list is based upon current practice but any source may be considered, if it meets the requirements of this soil/material re-use policy.

Types of Sources and Data Availability:

1) Undisturbed property with no previous operational use and no Phase I,

2) Property with past operational use but Phase I investigation shows no likely environmental impact,

3) Developed property with potential for contamination based on Phase I investigation,

4) Site as defined by a DAWM program (SIRB, TMB, SHWMB) with confirmed environmental impact and data that meets the Soil Re-Use Policy volume and constituent criteria or a Beneficial Use Determination (BUD) from the SHWMB, or

5) Site as defined above with recently completed and approved Remedial Investigation (RI) Report.

Appropriate re-use will be based upon current data. Impacted soil/material is defined as having a compound present that exceeds the applicable Uniform Risk-Based Standard (URS) or equivalent standard as determined by SIRB for the intended re-use of soil/material. For example, if the soil/material is to be used as a surface cap at a site under an unrestricted (residential) use scenario, then the material will be compared to the unrestricted use URS value(s) to determine if it is an appropriate reuse.

Soil/Material Sampling

Soil/material may be found in multiple types of locations and dispositions. This policy provides the applicant with acceptable options for characterizing the soil/material where and how it is located. Soil/material may be re-used when it is found in-situ and when it has been excavated and staged, provided that it is adequately sampled. Samples will be tested for Target Analyte List and Target Compound List (TAL/TCL) contaminants in all cases. Composite sampling will not be considered appropriate for volatile sampling. Discrete sampling must occur for volatiles at the frequency listed for each situation listed below. The sampling frequency options are listed below.

Composite Sampling Composite sampling is most often used in locations where soil is easily accessed such as a stockpile or borrow pit.

Stockpiles- 1 (one) 30-point composite sample per 1,000 cubic yards and 5 volatile discrete sample. A typical residential lot is 0.25 acre. 1,000 cubic yards is equivalent to 1 sample per ¼ acre residential lot 2 feet deep.

In-situ Soil (Non-regulated properties) including Borrow Pits-1 (one) 20-point composite per 4,000 cubic yards and 4 volatile discrete samples with Phase I or DNREC determined comparable documentation indicates no evidence of potential impact. 4,000 cubic yards is equivalent to 1 sample per acre 2 feet deep.

Regulated Site - DNREC Project officers will evaluate if the soil is sufficiently characterized to use on another site. If additional sampling is judged to be necessary, one (1) 10 point composite per 8,000 cubic yards and 3 discrete volatile samples may be required to further characterize the site,8,000 cubic yards is equivalent to 1 sample per 2 acres, 2 feet deep.

Composite sampling criteria is based upon Hewitt, et al, *Validation of Sampling Protocol and the Promulgation of Method Modifications for the Characterization of Energetic Residues on Military Testing and Training Ranges*, June 2009 (ERDC/CRREL TR-09-6).

Discrete (Default) Sampling - Discrete sampling may be used in multiple situations but is most often used when soil/material is located in-situ at a site. Discrete or grab sampling is what a typical remedial investigation uses. The number of discrete samples to be taken should follow the table below.

Discrete Sampling Table

Volume of soils (Yd^3)	Sampling Frequency	Total # of Samples
0-500	1 sample per 100 yd^3.	1-5
501-5,000	5 samples plus 1 sample per 250 yd^3 >500.	5-23
>5,000	23 samples plus 1 sample per 500 yd^3 >5,000.	>23

Depending upon the source and potential re-use of the soil/material, different criteria may need to be met. The evaluation criteria are the minimum conditions that must be met in order to obtain approval from DNREC-SIRB. The evaluation criteria are presented below. Following the evaluation criteria listed below are the specific scenarios and the required evaluation criteria for each.

Section 1- Criteria Used to Evaluate the Suitability of Soil/Material for Re-use at a HSCA-regulated site

1) ***Consistent with Final Plan***: The re-use of the soil/material from the source site at the destination site is consistent with any Final (or Interim) Plan of Remedial Action that may exist for each site.

2) ***No Hazardous Waste***: The soil/material is not a hazardous waste as defined by the Delaware Regulations Governing Hazardous Waste, Part 261,

3) ***No Solid Waste***: The soil/material does not contain asphalt, trash, solid waste or yard-type waste,

4) ***Contaminant Type and Concentration Specific Evaluation*** : The source soil/material meets **one** of the conditions listed below:

    a) The soil/material contaminant concentration (95% UCL or mean) does not exceed background conditions as listed in the **Remediation Standards Guidance** or current SIRB guidance at the destination site,

b) The contaminant concentrations are less than the 95% upper confidence limit of contaminants that already exist on the destination site, and the cumulative risk of the contaminants is below the 1*10-5,

c) A quantitative risk assessment consistent with the current SIRB guidance shows that reuse of the proposed soil/material does not create an unacceptable risk (above 1*10-5 or HI above 1) at the destination site or,

d) The contaminant concentrations are less than what already exist onsite. Compare mean concentrations of source soil to mean soil concentrations for the destination site. A 95% UCL comparison of source and destination site soil may also be conducted in lieu of the mean.

5) ***No Groundwater Risk***: The soil/material does not contribute to groundwater contamination or increases groundwater risk at the destination site.

6) ***Letters to DNREC-SIRB:*** The owners of both sites will acknowledge in writing to DNREC-SIRB that they are aware of the quality of the soil/material proposed for re-use and are responsible for any potential future liability.

Section 2- Potential Reuse Scenarios and Appropriate Criteria

Scenario 1: Soil/ Material from a Regulated Site to HSCA Site

Soil shall meet Criteria:

#1) Consistent with Final Plan

#2) No Hazardous Waste

#3) No Solid Waste

#4) Contaminant Type and Concentration Specific Evaluation

#5) No Groundwater Risk

#6) Letters to DNREC-SIRB

Scenario 2a: Contaminant Impacted Soil/Material from a non-regulated property to HSCA site

#1) Consistent with Final Plan

#2) No Hazardous Waste

#3) No Solid Waste

#4) Contaminant Type and Concentration Specific Evaluation

#5) No Groundwater Risk

Scenario 2b: Non-impacted Soil/Material from a non-regulated property to HSCA site

#1) Consistent with Final Plan

#3) No Solid Waste

In all cases, the party proposing the soil re-use is responsible for presenting analytical data that shows the re-use meets all of the appropriate conditions for the scenario proposed **prior to transport**. The re-use proposal will be submitted to DNREC-SIRB at least two weeks prior to the intended date for transporting the soil/material. DNREC-SIRB will respond via email and in writing with an approval once the proposal is approved. Data obtained in the investigation may be adequate or may be supplemented with additional samples. In lieu of a site specific sampling plan, the individuals proposing the reuse may elect to use the default sampling frequency shown in the Discrete Sampling table or Composite Sampling description.

Material with BUD (Beneficial Use Determination) - Obtain a copy of BUD determination from Solid and Hazardous Waste Management Branch and review for potential contaminant issues for your site.

Other Material Debris -This scenario should be considered only if a BUD has not been obtained for the material but there appears to be a possible beneficial use of a recovered resource. For material other than that covered in a SHWMB-BUD, the process shall be the same as Scenario 1.

"Other" Material Reuse Determination

DNREC will evaluate on a case-by-case basis, any material that does not fit into the above criteria.

An approval granted by DNREC-SIRB for soil/material reuse is not to be construed as a substitute for any other permit or permission required by other agencies for the activity. Soil/Material reuse policy approval applies directly and only to the environmental (contaminants) suitability of the proposed soil/material. After soil from a source site has been approved, at the discretion of the DNREC-SIRB project officer, it may not need to be re-sampled in the future to determine if it is appropriate to use as a continued source.

This policy replaces "Policy for Presumptive Soil Re-use" dated September 21, 2004 and May 4, 2006.

TAK:vdc
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