

## **SITE PREPARATION**

### **Site Work**

Road improvements throughout the Site will include the implementation of erosion controls along each roadway for the duration of the project. Erosion controls will consist of silt fence and a single line of hay bales bordering each road and work area.

Two material and equipment lay down and handling areas will be established including:

- A location in the northern portion of the Site to support the removal operations in and around the Eastern Channel Corridor (ECC). This area will be approximately 100 by 100 feet square to accommodate the stockpiling and handling of up to 500 CY of material.
- A southern location at the Cold Waste Area (CWA) (following the completion of the munitions debris clearance) to support all other removals. This area will be approximately 100 feet by 200 ft to accommodate the stockpiling and handling of up to 1,000 CY of material.

Each material and equipment lay down and handling area will be constructed with 6 inches of crushed stone, overlain by 4 inches of bituminous pavement, a central pre-cast reinforced concrete drain with heavy-duty grate, and a nominal drainage/collection storage capacity of 1,300 gallons. This drainage/collected water treatment system will contain a primary filtration and granulated activated carbon with a design flow rate of 200 gallons per minute. Each pad will include pre-cast concrete blocks to create individual staging subareas, each holding 100 yards of material for drying, stabilization, and sampling.

A minimum of three 20,000 gallon frac tank systems are proposed for each location including a weir tank, a second tank to accumulate contaminated water, and a third tank to hold treated water prior to discharge back into the waterway.

These two locations will be set up sequentially starting with the northern location so the water treatment system, pumps and Frac tanks can be moved from to the southern location once the northern operations are complete.

The site staff will include a full-time Site Superintendent, Health and Safety Officer, Site Engineer, Site Quality Control Officer, and Site Clerk. Home office support will include the Project Manager and the Licensed Site Professional (LSP) part-time during the field work.

Temporary Facilities will include: office trailers; storage facilities; temporary security fencing and signs; decontamination facilities; utilities (power, telephone) connections; and sanitary and potable water.

A non-armed security guard is also included for non-working hours during the field activities.

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE EASTERN CHANNEL CORRIDOR SEDIMENT REMOVAL**

Quantity	Site Preparation	Remedial Approach	Restoration
2,529 CY of sediment	<p>Clear trees and establish a working area along entire length of channel.</p> <p>Seal the upstream culverts to allow diversion of the water into the Upper Drinkwater River.</p> <p>Lower the water level in the entire watershed by making adjustments at the Factory Pond Dam.</p>	<p>The removal of these sediments will involve dividing the channel into 100 ft sections and constructing small berms or using sheeting to isolate each section. Gasoline-powered pumps will be used to move water from each working section downstream. The removal will progress in an upstream to downstream progression, to minimize the potential for re-contamination of a completed section of the channel.</p> <p>Removal will be accomplished using a conventional track-mounted or long-stick excavator, placed on the outer bank of the channel. Contaminated sediment will be placed on a liner adjacent to the channel and any free liquids will be allowed to drain back into the current working section. The excavated material will then be transported to the northern material and equipment lay down and handling area for further stabilization (using kiln dust or other drying agents) and for further waste characterization prior to off-site transportation and disposal.</p>	<p>Backfill will consist of bank run (or equivalent) to 6 inches below grade that will be field compacted. The top 6 inches will be restored using an amended topsoil mix to match the pre-existing wetland or upland soils. The borders of the channel will be restored using coconut fiber logs (or equivalent) to stabilize the bank and hydric soils will be placed to achieve the pre-existing slopes and final grade. Both upland and wetland diversity seed mixes will be used to restore the area.</p> <p>All upland areas will be restored with a minimum of 6 inches of hydric soil and woody vegetative species will be planted to match the pre-existing vegetation mix.</p>

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE COLD WASTE AREA SOIL REMOVAL**

Quantity	Site Preparation	Remedial Approach	Restoration
<p>1,054 CY of soil          Assume 1 ton (or less) of metallic and non-metallic munitions debris generated during the screening process</p>	<p>Clear trees and establish a working area.          Improve roads into the Site from the P.A. Landers property.</p>	<p>Removal of the entire 0.29 acre area to an assumed depth of one or three feet below grade or to the encountered water table. All soil will be transported to an on-site portable screener for segregation of any metallic or non-metallic munitions debris. Assume screening to 2 inch minus and then to 0.50 inch.</p> <p>An unexploded ordnance (UXO) technician is assumed to be present during the entire operation. All munitions debris will be segregated, characterized for type, screened for the presence of high-explosives (HE), stockpiled, and transported off-site for inert certification and disposal. 1 ton (or less) of munitions debris is assumed to be collected from this area and require disposal.</p> <p>Confirmatory sampling will include the collection of soil samples on a 20 foot grid across the entire removal area for resource Conservation and Recovery Act (RCRA) metals analysis.</p>	<p>Backfill will consist of bank-run gravel (or equivalent) to 6 inches below grade that will be field compacted. The top 6 inches will be restored using an amended topsoil mix to match the pre-existing upland soils. An upland seed mix will be used to restore the area after the establishment of the final grade. The portion of the area along Upper Factory Pond will be restored using coconut fiber logs (or equivalent) to stabilize the bank and hydric soils placed to achieve the pre-existing slopes and final grade. A wetland diversity seed mix will be used in this area of the site. Restoration of the upland portion of the area also will include planting of woody vegetative species including red oak and other species.</p>

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE WATER-SIDE REMOVAL OF SEDIMENT**

**[This includes Lily/Upper Factory Pond and Middle/Lower Factory Pond, and a working water depth of 6 feet.]**

<b>Quantity</b>	<b>Site Preparation</b>	<b>Remedial Approach</b>	<b>Restoration</b>
12,396 CY of sediment Lily/Upper Factory Pond - 8,420 CY (half of the removal volume) Middle/Lower Factory P. - 3,976 CY - (all of the removal volume)	<p>Raise the water level in the watershed to a normal level.</p> <p>Construction of a temporary shoreline bulkhead/unloading area near the Cold Waste Area (CWA) with sheeting near the bank to allow a material-carrying barge to moor at this location.</p> <p>Placement of crane mats (or other pre-engineered structures) in the shallow water to act as a temporary loading platform allowing the unloading of contaminated sediment from the barge and the loading of clean material.</p> <p>Removal of the existing foot bridge across Factory Pond to create a 20-foot-wide open water corridor to allow the barge to access the remaining portions of Factory Pond.</p>	<p>Mechanical removal of these sediments using a long-stick excavator on a small barge working from the eastern channel bordering this area.</p> <p>A second barge to ferry material from the removal footprints back to the CWA for stabilization and characterization prior to load-out.</p>	<p>Backfill will consist of bank-run gravel, or equivalent, to match pre-existing bottom contours.</p> <p>No other restoration is proposed for open water dredging locations.</p>

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE LAND-SIDE REMOVAL OF SEDIMENT**

[This includes the remaining portions of the Lower Drinkwater River, Lily/Upper Factory Pond, and all western shoreline areas and a working water depth of 2 feet or less.]

Quantity	Site Preparation	Remedial Approach	Restoration
9,153 CY of sediment Lower Drinkwater River - 733 CY (all of the volume) Lily/Upper Factory Pond - 8,420 CY (half of the volume)	<p>Lower the water level in the watershed.</p> <p>Improve the existing roads and limited clearing along the western edge of Upper Factory Pond.</p> <p>Place a temporary vehicle bridge with (30-feet-wide) across current foot bridge location to span Factory Pond.</p> <p>Construct a temporary causeway in the shape of a “T” from the western shoreline of Lily/Upper Factory Pond to access the areas of removal using a track-mounted machine.</p>	<p>Mechanical removal of these sediments using a long-stick excavator working from the causeway and crane mats. Direct-loading material into articulated dump trucks for transport of material back to Cold Waste Area (CWA) for stabilization/sampling/load-out.</p>	<p>Backfill will consist of bank-run gravel (or equivalent) to match pre-existing bottom contours.</p> <p>An emergent wetland grass mix and woody material plantings will be used in this area.</p>

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE MARSH UPLAND SEDIMENT AREA REMOVAL**

<b>Quantity</b>	<b>Site Preparation</b>	<b>Remedial Approach</b>	<b>Restoration</b>
410 CY of sediment	<p>Lower the water level in the watershed.</p> <p>Improve the existing roads and limited clearing around the perimeter of the removal area.</p>	<p>Mechanical removal of these sediments using a long-stick excavator working from crane mats. Direct-loading of material into articulated dump trucks for transport of material back to Cold Waste Area (CWA) for stabilization/sampling/ load-out.</p>	<p>Backfill will consist of bank-run gravel (or equivalent) to match pre-existing bottom contours. Hydric soil mixed on-site to create backfill of the final 6 to 8 inches.</p> <p>This area will be restored as wet meadow using an emergent wetland grass mix and woody material plantings around the perimeter.</p>

**ACTIVITIES PROPOSED SPECIFICALLY FOR THE UPLAND SOIL REMOVAL**

<b>Quantity</b>	<b>Site Preparation</b>	<b>Remedial Approach</b>	<b>Restoration</b>
14,411 CY of soil Upper North Area - 0 CY Potential Greenway Area - 656 CY Southern Conservation Commission Area - 5,231 CY Southern Disposal Area - 6,648 CY Marsh Upland Area - 1,876 CY	Improve the existing roads and limited clearing into each removal area.	Removal of these soils using a track-mounted excavator.	Backfill will consist of bank-run gravel (or equivalent) to match pre-existing bottom contours. Hydric soil mixed on-site to create the final 6 to 8 inches of backfill and use of woody vegetation plantings, as appropriate to the specific area.

**ACTIVITIES PROPOSED SPECIFICALLY FOR FINAL RESTORATION**

<b>Site Work</b>	<b>Restoration</b>
Remove/recycle paved surfaces from the material and equipment lay down and handling areas. Remove temporary vehicle bridge across Factory Pond and re-construct the foot bridge.	Loam and seed all remaining disturbed areas. Plant woody vegetative species to match pre-existing species. A typical planting schedule per acre is shown in Table B2-A. The proposed long term operation and maintenance tasks are shown in Table B2-B.



Table B2-A Typical Planting Schedule Per Acre					
Species	Common Name	Type	Height	Caliper	Total Number
<i>Acer rubrum</i>	Red Maple	tree	6-8 feet	¾ inch	15
<i>Acer rubrum</i>	Red Maple	tree	5-6 feet	½ inch	3
<i>Acer rubrum</i>	Red Maple	tree	10-12 feet	1½ inch	2
<i>Betula lenta</i>	Black Birch	tree	6-7 feet	¾ inch	25
<i>Betula populifolia</i>	Gray Birch	tree	6-8 feet	¾ inch	3
<i>Fraxinus americana</i>	White Ash	tree	6-8 feet	¾ inch	3
<i>Liriodendron tulipifera</i>	Tuliptree	tree	6-8 feet	¾ inch	5
<i>Nyssa sylvatica</i>	Blackgum	tree	6-8 feet	¾ inch	8
<i>Quercus rubra</i>	Northern Red Oak	tree	6-8 feet	¾ inch	8
<i>Quercus rubra</i>	Northern Red Oak	tree	10-12 feet	1½ inch	2
<i>Quercus alba</i>	White Oak	tree	6-8 feet	¾ inch	6
<i>Cephalanthus occidentalis</i>	Buttonbush	shrub	3-4 feet	3-4 canes	9
<i>Clethra alnifolia</i>	Sweet Pepperbush	shrub	2-3 feet	3-4 canes	30
<i>Hamamelis virginiana</i> <sup>2</sup>	Witch Hazel	shrub	2-3 feet	3-4 canes	15
<i>Kalmia latifolia</i>	Mountain Laurel	shrub	2-3 feet	3-4 canes	1
<i>Lindera benzoin</i>	Spicebush	shrub	3-4 feet	3-4 canes	5
<i>Myrica pennsylvanica</i>	Bayberry	shrub	2-3 feet	3-4 canes	12
<i>Vaccinium corymbosum</i>	Highbush blueberry	shrub	2-3 feet	3-4 canes	18
<i>Viburnum acerifolium</i>	Maple-leaf viburnum	shrub	15-18 inches	1-2 canes	13
<b>Total</b>					<b>183</b>

**Table B2-B**  
**Long Term Operation and Maintenance Tasks**

<b>BASELINE TASKS</b>	Preparation of a Work Plan and a Field Sampling and Analysis Plan
	Baseline Fisheries/Fish Tissue Sampling
	Baseline Sediment Benthic Community and Aquatic Plant Survey
	Baseline Wildlife Survey
	Endangered/Threatened Species Survey
	Preparation of Baseline Monitoring Report
<b>POST-REMEDIATION ACTIVITIES (Years 1-5 After Completion of Remediation)</b>	Annual Fisheries/Fish Tissue Sampling
	Annual Benthic Community & Aquatic Plant Survey
	Annual Wildlife Survey
	Preparation of Annual Monitoring Report
<b>POST-REMEDIATION ACTIVITIES (Years 6-10 After Completion of Remediation)</b>	Annual Fisheries/Fish Tissue Sampling
	Sediment Monitoring Survey
	Preparation of Annual Monitoring Report
<b>POST-REMEDIATION ACTIVITIES (Year 10 After Completion of Remediation)</b>	Preparation of a Summary Monitoring Report