

TECHNICAL MEMORANDUM

**REVIEW AND EVALUATION OF EPA'S PROPOSED CLEANUP PLAN
FOR IMPACTS UPON HISTORIC PROPERTIES**

CENTREDALE MANOR SUPERFUND PROJECT, NORTH PROVIDENCE, RI

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Overview

The U.S. Army Corps of Engineers (Corps), New England District, is assisting the Environmental Protection Agency (EPA), Region 1 for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and the guidance included in EPA's CERCLA Compliance with Other Laws Manual: Part II (Clean Air Act and Other Environmental Statutes and State Requirements) (EPA-540-G-89-009, OSWER Directive 9234.1-02, August 1989), for remediation of the Centredale Manor Superfund Project in North Providence, Rhode Island (RI). Elevated levels of contaminants from industries operating along the Woonasquatucket River have been detected in sediments sampled along sections of the river in North Providence and Johnston, Rhode Island. The Centredale Manor site was listed on EPA's National Priority List in 2000.

At the request of EPA, the Corps has prepared this Technical Memorandum to review and evaluate the potential impacts to historic and/or archaeological sites or properties from EPA's proposed cleanup plan of Centredale Manor Site. The proposed cleanup plan is based on the alternatives documented and evaluated in the project Feasibility Study (FS) (Battelle 2010) and Addendum (Battelle 2011). This memorandum updates a previous version that was completed in the summer 2011 which evaluated all cleanup alternatives present in the FS. In cases where appropriate, this present memorandum also includes possible mitigation recommendations for consideration in the development of a Memorandum of Agreement (MOA) between EPA, RI State Historic Preservation Officer (SHPO), Narragansett Indian Tribe and other consulting parties to avoid, minimize, and/or mitigate for adverse effects of site cleanup on significant historic properties as defined by Section 106 of the NHPA and implementing regulations 36 CFR 800.

The Corps has previously prepared a Stage IA Cultural Resources Survey of the study area (Paiva 2011) in consultation with EPA, RI State Historic Preservation Officer (SHPO), and the Narragansett Indian Tribe. The purpose of the Stage IA survey was to conduct a literature and historical map review to identify known or potential archaeological and historical resources as well as a pedestrian reconnaissance of the study area to observe conditions and assess the potential for historic and archaeological resources to be present within the area of potential effect (see Figure 1). This information was then utilized in evaluating the various cleanup alternatives in the project FS.

Elevated levels of dioxin, furans, pesticides, PCBs, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and various metals produced from industrial operations in the Source Area along the Woonasquatucket River have been detected in soil, sediments and water sampled along sections of the river in North Providence and Johnston. The study area includes two former mill dams and the locations of three former woolen and textile mills: Lyman Mill, Centredale Worsted Mill, and Allendale Mill. A chemical company and drum reclamation plant occupied the site of the Centredale Worsted Mill after a fire claimed the mill. The investigation extends from the former site of the Centredale Worsted Mill in the north to the Lyman Mill Dam (also known as the Lymanville Dam) in the south. The RI SHPO has also indicated the potential for the new discovery of historic and archaeological resources

associated with pre-colonial, colonial, and industrial era occupations along the Woonasquatucket River.

Centredale Manor Site Areas and EPA Proposed Cleanup Plan

1. Source Area Soil

The nearly 8-acre Source Area is the main part of the Site where the contamination originally occurred and now includes two apartment buildings, paved and landscaped surfaces, and three temporary capped areas. These three temporary soil covers were constructed from the 1990s through mid-2000s in the area not occupied by buildings, parking lots, or roadways; soil was also removed under one of the parking lots in the late 2000s as part of the groundwater short-term cleanup. Most of the Source Area is located within the floodplain, and also includes riverbank wetlands.

Source Area Soil/Alternative 4E: Targeted excavation, converting existing surfaces to caps designed to cover hazardous waste, and off-site disposal and/or treatment of highly toxic or mobile contaminants.

2. Groundwater

Groundwater is the water that is found beneath the surface of the ground. The groundwater area contaminated in excess of cleanup levels is located underneath the 8-acre Source Area which is bound by the Woonasquatucket River and streams. A short-term cleanup action in 2009 addressed about 0.13 acres on the west side of the Brook Village parking lot where contaminated groundwater was flowing into the River. The proposed cleanup plan includes the installation of additional groundwater monitoring wells. Future monitoring is expected to confirm that contaminated groundwater is not leaving the Source Area.

Groundwater/Alternative 2: Compliance with groundwater standards at the source area.

3. Allendale Pond and Lyman Mill Pond Sediment

This area includes all contaminated sediment in Allendale Pond and Lyman Mill Pond.

Allendale Pond and Lyman Mill Pond Sediment/Alternative 7A: Excavation and on-site containment in an upland confined disposal facility (an area located on higher land designed to permanently and securely contain excavated contaminated sediment/soil).

4. Allendale Floodplain Soil

A floodplain is the flat or nearly flat area that floods easily. This cleanup area includes riverbank and floodplain areas next to the Woonasquatucket River along the Source Area and Allendale Pond.

Allendale Floodplain Soil/Alternative 5A: Excavation and on-site containment in an upland confined disposal facility.

5. **Lyman Mill Stream Sediment and Floodplain Soil (including the Oxbow Area)**

This cleanup area includes the stream channel and old mill raceway connecting Allendale Pond and Lyman Mill Pond, the Oxbow Area, and riverbank and floodplain areas along Lyman Mill Pond. The Oxbow Area is a large forested wetland area below the Allendale Dam.

Lyman Mill Stream Sediment and Floodplain Soil (including Oxbow Area)/Alternative 3A: Targeted excavation and on-site containment in an upland confined disposal facility and enhanced natural recovery.

Evaluation of the Potential for Adverse Effects on Historic Resources by Cleanup Area

1. Source Area Soil / Alternative 4E: Targeted excavation, converting existing surfaces to caps designed to cover hazardous waste, and off-site disposal and/or treatment of highly toxic or mobile contaminants.

Targeted excavation of portions of the Source Area has the potential to disturb historic properties in previously undisturbed areas. In cases where undisturbed soil must be excavated, a Stage IB cultural resources survey would be recommended to determine if significant historic properties are present in these areas. If significant properties are identified and cannot be avoided, then additional testing, documentation and/or data recovery investigations are options that will be considered for mitigation for the impact to those resources. Excavation alternatives could result in a greater adverse impact to tribal cultural resources than capping alternatives, and therefore may entail more significant and costly mitigation measures depending on what is found.

The placement of capping or covers over site areas has the potential to adversely impact archaeological resources since it would prevent further access to and/or future study of these areas as well as introduce an "intrusive" element to the landscape. In areas where caps or covers are proposed, compliance with the NHPA would entail a Stage IB cultural resources survey (archaeological survey testing and excavation) in any undisturbed areas and/or historic recordation and documentation of any historic structures or sites that may be impacted in coordination with the proper stakeholders. Generally, caps or covers are preferred as any historic property beneath is protected as long as the material and any underlying clean soil remain intact. However, documentation is required prior to implementation so that any resource is properly recorded. In some cases, the cap itself may be considered a mitigation measure as it will prevent disturbance or destruction of the historic property beneath over the life of the covering.

2. Groundwater / Alternative 2: Compliance with groundwater standards at the source area.

The groundwater cleanup effort was performed by a Potentially Responsible Party as an EPA short-term cleanup and completed in 2010. Additional measures of the groundwater effort that will be implemented as part of the proposed plan include: land use controls, long-term monitoring (the installation of additional monitoring wells), and EPA Five-Year Reviews.

Of these measures, the only one that may potentially impact historic properties would be the installation of additional monitoring wells to assist in long-term monitoring. The locations of these wells should ideally be within areas that have previously been disturbed. If new wells are to be located within areas of potential archaeological sensitivity, a Stage IB archaeological survey as described above for the Source Area will be conducted.

3. Allendale and Lyman Mill Sediment / Alternative 7A: Excavation and on-site containment in an upland confined disposal facility (an area located on higher land designed to permanently and securely contain excavated contaminated sediment/soil).

In cases where undisturbed sediment must be excavated, a Stage IB cultural resources survey should be conducted to determine if significant historic properties are present in these areas. If

significant properties are identified and cannot be avoided, then additional testing, documentation and/or data recovery investigations are options that will be considered for mitigation for the impact to those resources. Excavation alternatives could result in a greater adverse impact to tribal cultural resources than capping alternatives, and therefore may entail more significant and costly mitigation measures depending on the historic property.

The construction of upland confined disposal facilities has the potential to impact significant historic properties. Prior to the construction of these facilities in undisturbed areas, a Stage IB cultural resources survey should be conducted and coordinated with the project stakeholders. Mitigation for any identified properties could entail additional testing, research and documentation, and data recovery archaeological investigations if impacts are unavoidable.

These proposed remediation measures have the potential to adversely impact significant historic features and archaeological deposits through the alteration of the mill ponds and riverbanks within the Allendale Historic District and the Lymanville Mill area. Coordination with the RI SHPO has also indicated the potential for project impacts upon undisturbed historic and archaeological resources associated with pre-colonial, colonial, and industrial era occupations along the river. Recommendations for the avoidance, minimization of impact, and mitigation options for these National Register listed and eligible properties, as well as for the potentially undisturbed resources along the river, will be included in the development of a Memorandum of Agreement (MOA).

4. Allendale Floodplain Soil/Alternative 5A: Excavation and on-site containment in an upland confined disposal facility.

In cases where undisturbed soil must be excavated, a Stage IB cultural resources survey should be conducted to determine if significant historic properties are present in these areas. If significant properties are identified and cannot be avoided, then additional testing, documentation and/or data recovery investigations are options that will be considered for mitigation for the impact to those resources. Excavation alternatives could result in a greater adverse impact to tribal cultural resources than capping alternatives, and therefore may entail more significant and costly mitigation measures depending on the historic property.

The construction of upland confined disposal facilities has the potential to impact significant historic properties. Prior to the construction of these facilities in undisturbed areas, a Stage IB cultural resources survey should be conducted and coordinated with the project stakeholders. Mitigation for any identified properties could entail additional testing, research and documentation, and data recovery archaeological investigations if impacts are unavoidable.

These proposed remediation measures have the potential to adversely impact significant historic features and archaeological deposits through the alteration of the mill ponds and riverbanks within the Allendale Historic District and the Lymanville Mill area. Coordination with the RI SHPO has also indicated the potential for project impacts upon undisturbed historic and archaeological resources associated with pre-colonial, colonial, and industrial era occupations along the river. Recommendations for the avoidance, minimization of impact, and mitigation

options for these National Register listed and eligible properties, as well as for the potentially undisturbed resources along the river, will be included in the development of a Memorandum of Agreement (MOA).

5. Lyman Mill Stream Sediment and Floodplain Soil (including Oxbow Area)/Alternative 3A: Targeted excavation and on-site containment in an upland confined disposal facility and enhanced natural recovery.

In cases where undisturbed soil and/or sediment must be excavated, a Stage IB cultural resources survey should be conducted to determine if significant historic properties are present in these areas. If significant properties are identified and cannot be avoided, then additional testing, documentation and/or data recovery investigations are options that should be considered for mitigation for the impact to those resources. Excavation alternatives could result in a greater adverse impact to tribal cultural resources than capping alternatives, and therefore may entail more significant and costly mitigation measures depending on the historic property.

The construction of upland confined disposal facilities has the potential to impact significant historic properties. Prior to the construction of these facilities in undisturbed areas, a Stage IB cultural resources survey should be conducted and coordinated with the project stakeholders. Mitigation for any identified properties could entail additional testing, research and documentation, and data recovery archaeological investigations if impacts are unavoidable.

These proposed remediation measures have the potential to adversely impact significant historic features and archaeological deposits through the alteration of the mill ponds and riverbanks within the Allendale Historic District and the Lymansville Mill area. Coordination with the RI SHPO has also indicated the potential for project impacts upon undisturbed historic and archaeological resources associated with pre-colonial, colonial, and industrial era occupations along the river. Recommendations for the avoidance, minimization of impact, and mitigation options for these National Register listed and eligible properties, as well as for the potentially undisturbed resources along the river, will be included in the development of a Memorandum of Agreement (MOA).

Estimated Costs for Survey and Mitigation Measures

Due to the similarity between the various alternatives, it is possible to develop generalized estimates for performing a Phase IB archaeological survey for the clean-up areas. The cost of conducting these surveys is based upon the actual acreage that will be remediated, whether via excavation or other ground-disturbing activity including the construction of caps or covers. Generally, the larger the amount of undisturbed soil or sediment to be tested, the larger the cost of the survey. If historic properties are identified as a result of this testing, coordination with RI SHPO and additional evaluation may be required to determine if the property is eligible for listing on the National Register of Historic Places.

If a property is determined eligible and will be adversely impacted by the proposed remedy, a Memorandum of Agreement (MOA) documenting the mitigation measures agreed upon by the

stakeholders is required. In the case of archaeological sites that cannot be avoided, mitigation is typically done as a Phase III data recovery investigation that excavates the site prior to remediation. For historic structures, buildings and landscapes, mitigation normally consists of documentation and recordation. Other specific measures may be developed during the consultation process.

Estimated Stage IB survey costs have been developed for EPA's cleanup proposal by site area. Please note that the cost of this survey includes background research, site mobilization, testing, analysis, and preparation of a technical report. These costs can be better refined during the design and construction phases.

Stage IB Survey Estimated Cost:

I. Source Area Soil

Alternative 4E: \$30-35,000

II. Groundwater

As the Potentially Responsible Party has mostly completed this effort, no further evaluation is required at this time. The placement of additional monitoring wells as part of future efforts would be included in the survey cost of a Stage IB survey.

III. Allendale Pond and Lyman Mill Pond Sediment

Alternative 7A: \$70-80,000

IV. Allendale Floodplain Soil

Alternative 5A: \$60-75,000

V. Lyman Mill Stream Sediment and Floodplain Soil (including the Oxbow Area)

Alternative 3A: \$90-100,000

Mitigation Estimated Costs (including Phase II and III (Data Recovery) archaeological surveys and/or historic documentation and/or recordation), if needed:

I. Source Area Soil

Alternative 4E: \$90-100,000

II. Groundwater

As the Potentially Responsible has mostly completed this effort, no further evaluation is required at this time. The placement of additional monitoring wells as part of future efforts would be included in the survey cost of a Stage IB survey.

III. Allendale Pond and Lyman Mill Pond Sediment

Alternative 7A: \$140-160,000

IV. Allendale Floodplain Soil

Alternative 5A: \$180-200,000

V. Lyman Mill Stream Sediment and Floodplain Soil (including the Oxbow Area)

Alternative 3A: \$200-250,000

Depending on the series of alternatives selected, the findings of the Stage IB survey and consultation with the RI SHPO and Narragansett Indian THPO, additional mitigation may be necessary. Please note that these costs are estimates only and will be further refined during the design and construction phases of the project and after review of the Stage IB survey results. The mitigation costs listed above include hypothetical Stage II and III surveys, if required, and/or historic documentation. In reality, some of the alternatives may not require all levels of mitigation listed. At this time, it is impossible to determine with certainty the level of mitigation required until these alternatives are further evaluated and the Stage IB survey completed.

Summary of EPA Proposed Plan and Potential Impacts to Historic Properties, Centredale Manor Restoration Project Superfund Site

Clean-Up Area Alternatives	Potential Impacts	Archaeological Sensitivity	Design Recommendations	Estimated Survey Costs	Mitigation Recommendations	Estimated Mitigation Costs
<u>I. Source Area Soil</u>						
4E – Targeted Excavation, Convert to Hazardous Waste Caps, Off-Site Disposal and/or Treatment	Primarily undisturbed areas away from buildings and along the river	Low (buildings and parking lots) to Moderate (undisturbed areas)	Identify historic properties in undisturbed areas (Phase IB Survey) and determine significance	Phase IB Survey: \$30-35K	Additional testing (Phase II) and data recovery if unavoidable; Historic Documentation unlikely	Phase II and Data recovery for unavoidable impacts: \$90-100K
<u>II. Groundwater</u>						
Additional monitoring wells to be included in Stage IB survey if required						
<u>III. Allendale Pond and Lyman Mill Pond Sediment</u>						
7 – Excavation and Disposal and/or Treatment	Allendale Historic District and Lymansville Mill; undisturbed soil/sediment and submerged areas of the ponds	High within Allendale HD and Lymansville, riverbanks and mill ponds	Identify historic properties including submerged resources; assess visual impacts	Phase IB: \$70-80K including historic inventory recordation	Additional testing and evaluation, data recovery if unavoidable Documentation and recordation	Depending on Phase IB results and mitigation measures: \$140-160K

Option A – On-Site Containment in an Upland Confined Disposal Facility	Same as above; dependent on CDF location	Location would need to be evaluated	Identify historic properties including submerged resources; assess visual impacts	Evaluation of CDF site would be included in cost	Additional testing and evaluation, data recovery if unavoidable Documentation and recordation	Evaluation of CDF site would be included in cost
<u>IV. Allendale Floodplain Soil</u>						
5 – Excavation and Disposal and/or Treatment	Allendale Historic District and undisturbed areas	High within Allendale HD, riverbanks and mill ponds	Identify historic properties including submerged resources; assess visual impacts	Phase IB: \$60-75K including historic recordation	Additional testing and evaluation, data recovery if unavoidable Documentation and recordation	Depending on Phase IB results and mitigation measures: \$180-200K
Option A – On-Site Containment in an Upland Confined Disposal Facility	Dependent on site location	Location would need to be evaluated	Identify historic properties at upland site; assess visual impacts	Evaluation of CDF site would be included in cost	Additional testing and evaluation, data recovery if unavoidable Documentation and recordation	Evaluation of CDF site would be included in cost
<u>V. Lyman Mill Stream Sediment and Floodplain Soil (incl. Oxbow)</u>						
3 – Targeted Excavation, Enhanced Natural Recovery and Disposal and/or Treatment	Lymansville Mill area and Oxbow	High at Lymansville Area, submerged and undisturbed area	Identify historic properties, evaluate significance and access visual impacts	Phase IB: \$90-100K including historic recordation	Additional testing (Phase II) and data recovery if unavoidable; Documentation and recordation	Depending on Phase IB results and mitigation measures: \$200-250K
Option A – On-Site Containment in an Upland Confined Disposal Facility	Dependent on site location	Location to be evaluated	Identify historic properties, evaluate significance and access visual impacts	Evaluation of CDF site would be included in cost	Additional testing (Phase II) and data recovery if unavoidable; Documentation and recordation	Evaluation of CDF site would be included in cost

Cleanup Areas at the Centredale Manor Restoration Project Superfund Site

