EA Engineering, Science, and Technology, Inc.

2350 Post Road
Warwick, Rhode Island 02886
Telephone: 401-736-3440
Fax: 401-736-3423
www.eaest.com

30 November 2009

Mr. Timothy Fleury
RI Department of Environmental Management
Office of Waste Management
235 Promenade Street
Providence, RI 02908

RE: Revised Remedial Alternative No. 3
Lincoln Lace & Braid Remediation Project
Ponagansett Avenue; Providence, Rhode Island
EA Project No. 61891.05.0008

Dear Mr. Fleury:

EA Engineering, Science, and Technology, Inc. (EA) is pleased to submit this revised Remedial Alternative No. 3 on behalf of the City of Providence Parks Department to present additional information regarding the preferred remedial alternative. This letter will serve to expand on the 7 July 2009 Remedial Alternatives Analysis submittal by EA to the Rhode Island Department of Environmental Management (RIDEM) regarding future remedial efforts within the former site tailrace, commonly referred to as the sluiceway.

We are sending this letter per a teleconference between Kelly Owens of RIDEM and me on 24 November 2009, this was a follow-up teleconference to a meeting with RIDEM, the City of Providence Parks Department, and EA personnel on 2 November 2009.

The 2 November 2009 meeting with RIDEM was held to discuss remedial options for the sluiceway, since previous investigations at the site had determined that several contaminants, including polycyclic aromatic hydrocarbons (PAHs) and metals, were present within site sluiceway soils above the RIDEM Residential Direct Exposure Criteria (RDEC). Subsequent sluiceway sediment sampling, completed by EA at the request of RIDEM, detected arsenic and lead above RDEC and Industrial/Commercial Direct Exposure Criteria (I/CDEC). These contaminants are typical of historic mill operations in urban settings.

This letter will address the remedial alternative proposed for the site, which expands on the previously submitted "Remedial Alternative 3 - Engineered Cap Construction, Wetland Restoration, and Implementation of an Environmental Land Use Restriction", and will serve to tie together the previously proposed site engineered cap with the wetland restoration. Additionally, the proposed alternative will serve to assist the groundwater iron concentrations remaining in solution at the confluence of the sluiceway and river.

Revised Remedial Alternative 3 – Engineered Cap Construction, Wetland Restoration, and Implementation of an Environmental Land Use Restriction

The preferred alternative would include the construction of an engineered barrier (cap) throughout the formerly developed portions of the site. This cap would have several configurations but would mainly consist of 1 ft of certified clean fill over a geotextile fabric throughout the majority of the site. An engineered cap constructed in this manner would effectively isolate future site visitors from the impacted soil.

In the wetland buffer areas along the sluiceway and river, the cap would consist of 1 ft of certified clean material without the geotextile material to allow for the permanent establishment of wetland vegetation. Wetland vegetation would be densely planted in a buffer area between the sluiceway and the proposed landfill cap. This dense vegetation would serve a dual purpose to prevent easy access for the public into the sluiceway and to limit visual impacts from some of the iron staining, as discussed with RIDEM on 21 August 2008. RIDEM is aware of the public perception problem that is likely to result in regard to leaving this iron staining in place and suggested that a public education effort via posted signs and/or brochures be developed. The education effort should provide the public with information that this iron staining does not pose a public health threat and that this particular staining is a naturally occurring phenomenon.

Within the upper portions of the sluiceway, areas with historical and recently-detected contaminant concentrations above the RDEC, we propose to install an engineered cap that will isolate sediments but allow for the free flow of groundwater into the sluiceway and flow from the sluiceway to the Woonasquatucket River. This proposed system would consist of a geotextile overlaid by a geogrid for structural support and a 6-in. thick layer of 1-1/2-in. diameter (maximum) stone aggregate. This method limits the volume of material to be excavated so that no net loss of flood storage is achieved, since the sluiceway is located within the 100-year floodplain.

In the lower portions of the sluiceway, areas with no detected contaminant concentrations above the RDEC, we propose to excavate soils to serve two purposes. The first is to compensate for the installation of the sluiceway engineered barrier in the upper portions of the sluiceway to result in no net loss of flood storage. The second reason is for the development of an elevation drop near the confluence of the sluiceway and river which will limit the generation and flow of aesthetically displeasing iron floc into the river through aeration of the water. EA proposes to install three riprap check dams and repair a fourth check dam to assist with the iron floc remedy. Refer to the attached Proposed Sluiceway Engineered Barrier Plan for an overall conceptual plan of the sluiceway proposal.

In areas within the 100-year floodplain outside the sluiceway, the engineered cap would involve excavating 1 ft of soil prior to filling 1 ft to maintain the original grade. This methodology would prevent the subtraction of flood volume storage within the Woonasquatucket River watershed.

In addition to the engineered cap, an Environmental Land Usage Restriction (ELUR) would be recorded in the Providence land evidence records describing the extent of the cap and would include a site-specific Soil Management Plan (SMP). This SMP would provide instruction for future cap

inspections and the proper measures to take in the event of any construction or cap disturbance, including RIDEM notification and proper soil handling procedures.

This revised remedial alternative is the preferred remedial alternative for the site. It would adequately isolate contaminated soils and sediments from future direct exposure, limit annual maintenance of the engineered barrier, and would include measures to annually inspect and repair the cap as needed. The engineered cap would improve the site as green space by removing the mill structure and seeding the area. The wetland plantings will not only greatly improve the area aesthetically, but will become a greatly improved habitat for all wetland species. It is expected that the site will become a valuable asset to future recreational users of the bike path, as well as native flora and fauna.

Please do not hesitate to contact me with any questions or concerns on this matter at (401) 736-3440, Ext. 202.

Sincerely,

EA ENGINEERING, SCIENCE,
AND TECHNOLOGY, INC.

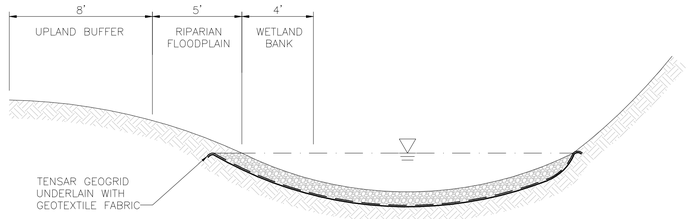
Mark K. Speer, P.E.
Project Manager

MKS/elh

cc: K. Owens - RIDEM
R. Gagnon - RIDEM
R. McMahon, Superintendent - Providence Parks Department
S. Riesland, PE – Fay, Spofford & Thorndike
D. Capalbo - Rhode Island Department of Transportation
F. Postma, PG, LEP, LSP - EA
R. Mack - EA

General Notes

1. TOPOGRAPHY BASED ON ADDITIONAL FIELD WORK AND DATA COMPILATION PERFORMED BY DIPRETE ENGINEERING ASSOCIATES, INC. (DEA) ON SITE IN APRIL OF 2007. NO PROPERTY LINE SURVEY WAS PERFORMED BY DEA. SURVEY OF THE FORMER RACEWAY WAS PERFORMED BY DEA IN DECEMBER, 2004 AND MAY, 2005.
2. ADDITIONAL INFORMATION & BASEMAPPING PROVIDED TO DEA BY EA ENGINEERING, SCIENCE & TECHNOLOGY IN THE FORM OF THE FOLLOWING PLAN: "THE TRUST FOR PUBLIC LAND PONAGANSETT AVENUE REMEDIATION PROJECT, 67 MELISSA STREET, PROVIDENCE, RHODE ISLAND, FIGURE 2, EXISTING CONDITIONS PLAN, DATE: September 2005, PROJECT NO: 6184601"
3. BENCHMARKS PROVIDED BY EA ENGINEERING VIA PLAN REFERENCE IN NOTE #2. VERTICAL DATUM CONFIRMED BY DIPRETE ENGINEERING ASSOCIATES, INC. VIA GPS OBSERVATIONS IN APRIL 2007. THE VERTICAL DATUM IS NGVD'29. HORIZONTAL DATUM IS R.I. STATE PLANE, NAD–83.
4. THERE IS A 100 YEAR FLOOD PLAIN LOCATED ON SITE. REFERENCE FEMA FLOOD INSURANCE RATE MAP 445406 0004 F , MAP REVISED JUNE 6, 2000. THE FLOOD ELEVATION RANGES BETWEEN ELEVATION 43 AND 41.7.
5. PROPOSED PLANTING AREAS INCLUDE REMOVAL OF UP TO 12" OF SOIL IN UPLAND BUFFER AND RIPARIAN ZONES. MATERIAL WILL BE REPLACED WITH CLEAN TOPSOIL SUITABLE FOR WETLAND PLANTINGS.



PROFILE A–A
DOWNSTREAM SLUICEWAY

8 4 0 8
SCALE IN FEET

LEGEND

AREA OF SLUICEWAY MODIFICATION

PROPOSED PLANTING ZONES

UPLAND BUFFER (TYPE 1)
RIPARIAN FLOODPLAIN
WETLAND BANK
UPLAND BUFFER (TYPE 2)

PROPOSED PLANTING LIST

Common Name	Latin Name	Note
Upland Buffer (Type 1)		
Arborvitae	*Thuja occidentalis*	Tree/shrub
American Holly	*Ilex opaca*	Shrub
Upland Buffer (Type 2)		
Sugar maple	*Acer saccharnum*	Tree
White pine	*Pinus strobus*	Tree
White oak	*Quercus alba*	Tree
Red oak	*Quercus rubra*	Tree
Red cedar	*Juniperus viginiana*	Tree
Gray dogwood	*Cornus racemosa*	Tree
Sweetfern	*Comptonia peregrina*	Shrub
Hazelnut	*Corylus americana*	Shrub
Witchhazel	*Hammamelis virginiana*	Shrub
Staghorn sumac	*Rhus typhina*	Shrub
Riparian Floodplain		
Atlantic white cedar	*Chamaecyparis thyoides*	Tree/shrub
Eastern red cedar	*Juniperus virginiana*	Tree/shrub
Weeping willow	*Salix babylonica*	Tree
Bayberry willow	*Salix myricoides*	Tree
Bog willow	*Salix pedicellaris*	Tree
Meadow willow	*Salix petiolaris*	Tree
Black willow	*Salix nigra*	Tree
Inkberry	*Ilex glabra*	Shrub
Winterberry	*Ilex verticillata*	Shrub
Alder	*Alnus spp.*	Shrub
Northern arrowwood	*Viburnum dentatum*	Shrub
Sweetpepperbush	*Clethra alnifolia*	Shrub
Spicebush	*Lindera benzoin*	Shrub
Wetland Bank		
Broadleaf cattail	*Typha latifolia*	Herb

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DESIGNED BY	DRAWN BY	DATE	PROJECT NO.	FILE NAME
RGM	DPA	11–30–09	61891.05	–
CHECKED BY	PROJECT MGR.	SCALE	DRAWING NO.	FIGURE
MKS	MKS	1" = 30'	–	1

LINCOLN LACE AND
BRAID SLUICEWAY RECONSTUCTION
PROVIDENCE, RHODE ISLAND

PROPOSED SLUICEWAY ENGINEERED BARRIER
FIGURE 1