BORIT SITE INVESTIGATION PLANNING GUIDE

Problem Statement

Operable unit one (OU-1) at the Borit Site consists of two asbestos-containing material (ACM) waste disposal areas and a reservoir constructed, in part, of ACM in the town of Ambler PA. A site walk-over and review of background information indicates that other waste material is disposed with the ACM. The first area, known as the Park, is relatively flat and is the site of a former play ground and tennis courts. Activity-based sampling resulted in unacceptable concentrations of asbestos in air. The second ACM disposal area is referred to as the Asbestos Pile. Test pits in this area found "sludge" and cinders. A portion of this area was used for fire training and as a waste transfer station. The third area, known as the Reservoir, is a reservoir of unknown origin and construction located between the two waste disposal areas. The berm of the Reservoir is constructed of ACM. All three areas are bound on the west by Wissahickon Creek. Rose Valley Creek is a tributary to Wissahickon Creek and flows between the Reservoir and the Park. Tannery Run flows on the south side of the Asbestos Pile. The vertical and lateral extent of ACM is unknown in all three areas as well as in the streams and adjacent residential properties. The presence/absence and nature of other contaminants, the media that they impact and the extent (if present) within those media are not known.

Study Questions

The overall objective of the work assignment is to define the nature and extent of contamination (asbestos and chemical) through a remedial investigation (RI) to the extent that a Conceptual Site Model (CSM) can be developed/refined. The CSM will be used to support the performance of a feasibility study (FS), and to provide analytical data to support a comprehensive human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA). The primary study questions are:

- What is the nature and extent of the disposed waste at the Borit Site?
- Does the contamination at the Borit Site pose a threat to human health and the environment?

Many secondary questions arise in considering the data that will need to be generated to evaluate these primary questions. For the purposes of this planning discussion, these secondary questions are called "Investigative questions " and are listed in Table 1 where they are organized by the distinctive areas to be investigated.

Required Data

Some limited data exist to help answer these questions and guide the approach for collecting additional data. For all areas the documents which are necessary to perform the enclosed work are:

- EPIC aerial photos,
- Sanborn® maps,
- any information the EPA on-scene coordinator has in regards to personal air monitoring, flood plain data (used in the removal design for stream bank stabilization),
- information from the Wissahickon Waterfowl Preserve in regard to species observed and fish species used to stock reservoir,
- information from the Wissahickon Valley Watershed in regard to stream flow data,
- information from the Wissahickon Valley Watershed or US Fish and Wildlife, PA Fish and Boat Commission, PA Game Commission, and PA Department of Conservation and Natural Resources in regard to ecological receptors in Site waterways, and
- Reservoir construction data from Dams and Waterways, Montgomery County, Ambler Asbestos Site File, and PADEP.

For each detailed investigative question, Table 1 provides a brief summary of the existing data, the identified data gap, and the proposed actions and planned investigation phase for filling the data gap.

Table 1 Identification of Borit Site RI Data Requirements				
Question Number	**Investigative Question**	**Existing Information**	**Data Gaps**	**Proposed Action/Investigation Phase**
Park Area				
1	What is the extent of ACM Waste in the cover and waste layers of the Park Area?	• Only surface soil samples have been collected • START collected ~25 samples on a grid from 0-3". Some form of asbestos was detected in 9 widely-distributed samples	• Aerial and vertical extent of ACM in the cover and waste layers • Depth of waste is unknown… assume 15-ft depth on average for investigation planning purposes	• **PHASE 1** • Locate utilities (pipes, former USTs near former residences, etc.) and possible metal debris beneath the Park prior to performing intrusive activities. • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of direct push sampling (24 hour turnaround time), if no fibers are observed passive air sampling will cease for this activity (approximately 8 samples at the Park). • Collect direct push soil samples on 100-ft grid for visual screening of ACM material (51 locations through cover and waste layers); log depth to native material. • Hold additional 5 locations (10%) in reserve for more refined delineation, if necessary. • Collect 5 randomly determined grab samples at 0-3" in cover for ingestion, dermal, and inhalation and 5 to 8 randomly determined samples (composite from 3 to 5 locations) from the cover/waste interface and from the waste layer. Collect 3 biased samples (composite from 3 to 5 locations) within the waste layer based on PID readings or visual contamination (see investigative question #2). Ten (10) analytical samples will be held in reserve for any sample interval. • Analyze approximately 26 samples will be analyzed by the PLM method in the cover and waste layers. • Collect GPS points at all direct push locations.

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2	Are there chemical contaminants of concern other than asbestos within the cover and ACM waste layers on the Park Area?	• No data available	• Chemical analytical data for cover layer and waste samples	• **PHASE 1** • Use same direct push soil samples collected on 100-ft grid for visual screening of ACM material (51 locations) (from investigative question #1). • Collect 3 randomly determined grab samples at 0-3" in the cover for ingestion, dermal, and inhalation and 5 to 8 randomly determined grab samples from the cover/waste interface and from the waste layer. Collect 3 grab samples within the waste layer (biased based on PID readings or visual contamination). Hold 10 analytical samples in reserve (same as investigative question #1). • Collect PID headspace data every 2 ft through waste (and soil, see investigative question #3) in direct push sample. • Analyze approximately 24 samples for TCL VOCs, SVOCs, Pest/PCBs and TAL metals in the cover and waste layers.
3	Has native soil (if present) been impacted by the waste above it in the Park Area?	• No data available	• Asbestos and chemical analytical data for native soil samples	• **PHASE 1** • Direct push into the soil at the 51 locations; penetrate 4 feet into native soil or until the water table is encountered, whichever is more shallow. Visually log native material. • Collect selected soil samples biased toward the groundwater preferential pathway. Within native soil, collect samples at: 0-3" or in water table if water table is encountered shallower than 4 feet (48") within the native material. If the water table is encountered at all 5 locations, collect 2 to 3 samples at the water table and collect the remaining samples 0-3" in native soil. Collect 5 PLM samples as a composite from 3 to 5 locations and collect 5 grab samples for TCL VOCs, SVOCs, Pest/PCBs and TAL metals in native soil.

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4	Has groundwater been impacted beneath the Park Area?	• No groundwater data have been collected	• Asbestos and chemical groundwater analytical data • Groundwater flow direction/gradient • Groundwater depth	• **PHASE 1** • Determine if soil or waste material is contaminated with compounds that can leach to the groundwater. • Collect groundwater or perched water grab samples during Phase 1 if water is observed during direct push activities. Reserve 5 Phase 1 groundwater samples for this activity. Bias groundwater samples towards the downgradient site groundwater pathway. • Install 3 temporary piezometers, collect water levels and survey to determine groundwater flow direction. • **PHASE 2** • Install monitoring wells in Phase 2, if warranted, based upon Phase 1 soil and perched water results.
5	Are additional data necessary to perform the HHRA for the Park Area?	• Some activity-based sampling (ABS) has been conducted such as maintenance scenarios: raking and grass cutting, walking, and soil sampling • Maintenance ABS scenario (raking). This ABS scenario showed an asbestos level of 0.076 fibers/mm^2 • Modeled risk from asbestos was sufficient to	• Additional activity-based samples to evaluate the air exposure pathway from asbestos • Additional chemical analytical data if non-ACM contamination is found in cover, waste, subsurface soil or groundwater	• **PHASE 1** • Refine CSM. • Collect 2 personal air samples per day (8 hour TWA and a 30 min. exposure limit) during all days of Phase 1 intrusive investigation activities for personal air monitoring for asbestos. Analyze approximately 12 samples at the Park for PCM and if this exceeds the PEL, then run for TEM. • **PHASE 2** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) each day during ABS (approximately 8 samples at the Park). • Conduct ABS for construction activity and raking activity. • Analyze 2 activity-based air samples (high and low volume) by TEM. • Collect 2 grab surface soil samples (0-3”) in cover for asbestos (Phase 1), if needed and percent moisture (Phase 2) at ABS locations prior to performing ABS activities. • Collect GPS points at all ABS locations.

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		score the Site for the proposed NPL		• **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.
6	Are additional data necessary to perform the screening level ecological risk assessment for the Park Area?	• None	• Determine whether there are burrowing animals at the site • Determine ecological risks and exposure pathways	• **PHASE 1** • Order a threatened and endangered species map. • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **AFTER PHASE 2** • Perform a SLERA using HHRA data.
Asbestos Pile				
7	What is the extent of ACM Waste in the cover and waste layers of the Asbestos Pile?	• START collected 2 surface soil samples (0-3") in cover for asbestos only and 2 bulk waste samples for asbestos only • In general, test pits were limited to the northern (Reservoir) and eastern (Maple Street) edges of the Asbestos Pile • Test pits were limited by the approximately 14-ft reach of the	• Aerial and vertical extent • Depth of waste is unknown… assume 35-ft depth on average for investigation planning purposes • Data from the center, east, south, and west sides of the pile • EPA Remedial wants to minimize disturbance	• **PHASE 1** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of direct push sampling (24 hour turnaround time). Cease passive air sampling if no fibers are observed for this activity (approximately 8 samples at the Asbestos Pile). • Sample cover and waste with direct push on a 100-ft grid on the Asbestos Pile (approximately 28 direct push locations if equipment access is available); log depth to native material. • Reserve additional 3 locations (10%) for more refined delineation, if necessary. • Collect 5 randomly determined grab samples at 0-3" in cover for ingestion, dermal, and inhalation and 5 to 8 randomly determined samples (composite from 3 to 5 locations) from the cover/waste interface and from the waste layer. Collect 3 biased samples (composite from 3 to 5 locations) within the waste layer (based on PID readings or visual contamination) (see investigative question #8). Hold 10 analytical samples in

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		backhoe (Gilmore Report) • An electromagnetic survey was conducted (Gilmore Report); CDM will reevaluate the use of this report after Phase 1 has been completed to determine if the existing report is sufficient or if a new survey needs to be conducted • Site is heavily vegetated; which will make field activities difficult if not impossible in some areas	and minimize additional clearing or grubbing • If access is limited, need to take advantage of locations where EPA Removal has already performed clearing and grubbing	reserve for any sample interval. • Analyze approximately 26 samples for asbestos by the PLM method in the cover and waste layers. • Collect GPS points at all direct push locations. • **Will Evaluate Need After Phase 1** • Perform an electrical resistivity survey to determine the lateral extent and thickness of the Asbestos Pile.
8	What bulk waste material exists in the Asbestos Pile?	• There is a pipe crossing over Tannery Run which appears to run through the Asbestos Pile. • It is known that the Asbestos Pile	• Extent of metal objects existing within the Asbestos Pile • If there are large metal objects, will	• **PHASE 1** • Perform an electromagnetic and magnetic survey prior to performing investigative question # 7 to locate buried metal.

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		was used as a transfer station and as a municipal trash disposal facility; therefore, there may be large metal objects such as appliances or drums within the pile.	drilling be prohibited or does it pose a health and safety concern • Locate utilities crossing the Asbestos Pile prior to drilling	
9	Are there contaminants of concern other than asbestos within the cover or ACM waste on the Asbestos Pile?	• EPA START collected 2 surface soil samples (0-3") in cover for organic and inorganic data in the former fire training area on the northern edge • Limited analysis on samples from the test pits for other contaminants. Have previously identified 2-butanone (150+ ug/kg), 1,2-DCA (180 ug/kg) and	• Chemical analytical data confirming the nature of the other contaminants • Extent of other contaminants already detected	• **PHASE 1** • Collect direct push soil samples on 100-ft grid used for visual screening of ACM material on the Asbestos Pile (approximately 28 locations); log depth to native material (see investigative question #7). • Collect 3 randomly determined grab samples at 0-3" in the cover for ingestion, dermal, and inhalation and 5 to 8 randomly determined grab samples from the cover/waste interface and from the waste layer. Collect 3 biased grab samples within the waste layer based on PID readings or visual contamination. Reserve 10 analytical samples for any sample interval (same as investigative question #7). • Collect PID headspace data every 2 ft through waste (and soil, see investigative question #10) in direct push sample. • Analyze approximately 24 samples for TCL VOCs, SVOCs, Pest/PCBs and TAL metals in the cover and waste layers.

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		other VOCs (likely lab contaminants) • Four test pits in the area of the former trash transfer station encountered glass, plastic, tile, sludge, slag, metal, and "white material" • One test pit encountered material with "heavy odor) fuel oil/hydraulic fluid" • White sludge ("magnesia") reported		
10	Has native soil (if present) been impacted by the waste above it in the Asbestos Pile?	• Backhoe had a maximum reach of approximately 14 ft. Some indication of bedrock bottom to the pile • In transfer station area native soil was found at 4 ft and 10 ft at two test	• Native soil samples with chemical analytical data	• **PHASE 1** • Direct push into the soil at the 28 locations; penetrate 4 feet into native soil or until the water table is encountered, whichever is more shallow. Visually log native material. • Collect selected native soil samples biased toward the groundwater preferential pathway to determine vertical extent. Within native soil, collect samples at: 0-3" or in water table if encountered shallower than 4 feet (48") within the native material. If the water table is encountered at all 5 locations. Collect 2 to 3 samples at the water table and the remaining samples 0-3" in native soil. Collect 5 PLM samples as a composite from 3 to 5 locations and collect 5 grab

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		pits		samples for TCL VOCs, SVOCs, Pest/PCBs and TAL metals in native soil.
11	Has groundwater been impacted beneath the Asbestos Pile?	• Groundwater seep at base of test pits was noted. May be perched water	• Groundwater asbestos and chemical analytical data • Groundwater flow direction/gradient • Groundwater depth	• **PHASE 1** • Determine if soil or waste material is contaminated with compounds that can leach to the groundwater. • Collect groundwater or perched water grab samples if observed during direct push activities. Reserve 5 groundwater samples for this activity. Bias groundwater samples towards the downgradient site groundwater pathway. • Analyze approximately 5 groundwater samples for asbestos by TEM, TCL VOCs, SVOCs, Pest/PCBs and TAL metals, if observed. • Install 3 temporary piezometers, collect water levels and survey to determine groundwater flow direction. • **PHASE 2** • Install monitoring wells in Phase 2 if warranted, depending on soil and perched water results.
12	Are additional data necessary to perform the HHRA for the Asbestos Pile?	• Some activity-based sampling (ABS) has been conducted such as a raking maintenance scenario	• Additional activity-based samples to evaluate the air exposure pathway • Additional analytical data if non-ACM contamination is found in cover, waste, subsurface soil	• **PHASE 1** • Refine CSM. • Collect 2 personal air samples per day (8 hour TWA and a 30 min. exposure limit) during all days of Phase 1 intrusive investigation activities for personal air monitoring (approximately 14 samples at the Asbestos Pile will be analyzed for PCM and if this exceeds the PEL, then run for TEM). • **PHASE 2** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) each day during activity-based sampling (ABS) (approximately 8 samples at the Asbestos Pile).

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			and groundwater	• Perform ABS for construction activity and raking activity. • Analyze 2 activity-based air samples (high and low volume) by TEM for each ABS activity (approximately 4 samples). • Collect 2 grab surface soil samples (0-3") in cover for asbestos (Phase 1), if needed and percent moisture (Phase 2) at ABS locations prior to performing ABS activities. • Collect GPS points at all ABS locations. • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.
13	Are additional data necessary to perform the ecological risk assessment For the Asbestos Pile?	• None	• Determine if there are burrowing animals in the Asbestos Pile • Determine ecological risks and exposure pathways	• **PHASE 1** • Order a threatened and endangered species map. • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **AFTER PHASE 2** • Perform a SLERA using HHRA data.
Reservoir				
14	What is the nature and extent of the waste on the banks and within the Reservoir?	• ACM and other waste material have been observed on the banks of the Reservoir	• Analytical data from waste material that the berm is constructed of • Depth of waste is unknown… assume 20-ft average depth for investigation planning purposes	• **PHASE 1** • Locate utilities (stormwater piping, filling and drainage piping and controls, etc.) within the Reservoir berm prior to performing intrusive activities. • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of direct push or handauger sampling (24 hour turnaround time), if no fibers are observed cease passive air sampling for this activity (approximately 8 samples at the Reservoir). • Direct push or handauger 20 equally-spaced locations along the berm (about every 130 ft); log depth to native material. Try to place 1 direct push location near where the

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				observation platform is proposed. (Need to get design from Wissahickon Waterfowl Preserve.) • For investigation planning purposes, assume 10 locations can be performed with direct push to approximately 20-ft (along the boundary with the Asbestos Pile) and 10 locations will be handaugered to approximately 4-ft (around the remainder of the Reservoir perimeter). • Collect 5 randomly determined grab samples at 0-3" within the cover and 5 randomly determined grab samples at depth within the waste. • Collect 1 grab sample 0-3" deep within the cover where the transformer is lying on the ground and analyze for PCBs. • Analyze approximately 10 soil samples for asbestos by PLM, TCL VOCs, SVOCs, Pest/PCBs and TAL metals along the berm and 1 sample near the transformer for PCBs only. • Collect PID headspace data every 2 ft through waste (and into native soil, if observed) in direct push and handauger samples. • Collect GPS points at all direct push and handauger locations.

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15	Are there risks to ecological receptors at the Reservoir?	• Reservoir area used as a waterfowl preserve • EPA OSC noted that the Reservoir is being stocked with fish for the waterfowl • EPA BTAG stated that asbestos fibers have been shown to be toxic to some fish	• Confirm presence of ecological receptors in Reservoir • Confirm type of waterfowl observed at the Wissahickon Waterfowl Preserve • Confirm type of fish being stocked in the Reservoir	• **PHASE 1** • Refine CSM that addresses exposures to ecological receptors. • Order a threatened and endangered species map. • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Reservoir. • Talk with the Wissahickon Waterfowl Preserve to determine what waterfowl or other species have been observed at the Reservoir and what fish are used to stock the Reservoir. • **AFTER PHASE 2** • Perform a SLERA using HHRA data.
16	What is the depth to sediment and depth of sediment in the Reservoir?	• Some references to Reservoir depth are 3 ft to nearly 12 ft. O'Brien & Gere report noted field measurements on a drawing with no reference or field notes regarding how they were collected • Implies Reservoir is deeper closer to Wissahickon	• Measure bathymetry • Depth of sediment	• **PHASE 1** • Perform simple bathymetric survey. Measure depth of water on a 100-foot grid. However, near the shore, collect measurements every 50 feet for the first 150 feet away from the banks. Collect measurements from a motorless boat with a six inch diameter plate attached to a measurement pole. • Probe sediment with metal probe to determine approximate depth of soft sediment.

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		Creek		
17	What does the bottom sediment of the Reservoir consist of?	• None	• Grain size analyses for sediment • Total organic carbon in sediment	• **PHASE 1** • Analyze the sediment for total organic carbon and grain size.
18	Are Reservoir surface water and sediment contaminated?	• Three surface water and three sediment samples were collected by O'Brien & Gere for Priority Pollutants + 40. For surface water only toluene (27 ppb) and cyanide (21.7 ppb) were detected • PAH's were detected at a total concentration of ~128 ppm in SD-1 by O'Brien & Gere • Inorganic results collected in the three samples by O'Brien & Gere found lead at 40	• Surface water and sediment chemical and asbestos analytical data	• **PHASE 1** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of sediment/surface water sampling (24 hour turnaround time). If no fibers are observed cease passive air sampling for this activity (approximately 8 samples at the Reservoir). • Collect 15 sediment samples (0-6"), each of which is comprised of 3 to 5 grabs and homogenized to make a composite sample. Space sediment locations approximately equally. • Collect 5 surface water samples from different areas of the Reservoir from five approximately equal sections (collect surface water sample from bottom of the water column). • Collect general water quality (dissolved oxygen, turbidity, temperature, pH, salinity) parameters from the surface water locations by depth (at one third of water column and at two thirds of water column). • Analyze 15 sediment samples for asbestos by PLM, TCL VOCs, SVOC, Pest/PCBs and TAL metals. • Analyze 5 surface water samples for asbestos by TEM, TCL VOCs, SVOC, Pest/PCBs and TAL metals. • Collect GPS points at all sediment and surface water locations.

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		ppm, copper at 29 ppm and zinc at 120 ppm		
19	How does the Reservoir fill and drain? What is the current integrity of the berm structure?	• Anecdotal reports indicate that it may drain through a pipe located near the former dam into Wissahickon Creek	• Reservoir construction data • Reservoir current integrity analysis	• **PHASE 1** • Perform file search for background information concerning the construction of the Reservoir. Agencies to contact: Dams and Waterways, PADEP, County, and EPA (Ambler Asbestos Site File). • Take no action on integrity at this time. EPA may contact USACE for support.
20	Is the Reservoir hydraulically connected to the other surface water (streams) or groundwater?	• None	• Piezometric data from Reservoir, groundwater, and streams	• **PHASE 2** • Evaluate data obtained from the Phase 1 investigation and data from the Wissahickon Watershed and determine if additional information is required. • If additional data are still required, install staff gauges in the Reservoir, upstream and downstream in the Wissahickon Creek, and upstream in the Rose Valley Creek and Tannery Run • Install and survey piezometers in groundwater table. Collect water level data quarterly and immediately following major storm events.
21	If the Reservoir is hydraulically connected to the groundwater, has the groundwater quality been impacted?	• None	• Reservoir surface water quality data • Hydraulic connectivity data • Groundwater quality data	• **PHASE 2** • Evaluate Reservoir water and sediment quality data (see investigative question #18). • Install and survey staff gauges in streams and reservoir and piezometers in water table aquifer (see investigative question #20). • If Reservoir surface water is contaminated and recharging the groundwater, install 1 monitoring well upgradient and 3 monitoring wells downgradient of Reservoir.

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22	Are additional data necessary to perform the HHRA for the Reservoir?		• Additional activity-based samples to evaluate the air exposure pathway	• **PHASE 1** • Refine CSM. • Collect 2 personal air samples per day (8 hour TWA and a 30 min. exposure limit) during all days of Phase 1 intrusive investigation activities for personal air monitoring (approximately 6 samples at the Reservoir will be analyzed for PCM and if this exceeds the PEL, then run for TEM). • **PHASE 2** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) each day during ABS (approximately 8 samples at the Reservoir). • Perform ABS for construction and raking. • Analyze 2 activity-based air samples (high and low volume) by TEM for each ABS activity (approximately 4 samples). • Collect 2 grab surface soil samples (0-3") in cover for asbestos (Phase 1), if needed and percent moisture (Phase 2) at ABS locations prior to performing ABS activities. • Collect GPS points at all ABS locations. • Collect soil samples at depths useful for assessing risks for specific scenarios (see investigative question # 14). • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report.
Creeks (Wissahickon, Rose Valley and Tannery Run)				
23	What is the extent of ACM waste material remaining on the banks of the creeks after EPA	• EPA Removal Group has removed or contained ACM on banks along some sections of Wissahickon	• Extent of ACM along most of the creeks	• **PHASE 1** • Visually survey all stream banks near the Park, Reservoir, and Asbestos Pile, as well as areas downstream and upstream for ACM wastes. Photo document.

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	Removal activities are completed?	Creek and along Rose Valley Creek		
24	Are there ACM or non-ACM contaminants in the creek surface water and sediments?	• EPA START collected 20 sediment samples from the creeks and sampled for asbestos. Three contained asbestos • EPA START collected eight surface water samples from the creeks and analyzed for asbestos. None contained asbestos	• Asbestos and chemical analytical data from sediment in surface water and sediment from all creeks • Surface water analytical data • No non-ACM analytical data are known for surface water or sediment	• **PHASE 1** • Collect composite sediment samples (0-6”) from heavy depositional areas including in Wissahickon Creek: one upstream north of Mt. Pleasant Ave and one downstream south of Butler Pike. • Collect surface water (collected from bottom of water column) and sediment samples (collected 0-6”) within normal depositional areas (preferably at the same locations): in Wissahickon Creek: one upstream north of Mt. Pleasant Ave and one downstream south of Butler Pike; one each upstream and downstream of the confluence with Rose Valley Creek; one each upstream and downstream of the confluence of Tannery Run. In Rose Valley Creek: one midway between Wisshickon Ambler Alley and Wissahickon Creek. In Tannery Run: one midway between Maple St. and Wisshickon Creek. • Collect one 3 to 5 point composite sediment (collected 0-6”) sample behind the former dam and one 3 to 5 (collected 0-6”) point composite sediment sample behind the temporary turbidity curtain, both on Wissahickon Creek. • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of sediment/surface water sampling (24 hour turnaround time), if no fibers are observed cease passive air sampling for this activity (approximately 8 samples at the Creeks). • Analyze 12 sediment samples for asbestos by PLM, TCL VOCs, SVOCs, Pest/PCBs, TAL metals, grain size and TOC.

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				• Analyze 8 surface water samples for asbestos by TEM, TCL VOCs, SVOCs, Pest/PCBs, and TAL metals. • Collect GPS points at all sediment and surface water locations.
25	What is the risk to ecological receptors from the creeks?	• None	• Full CSM • Confirm presence of receptors in creeks	• **PHASE 1** • Develop CSM that addresses exposures to ecological receptors. • Check with the Wissahickon Valley Watershed and US Fish and Wildlife, PA Fish and Boat Commission, PA Game Commission, and PA Department of Conservation and Natural Resources to access any documents reporting ecological receptors in these waterways. • Order a threatened and endangered species map. • Perform an ecological site walk over (habitat survey) to observe what species inhabit or visit the Site. • **AFTER PHASE 2** • Perform a SLERA using HHRA data.
26	What are the depths to the sediment and the depth of the sediment in the creeks?	• Use EPA Removal Program's stream bank stabilization design drawings to determine stream depth	• Sediment depth data	• **PHASE 1** • Visually survey the length of the Creeks to identify depositional areas. • Probe sediment, where possible, to determine the depth of the soft sediment.
27	What is the nature of the bottom of the creek?	• Sediment exists in some areas	• Information on the substrate (bedrock? gravel? silts?)	• **PHASE 1** • Document substrate below sediment at base of Creeks by collecting a Creek bottom sample and visually classifying.
28	How does creek	• None	• Stream flow data	• **PHASE 1** • Research existing stream flow data and flood information.

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	flow relate to the potential for streambank erosion?		• Flood data information	EPA OSC may have this information. • **PHASE 2** • If necessary, collect stream flow measurements on profiles upstream on each creek, and downstream of each tributary on Wissahickon Creek, on Rose Valley Creek just prior to confluence with Wissahickon, and on Tannery Run, just prior to confluence with Wissahickon Creek.
29	Are the soils in the flood plains of the creeks contaminated?	• EPA START collected 5 soil samples from 0-3" in the Wissahickon "flood prone areas" and analyzed for asbestos. None detected	• Analytical data for non-ACM contaminants	• **PHASE 1** • Collect 16 composite soil samples (collect 0-6" and 6-24" consisting of 5 grab samples each) from 8 flood plain areas. • The 8 floodplain areas are: northwest corner of the Park parcel; south corner of the Park parcel; southwest corner of the Reservoir parcel at the confluence of Rose Valley Creek; between Rose Valley Creek and the Reservoir parcel; between Wissahickon Creek and the Reservoir parcel; between Tannery Run and the Asbestos Pile parcel; south corner of the Asbestos Pile parcel at the confluence of Tannery Run; and downstream of the Borit Site, downstream of the WWTP. • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) for the first two days of floodplain sampling (24 hour turnaround time), if no fibers are observed cease passive air sampling for this activity (approximately 8 samples in the Creek floodplains). • Analyze 16 samples by PLM, TCL VOCs, SVOCs, Pest/PCBs, TAL metals, and TOC. • Collect GPS points at all floodplain sample locations.
30	What are the risks to human health from the creeks? Is there	• None	• CSM • Analytical data for assessing risk	• **PHASE 1** • Develop CSM to identify receptors and exposure pathways/media. • Collect analytical data from soil, sediment, and surface water (see investigative questions 24 and 29 above).

Question Number	Investigative Question	Existing Information	Data Gaps	Proposed Action/Investigation Phase
	an exposure from wading or fishing?			• **PHASE 2** • Analyze 4 stationary passive air samples for asbestos by TEM and particulates (upwind, downwind, and both crosswind directions) each day during activity-based sampling (ABS) (approximately 4 samples at the downstream floodplain). • Perform ABS on the downstream floodplain area. Raking scenario. • Analyze 2 activity-based air samples (high and low volume) by TEM for each ABS activity (approximately 2 samples). • Collect 1 grab surface soil samples (0-3") in cover for asbestos (Phase 1) and percent moisture (Phase 2) at ABS locations prior to performing ABS activities. • Collect GPS points at all ABS locations. • **AFTER PHASE 2** • Prepare a Baseline Human Health Risk Assessment Report (Phase 2).
31	Are soils located on the other side of the Wissahickon from the Site contaminated?	• None	• Analytical data	• **PHASE 1** • Collect 3 samples (0-3") for PLM, TCL VOCs, SVOCs, Pest/PCBs, and TAL metals.
Other				
32	Determine predominant wind direction?	• Windroses	• Determine predominant wind direction	• **PHASE 1** • Evaluate windroses to determine predominant wind direction.
33	What is the history of these sites?	• Aerial photos	• Historical figures and maps • EPIC aerials	• **PHASE 1** • Order Sanborn® maps. • Review EPIC aerials when they are available.
34	Has the waste	• None	• Groundwater	• **PHASE 2**

Question Number	Investigative Question	Existing Information	Data Gaps	Proposed Action/Investigation Phase
	material at all or any of the three sites impacted groundwater?		analytical data • Groundwater flow data	• For purposes of investigation planning assume that 4 groundwater monitoring wells will be installed (assume 40-ft average).
35	Have there been any impacts to soil, sediment, surface water or groundwater at any of the three sites?	• ABS data has shown a threat to human health while raking on the asbestos pile • Surface soil data has shown high percentages of asbestos	• Reports	• **AFTER PHASE 2** • Prepare Draft and Final Remedial Investigation Reports.
36	What are the cleanup alternatives and costs based on the findings of the RI?	• None	• Reports	• **AFTER PHASE 2** • Prepare Draft and Final Feasibility Study reports.
37	Community Involvement	• NA	• NA	• **ONGOING** • Provide community involvement support for 5 meetings which may include: preparation of poster boards and other materials, CDM attendance at meetings in Ambler, PA, and meeting minutes.

Health and Safety Considerations

- During the field effort, all field personnel will wear Level C PPE, for intrusive activities. If a quick enough turnaround time is available for asbestos samples, workers may downgrade to modified level D PPE if personal air data meets the OSHA requirements and workers feel comfortable operating in modified level D.
- The direct push rig operators will be required to don level C and also wears 2 pumps for personal air (to be used as an activity-based sample in addition to H&S purpose), which will be sampled for an 8 hour TWA and a 30 min. exposure limit. Samples will be analyzed for PCM and if this exceeds the PEL, then run for TEM. This will be done for all days of sampling activities at the Park, Reservoir, and at the Asbestos Pile, with the samples being analyzed to determine worker exposure.
- Keep soil moist to reduce dust (except during ABS sampling). No dust generated by site investigation activities may leave the Site boundaries through the air or other transport pathways.
- ABS sampling activities may require a robust pump sprayer to spray dust to insure dust does not leave the site.
- Keep vehicles off of the Site unless absolutely necessary.

Approach

Refine CSMs then use a phased approach:

Phase 1:

- Identify source areas– sample waste soil and native soil (Park, Asbestos Pile, Reservoir berm), Reservoir sediment, and Reservoir surface water.
- Identify potential contaminant transport pathways: determine local wind directions, conduct hydrologic studies (piezometers) at the Park and Asbestos Pile.
- Collect other media as indicated: creek sediment, creek surface water, floodplains, and heavy depositional areas.
- Identify potential ecological receptors: survey Reservoir, creeks, and other areas for ecological receptors.

- Collect other easily collected data for efficiency: bathymetry, stream survey data, perched water or groundwater from boreholes, and dust samples.
- Prepare Phase 1 Data Summary Report.

Phase 2:

- Collect other media as indicated: groundwater.
- Identify potential contaminant transport pathways: conduct hydrologic studies (piezometers and staff gauges) at the Reservoir and Creeks. Determine flow into and out of Reservoir.
- Conduct detailed hydrologic (stream flow) studies as necessary.
- Perform activity-based sampling on the Park, Reservoir, Asbestos Pile, and floodplain.

After Phase 2:

- The following reports will be prepared after incremental work plan preparation and approval: Phase 2 Data Summary Report, Draft and Final RI, Draft and Final SLERA, Draft and Final HHRA, and Draft and Final FS.
- Sample potential receptors: ecological receptors if identified.

To be determined by EPA:

- Additional sampling locations.

Note:

- CDM understands that there are limited samples available for analysis and therefore may recommend the collection of additional samples (based on field observations to be placed on hold until EPA reviews the boring logs and provides direction, above the allotted analytical amount (noted within this document), which CDM suggest for laboratory analysis.
- EPA will collect four surface water samples (dust suppression) for TCL VOCs, SVOCs, PCBs/Pesticides, TAL metals, and TEM. Pending these results, dust suppression water will be pumped from creeks.

- CDM understands that no tree clearing, hauling, and chipping/disposal is required to perform this work.
- CDM understands that purge water and decontamination water may be discharged to the ground surface.
- CDM understands that soil cuttings may be placed back downhole, if possible.
- CDM understands that work will be performed during week days and is not scheduled for weekends.