

### **SRSNE Site Group**

## Remedial Design Work Plan Attachment H

### **Habitat Restoration Work Plan**

Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site Southington, Connecticut

November 2010

#### Remedial Design Work Plan Attachment H

# Habitat Restoration Work Plan

Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site Southington, Connecticut

Prepared for: SRSNE Site Group

Prepared by: ARCADIS 160 Chapel Road, Ste 201 Manchester Connecticut 06042 Tel (860) 645-1084 Fax (860) 645-1090

Our Ref.: B0054634

Date:

November 2010

### **Table of Contents**

ΕX	Executive Summary		
1.	Purpose and Scope		1
2.	Performance Standards		3
3.	Task 1 - Review of Existing Information		4
4.	Task 2 - Site Characterization		5
5.	Task 3 - Evaluation of Potential Impacts of Remedial Activities on Site Habitats		8
6.	Task 4	- Habitat Restoration Plan	9
7.	Task 5	- Restoration Monitoring	10
8.	Reporting and Schedule		11
	8.1	Reporting	11
	8.2	Schedule	11
9.	References		13

## **Figures**

- H-1 Site Plan with Historical Delineated Wetlands
- H-2 Habitat Assessment Areas

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### **Executive Summary**

This Habitat Restoration Work Plan has been prepared to address certain requirements of the Statement of Work (SOW) for the Remedial Design/Remedial Action (RD/RA) activities at the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut. Specifically, SOW Section V.C.1.h requires a "plan to restore the functions and values of the various habitats affected by the remediation," including "a study to determine the current functions and values of the areas to be affected by the remediation, and ... an evaluation of actions to minimize impacts to the wetlands and floodplains, to the extent practicable." To address the SOW requirements, this Habitat Restoration Work Plan presents the activities that will be performed to assess, protect, restore, and monitor ecological habitat areas that may be affected by remedy implementation at the Site. These activities include: characterizing habitats, evaluating the potential impacts of remedial activities on the identified habitats, evaluating alternatives to minimize impacts to regulated resources, designing the restoration of disturbed habitats, and monitoring the development of the restored habitats.

Six wetlands (designated as A, B, C, D, E and F) were historically identified on the Site, and their boundaries were delineated to evaluate potential impacts of previous remedial activities. Although none of these wetlands were impacted by remedial activities, wetland mitigation was performed by the expansion (Wetland G) and enhancement of Wetland A along the Quinnipiac River. The current status of wetlands and other natural habitats will be re-evaluated during planned pre-design field activities to establish baseline conditions such that mitigation and restoration activities can be incorporated into the design of the various components of the Site remedy, as appropriate. The results of Site characterization efforts will be documented in a Summary Report to be included with the detailed design documentation for one of the initial design components. If disturbed, wetland and terrestrial habitats will be restored to pre-disturbance conditions to the maximum extent practical. For each component of the remedial approach that may affect existing habitat areas, the design reports will include an evaluation of the potential habitat impacts, mitigation measures, and restoration approach.

Disturbed wetlands will be restored to original grades and seeded and planted to restore the current functions of the wetland when possible, else alternative mitigation measures will be identified. Vegetation restoration will be designed to match native species and densities observed in the wetland

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

prior to the disturbance and will include seeds and woody plantings, as appropriate. Habitat restoration plans will be developed that specify the soil conditions, ground elevations, seed types, woody plantings, and/or hydrologic requirements to restore disturbed habitats. If the creation or enhancement of additional wetlands is required to mitigate permanent wetland losses, the restoration plan will include a wetland mitigation plan that will specify the location and the physical and biological characteristics of the mitigation area that will be created or enhanced. A monitoring plan will be developed as part of the design reports that will describe the methods to be used to assess the development of restored habitats and provide the data required to evaluate the success of restored areas by comparison to site-specific Performance Standards. Annual monitoring will be incorporated into the Annual Demonstration of Compliance Reports to summarize the development of restored habitats and to determine whether Performance Standards are being met or if any maintenance actions are required.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 1. Purpose and Scope

This document has been prepared on behalf of the SRSNE Site Group, an unincorporated association of Settling Defendants to a Consent Decree (CD) and Statement of Work (SOW) for the Remedial Design/Remedial Action (RD/RA) at the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut (Site). The CD was lodged on October 30, 2008 with the United States District Court for the District of Connecticut in connection with Civil Actions No. 3:08cv1509 (SRU) and No. 3:08cv1504 (WWE). The CD was entered by the Court on March 26, 2009.

This *Habitat Restoration Work Plan* has been prepared to address certain requirements of the SOW for the RD/RA activities at the Site. Specifically, Section V.C.1.h of the SOW requires a "plan to restore the functions and values of the various habitats affected by the remediation," including "a study to determine the current functions and values of the areas to be affected by the remediation, and ... an evaluation of actions to minimize impacts to the wetlands and floodplains, to the extent practicable." It also requires that the plan include monitoring and reporting requirements to demonstrate compliance with Performance Standards, which are specified in Section IV.B.4 of the SOW and summarized below in Section 2.

To address the SOW requirements, this *Habitat Restoration Work Plan* presents the activities that will be performed to assess, protect, restore, and monitor ecological habitat areas that may be affected by remedy implementation at the Site. These activities include: characterizing habitats, evaluating the potential impacts of remedial activities on the identified habitats, evaluating alternatives to minimize impacts to regulated resources, designing the restoration of disturbed habitats, and monitoring the development of the restored habitats. These activities will be accomplished by the sequential performance of the following five tasks:

- Task 1 Review of Existing Information
- Task 2 Characterization of Existing Conditions
- Task 3 Evaluation of Potential Remedial Impacts

# Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

- Task 4 Restoration Design for Disturbed Habitats
- Task 5 Restoration Monitoring

These tasks are described below in Sections 3 through 7, following a summary of the SOW-specified Performance Standards in Section 2. Reporting and Schedule activities are discussed in Section 8.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 2. Performance Standards

As indicated above, Performance Standards associated with Habitat Restoration are specified in Section IV.B.4 of the SOW as follows:

The areas disturbed during implementation of the remedy shall be restored to their original functions and values. Disturbed areas include excavation sites on the Cianci Property and the culvert outfall, and, access areas and roads, staging/handling areas, etc. that will be constructed during implementation of the remedy.

Cap and cover materials shall be selected and applied so as to provide a suitable substrate for plant species, as appropriate for the area being capped and/or restored. Vegetative cover of the disturbed areas shall be established within one year of remediation in that area. After three growing seasons, the restored areas shall demonstrate a 70% rate of successful establishment of 80% of the planted species. After five growing seasons, a stable vegetative community shall be demonstrated in the disturbed areas.

These Performance Standards provide the basis for the scope of the planned habitat restoration activities, and the measures against which the success of the future restoration activities will be evaluated.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 3. Task 1 - Review of Existing Information

Habitat characterization and identification of regulated resources were performed in support of previous remedial actions conducted at the Site. Specifically, six wetlands (designated as A, B, C, D, E and F) were identified on the Site, and their boundaries were delineated to evaluate potential impacts of remedial activities (BBL 1995a)(Figure H-1). Of these, only Wetland E, located within the Non-Time-Critical Removal Action No. 1 (NTCRA 1) Containment Area (Figure H-2), was determined to be potentially impacted as a result of the groundwater treatment system lowering the water table. Due to the timing of the start-up of the NTCRA 1 groundwater extraction system, the potential impacts to this wetland were mitigated by the expansion (Wetland G) and enhancement of Wetland A along the Quinnipiac River before a conclusion of impact was reached (BBL 1995b). Monitoring subsequently found no impacts to Wetland E due to operation of the NTCRA 1 system.

Under this task, existing information regarding the characteristics of the existing and mitigation wetlands will be reviewed to provide a preliminary habitat and resource map of the Site for use during efforts to update site habitat descriptions, as described in Section 4 of this work plan.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 4. Task 2 - Site Characterization

A field reconnaissance will be performed to assess current cover/habitat types present within or adjacent to the planned remediation areas on the Site (e.g., in-situ thermal remediation, capping, and culvert replacement), and to verify and/or update the information from prior assessments. The target extent of the reconnaissance encompasses the extent of the previously delineated wetland areas and the anticipated extent of remedial activities planned for the Site. The reconnaissance area is shown on Figure H-2.

The objective of this task is to create an accurate cover-type map depicting the habitats and resources currently present in these areas of the Site and to characterize these habitats to support their restoration. Habitats will be identified and classified based on the observed community structure and dominant vegetative species. Included in this task will be an evaluation of the current accuracy of previously delineated state and federal wetland boundaries. If recent site activities or other environmental changes have resulted in hydrologic changes that affected the previously delineated wetland boundaries, the new boundaries of potentially impacted wetlands will be identified, documented, and included on the updated covertype map. Wetland identification and boundary delineation, if required, will be performed in accordance with the Routine Determination Method presented in the 1987 Corps of Engineers Wetlands Delineation Manual (the Manual) (Environmental Laboratory 1987) and the Connecticut Department of Environmental Protection methodology, which is primarily based on the presence of hydric soil (Connecticut Department of Environmental Protection [CTDEP] 2009a). Wetland delineation methods presented in the Manual require areas identified as wetlands to meet all of the following criteria:

- The dominant vegetation is hydrophytic (water tolerant)
- The soils are hydric or possess reducing soil characteristics
- The area is either permanently or periodically at mean water depths less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

The criterion for wetland vegetation is a dominance of hydrophytic (water tolerant) species. A species is considered hydrophytic if it is classified as obligate, facultative wet, or facultative in the National List of Plant Species That Occur in Wetlands published by the United States Fish and Wildlife Service (USFWS) (1996). A dominance of hydrophytic vegetation requires that greater than 50% of the vegetation in an area be hydrophytic. The presence of hydric soils is determined based on a comparison of observed soil characteristics to field indicators of hydric soil presented in the Manual. Investigatory boreholes will be manually advanced with a Dutch auger at sample plots to a depth of at least twenty inches to evaluate the soil characteristics. Observed soil characteristics of texture, degree of saturation, matrix color, and the presence and color of mottles are used to evaluate the hydric soil criterion for wetlands. According to the Manual, wetland hydrology consists of permanent or periodic inundation, or soil saturation to the surface during the growing season. Hydrology is evaluated by observing field conditions for the presence of primary and/or secondary hydrology indicators, such as:

- Ground surface inundation or evidence of inundation
- Saturated soils within twelve inches of the ground surface
- Standing water within twelve inches of the ground surface in investigatory boreholes
- Drift lines
- Evidence of drainage patterns

Wetland criteria evaluations are conducted in areas exhibiting potential wetland characteristics and field data sheets are completed and photographs are taken to document the observations used to define the wetland boundary. The identified wetland boundaries will be flagged with sequentially numbered wetland delineation tape and the flag locations will be surveyed to depict the identified wetland boundaries on the Site Plan.

The Site reconnaissance will be performed during the growing season of the dominant site vegetation (June-September).

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

The functions and values of Site habitats will also be evaluated during the site reconnaissance. The CTDEP identifies the following wetland functions and values (CTDEP 2009b):

- Ecological Integrity
- Wildlife Habitat
- Finfish Habitat
- Nutrient Retention, Sediment Trapping, and Pollution Filtration
- Flood Control
- Shoreline Anchoring, and Dissipation of Erosive Forces
- Groundwater Use Potential

- Agricultural Potential
- Forestry Potential
- Visual and Aesthetic Quality
- Education Potential
- Water Based Recreation
- Noteworthiness

These wetland functions and values will be evaluated in the field based on observed wetland characteristics and their position in the watershed. In general, not all wetlands provide the same functions, and functions do not necessarily have the same value in different locations. Therefore, each wetland will be evaluated for its ability to provide the functions listed above, and the value of these functions will be assessed based on wetland size, hydrology, vegetative communities, location, uses, and uniqueness.

Upland habitats of the Site that may be impacted by the remedy will also be identified and classified, and the functions and values they provide will be qualitatively evaluated based on size, vegetative communities, location, and wildlife use. The results of the habitat identification and function and value assessments will be summarized in the *Pre-Design Investigation Summary Report*, and considered in the area-specific design of restoration measures for areas affected by the planned remedial actions.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

## 5. Task 3 - Evaluation of Potential Impacts of Remedial Activities on Site Habitats

Several remedial activities have the potential to disturb Site habitats. including the in-situ treatment of soil, construction of the cap in the Operations Area, the construction of access roads and staging areas, the replacement of culverts and relocation of drainage pipes, the excavation of soil from the Cianci Property, and grading activities throughout the Site. Under this task, the conceptual remedial design activities will be evaluated for the locations and extents of impacts to terrestrial habitats and wetlands. Impacts to habitats can be direct, as in the removal of vegetation to construct a staging area, or indirect, as in changing drainage patterns to reduce hydraulic inputs to wetlands. Some impacts may be temporary, which would allow disturbances to be restored to similar pre-disturbance conditions by grading and planting. Some disturbances may be permanent, such as the capping of an existing wetland. Permanent loss of wetland habitats or functions may require mitigation in accordance with federal and state regulations. Mitigation can occur through construction of replacement wetlands and/or improvement of the function of existing wetlands, if currently degraded. Temporary impacts to Site wetlands can be mitigated by the restoration of the wetland in-place and in-kind or to a higher quality if currently degraded.

Under this task, the preliminary conceptual remedial activities will be evaluated with respect to potential impacts on Site resources and habitats to determine if there are minor design modifications that can be made to avoid or minimize impacts to regulated resources. The conceptual and final design processes will reflect this effort and summarize the unavoidable resource impacts. Disturbances to wetland and upland habitats will be quantified to assist in the development of the restoration plan for the Site. The acreage of impacted wetlands will be compared to the acreage of successful wetland mitigation already created on the Site (i.e., Wetland G) to determine if additional mitigation is required. A wetland mitigation plan will be prepared for the design of any additional wetland mitigation requirements, as discussed in the following section.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 6. Task 4 - Habitat Restoration Plan

Wetland and terrestrial habitats that are temporarily disturbed by remedial activities will be restored to pre-disturbance conditions to the maximum extent practical. This task will utilize the information generated under previous tasks to determine which habitats require restoration and how best to restore the habitats to their pre-disturbance characteristics and functions. Habitat restoration plans will be developed that specify the soil conditions, ground elevations, seed types, woody plantings, and/or hydrologic requirements to restore disturbed habitats. It is anticipated that upland terrestrial habitats will primarily be restored with seed for erosion control and habitat restoration. Woody plantings will be incorporated into restoration designs if woody vegetation providing ecological functions and values was present prior to the disturbance, and their continued presence is consistent with planned Site uses (e.g., woody vegetation will not be consistent with the Resource Conservation and Recovery Act Subtitle C ["RCRA C"] cap).

Disturbed wetlands will be restored to original grades and seeded and planted to restore the original functions of the wetland. Vegetation restoration will be designed to match native species and densities observed in the wetland prior to the disturbance and will include seeds and woody plantings, as appropriate. If the creation or enhancement of additional wetlands is required to mitigate permanent wetland losses, the restoration plan will include a wetland mitigation plan that will specify the location and the physical and biological characteristics of the mitigation area that will be created or enhanced. Enhancement can include removal of invasive species or supplemental plantings to diversify the habitat structure. The design for the creation of wetlands will include target ground elevations, anticipated hydrology, topsoil specifications, and a seeding and planting plan to create a wetland that mitigates the lost functions of the lost wetland(s). The habitat restoration plan will be included in the conceptual and final design reports for each component of the remedial approach.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 7. Task 5 - Restoration Monitoring

This task consists of the development of a monitoring plan that will describe the methods to be used to assess the development of restored habitats and provide the data required to evaluate the success of restored areas by comparison to site-specific Performance Standards. Although restored areas will have been designed to restore disturbed Site habitats, disturbances can alter environmental conditions to favor invasive or pioneering plant species that can out-compete desirable vegetation during the early stages of habitat establishment. Therefore, monitoring is required to determine if the desired habitat is being created or if adaptive management will be required to react to observations of conditions that may impede the ability of the restoration area to meet Performance Standards. Monitoring activities will include evaluations of the percent ground cover resulting from seed applications and the percent survival of planted woody vegetation. The SOW requires restored habitats to meet the following Performance Standards:

- Vegetative cover of the disturbed areas is to be established within one year of remediation of that area
- 70% ground cover must be established and must contain 80% of the planted species after three growing seasons
- A stable vegetative community must be established after five growing seasons

The results of annual restoration monitoring will be incorporated into the Annual State of Compliance Report for the Site. The restoration monitoring section will present the results of the monitoring activities each year and compare the observed results to the established Performance Standards. The report will include photographs from permanently-established locations to document the development of the restored habitats over time. The report will also include summaries of any maintenance activities or adaptive management actions that were implemented to address observed deficiencies, if any, in restored habitats. For each component of the remedy that involves habitat restoration, the plan for monitoring restored habitats will be included in the associated conceptual and/or final design documentation.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 8. Reporting and Schedule

#### 8.1 Reporting

The results of Site characterization efforts (Tasks 1 and 2) will be documented in a Summary Report to be included with the final (100%) design package for the pre-ISTR site preparation activities. This is based on the fact that an understanding of existing habitat areas will be necessary so that restoration can be accommodated during design, and the design documentation for the pre-ISTR activities is expected to be the first design-related submittal (refer to the discussion of schedule in Section 2 of the Remedial Design Project Operations Plan).

For each component of the remedial approach that may affect existing habitat areas, the concept and final design reports will include an evaluation of the potential habitat impacts, mitigation measures, and restoration approach. In addition, the design reports will identify the planned and post-restoration monitoring program. Annual monitoring will be incorporated into the Annual Demonstration of Compliance Reports to summarize the development of restored habitats and to determine whether Performance Standards are being met or if any maintenance actions are required.

#### 8.2 Schedule

Pending USEPA approval of this work plan, the SRSNE Site Group anticipates that the Task 2 field activities described above, including the Site reconnaissance and wetland assessment/delineation, will be performed during the first growing season after approval of this work plan, preferably between June and September 2009. This time period is necessary to characterize habitats and evaluate wetland functions and values during the growing season.

## Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

The *Pre-Design Investigation Summary Report* will be submitted within 90 days of the completion of selected<sup>1</sup> pre-design activities, including the habitat assessment, wetland delineation, and field survey included as part of Task 2, and receipt of all analytical data. Restoration monitoring will begin during the first full growing season following the restoration of the habitat. Monitoring results will be incorporated into the Annual State of Compliance Reports required by Section VIII.B of the SOW.

<sup>&</sup>lt;sup>1</sup> As further described in the *Remedial Design Project Operations Plan*, the *Pre-Design Investigation Summary Report* will summarize the scope and results of selected pre-design investigations, excluding those that are proposed to be performed on an accelerated basis and those which cannot be performed pending completion of certain remedial actions.

# Habitat Restoration Work Plan

SRSNE Superfund Site Southington, Connecticut

#### 9. References

BBL. 1995a. Conceptual Wetlands Mitigation Plan. April 1995.

BBL. 1995b. Detailed Wetlands Mitigation Design. September 1995.

CTDEP. 2009a. Inland and Tidal Wetlands website: http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325674#TidalWetlands&depN av GID=1654

CTDEP. 2009b. Inland and Tidal Wetlands website: http://www.ct.gov/dep/lib/dep/water\_inland/wetlands/seg1\_functional\_values.pdf

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

USFWS. 1996. National List of Vascular Plant Species that Occur in Wetlands.

Figures



