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LETTER OF TRANSMITTAL

TO: Mr. Frank Gally, Engineer
 RIDEM - Office of Waste Management
 235 Promenade Street
 Providence, Rhode Island 02908

DATE: 13 April 2005	JOB NO.: 6184601
ATTENTION: Frank Gally	
RE: Response to RIDEM Wetlands Comments	
Ponagansett Avenue Remediation Project	

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COPY TO: Nancy Kafka, TPL
 Bob McMahon, City of Providence
 Michael Weremay, Beckman Weremay Ltd.
 File

SIGNED Timothy Regan
 Title Client Manager

2005 APR 13 12
 RIDEM
 OFFICE OF WASTE MANAGEMENT
 235 PROMENADE STREET
 PROVIDENCE, RI 02908



13 April 2005

Mr. Frank J. Gally, III, Engineer
RIDEM Office of Waste Management
Site Remediation Program
235 Promenade Street
Providence, RI 02908

RE: Response to RIDEM Comments received via email dated 8 March 2005
Ponagansett Avenue Remediation Project
67 Melissa Street, Providence, Rhode Island
Case No. 2001-024

Dear Mr. Gally:

On behalf of The Trust for Public Land, the current site owner, EA Engineering, Science, and Technology, Inc. (EA) offers the following responses to your comments on the Remedial Action Work Plan (RAWP) for the above referenced site, dated July 2004.

- 1. Please address how the remainder of the 200-foot riverbank wetland present south of the proposed limit of riparian restoration will be vegetated. Please note that native shrubs and small trees must be planted on the southerly side of the planned bike path. This could be accomplished by using species from the list provided in Table 2: Zone-B Riparian Uplands. Upwards of approximately 150 additional plantings installed in a staggered fashion may be required. Also, mature trees and other native vegetation currently present within the riverbank wetland should be preserved wherever practicable as already proposed for the riparian restoration area, which may reduce the number of additional plantings necessary.**

Response:

The Trust for Public Land has prepared a Draft Master Plan for the 67 Melissa Street site to support redevelopment that includes playground areas, grassed open space, and youth soccer fields. The design also includes a 10-foot buffer area of native shrubs and small trees to be planted along the southerly edge of the future bike path alignment within the 200-foot riverbank wetland (Attachment A). The plantings will consist of a mix of one or more of the species from the list provided in Table 2: Zone-B Riparian Uplands (Attachment B). In addition, during construction of the riparian restoration area, mature trees and other native vegetation currently present within the riverbank wetland will be preserved wherever practicable.

- 2. The RAWP should incorporate the planting of “deterrent” species (e.g. rose) along the southerly edge of the proposed riparian restoration area which would help to deter human access into the portion of the site where only a 1-foot cap (without a geotextile) is proposed for construction. This is important because the planned location of the future bike path is adjacent to the riparian restoration area. Such plantings would also help reduce**



disturbance of wildlife that is expected to utilize the restored area. To further minimize impacts, an evergreen screen of vegetation along the southerly edge of the riparian restoration area would also be beneficial (e.g. a row of 4-foot high white pine (*Pinus strobes*) planted 8 feet on center).

Response:

Deterrent species (rose, raspberry, evergreen or equivalent) will be planted along the southerly edge of the riparian buffer area to help deter human access and reduce disturbance of wildlife that is expected to utilize the restored area (Attachment A).

- 3. FACW and FACU shrubs are both proposed within the drier portion of the riparian zone to be restored, so it would appear inevitable that at least some of these plantings will fail to thrive. Further, although watering is proposed during the first growing season, monitoring of the plantings is proposed only for the first 2 months after planting (“plant establishment period”). Longer-term monitoring and replacement of vegetation is recommended, in order to ensure the long-term viability of the plantings. This could be coordinated with the monitoring of invasive species, which is proposed to last at least 5 years.**

Response:

Species composition programmed for zone B (Riparian Uplands) of the restoration area includes species that are commonly found in a wide variety of habitats ranging from seasonally saturated to periodically inundated or flooded areas, including both FACU and FACW species. Based on existing and proposed topography in this zone, a species mixture was chosen to increase diversity, structure, and adaptation to various hydrologic conditions consistent with a riparian community. Incorporating a small portion (~10% of total plantings in this zone) of species adapted for medium soil moisture use (e.g. FACW) will increase overall species survival in this area of the restoration site, as well as increase diversity. These species are expected to be planted in areas of the restoration site that are expected to experience wetter microclimatic conditions (e.g. receiving surface runoff from the proposed bike path).

EA agrees with the recommendation to extend the monitoring and replacement period for restorative plantings. Bidding documents for the restoration project will include a 1-year warranty for all plant material, which will require the selected contractor to water the plantings as necessary to meet the contract requirements and help to ensure the long-term viability of the plantings.

- 4. Please be advised that only those activities specifically defined in Rule 6.08 are eligible for a wetlands exemption. Any additional work beyond that required to remediate the site as enumerated in Rule 6.08 (such as the proposed bike path) will require the submission and review of an appropriate Application for the Department’s Freshwater Wetlands Program, such as a Request for Preliminary Determination. Such application will determine if the additional activities can be authorized as an insignificant alteration or if the proposed work represents a significant alteration of the subject wetlands.**

Response:

Agreed.



If you have any further questions about this property, please do not hesitate to contact me at 401-736-3440.

Sincerely,

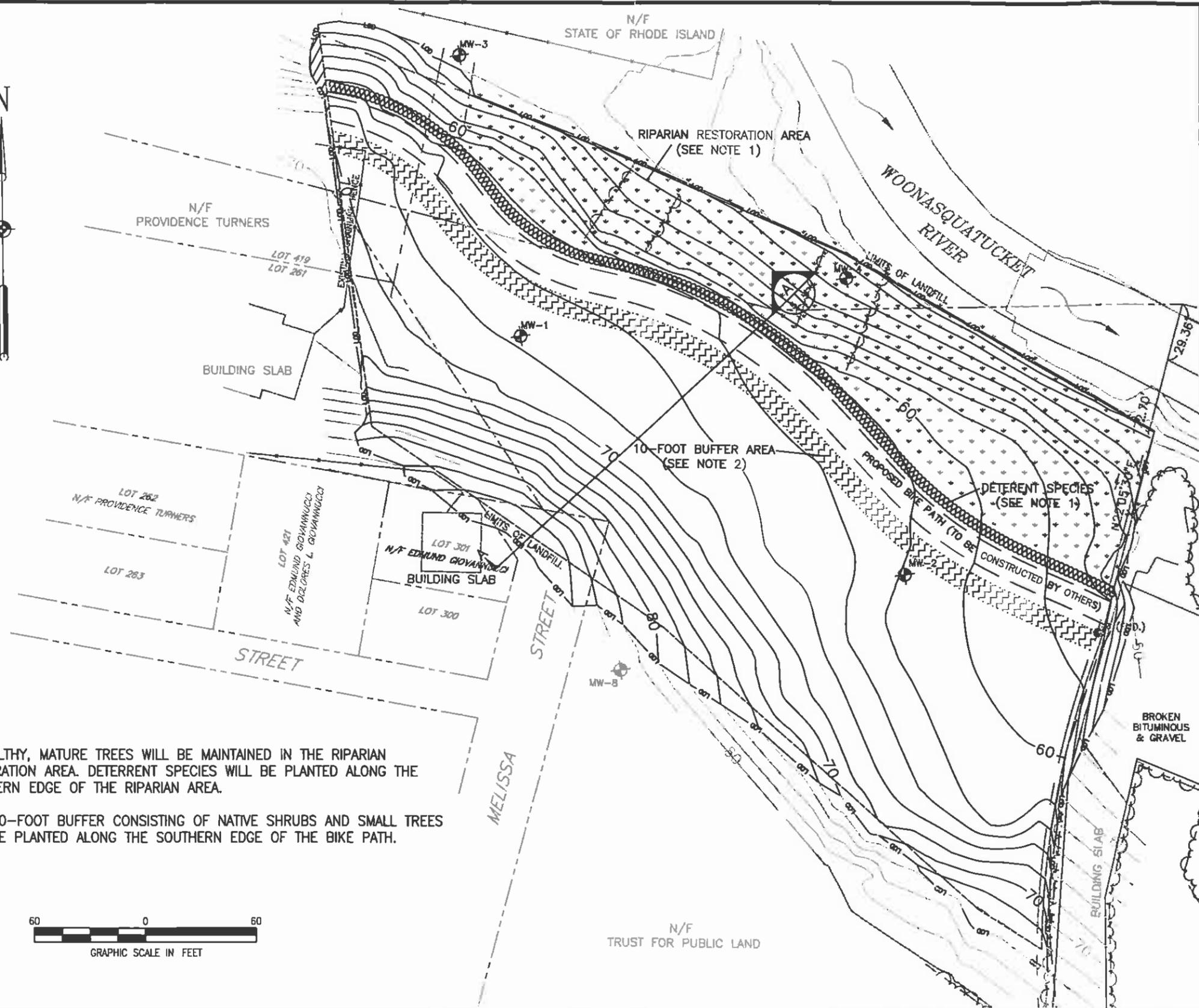
EA ENGINEERING, SCIENCE,
AND TECHNOLOGY, INC.

A handwritten signature in black ink, appearing to read 'Timothy C. Regan'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Timothy Regan, P.E., M.B.A.
Client Manager/Senior Engineer

cc: N. Kafka, The Trust for Public Land
M. Wencek, RIDEM Freshwater Wetlands Program
B. McMahon, Providence Parks Department
M. Weremay, Beckman Weremay Ltd.

ATTACHMENT A



LEGEND

- 50— EXISTING CONTOUR
- X— EXISTING FENCELINE
- ⊕ EXISTING MONITORING WELL
- — — EDGE OF WATER
- — — EXISTING TREELINE
- — — PROPERTY LINE
- LOD— LIMIT OF DISTURBANCE
- 50— PROPOSED CONTOUR
- — — PROPOSED INTERMEDIATE CONTOUR
- - - - PROPOSED GRADE BREAK
- - - - 100-YEAR FLOODPLAIN LIMIT
- ⊕ RIPARIAN RESTORATION AREA
- ▨ NATIVE SHRUBS AND TREES
- ⊕ DETERRENT SPECIES APPROXIMATE LOCATION

NOTES:

1. HEALTHY, MATURE TREES WILL BE MAINTAINED IN THE RIPARIAN RESTORATION AREA. DETERRENT SPECIES WILL BE PLANTED ALONG THE SOUTHERN EDGE OF THE RIPARIAN AREA.

2. A 10-FOOT BUFFER CONSISTING OF NATIVE SHRUBS AND SMALL TREES WILL BE PLANTED ALONG THE SOUTHERN EDGE OF THE BIKE PATH.



THE TRUST FOR PUBLIC LAND
 PONAGANSETT AVENUE REMEDIATION PROJECT
 67 MELISSA STREET
 PROVIDENCE, RHODE ISLAND

FIGURE 5
 PROPOSED REDEVELOPMENT PLAN

PROJECT MGR:
 TR

DRAWN BY:
 BMS

CHECKED BY:
 DWE

DATE:
 APRIL 2005

SCALE:
 AS SHOWN

PROJECT NO:
 6184601

FILE NO:
 I:\Rhode_Island_projects\
 TPL\
 FIG5_REDEVELOPMENT.DWG

ATTACHMENT B

WOONASQUATUCKET RIVER

Providence, Rhode Island

PONAGANSETT AVENUE REMEDATION PROJECT

HABITAT RESTORATION/ PLANTING SPECIFICATIONS

*SEPTEMBER 2004
(Revised October 2004)*

Prepared for:

EA Engineering, Science and Technology, Inc.

Prepared by:

Kleinschmidt
Energy & Water Resource Consultants

WOONASQUATUCKET RIVER
Providence, Rhode Island

PONAGANSETT AVENUE
REMEDIAION PROJECT

Habitat Restoration/
Planting Specifications

September 2004
(Revised October 2004)

Prepared for:

EA Engineering, Science and Technology, Inc.

Prepared by:

Kleinschmidt
Energy & Water Resource Consultants

**WOONASQUATUCKET RIVER
PROVIDENCE, RI**

PONAGANSETT AVENUE REMEDIATION PROJECT

**HABITAT RESTORATION/
PLANTING SPECIFICATIONS**

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**WOONASQUATUCKET RIVER
PROVIDENCE, RI**

PONAGANSETT AVENUE REMEDIATION PROJECT

**HABITAT RESTORATION/
PLANTING SPECIFICATIONS**

1.0 GENERAL

1.1 Summary

This document describes riparian buffer restoration activities which are limited to the area of restoration (see Sheet 2 Planting Plan). Remediation activities will precede restoration of the riparian forest buffer. These activities will focus on the removal of contaminated soil, debris, and invasive vegetation. Efforts will be taken to preserve mature trees and other desirable native vegetation. Surficial debris, soil piles and discrete waste will be removed/regraded, these areas will be supplemented with approximately 1 foot of clean, high organic content fill. The site will then be revegetated to stabilize soils and enhance species diversity and structural complexity. These activities will be conducted using best management practices and every effort to minimize impacts to the surrounding landscape will be taken.

This section covers specifications regarding acquisition and handling of plant material, planting, post planting maintenance, and performance criteria. Specifications for supplemental topsoil, amendments to this topsoil, topsoil testing, and topsoil placement are also included.

1.2 Qualifications for Plant Installation

Plant installation shall be supervised by an experienced landscaping firm and a wetland scientist/habitat restoration specialist. Volunteer labor from local conservation/watershed groups, may be used to supplement professional landscaping staff and the restoration specialist.

1.3 Shipment, Delivery, Inspection, Storage, and Handling of Materials

1.3.1 Shipping Containers

- a. **Plugs and container-grown trees and shrubs.** Containers shall be sufficiently rigid to hold root ball shape and protect plant from damage during shipping.

1.3.2 Identification of Plant Material

Trees and shrubs shall be identified with durable waterproof, u-v stabilized labels, and weather-resistant ink stating the correct plant name and size.

1.3.3 Protection of Plant Material During Shipment

Plant material shall be protected during shipment and delivery to prevent desiccation or excessive damage to the branches, stems, or leaves.

1.3.4 Inspection

Plant material and other products shall be inspected upon arrival at the jobsite for conformity to the specifications. Any unacceptable materials shall be removed from the jobsite.

1.3.5 Storage of Plant Material

Plant material not installed on the day of arrival at the site shall be stored in appropriate designated areas. All plant material, including container-grown trees and shrubs, shall be kept moist. Plants shall be protected from exposure to wind and shall be shaded from the sun.

1.3.6 Storage of Other Materials

Mulch and planting stakes et al. shall be stored in areas designated or approved by the Project Manager.

2.0 PRODUCTS

2.1 Plants

2.1.1 Vegetation Zones

- a. The restoration planting plan for the Ponagasset Remediation Project consists of two distinct vegetation zones. The species composition of each zone reflects morphological and physiological adaptations of the species occupying them to their specific habitats. In a pristine riparian habitat, stream/river specific hydrology and soil characteristics are primary determinants of the extent of these zones. Since remediation activities will strive to preserve mature trees and other desirable native vegetation when possible, an enhancement planting approach has been taken. This approach stresses under-story, and shade tolerant plantings as the primary components of the Revegetation activities. In addition, only woody species have been selected for these plantings in order to enable installation between 15 September and 1 November.

- b. The following passages briefly describe the physical characteristics which are commonly associated with these zones. The diversity of species outlined in the zone descriptions is reflective of the inherent uncertainties of restorative planting success. For this reason many of the species are redundant throughout the various zones, these redundancies are also found in nature as certain plant species are tolerant of a wide range of hydrologic and soil saturation scenarios. Due to the uncertainty of the normal high water levels in this section of the Woonasquatucket River, specific elevation boundaries for these zones are not described.

Zone A-Floodplain Forest

The floodplain forest community is made up of plant species which are tolerant of both saturated and unsaturated

soils and infrequent seasonal inundation. This community is typically found approximately 1' to 5' above normal high water levels. See Section 2.1.2 Table 1 for species composition, planting densities and stock sizes.

Zone B- Riparian Uplands

Uplands Riparian upland communities are typically made up of species that are tolerant of infrequent inundation, usually associated with flooding events above annual high water levels. This community is typically found +5' above normal high water levels, however exact location may vary. See Section 2.1.2 Table 2 for species composition, planting densities and stock sizes.

2.1.2 Vegetation Zone Tables

Table 1: Zone A- Floodplain Forest

Zone A- Floodplain Forest					
Scientific name	Common Name	Size	Quantity (~12' ctrs)	USFS Indicator Status (Region 1)	Inundation Tolerance*
Trees					
<i>Acer rubrum</i>	Red maple	4-6'	2	FAC	25
<i>Acer saccharinum</i>	Silver maple	2-3'	2	FACW	25
<i>Betula alleghaniensis</i>	Yellow birch	3-4'	2	FAC	N/A
<i>Faxinus pennsylvanica</i>	Green ash	18-24"	2	FACW	75
<i>Nyssa sylvatica</i>	Black gum	4-6'	2	FAC	25
<i>Quercus bicolor</i>	Swamp white oak	4-6'	2	FACW+	25
Shrubs					
<i>Aronia arbutifolia</i>	Red chokeberry	2-3'	4	FACW	25
<i>Ilex verticillata</i>	Winterberry	18-24"	6	FACW+	25
<i>Lindera benzoin</i>	Spicebush	2-3'	2	FACW+	13-25
<i>Clethra alnifolia</i>	Sweet pepparbush	18-24"	8	FAC+	NA
<i>Viburnum trilobum</i>	American cranberrybush	2-3'	7	FACW	NA
<i>Myrica pensylvanica</i>	Bayberry	2-3'	3	FAC	25
<i>Sambucus canadensis</i>	Elderberry	18-24"	3	FACW-	26-100
<i>Vaccinium corymbosum</i>	Highbush blueberry	3-4'	4	FACW-	13-25
<i>Viburnum cassinoides</i>	Wild raisin	18-24"	3	FACW+	N/A
Total Plants			52		
Total Area of Zone A-Floodplain Forest (enhancement)			0.13 acres		

* Inundation tolerance indicates the percentage of the growing season in which the species can tolerate flooding inundation, from: Thumhorst G.A. (1993) *Wetland Planting Guide for the Northeastern United States: Plants for Wetland Creation, Restoration, and Enhancement*. Environmental Concern, Inc., St. Michaels, Maryland.

Table 2: Zone B- Riparian Uplands

Zone B- Riparian Uplands				
Scientific name	Common Name	Size	Quantity	USFS Indicator Status (Region 1)
Trees				
<i>Acer saccharum</i>	Sugar maple	4-6'	2	FACU-
<i>Cornus florida</i>	Flowering dogwood	18-24"	14	FACU
<i>Fagus grandifolia</i>	Beech	4-5'	6	FACU
<i>Ostrya virginiana</i>	Ironwood	18-24"	6	FACU-
<i>Pinus strobus</i>	White pine	2-3'	5	FACU
<i>Prunus serotinus</i>	Black cherry	3-4'	7	FACU
<i>Quercus alba</i>	White oak	2-3'	2	FACU/FACU+
<i>Quercus rubra</i>	Red oak	3-4'	4	FACU-
<i>Quercus velutina</i>	Black oak	3-4'	5	NI
<i>Tilia americana</i>	Basswood	2-3'	8	FACU
Shrubs				
<i>Aronia arbutifolia</i>	Red chokeberry	2-3'	8	FACW
<i>Clethra alnifolia</i>	Sweet pepparbush	18-24"	12	FAC+
<i>Cornus racemosa</i>	Gray dogwood	2-3'	9	FAC
<i>Ilex verticillata</i>	Winterberry holly	3-4'	8	FACW+
<i>Lindera benzoin</i>	Common spicebush	18-24"	4	FACW-
<i>Vaccinium angustifolium</i>	Lowbush blueberry	18-24"	6	FACU-
<i>Viburnum trilobum</i>	American cranberrybush	2-3'	6	FACW
<i>Comptonia peregrina</i>	Sweet fern	18-24"	8	NI
<i>Corylus americana</i>	Hazelnut	18-24"	12	FACU-
<i>Gaylussacia baccata</i>	Black huckleberry	18-24"	9	FACU
<i>Hammamelis virginiana</i>	Witchhazel	18-24"	14	FAC-
<i>Kalmia latifolia</i>	Mountain laurel	2-3'	18	FACU
<i>Myrica pennsylvannica</i>	Bayberry	18-24"	9	FAC
<i>Prunus maritima</i>	Beach plum	18-24"	10	UPL
<i>Rhus typhina</i>	Staghorn sumac	18-24"	8	UPL
Total Plants			200	
Total Area Zone B- Riparian Uplands (Enhancement)			0.44 acres	

2.1.3 Source

Plant material shall be provided by a nursery which procures and/or produces native material specifically for restoration or construction projects. Possible sources of this plant material include, but are not limited to, the following:

New England Wetland Plants, Inc.
800 Main Street
Amherst, MA 01002
Phone: 413-256-1752

NYS Urban and Community Forestry Council
87 State Street
Brooklyn, NY 11201
Phone: 718-834-4589

Plant material shall derive from stock native to the northern United States, east of Ohio and north of 39.5 degrees north latitude.

2.1.4 Substitutions

Plant material shall be provided as indicated on the Planting Plan drawings for all vegetation zones in the restoration area. Requests for substitutions shall be submitted in writing to the Project Biologist for approval.

2.1.5 Quality

2.1.5.1 Trees and Shrubs

Vigorous, healthy plants having healthy and well-branched root systems shall be provided. If in leaf, plants shall be provided free from disease with no leaf damage, chlorosis, or wilting and no insect damage, sun-scald injury, or broken branches. If dormant (without leaves), stems shall be pliable and exhibit healthy (light green to yellowish green) cambium. Plants with brittle stems, unhealthy cambium, or broken branches will not be accepted.

2.1.6 Size

Plants shall be furnished in sizes indicated. Plants larger in size than specified are acceptable.

2.1.7 Measurement

Trees and shrubs shall be measured from the base of the plant to the highest naturally occurring branch or leaf. Drooping branches shall not be extended while the plant is being measured.

2.2 Other Materials

2.2.1 Fertilizer

Fertilizer shall be a commercial grade tablet or granular release (8 to 14 month) variety such as Osmocote 18-5-11, Agriform 20-10-5, or approved equal. Fertilizer shall be provided by the contracting landscaper and application methods/rates shall be determined by this firm in the field at the time of planting.

2.2.2 Topsoil

Topsoil shall be suitable planting medium (*i.e.*, loam with proper proportion of sand, silt and clay—no more than about 28% clay and no more than about 70% sand). Supplemental topsoil and amendments shall be added as necessary to create a suitable growth medium. Soil physical properties (*i.e.*, pH texture, organic content, lack of salt or contaminants) shall be suitable for plant growth at the time of plant installation. The soil shall be free of debris, noxious weeds, substances, or other materials harmful to plant growth. Consistence shall be friable (*in situ* soil density must be < 1.40 g/cm); pH levels should range from 5.0 to 7.0. The depth of clean topsoil over subsoil shall be a minimum of 6 inches. Greater depths are acceptable.

2.2.3 Top Dressing

Three to four inches of well-aged organic mulch is to be spread around restorative plantings as top dressing over clean topsoil. Mulch can be shredded and composted hardwood mulch (usually a mixture of hardwood chips, twigs, and leaves) or composted organic matter. Uncomposted organic matter or fresh (green) wood, twigs, clippings, or other waste is not acceptable. When planting

woody plant material, mulch shall be spread back a few inches from the base of the stems to discourage boring insects and fungi. The mulch application shall minimize watering requirements (by retarding evaporation and high soil temperatures) and will improve appearance. Silt fences should be used to prevent mulch from washing downslope to the river in the event of flooding. Additional silt fencing may need to be installed to protect restoration areas from run-off originating from topographically higher project areas.

3.0 ***EXECUTION***

3.1 Site Preparation

3.1.1 Invasive Species

The Ponagansett Remediation site is typical of many disturbed sites in that it harbors numerous invasive plant species. Invasive plants of note at this site include; Japanese knotweed (*Fallopia japonica*), and Oriental bittersweet (*Celastrus orbiculatus*). If these populations are not addressed they will undoubtedly compromise the integrity of the restoration project. The aggressive nature and superior competitive ability of these plants in disturbed habitats (i.e. newly planted areas), will negatively affect botanical diversity and survivorship of restorative plantings.

The following recommendations and action plans are proposed with the understanding that trained professionals will identify and treat targeted invasive species at this site. It is important to note that these recommendations will only be effective if diligent maintenance and monitoring schedules are adhered to.

3.1.1.1 Japanese knotweed (*Fallopia japonica*):

Japanese knotweed (*Fallopia japonica*) is a clonal herbaceous perennial expanding primarily from rhizomes; however it has been observed propagating from inter-nodal aerial tissue as well. This herbaceous perennial combines early emergence with a fast growth rate to

establish a dense leaf canopy, its photosynthetic potential facilitates large and extensive rhizome growth. This strategy excludes many native annuals and herbaceous perennials through effective above and below-ground competition.

Treatment options include chemical and mechanical approaches, while a combination of the two is most effective. Multiple cuts in one growth season are required to significantly effect resource assimilation to belowground parts. Application of glyphosate (Rodeo) to cut stems near the time of leaf senescence (fall) will transport the herbicide to belowground parts detrimentally effecting the vigor of the rhizome system and reducing the following years aboveground biomass production.

Replacement planting is recommended post herbicide treatment to reduce the risk of re-establishment. In addition to replacement therapy, a monitoring regime should be adhered to for at least five years. This should include cutting above ground growth and spot applications of glyphosate to particularly resilient areas. All cut stems of *F. japonica* should be bagged and removed from the site, failure to properly dispose of these cut stems can result in the further spread of this invasive. While eradication of this invasive is unlikely, control of fairly young colonies is possible if the treatment recommendations outlined above are followed.

3.1.1.2 Oriental bittersweet (*Celastrus orbiculatus*):

Oriental bittersweet (*Celastrus orbiculatus*) is a woody climbing vine which utilizes surrounding vegetation or buildings for structural support. Its climbing habit can result in the constriction of vascular systems and/or smothering of surrounding vegetation. It has also been suggested that *C. orbiculatus* vines contribute to higher incidence of tree mortality due to reduced photosynthesis of host plants. The additional weight of these vines burden their host which is thought to increase the likelihood of host plant upheaval under severe weather conditions.

Prolific seed production and an avian dispersal vector compound control difficulties.

Recommended treatment of *C. orbiculatus* should combine severing the connection of climbing vines from their associated root balls (severed vines can be expected to die and decompose in a couple of years), with cut stem application of herbicide (Garlon3A) in early fall or mid summer. Late fall herbicide applications require lower concentrations than summer applications (0.5% vs. 1.0% respectively), therefore fall application is recommended. Due to constraints inherent in the work site vines should be cut during the winter (when they are easily identified) and treated prior to restorative planting and followed up in the fall with a second application. Monitoring should last four-five years and recognize the likelihood of the need for repeated herbicide applications.

3.1.1.3 Poison Ivy (*Toxicodendron radicans*)

While poison ivy is not generally considered an invasive species, compounds within this plant are known to cause allergic reactions causing rashes and other skin irritations in humans. For this reason its abundance at the Ponagansett Avenue Restoration site are of special concern considering that plant installations may be completed by volunteers.

The treatment recommendation for *T. radicans* is a foliar application of herbicide (Rodeo). Cut stem application may be necessary for large specimens or vines with significant amounts of biomass that is not accessible by foliar herbicide application. Treatment may need to be repeated over multiple seasons, but should be initiated at least two weeks prior to the use of volunteers on site in order to allow the herbicides to take effect and reduce the likelihood of human skin irritations.

3.2 Planting

3.2.1 Planting Times

Planting times shall be as follows, unless otherwise approved by the Nursery Contractor and the Contracting Officer:

Trees and Shrubs. 15 May to 15 June or 15 September to 1 November.

3.2.2 Planting Conditions

Planting shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted to and approved by the Project Biologist.

3.2.3 Planting

Plant material shall be installed at the densities indicated on the contract drawings.

- a. **Plugs, trees, and shrubs.** Material shall be set plumb and held in position until sufficient soil has been firmly placed around the root mass or plug. Plants shall be set in relation to surrounding grade so that they are even with the depth at which they were grown in the container. Plastic containers shall be removed prior to planting. Under no circumstances shall trees and shrubs be planted in standing water.

3.2.4 Fertilization

Container-grown trees and shrubs shall be fertilized with a granular or tablet form of slow release fertilizer placed at the bottom of the hold dug for planting. Each plant shall be fertilized with 30 grams of 12- to 14-month

Agriform 20-10-5 or approved equal or as directed by the project landscaping contractor once field conditions are apparent..

3.2.5 Clean Up

Excess and waste material from the planting operation shall be removed and disposed of off the project site.

3.3 Erosion Control

A line of properly toed-in silt fence shall protect downslope areas from work in the project area. Additional erosion control measures may be prescribed by the project manager depending on site specific conditions.

3.4 Maintenance

3.4.1 Watering

Planted areas shall be watered during the initial growing season as necessary to maintain an adequate supply of moisture within the root zone. Irrigation water may be pumped from the Woonasquatucket River during high flow months such as May and June. When the River is at low levels and there is little flow, as determined by best professional judgement, River water shall not be used for irrigation.

3.4.2 Replacement

If performance standards are not met, the contracting officer may require replanting or reseeding. Material provided for replacement shall be in accordance with Subsection 2.1.2. Replacement plants shall be installed in accordance with Section 3.2. An extended plant establishment period may be required for replacement plants.

3.5 Performance Standards and Monitoring

3.5.1 General

Following planting, long-term monitoring of restored areas shall be completed as necessary and as possible. Monitoring is especially crucial during the first two months after plant installation, "plant establishment period". At the end of the period, certain performance standards as described below should be strived for.

3.5.2 Plant Establishment Period

The plant establishment period shall commence immediately after planting and extend two months past planting.

3.5.3 Performance Standards

The following performance standards should be met at the end of vegetation establishment period unless otherwise directed by the contacting office.

- a. Sideslopes shall be stabilized with native vegetative cover and have no eroding areas.
- b. Eighty percent of planted trees and shrubs shall be in a vigorous growing condition with at least 75 percent of branches alive and supporting a typical number of leaves for a healthy sapling of the species or, if dormant, with healthy (light green to yellowish green) cambium.

3.6 Inspections, Corrective Action, and Acceptance

3.6.1 Preliminary Inspection

Immediately after planting is complete, a preliminary inspection shall be held by the Project Biologist and by the landscaping contractor. The quantity and type of plants installed and general acceptability in accordance with the planting plan shall be determined.