SITE RESTORATION PLAN

For

Ford Motor Company
Ramapo Paint Sludge Site - Operable Unit 2 (OU-2)
Ramapo, Rockland County, New York
Site No 3-44-065

July 2015

Revised February 2016

PREPARED BY:

ARCADIS US Inc.
17-17 Route 208 North
Fair Lawn, NJ 07410

AMY S. GREENE ENVIRONMENTAL
CONSULTANTS, INC.
4 Walter E Foran Blvd., Suite 209
Flemington, NJ 08822
ASGECI Project # 3437B

TABLE OF CONTENTS

Section **Page**

FIGURES

1.0 INTRODUCTION

On behalf of Ford Motor Company (Ford), ARCADIS U.S., Inc. (ARCADIS) and Amy S. Greene Environmental Consultants, Inc. (ASGECI) have prepared this Site Restoration Plan (SRP) as an attachment to the Remedial Design for the Torne Valley Road Area designated as Operable Unit 2 (OU-2) of the Ramapo Paint Sludge Site located in Ramapo, Rockland County, New York (the Site). A remedial action consisting of targeted removal and disposal of paint sludge with embankment excavation is planned for the Site in accordance with the Record of Decision (ROD) issued by the New York State Department of Environmental Conservation (NYSDEC) dated March 2014.

ASGECI and ARCADIS conducted a preliminary site visit on September 5, 2014 to assess and document the existing site conditions. Along with other background site information, ARCADIS and ASGECI utilized information gathered during the site visit to prepare the following SRP.

1.1 Site Description

The Site includes valley side and river flat areas and extends along the bottom of Torne Valley in a north/south direction. OU-2 is generally bound to the west by the Ramapo River and Torne Brook; to the north by Harriman State Park and a Consolidated-Edison Substation; to the east by Harriman State Park and Torne Valley Road; and to the south by Sloatsburg Road/State Route 59.

The majority of OU-2 (approximately 15.4 acres) is located west of Torne Valley Road (OU-2 North) with an additional area (approximately 0.7 acres) located east of Torne Valley Road (OU-2 South), approximately 3,765 feet south of OU-2 North.

OU-2 is comprised of natural lands and includes upland forests, maintained accessways, and riparian corridors along Torne Brook. Torne Brook flows to the Ramapo River, which flows to the Pompton River, part of the Passaic River Drainage System. The project area is also adjacent to the nearby Harriman State Park, which is owned and operated by the NYSDEC.

1.2 Site History

The Site, formerly known as the Ramapo Land Company (RLC) Site No. 344015, is an undeveloped parcel of land currently owned by the Town of Ramapo. OU-2 has a history of mining and backfilling operations.

Paint sludge was discovered in OU-2 adjacent to Torne Brook by the Town of Ramapo Highway and Engineering Department in 1983. Since 1983, a series of site investigations and interim remedial measures have been conducted at the Site in accordance with the NYSDEC.

In March 2014, the NYSDEC issued a ROD establishing a selected remedy for the Site based on the extent of paint sludge discovered at the Site. The selected remedy is the Targeted Removal and Disposal of Paint Sludge with Embankment Excavation. In order to meet the substantial requirements for the selected remedy established by the ROD, this Site Restoration Plan is being submitted.

1.3 Project Description

The total area to be disturbed during the execution of the Remedial Design is approximately 11.32 acres. Of this, only 0.31 acres is located within OU-2 South. All areas of disturbance can be viewed on Figure 1.

Vegetation within the proposed limits of excavation, the access road and the material staging (MSA) area will be cleared/grubbed, as necessary, to permit access by heavy equipment and allow visual inspection of the area prior to the performance of work activities. Areas within the Limit of Disturbance that are deemed not necessary to clear will be protected in accordance with the Tree Protection Detail provided on Figure 2.

Tree Clearing:

Large trees (more than 12 inches in diameter) within the limit of disturbance will be protected to the extent possible to retain the character of the area and provide soil stability in the future. Tree(s) removed during clearing operations will be checked for the presence of paint sludge. Tree(s) with visual paint sludge impacts will be disposed of off-site at an approved Ford and NYSDEC disposal facility; while tree(s) with no visual paint sludge impacts will be chipped and/or grinded for use during remediation.

Remediation:

The remedial contractor will utilize traditional construction equipment to implement the remedial design. Prior to excavation, the remedial contractor will clear and grub all downed trees within the excavation footprint and relocate all accessible rootballs to the MSA. Rootball(s) will be visually inspected for the presence of paint sludge similar to how the trees are managed. Rootball(s) with no visual paint sludge will be grinded/mulched and utilized on-site; while rootball(s) with visual paint sludge impacts will be disposed of off-site at an approved Ford and NYSDEC disposal facility.

Excavation will be conducted using sloping techniques (i.e., open-cut). The excavated soil will be transferred to the proposed MSA to be segregated, stockpiled and profiled for disposal. Excavation and off-site disposal includes all visible paint sludge and surface soils exceeding the ROD defined Soil Cleanup Objectives (SCOs) and sediment screening, criteria and guidance (SCGs), to the extent feasible. Following excavation certified clean backfill will be used to backfill the excavation to within six inches of the grade illustrated on Figure 1. The remaining six inches will consist of topsoil. Topsoil shall contain of a sufficient quantity of organic material (10%) to support the restoration plan. General backfill should have an organic content of 5%. Documentation will be provided to the NYSDEC for approval regarding organic content, prior to importation.

Site stabilization and temporary seeding will occur concurrent with placement of topsoil and final grading.

Site Restoration:

The Site Restoration Plan will be implemented during the appropriate planting season once the entire project area has been remediated. It is expected that planting will occur during the spring of 2016.

This Restoration Plan has been designed to address the restoration of all areas cleared and disturbed during construction activities (11.32 acres). A total of 8.29 acres of upland forest, 0.03 acres of forested streambank, 1.82 acres of upland meadow and 0.5 acre of native meadow will be restored within the limits of disturbance. An area of 0.68 acres will remain as a gravel access area.

2.0 EXISTING CONDITIONS

Topography in the vicinity of the project area is generally undulating, with areas of steep slopes. A steeply sloped "berm" is located within the Site along the eastern portion of Torne Brook. Surrounding land use consists mainly of natural lands, major roadways, transmission lines with a substation, and an inactive landfill.

The majority of the project area consists of naturalized lands that show signs of major disturbance in past years. Along with evidence of earthen disturbance, a number of easements are located within the Site boundaries. Orange and Rockland Utility and Consolidated Edison manage easements and subsequent utility/transmission lines (abandoned/active) bisecting the Site in two locations (Figure 1).

2.1 Vegetation Communities

Existing vegetation within the project area consists of multiple communities. A general description of these communities can be seen below.

Forested Uplands:

Secondary upland forest communities were observed to contain sweet birch (*Betula lenta*), red oak (*Quercus rubra*), black oak (*Q. velutina*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), big-tooth aspen (*Populus grandidentata*) and tulip poplar (*Liriodendron tulipifera*) trees. The forest understory comprises multiflora rose, autumn olive (*Elaeganus commutata*), Japanese barberry (*Berberis thunbergii*), poison ivy (*Toxicodendron radicans*), witch hazel (*Hamamelis virginiana*) and wineberry (*Rubus phoenicolasius).*

Disturbed Uplands:

Disturbed areas are represented by mugwort (*Artemisia vulgaris*), common reed (Phragmites australis), late flowering thoroughwort (*Eupatorium serotinum*), black locust

(*Robinia pseudoacacia*), eastern cottonwood (*Populus deltoides*), multiflora rose (Rosa multiflora), wineberry (*Rubus phoenicolasius*), orchard grass (*Dactylis glomerata*), and grasses (*Poa* species).

Riparian Forest:

Areas directly adjacent to the Torne Brook and many floodplain areas have been identified to contain a slightly different tree and shrub species composition than all other areas throughout the project area. The riparian forest along the stream bank areas are dominated by the presence of American sycamore (*Platinus occidentalis*). Also present along the stream is green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), as well as black cherry (*Prunus serotina*) and black locust (*Robinia psuedoacacia*).

Native shrubs identified included Southern arrowwood (*Viburnum dentatum*) and blackhaw (*Viburnum prunifolium*). Also present within the stream bank areas are typical disturbed site species including Japanese honeysuckle (*Lonicera japonica*), Oriental bittersweet (*Celastris orbiculatis*), multiflora rose (*Rosa multiflora*) and Japanese barberry (*Berberis japonica*).

Upland Meadow:

Areas along Torne Valley Road have been identified as upland meadow. Species associated with these areas contain typical roadside species including grasses (*Poa* spp.), goldenrods (*Solidago* and *Euthamia* spp.), ragweed (*Ambrosia artemesifolia*) and mugwort (*Artemesia vulgaris).*

2.2 Site Hydrology

An onsite investigation was performed on October 23, 2014 by representatives of ASGECI to delineate any wetland or open water features present at the Site. In order to be identified as a wetland, an area must have hydrophytic vegetation, hydric soils, and be saturated by groundwater or inundated by surface water for a significant period of time during the growing season. The findings of the onsite investigation were presented in a Jurisdictional Waterbody Determination submitted on December 19, 2014 to the United States Army Corps of Engineers (USACE) and NYSDEC.

The findings of the delineation revealed the presence of two small isolated wetland areas. These wetlands are likely formed from surface water ponding and are not associated with seasonably high groundwater table.

2.3 Site Soils

The State Soils Geographic database for New York State maps two (2) soil mapping units across the site identified as Charlton fine sandy loam, 2 to 15 percent slopes, very stony (ChC) and Pits and gravel (Pt). The ChC soil is mapped along the corridor of Torne Brook while the Pt soil is mapped along Torne Valley Road. Neither of these soil map

units is considered hydric soils; however, hydric soils were identified within the wetland features by the presence of low chroma matrixes and mottling. Upland soil samples lacked these characteristics.

Soils within the project area can be identified as rocky in nature, containing larger cobbles and boulders throughout. This material is consistent with bed and bank material throughout alluvial valleys and Precambian regions. Topsoil layer can be attributed to mainly an organic duff layer, and subsequent compost.

3.0 RESTORATION PLANTING PLAN

Remediation of the project area will result in the temporary disturbance of 11.32 acres. The project area will be planted to restore vegetative communities within six months after the disturbances occur. The area will be restored to the following communities:

- 8.29 acres of upland forest
- 0.03 acres streambank areas
- 1.82 acres upland meadow
- 0.5 acre native meadow
- 0.68 acres gravel access areas

The project area will be planted entirely with native species. Plants will be installed in a random pattern, with groups of similar species clustered together. All of the selected species are native plants that will require no maintenance once established. The plant diversity should, as the site matures, improve the value of the Site to a variety of wildlife.

Planting of deciduous trees and shrubs will occur from March 1 to May 15. Tree and shrub planting will be performed only when weather and soil conditions are suitable for optimal benefit to the plants. No plant material will be planted when the ground is frozen or in excessively moist condition.

The seeding of the disturbed project area with the herbaceous seed mix may be performed at any time after remediation. Planting, seeding, fertilizing, and stabilization will be performed according to the specifications prepared specifically for this project.

3.1 Upland Meadow

Upland meadows will be restored in areas along Torne Valley Road. A total of 1.82 acres of meadow is scheduled to be restored (Figure 1). All upland meadow areas will be permanently stabilized by seeding with a warm season grass mixture including little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*;), switchgrass (*Panicum virgatum*), oats (*Avena sativa*), Virginia wild rye (Elymus virginica), annual ryegrass (*Lolium multiflorum*), Smooth aster (*Aster laevis*), Black-eyed susan (*Rudbeckia hirta*), purple coneflower (*Echinacea purpurea*), wild bergamot (*Monarda fistulosa*), and lance-leaved coreopsis (*Coreopsis lanceolata*). All permanent seeding and stabilization will be completed in accordance with this SRP.

3.2 Upland Forest Areas

Upland forests to be restored include 8.29 acres of area (Figure 1). All disturbed upland forests will be planted with a combination containerized plant materials. Trees and shrubs will be planted at approximately 20-foot on-center. Tree and shrub species including red oak (*Quercus rubra*), sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), sweet birch (*Betula lenta*), sycamore (*Plantanus occidentalis*), tulip poplar (*Liriodendron tulipifera),* black chokeberry (*Aronia melanocarpa*), Eastern red cedar (*Juniperus virginica*), Virginia rose (*Rosa virginiana*), witch hazel (*Hamamelis virginiana*), and Southern arrowwood (*Viburnum dentatum*) will be installed within the upland areas. All upland areas will be stabilized by seeding with a warm season grass mixture including little bluestem (*Andropogon scoparius*), big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*;), switchgrass (*Panicum virgatum*), oats (*Avena sativa*), Virginia wild rye (Elymus virginica) annual ryegrass (*Lolium multiflorum*), Smooth aster (*Aster laevis*), Black-eyed susan (*Rudbeckia hirta*), purple coneflower (*Echinacea purpurea*), wild bergamot (*Monarda fistulosa*) and lance-leaved coreopsis (*Coreopsis lanceolata*).

Within the upland forest restoration area, steep slopes have been identified and will receive additional seeding and stabilization measures. All slopes 25-pecent (4:1 slope) or steeper will be stabilized with the temporary stabilization seed mixture in addition to the upland forest seed mix. The steep slope areas will also be stabilized with high performance biodegradable erosion control matting. All permanent seeding, stabilization and plantings will be completed in accordance with this SRP.

3.3 Streambank Stabilization Area

The streambank stabilization area can be described as all areas within 3 feet horizontally from the mean high water mark of Torne Brook. Therefore the width of the streambank stabilization will vary depending on proposed disturbance and slopes. Streambank stabilization areas to be restored include 0.03 acres located along the southern bank of Torne Brook. (Figure 1). As needed, streambank areas may be stabilized by adding natural stone at the toe-of-slope within Torne Brook. All areas above the toe-of-slope and normal water levels will be restored utilizing only soil, vegetation, and other bioengineering devices. All disturbed riverbank areas will be planted with a combination of livestakes and containerized plant materials. Livestakes will be planted in a staggered fashion along the riverbank at approximately 1-foot on-center to provide instant protection from scour and erosion. Containerized shrubs will be planted at 4-foot on-center in streambank areas that are >2 feet above bank full. Additionally, containerized trees will be planted at 10-foot on-center. Tree and shrub species such as black willow (*Salix nigra*), silky dogwood (*Cornus amomum),* elderberry (*Sambucus canadensis*), witch hazel (*Hamamelis virginiana*) will be installed within the streambank stabilization areas.

All stream bank stabilization areas will be stabilized by seeding with a native grass mixture including little bluestem (*Andropogon scoparius*), Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), Virginia wild rye (*Elymus virginica*), annual ryegrass (*Lolium multiflorum*), fox sedge (*Carex vulpinoides*), soft rush (*Juncus effuses*), path rush (*Juncus tenuis*), swamp sunflower (*Helianthus angustifolius*), joe-pye-weed (*Eupatorium fistulosum),* boneset (*Eupatorium perfoliatum*), grass-leaved goldenrod (*Euthamia graminifolia*), Canada goldenrod (*Solidago Canadensis*), and wild bergamot (*Monarda fistulosa*). The streambank areas will also receive the temporary stabilization mixtures to insure stabilization. All permanent seeding, stabilization, and plantings will be completed in accordance with this SRP.

3.4 Native Meadow Area

A native meadow area will be planted, following restoration of the Upland Forest Areas. Ford will provide funding for the permanent seeding and plantings associated with the 0.5 acre footprint; however, the installation will be completed by Others. Permanent seed mixtures and plantings planned for the area include Sweetgrass (*Hierochloe odorata*), Red Clover (*trifolium pretense*), Purslane (*Portulaca grandiflore*), Mountain Mint aka Hairy Mountain Mint (*Pycnanthemum verticillatum var. pilosum*), Common Mullein (*Verbascum Thapsus*), and Common Milkweed (*Asclepias syriaca)*. The native meadow will also receive the temporary stabilization mixtures to insure stabilization. All permanent seeding, planting and stabilization will be completed in accordance with this SRP.

3.5 Wildlife Habitat Enhancement Features

Multiple wildlife habitat enhancement features will be incorporated into the site restoration plan. Wildlife habitat enhancement features are intended to add suitable habitat features for a wide variety of species expected to utilize the site.

Bird boxes and bat boxes will be added throughout the restoration area in order to provide nesting and roosting habitat. Bird boxes will be placed in suitable locations either on existing trees or posts approximately 5- foot off the ground, as determined by the Restoration Specialist. Bat boxes shall be mounted on the south side of a suitable existing tree at a minimum of 10 feet off the ground, as determined by the Restoration Specialist and Bat biologist.

All wildlife habitat enhancement structures will be inspected annually to ensure that the structures are intact and functional. Records of activity within the wildlife habitat enhancement structures will be documented and presented in annual reports.

In addition, an appropriate number of previously felled trees will be stock-piled and used to restore the forested areas by randomly scattering throughout the site, creating coarse woody debris, brush piles, or other habitat features. Brushpiles will be constructed from coarse woody debris comprised of large trees greater than 12 inches in diameter and approximately 20 feet in length (Figure 1).

4.0 ADAPTIVE MANAGEMENT, MONITORING, AND MAINTENANCE PLAN

The following performance standards will be applicable to site restoration. The proposed site restoration will be deemed "successful" if after a minimum monitoring period of five (5) growing seasons post Completion of Construction, the following performance standards are met:

- The specified restoration areas have been restored or enhanced in accordance with the approved plan;
- 90% or greater survival of trees. (i.e., average density of native trees and shrubs greater than or equal to 200 trees/shrubs per acre) of restoration plantings including natural regeneration of native species throughout the restoration areas This benchmark will be assessed no later than one-year post-planting.
- Total vegetative cover (defined as ground and canopy cover of 85% within one growing season.
- Total vegetative cover (defined as ground and canopy cover) of 90% by Year 3 of monitoring.
- Total vegetative cover (defined as ground and canopy cover) of 95% by Year 5 of monitoring.
- Invasive species cover less than 5% of the ground surface in replanted areas after Year 5 of monitoring.
- 70% replacement of failed stakes in year 1 and adaptive management in years 2-5 or 1.5 feet on center with 1:1 replacement in year 1-3 and adaptive management in years 4 and 5.

4.1 Adaptive Management

Adaptive management refers to the development of a management strategy that anticipates likely challenges associated with the proposed site restoration and provides for the implementation of actions to address those challenges. A primary component of the adaptive management strategy is retention of institutional knowledge regarding the design and assumptions of the proposed site restoration. Therefore, to the fullest extent possible, it is essential for the project designer to be involved in and supervise the construction, monitoring and maintenance of the proposed site restoration.

The site restoration will be inspected during construction by an individual experienced in habitat restoration. Post construction inspections will be performed bi-annually during the first growing season in order to identify and address any developing problems. The results of the inspections and any observed problems shall be documented in a monitoring memo. A standard inspection form will be developed and will include documentation of the overall health of the plant material, wildlife species observed, integrity of the tree protection, evidence of herbivory, evidence of vandalism, invasive species observed and other pertinent management data.

Herbivory by white tailed deer is expected to be an issue within the project area. The project area is located within a naturalized area, and the presence of white tailed deer and other herbivores has been noted during field visits. To reduce potential damage associated with deer browsing and rubbing, a tree shelters will be installed and maintained around all trees. Containerized tree and shrub species may be protected from rodent damage by installation of photodegradable plastic collars.

The presence of invasive plant species will be monitored. Invasive species anticipated in the proposed restoration site include multiflora rose (*Rosa multiflora*), reed canarygrass (*Phalaris arundinacea*), porcelainberry (*Ameplopsis brevipedunculata*), common reed (*Phragmites australis*), Japanese stiltgrass (*Microstegium vimineum*), Japanese honeysuckle (*Lonicera japonica*), mile-a-minute weed (*Polygonum perfoliatum*), autumn olive (*Elaeagnus angustifolia*), Japanese barberry (*Berberis thunbergii*) and tree of heaven (*Ailanthus altissima*). Routine maintenance for control of unwanted plant species will be conducted twice during the first growing season (if necessary) to ensure that these species do not become well established within the project area. The routine maintenance may include digging, pulling and/or removing invasive plants from the restoration areas. If necessary, a suitable herbicide treatment may be applied by a certified pesticide applicator.

4.2 Monitoring Protocols

The project area will be documented by a post-construction, as-built survey. The as-built survey shall depict the post-construction elevations within the project area including adjacent areas at no less than one foot contour intervals, and other pertinent information required to assess construction and success of the site restoration. A table will be submitted listing the vegetative species and quantities of each species that were planted within the project including any grasses that may have been used for soil stabilization purposes. Any deviations from the approved plan will be highlighted and explained to the agencies for review and approval.

The proposed monitoring period for the restoration areas will commence following Completion of Construction and continue for a period of at least five years or until all performance standards are achieved, whichever is longer. The agencies may require monitoring beyond the five year period if monitoring data do not indicate that the species composition and density of the restored areas exhibit an ecological trajectory indicative of regional reference forest ecosystems.

Vegetative success criteria will be evaluated by systematic sampling within the site restoration areas. Permanent vegetation plots will be established within the project area. The proposed sampling methodology for inventory plots is discussed in the paper entitled "A Flexible Multipurpose Method for Recording Vegetation Composition and Structure" (Peet, R. K., Wentworth, T.R., and White, P.S., 1998).

The standard observation unit will be a 10 x 10 meter module. Generally, each plot will consist of a 2 x 3 array of modules. Within each array, woody stem presence, cover, and diameter, and height will be recorded within each module. Depending on coverage of herbs and bryophytes, these strata will be sampled using a subset of modules or nested quadrats within modules. Plot and site data will be recorded for each array including soil morphology, aspect, slope, elevation, topographic position, and total estimated cover of the vegetative strata (trees, saplings, shrubs, herbs, vines, and bryophytes).

4.3 Reporting

Annual monitoring reports shall contain summaries of the monitoring data including woody plant species, height and densities; herbaceous cover estimates and species; representative descriptions of soil morphology; site photographs; and description of management issues.

Monitoring Reports will be prepared following the fall field investigation for each monitoring year. A comprehensive, final report that summarizes the results and success of the site restoration will be prepared after the final site visit in the fall of the year five.

Upland Forest Planting Zone- OU-2 : 8.29 acres					
Plant Type	Common Name	Scientific Name	Size	Quantity	Spacing
Tree	sycamore	*Platanus occidentalis*	5'-6' Ht.	100	20 ft. O.C.
	white pine	*Pinus strobus*	5'-6' Ht.	100	20 ft. O.C.
	sugar maple	*Acer saccharum*	5'-6' Ht.	100	20 ft. O.C.
	sweet birch	*Betula lenta*	5'-6' Ht.	100	20 ft. O.C.
	red oak	*Quercus rubra*	5'-6' Ht.	100	20 ft. O.C.
	black oak	*Quercus velutina*	5'-6' Ht.	100	20 ft. O.C.
	tulip poplar	*Liriodendron tulipifera*	5'-6' Ht.	100	20 ft. O.C.
	sycamore	*Platanus occidentalis*	8'-10' Ht.	100	20 ft. O.C.
	white pine	*Pinus strobus*	8'-10' Ht.	100	20 ft. O.C.
	sugar maple	*Acer saccharum*	8'-10' Ht.	100	20 ft. O.C.
	sweet birch	*Betula lenta*	8'-10' Ht.	100	20 ft. O.C.
	red oak	*Quercus rubra*	8'-10' Ht.	100	20 ft. O.C.
	tulip poplar	*Liriodendron tulipifera*	8'-10' Ht.	100	20 ft. O.C.
Shrub	black chokeberry	*Aronia melanacarpa*	3'-4' Ht.	160	15 ft. O.C.
	virginia rose	*Rosa virginiana*	3'-4' Ht.	240	15 ft. O.C.
	southern arrowwood	*Viburnum dentatum*	3'-4' Ht.	160	15 ft. O.C.
	staghorn sumac	*Rhus typhina*	3'-4' Ht.	240	15 ft. O.C.
	witch hazel	*Hamamelis virgininana*	3'-4' Ht.	240	15 ft. O.C.

Streambank Stabilization: 0.03 acres					
Plant Type	Common Name	Scientific Name	Size	Quantity	Spacing
Shrub	witchhazel	*Hamamelis virginiana*	5'-6' Ht.	100	10 ft. O.C.
	pussy willow	*Salix bicolor*	live stakes	1000	1 ft. O.C.
	black willow	*Salix nigra*	live stakes	1000	1 ft. O.C.
	elderberry	*Sambucus canadensis*	3'-4' Ht.	200	4 ft. O.C.
	silky dogwood	*Cornus ammomum*	3'-4' Ht.	200	4 ft. O.C.

** Depending on the planting season, live stake material may be substituted with rooted cuttings or plugs.

Upland Meadow and Upland Forest Seed Mix - 25 lbs per acre

Scientific Name	Common Name	Percent
Panicum virgatum	switchgrass	20.0
Elymus virginicus	Virginia wild rye	15.0
Avena sativa	oats	15.0
Andropogon scoparius	little bluestem	10.0
Andropogon gerardii	big bluestem	10.0
Sorghastrum nutans	indian grass	10.0
Aster laevis	smooth aster	5.0
Rudbeckia hirta	black-eyed susan	5.0
Monarda fistulosa	wild bergamot	5.0
Echinacea purpurea	purple coneflower	2.5
Coreopsis lanceolata	lance-leaved coreopsis	2.5

**Add 20 lbs. per acre Annual Rye Grass (Lolium multiflorum)*

Bank Stabilization Area Seed Mix - 25 lbs per acre

Scientific Name	Common Name	Percent
Panicum virgatum	switchgrass	20.0
Carex vulpinoides	fox sedge	20.0
Andropogon scoparius	little bluestem	10.0
Elymus virginicus	Virginia wild rye	10.0
Juncus effuses	soft rush	5.0
Juncus tenuis	path rush	5.0
Helianthus angustifolius	swamp sunflower	5.0
Eupatorium fistulosum	Joe Pye Weed	5.0
Eupatorium perfoliatum	Boneset	5.0
Euthamia graminifolia	grass-leaved goldenrod	5.0
Solidago canadensis	canada goldenrod	5.0
Monarda fistulosa	wild bergamot	5.0

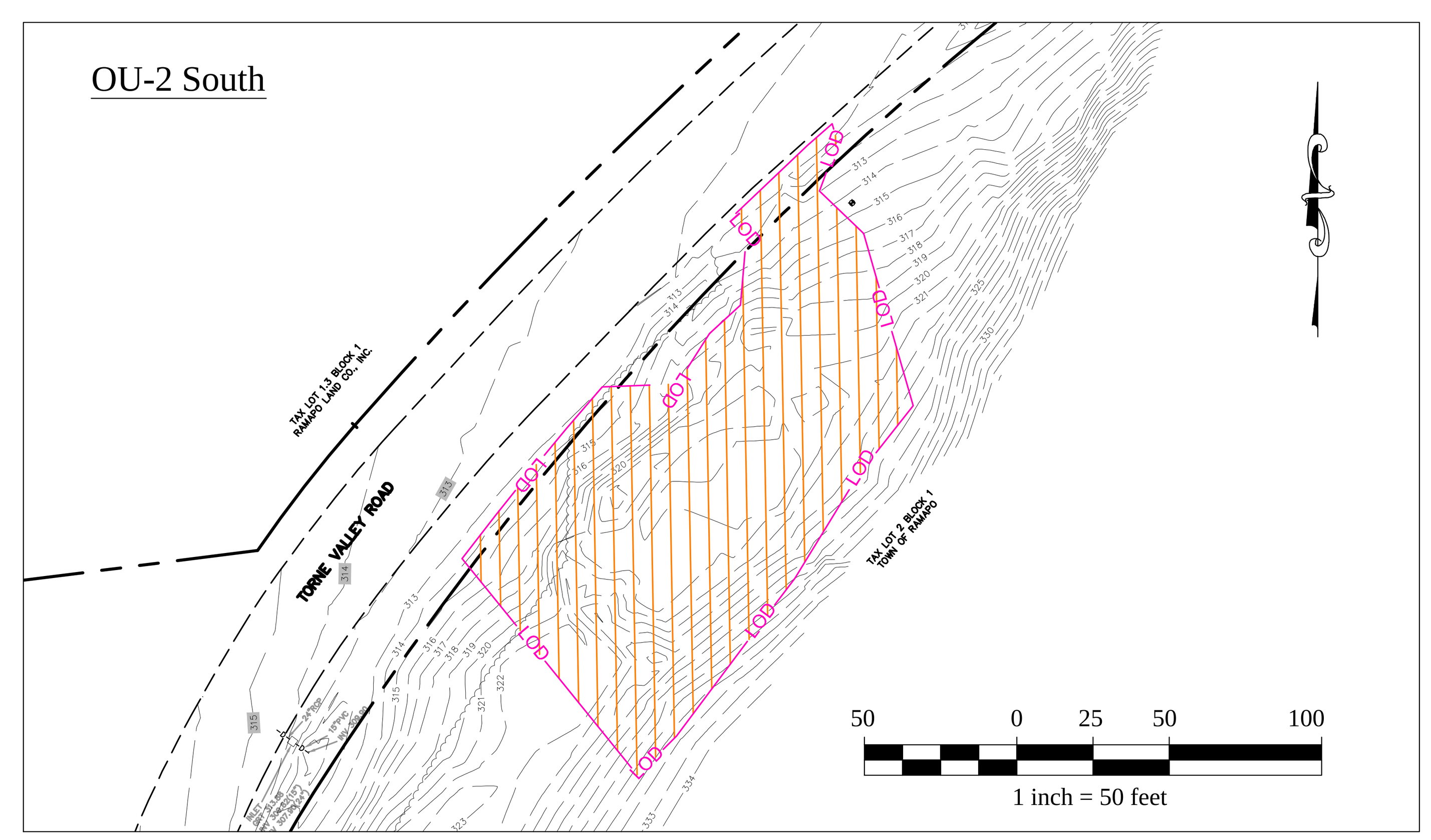
*Add Temporary Stabiliaztion Seed Mix as specified

Temporary Stabilization Seed Mix - 50 lbs per acre

Scientific Name	Common Name	Percent
Secale cereale	winter rye	40.0
Avena sativa	oats	40.0
Lolium multiflorum	annual ryegrass	20.0

Native Meadow Planting Zone - OU-2: 0.5 acres to be planted by Others		
Common Name	Scientific Name	Quantity
Sweet Grass	*Hierochloe odorata*	50 plugs
Red Clover	*Trifolium pretense*	25 lb bag
Purslane	*Portulaca grandiflore*	50 plugs
Mountain Mint aka Hairy Mountain Mint	*Pycnanthemum verticillatum var. pilosum*	50 plugs
Common Mullein	*Verbascum thapsus*	50 plugs
Common Milkweed	*Asclepias syriaca*	50 plugs
Black Eyed Susans	*Rudbeckia hirta*	10 lb bag

OU-2 South



NOTE: THIS FIGURE IS BASED ON DRAWINGS PREPARED BY AMY S. GREENE ENVIRONMENTAL CONSULTANTS, INC, DATED 7/29/2015.

RAMAPO PAINT SLUDGE OPERABLE UNIT 2
RAMAPO, NEW YORK
OU-2 CONSTRUCTION

RESTORATION PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:MAHWAH-NJ DIV/GROUP:ENVCAD DB:G.STEINBERGER, S.BELL LD:J.GONZALEZ PIC:R.ELLIS PM:E.ZIMMERMAN TM:J.ROCKLIN LYR:ON=*;OFF=*REF*
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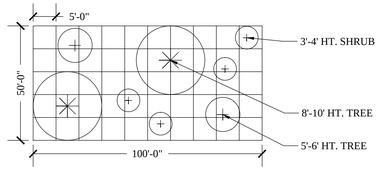
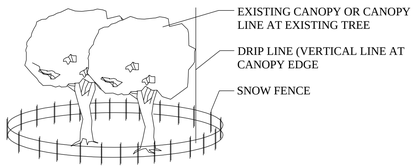
XREFS: NJ698X01 NJ698X05 NJ698X02 NJ698X00 IMAGES: batbox.jpg BIRD BOX.jpg PROJECTNAME: ----



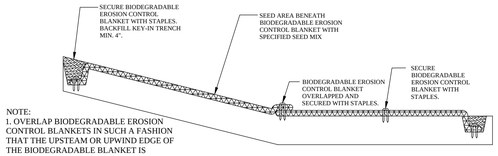
1. Detail is representative only. Purpose is to show design intent. Prior to plant installation plant layout shall be staked out by contractor and approved by engineer.
2. Refer to plans (Sheet 1) for locations of planting areas and planting summary (Sheet 1 & 2) for plant species, quantities, spacing and other requirements.
3. Restoration specialist will layout species in a naturalistic fashion.
4. Photos will be collected to identify the current location of species and these species will be placed in similar locations upon site restoration to the extent feasible.
5. Restoration specialist will layout the trees and shrubs prior to planting. NYSDEC will be informed of the timing of this layout to provide oversight for approval of the restoration specialist layout.

2 A — WOODY PLANTING LAYOUT, TYP.
SCALE: NONE



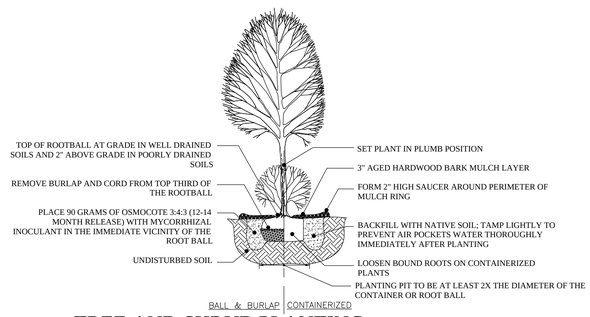
Contractor shall supply and install tree protection for existing trees or tree groups on the project property as necessary to protect and preserve trees from damage.

2 B — TREE PROTECTION
SCALE: NONE

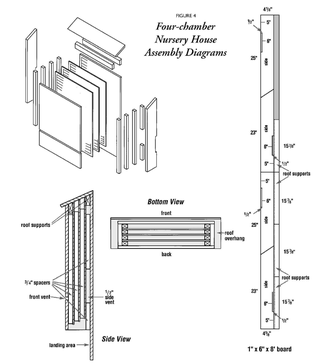


NOTE:
1. OVERLAP BIODEGRADABLE EROSION CONTROL BLANKETS IN SUCH A FASHION THAT THE UPSTEAM OR UPWIND EDGE OF THE BIODEGRADABLE BLANKET IS BENEATH THE DOWNSTREAM OR DOWNWIND EDGE OF THE NEXT BIODEGRADABLEBLANKET.

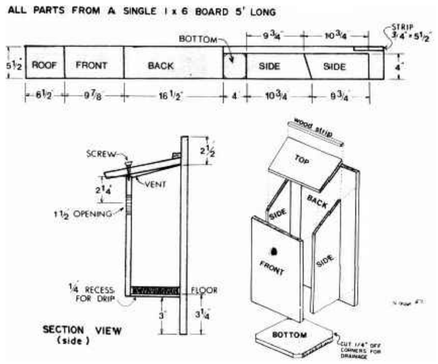
2 C — BIODEGRADABLE EROSION CONTROL BLANKET DETAIL
SCALE: NONE



TREE AND SHRUB PLANTING
2 D — BALL &BURLAP AND CONTAINERIZED
SCALE: NONE



2 E — BAT BOX
SCALE: NONE

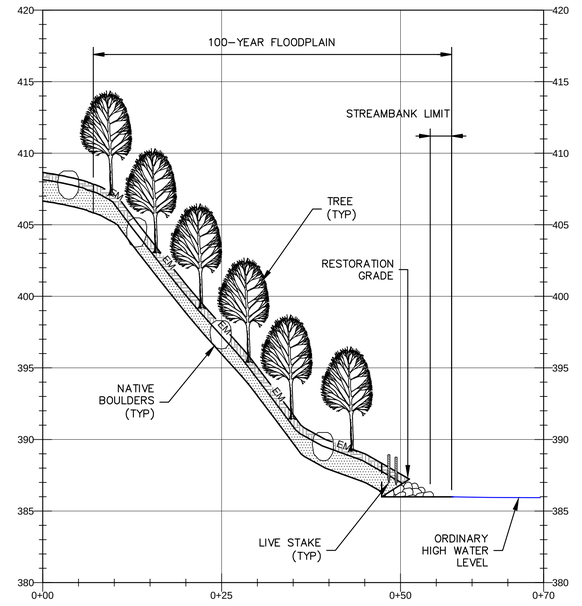


2 F — BIRD BOX
SCALE: NONE

COARSE WOODY DEBRIS

1. An appropriate number of previously felled trees will be utilized throughout the restoration area as coarse woody debris, brush piles, or other habitat features.
2. Brushpiles will be constructed from coarse woody debris comprised of large trees greater than 6 inches in diameter and approximately 15-20 feet in length.
3. In general, felled trees will be placed in approximate locations as determined by the Restoration Plan and supervising Restoration Specialist.

NOTE: THIS FIGURE IS BASED ON DRAWINGS PREPARED BY AMY S. GREENE ENVIRONMENTAL CONSULTANTS, INC, DATED 7/29/2015.



AREA D
RESTORATION CROSS SECTION A 1

RAMAPO PAINT SLUDGE OPERABLE UNIT 2
RAMAPO, NEW YORK
OU-2 CONSTRUCTION

RESTORATION PLAN DETAILS

ARCADIS Design & Consultancy for natural and built assets

FIGURE **2**

RESTORATION CONSTRUCTION SEQUENCE

1. As necessary, survey and stakeout limits of easements, fencing and other project features required to complete construction.
2. Install stabilized construction entrance and all sediment and erosion control measures as indicated on the plans.
3. Install tree protection in accordance with the Tree Protection Notes and Details in all applicable areas
4. Initiate site clearing, grubbing and all remedial excavation in accordance with the RAWP.
5. Place all topsoil in accordance with the RAWP.
6. Following commencement of the restoration process, restoration activities shall continue until such time that the entire phase has been completed and temporarily or permanently stabilized with the appropriate vegetative stabilization measures.
7. Disk or otherwise prepare the site for permanent stabilization and planting in accordance with notes and details.
8. Based on the stated seasonal constraints, apply temporary and/or permanent seed mixtures as specified.
9. Permanently stabilize all areas in accordance with the Landscaping Notes and Biodegradable Erosion Control Mat details.
10. Plant all trees and shrubs in accordance with the Plant List, notes and details.
11. Install wildlife habitat features as indicated by the supervising Restoration Specialist.
12. Commence the Maintenance and Monitoring Period.

TREE PROTECTION AREA NOTES

1. It is anticipated that all portions of the restoration area will not be completely cleared and subject to all aspects of the Restoration Plan. The tree protection should be used to preserve and protect areas within the LOD that will not be cleared, grubbed or excavated.
2. Designated tree protection areas shall be fenced with 3ft high visibility PVC fencing prior to commencement of construction. The tree protection areas shall encompass an area of at least 10ft radius from the subject tree or tree line as identified on the plans or greater as necessary to ensure the long-term survival of the tree.
3. Tree protection shall be installed in any areas as directed by the Restoration Specialist of Engineer.
4. Any debris and/or waste within the tree protection are shall be removed by hand and disposed of properly.
5. Residual vegetation within the tree protection are shall be treated with a suitable herbicide (i.e. Gyphosate) by Commercial Pesticide Applicator. The selected herbicide shall have no adverse effect (i.e. soil activity) on the subject tree.
6. Herbicide treatment within the tree protection areas shall be completed as necessary for at least one full growing season.
7. Following permanent seeding, protective fencing shall be removed from the tree protection area.

PERMANENT SEEDING NOTES

1. All Restoration Areas will be permanently seeded and stabilized with the specified seed mixtures following the placement of topsoil and approval of final grading.
2. All Restoration Areas should be disked in accordance with the Disk Treatment Notes and Details.
3. Spring seeding should be completed between March 1 and May 15. Fall seeding should be completed between September 15 and November 1.
4. Broadcast fertilizer and lime should not be applied to the restoration area.
5. Seed will be drilled using a no-till seed drill such as a Kasco KED-96 Eco Drill, John Deere 455, Frontier BD-1307, LESCO drill or equivalent towed behind a tractor or ATV.
6. Seed should be drilled at a slow speed, no greater than 3 to 5 miles per hour.
7. Seed should not be drilled if the soil is wet. Soil moisture conditions should be moist to dry at the time of seeding. If soil material sticks to the drill coulters, rollers and/or furrow openers, the soil is too wet to plant. Seeding should be delayed until soil conditions are appropriate.
8. The seed drill should be calibrated to plant and firm the seed at a depth of ¼ inch. Under no circumstances should seed be drilled and/or planted at a depth greater than ½ inch.
9. Planting depth and tractor speed should be checked regularly during the seeding operation.
10. Seed drilled at a depth greater than ½ inch will be rejected by the supervising Restoration Specialist and re-seeding will be required.
11. If portions of the area cannot be drill seeded, seed shall be broadcast spread uniformly by hand or by using centrifugal seeder mounted on an ATV or tractor at the specified rates.
12. After seeding, the soil should be firmed with a corrugated roller or drag mat to ensure good seed to soil contact. The soil firming should be performed on the contour using a roller operated perpendicular to the slope.
13. All seeded areas will be mulched with 2 tons/ac straw or mulch hay (free of undesirable seeds) or an approved equal form of stabilization. Straw mulch will be spread uniformly by hand or mechanically so that 85% of the soil surface is covered and anchored using liquid tackifier or crimper.

UPLAND FOREST AREAS

1. All Upland Forest Areas will be permanently seeded and stabilized with the specified seed mixtures in accordance with the Permanent Seeding Notes.
2. All portions of the Upland Forest Area that contain slopes of 25% (4:1) or steeper shall receive the following stabilization measures:
   a. Immediately upon final grading, seeding and stabilization shall take place.
   b. The specified seed mixture will be applied at a rate of 35 lbs per acre.
   c. This area will receive the Temporary Stabilization Seed mixture in addition to the specified seed mix.
   d. All areas will be stabilized with a rolled biodegradable erosion control fabric such as EC/SC2 or Coir 700 blankets. The contractor shall submit a proposed product for approval prior to application. All biodegradable erosion control blankets must be comprised of biodegradable material.
   e. All biodegradable erosion control matting shall be installed in accordance with manufacturer's recommendations, including top and bottom slope key trenching, and mat staples 3- foot on-center.
3. Following the permanent seeding and stabilization of the Upland Forest Areas, all areas will be planted with a variety of containerized trees and shrubs in accordance with the specified plant list.
4. These areas will be planted with a combination of native tree and understory shrub species, as per the Planting Notes.

STREAM BANK STABILIZATION NOTES

1. All areas of stream bank disturbed during construction shall receive bank stabilization according to the approved notes and details.
2. 8" Riprap (D50) shall be placed (as shown on detail) along the location of the former stream bank. Riprap may be replaced or supplemented with natural stone harvested from throughout the restoration area.
3. Riprap shall be placed as shown in a Longitudinal Peak Stone Toe Protection style.
4. The riprap base shall be approximately 1 foot below the existing stream bed elevation.
5. The peak of the rip rap shall be at the bankfull elevation, as determined in the field by the restoration plan designer.
6. A 5-foot wide planting bench shall be established at the bankfull elevation throughout the entire length of the bank stabilization measure.
7. The planting shelf will be created from clean fill, similar in gradation to the existing onsite stream bank soils.
8. The planting bench shall be seeded, covered by a biodegradable erosion control blanket, and planted with live stakes in accordance with the approved plans and details.
9. The planting shelf will be graded to meet the existing inland grades at a 3:1 slope or less.
10. All exposed areas will be seeded with the approved seed mixture and mulched according to the approved Streambank Stabilization Details.
11. Following stabilization, the Streambank Stabilization Area will be planted with a combination of live stakes and containerized plans in accordance with the specified planting list.
12. Live stakes shall be installed in accordance with the Streambank Stabilization Details and Live Stake Installation Notes.
13. The remainder of the Streambank Stabilization Areas will be planted with a combination of native tree and understory shrub species, as per the Planting Notes.
14. Restoration specialist will layout species in a naturalistic fashion.
15. Photos will be collected to identify the current location of species and these species will be placed in similar locations upon site restoration to the extent feasible.
16. Restoration specialist will layout the trees and shrubs prior to planting. NYSDEC will be informed of the timing of this layout to provide oversight for approval of the restoration specialist layout.

LIVE STAKE INSTALLATION NOTES

1. Care shall be taken not to damage the live cuttings/live stakes during Installation. Those damaged shall be left in place and supplemented with an intact live cutting/live stake.
2. The lengths of live cuttings/live stakes depends upon the application. The length shall extend through the surface of the stone fill. At least half the length shall be inserted into the soil, below the stone fill.
3. A pilot hole is required to ensure that the live cutting/live stake is not damaged when driven through the stone filling. Access shall be made through the use of a dibble bar, or similar tool to work an opening through the rock layer.
4. Minimum 2" to 4" and two live buds of the live cutting/live stake shall be exposed above the stone filling.
5. Live cuttings shall range from 1/2" to 1" in diameter and be from 1' to 4' in length.
6. Live stakes shall range from 1" to 4" in diameter and be from 5' to 6' in length.
7. See contract documents for species, size, spacing, location, and final determination on use of cuttings or stakes.
8. Live cuttings/live stakes shall be cut to a point on the basal end for insertion in the ground.
9. Live stakes shall be placed 1 foot on center with 70% replacement of failed stakes in year 1 and adaptive management in years 2-5 or 1.5 feet on center with 1:1 replacement in year 1-3 and adaptive management in years 4 and 5.
10. Live stakes shall be placed in a staggered fashion and not in a straight line.
11. Where the stakes are >2 feet above bank full, #1 potted shrubs shall be planted at 4 foot on center.

PLANT MATERIAL AND INSTALLATION NOTES

Plant Material

1. All planting materials and methods shall meet or exceed the requirements of ANSI Z-60.1 (current version), T he American Standard for Nursery Stock, published by the American Association of Nurserymen.
2. The Contractor shall provide trees and plants of quantity, size, genus, species and variety as provided in the plant schedules. The Contractor shall provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries abrasions, or disfigurement. All plants shall be free from disease and infestation. The engineer, or their onsite representative, reserves the right to reject any plant material that is deemed to be of inferior quality or that is damaged.
3. All plants shall be pruned to enhance vigor prior to, or upon installation, while retaining natural growth habit of the plants. The central leader shall not be cut; plants provided in this condition shall not be accepted. Damaged, broken or conflicting branches shall be pruned cleanly, flush with the main trunk or branch.
4. Nursery sources must be within a 250-mile radius of the planting site. All specified plants shall have been grown in the same climatic zone as that of the planting site. The contractor must submit their nursery source(s) to the engineer or their onsite representative prior to onsite delivery of plant material.
5. All plants shall be nursery-grown and tagged with a durable label indicating the genus, species and specified variety or cultivar. No "wild collected" plants will be accepted. The contractor shall be responsible for providing copies of sales orders, shipping lists or invoices at the time of delivery to the site.
6. The Contractor shall deliver trees and plants after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and plants in shade, protect from wind, weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture. Water as necessary. Note that herbaceous material dries out rapidly and must be watered as a minimum on a daily basis.
7. The engineer or their onsite representative retains the right to inspect all plant material for size and condition of root system, insects, injuries and latent defects, and to reject unsatisfactory or defective material anytime during the progress of work. The Contractor shall remove rejected plant material from the project site immediately upon notification without compensation. The Contractor shall replace rejected plant material.
8. Due to the timing of the plan approval and restoration activities, plant species composition may be based on the availability of native plant materials from nurseries in the Northeast and Mid-Atlantic region.

Planting

1. Planting will be supervised by the Restoration Specialist or qualified alternate.
2. Planting shall commence at the distal point within each restoration area so that planted areas will not be disturbed after they are planted. Trees will be planted initially, followed by shrubs, herbs and seeding.
3. Trees and shrubs will be planted in a random fashion to mimic natural plant occurrence.
4. The width of the planting pit is to be at least two times the diameter of the root ball or container of the plant that is to be installed. The bottom of the planting pit is to be undisturbed soil to prevent settling. In the event that the soil removal for remediation exceeds the depth of the root ball, the subsoil must be compacted beneath the root ball to minimize settling. Backfill shall be packed around the base of the rootball to provide stability. Remaining backfill should be tamped lightly and watered in. A raised ring of soil shall be placed around the perimeter of the tree or shrub planting hole to direct water toward the rootball.
5. Backfill material for tree and shrub planting pits shall be composed of 30% topsoil and/or organic matter.
6. The topsoil used for backfilling tree and shrub planting pits shall be a "loam" according to the " *Soil Texture Triangle*" and as classified by the U.S. Department of Agriculture. Loam topsoil shall be fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, free of subsoil, clay or impurities, plants, weeds and roots, woodchips, sticks or any other undesirable material. No stones over 1" in diameter shall be allowed.
7. If applicable, the cord binding the ball of all balled and burlapped (B&B) plants shall be cut and removed, and burlap on the upper 1/2 of the root ball shall be removed. Plants with synthetic non-degradable root ball wraps shall not be acceptable unless all wrapping material is removed. Wire baskets must be removed entirely from the upper 1/2 of the root ball. Trees must be watered thoroughly at the time of planting.

8. The Contractor shall incorporate 90 grams of Osmocote 3:4:3 (12-14 month release) and mycorrhizal inoculant (Mycor Plant Saver as manufactured by Plant Health Care, Inc., 440 William Pitt Way, Pittsburgh, PA 15238, (800) 421-9051, or approved equal) into each tree or shrub planting pit. The amount of inoculant used at each plant shall be based on the plant's size - see manufacturer's instructions.
9. All trees will receive 48" high Tree Pro tree guards to protect against damage caused by deer and rodents. Each guard will be staked and fastened in accordance with the manufacturers specifications.
10. Trees and shrubs will be laid out by the designing Restoration Specialist in a random fashion, mimicking a natural forest landscape. Layout will randomly incorporate trees and shrubs of various sizes. Typical spacing throughout the restoration area approximately 15 feet on-center.

NATIVE MEADOW NOTES

1. Sweetgrass *(Hierochloe odorata)* to be planted in the late summer 2016 in the center of the meadow.
2. Red Clover *(trifolium pretense)* to cover most of the area.
3. Purslane *(Portulaca grandiflore)* to be sowed into the southern area of the meadow where it would receive the most of the morning eastern light.
4. Mountain Mint aka Hairy Mountain Mint *(Pycnanthemum verticillatum var. pilosum)* to be planted along the north eastern side of the meadow and perhaps down along the boulders planned for the perimeter of the parking area.
5. Common Mullein *(Verbascum Thapsus)* and Common Milkweed *(Asclepias syriaca)* to be planted along the upper and more western border of the meadow.

MAINTENANCE AND MONITORING
ADAPTIVE MANAGEMENT NOTES

1. The strategy of adaptive management will be implemented in the management of the proposed restoration project during the monitoring period until all performance standards have been achieved.
2. Adaptive management refers to the development of a management strategy that anticipates likely challenges associated with the proposed restoration area project and provides for the implementation of actions to address those challenges.
3. A primary component of the adaptive management strategy is retention of institutional knowledge regarding the design and assumptions of the proposed restoration project. Therefore, the project will be constructed as a design-build or turn-key project with the design consultant directly involved in the design, construction, and maintenance and monitoring of the project.
4. In general, the project will be inspected by the Restoration Specialist quarterly throughout the monitoring period in order to identify any developing problems. Any observed problems will be summarized in the Annual Monitoring Report or Monitoring Memos. A standard inspection form will be developed for the project and will include documentation of the wildlife species observed activity in wildlife enhancement structures, evidence of herbivory, evidence of vandalism, invasive species observed and other pertinent management data.
5. Containerized tree and shrub species will be protected from deer and rodent damage by installation tree shelters.
6. Invasive and/or exotic plant species will be controlled during the monitoring period. Common invasive species anticipated in the proposed restoration site include multiflora rose (Rosa multiflora), reed canarygrass (Phalaris arundinacea), porcelainberry (Ameplopsis brevipedunculata), common reed (Phragmites australis), Japanese stiltgrass (Microstegium vimineum), Japanese honeysuckle (Lonicera japonica), mile-a-minute weed (Polygonum perfoliatum), autumn olive (Elaeagnus angustifolia), Japanese barberry (Berberis thunbergii) and tree of heaven (Ailanthus altissima). These invasive species are currently present within or in the vicinity of the project area.
7. Routine maintenance for control of unwanted plant species will be conducted twice during each growing season (if necessary) to ensure that these species do not become well established within the restoration project.
8. The routine maintenance may include digging, pulling, and/or removing invasive plants from the areas. If necessary, a suitable herbicide treatment will be applied by a certified pesticide applicator.
9. Maintenance memos will be prepared for each individual maintenance event. Maintenance memos shall describe the date, methods and personnel involved in accomplishing the maintenance goal. Maintenance memos will be stored in the project file and discussed/included in the annual monitoring report.

PERFORMANCE STANDARDS &MONITORING PROTOCOLS

1. The proposed restoration project will be deemed "successful" if, after a minimum monitoring period of five (5) years following completion of construction:
   - The specified restoration areas have been restored or enhanced in accordance with the approved plan;
   - 90% or greater survival of trees. (i.e., average density of native trees and shrubs greater than or equal to 200 trees/shrubs per acre) of restoration plantings including natural regeneration of native species throughout the restoration areas This benchmark will be assessed no later than one-year post-planting.
   - Total vegetative cover (defined as ground and canopy cover) of 85% within one growing season.
   - Total vegetative cover (defined as ground and canopy cover) of 90% by Year 3 of monitoring.
   - Total vegetative cover (defined as ground and canopy cover) of 95% by Year 5 of monitoring.
   - Invasive species cover less than 5% of the ground surface in replanted areas after Year 5 of monitoring.
   - 70% replacement of failed stakes in year 1 and adaptive management in years 2-5 or 1.5 feet on center with 1:1 replacement in year 1-3 and adaptive management in years 4 and 5.
2. Restoration areas will be documented by a post-construction, as-built survey of the project.
3. The as-built survey shall depict the post-construction features such as fence locations, existing tree lines, planting zones, monitoring plots, bearings and distances of the deed restricted area and other pertinent information required to assess construction and success of the project.
4. Plant survival and coverage estimates will be documented through the approved monitoring protocols outlined in the Restoration Plan
5. Annual monitoring reports shall be submitted to the agencies in December following each growing season during the monitoring period until the project has been released by the the regulatory agencies.
6. Annual monitoring reports shall contain summaries of the monitoring data including woody plant species, plant height and densities; herbaceous cover estimates and species; site photographs; and description of management issues.
7. Monitoring memos shall be submitted to the regulatory agencies in May each year during the first two (2) growing seasons. Monitoring memos shall address plant growth and survival, herbivory, invasive species and other maintenance issues that may affect the long term development of the proposed restoration area.
8. The proposed monitoring period will commence following completion of construction and continue for a period of at least five (5) years or until all success criteria are achieved, whichever is longer.
9. Vegetative success criteria will be evaluated by systematic sampling within the restoration area.
10. Permanent vegetation plots will be established within the restoration area at representative plot locations. Plots will be located in the field and mapped on the "as-built" survey of the project area.
11. The proposed sampling methodology for inventory plots is discussed in detail by Peet et al. (Peet, R. K., T. R. Wentworth, and P. S. White. 1998. A Flexible Multipurpose Method for Recording Vegetation Composition and Structure. Castanea 63(3):262-274).
12. The standard observation unit will be a 10 x 10 meter module (0.01 ha/0.02 ac). Generally, each plot will consist of a 2 x 3 array of modules (0.06 ha/0.12 ac). Within each array, woody stem presence, cover, and diameter, and height will be recorded within each module.
13. Depending on coverage of herbs and bryophytes, these strata will be sampled using a subset of modules or nested quadrats within modules.
14. Plot and site data will be recorded for each array including soil morphology, aspect, slope, elevation, topographic position, and total estimated cover of the vegetative strata (trees, saplings, shrubs, herbs, vines, and bryophytes).

WILDLIFE HABITAT ENHANCEMENT FEATURES

1. Bat boxes (2) shall be installed within the restoration area.
2. Bat boxes shall be constructed in accordance with the bat box detail.
3. Bat boxes shall be mounted on the south side of a suitable existing tree at a minimum of 10 feet off the ground, as determined by the Restoration Specialist and Bat biologist.
4. Bird boxes (5) shall be installed within the restoration area.
5. Bird boxes shall be constructed in accordance with the bird box detail.
6. Bird boxes shall be mounted on an installed post or suitable existing tree approximately 5 foot off the ground, as determined by the Restoration Specialist.
7. All wildlife habitat enhancement structures will be inspected annually to ensure that the structures are intact and functional.
8. Records of activity within the wildlife habitat enhancement structures will be documented and presented in annual reports.

NOTE: THIS FIGURE IS BASED ON DRAWINGS PREPARED BY AMY S. GREENE ENVIRONMENTAL CONSULTANTS, INC. DATED 7/29/2015.

RAMAPO PAINT SLUDGE OPERABLE UNIT 2
RAMAPO, NEW YORK
OU-2 CONSTRUCTION

RESTORATION PLAN NOTES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3

CITY:MAHWAH-NJ DIV/GROUP:ENVCAD DB:G.STEINBERGER, S.BELL LD:J.GONZALEZ PIC:R.ELLIS PM:E.ZIMMERMAN TM:J.ROCKLIN LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\NJ000698\0008\00002\OU2-RESTORATION-PLAN\NJ698G01.dwg LAYOUT: 3 SAVED: 2/11/2016 4:38 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: PDF-DL-ARCH PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/11/2016 4:38 PM BY: STEINBERGER, GEORGE
XREFS: NJ698X01 NJ698X05 NJ698X02 NJ698X00 IMAGES: batbox.jpg BIRD BOX.jpg PROJECTNAME: ----