



WETLAND BUFFER ENHANCEMENT/RESTORATION PLAN
SLAG DISPOSAL BECKWITH PROPERTY SITE

Prepared for

Farallon Consulting L.L.C.

Prepared by

Anchor QEA, LLC

1423 Third Avenue

Suite 300

Seattle, Washington 98101

June 2010

RECEIVED

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**CITY OF KENT
ENGINEERING DEPT**

APPROVED

City of Kent P.W. Dept.
Environmental Engineering

By: A. Gates

Date: 6/30/10

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1 INTRODUCTION

This Wetland Buffer Enhancement/Restoration Report provides the results of a critical areas assessment on an approximately 4.7-acre parcel of land located in the City of Kent, King County, Washington (Township 22 North, Range 5 East, Section 7). The purpose of this report is to assess wetland buffer impacts associated with the Slag Disposal Beckwith Property Site (Project) and to describe proposed wetland buffer restoration measures. The City of Kent has jurisdiction over development in the wetland buffer pursuant to the City of Kent City Code (KCC) Critical Areas Ordinance (CAO), Chapter 11.06 (City of Kent 2010). The Project site is located on the east side of Highway 167 at the intersection of South 218th Street and 88th Avenue South. Site investigations for this report were performed by Anchor QEA ecologists on April 28, 2010.

This report was prepared in accordance with City of Kent criteria, as defined in the KCC CAO (City of Kent 2010). The following sections of this report describe the methods used in the investigation and Anchor QEA's findings. Descriptions of the Project and the Project background are included in Section 2. A description of wetlands and wetland buffers within the site is included in Section 3. Section 4 includes a description of the wetland buffer impact area and the wetland buffer restoration, and Section 5 details a conceptual wetland buffer enhancement/restoration plan. Buffer restoration and enhancement of existing disturbed buffer habitat is proposed. Appendix A includes a vicinity map of the Project site and restoration plan drawings.

2 PROJECT BACKGROUND AND DESCRIPTION

The approximately 4.7-acre site is located near the intersection of South 218th Street and 88th Avenue South in the City of Kent, King County, Washington (Township 22 North, Range 5 East, Section 7). The site is located at the base of a north-south-trending, west-facing steep slope. South 218th Street forms the northern boundary of the site. The west side of the site is bordered by 88th Avenue South. Chain link fences and gates are located along the perimeter of the site. Highway 167 is located west of the site, and residential property is located to the north, south, and east. A vicinity map of the Project site is shown on Figure 1.

2.1 Review of Existing Information

As part of the analysis to identify and assess impacts to critical areas at the Project site, Anchor QEA ecologists reviewed the following sources of information to support field observations:

- KCC CAO (City of Kent 2010)
- *South 224th Street Extension Wetland Technical Report* (ESA Adolfson 2006)
- *Beckwith Property Slag Disposal Site Wetland Delineation Report* (Springwood Associates, Inc. 1995)
- *Slag Disposal Beckwith Property Site Excavation Project Design Plans* (Farallon Consulting L.L.C. 2010a)
- *Cleanup Action Work Plan* (Farallon Consulting L.L.C. 2010b)
- Aerial photographs

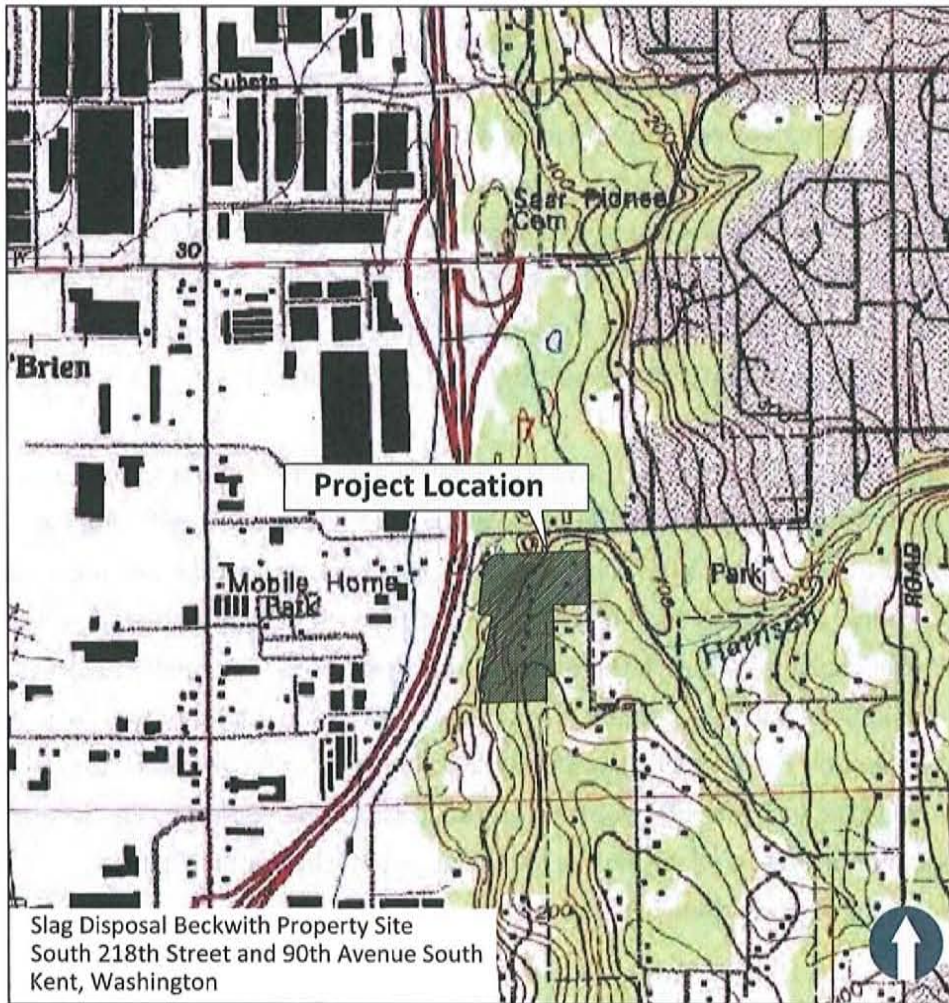
2.2 Project Background

Approximately 16,500 cubic yards of secondary steel slag containing lime ash were used as fill at the site between 1984 and 1990. Surface water reacted with the lime ash within the slag to increase pH to more than the regulatory limit of 8.5, as defined in Consent Decree No. 95-2-15301-1, entered into by the Washington State Department of Ecology (Ecology) and the land owner, Earle M. Jorgensen Company.

SOURCE: Base map prepared from Terrain Navigator Pro USGS 7.5 minute quadrangle map(s) of Kent, WA.



↑
Not to Scale



Slag Disposal Beckwith Property Site
South 218th Street and 90th Avenue South
Kent, Washington

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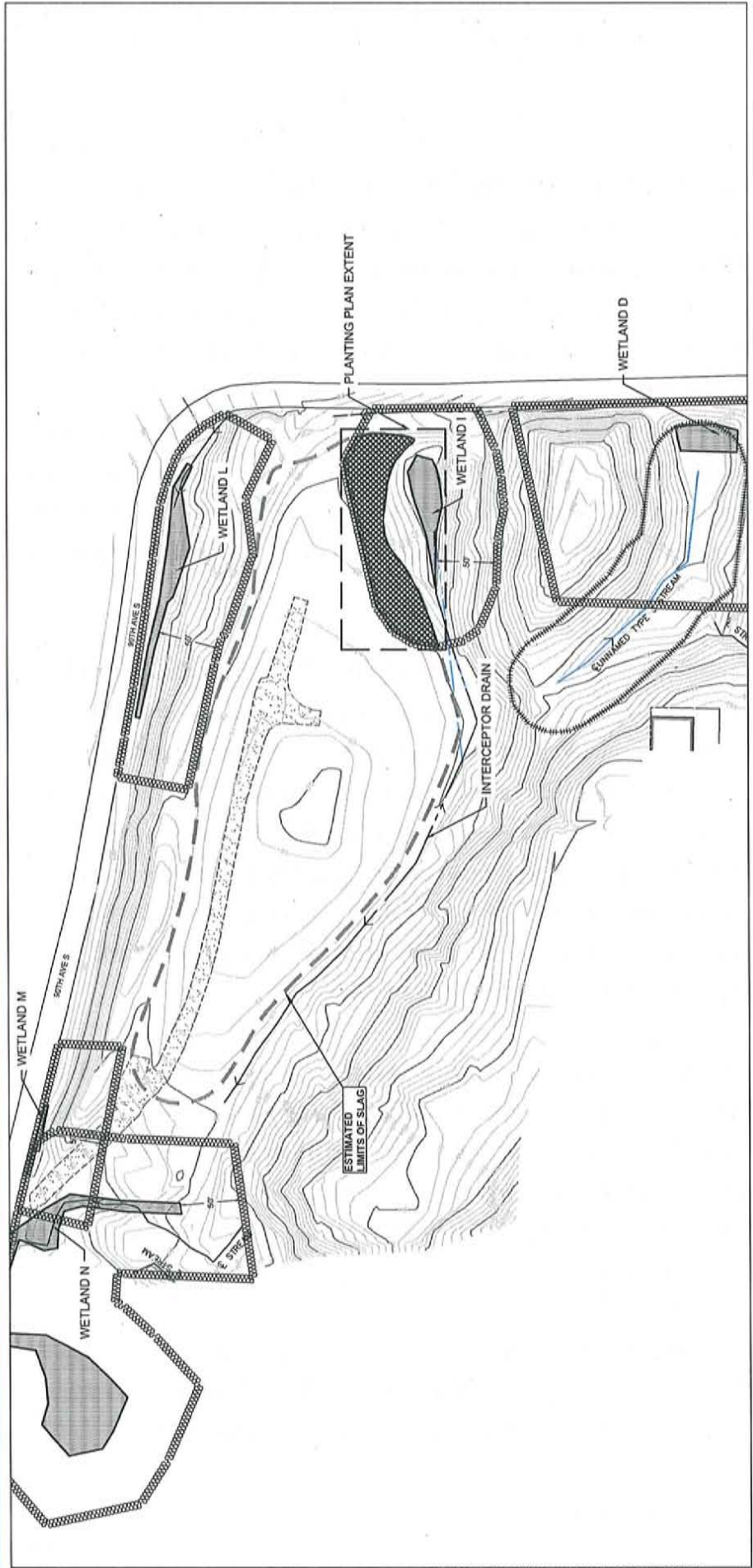


Figure 1
Vicinity Map
Wetland Buffer Enhancement/Restoration Plan
Slag Disposal Beckwith Property Site

2.3 Project Description

The selected cleanup action includes excavation and offsite disposal of the approximately 16,500 cubic yards of slag at the site to reduce the pH of surface water discharging from the site to less than 8.5. Following excavation, the site will be restored and graded to allow surface water to drain approximately as it did prior to slag removal activities. There are five wetlands located within the site (Wetlands D, I, L, M, and N) in the vicinity of the proposed excavation, as described in Section 3. Under the proposed cleanup action, excavation at the site will encroach into protective wetland buffers, as defined by the City of Kent (City of Kent 2010), but will not result in direct impacts to wetlands. The site restoration will include replanting native vegetation within disturbed wetland buffer areas and hydroseeding the remaining disturbed upland areas. The cleanup action will result in a permanent solution to protect human health and the environment and will meet Ecology requirements for closure and de-listing the site from the Ecology Confirmed and Suspected Contaminated Sites List. A more detailed description of the cleanup action is provided in the *Cleanup Action Work Plan* prepared by Farallon Consulting, L.L.C. (2010b).

Under the Project, approximately 0.13 acre (5,440 square feet [sf]) of temporary wetland buffer impacts would occur to the buffer of Wetland I. No wetland buffer impacts would occur to Wetlands D, L, M, or N. The Wetland I buffer impact would occur on the east side of the excavation activity, as shown on Figure 2. Proposed mitigation for the temporary wetland buffer impacts would be the enhancement/restoration of the disturbed wetland buffer by replanting native vegetation within the disturbed wetland buffer area. As described in Section 3, the existing buffer area of Wetland I that would be disturbed is currently degraded and provides poor buffer functions to the wetland. The locations of the existing wetland buffer, wetland buffer impact area, and the wetland buffer enhancement/restoration plantings are shown on Figure 2.



LEGEND:

-  Wetland
-  Wetland Buffer
-  Stream Buffer

-  Temporary Buffer Impact Area



Figure 2
 Wetland Buffer Plan
 Wetland Buffer Enhancement/Restoration Plan
 Slag Disposal Beckwith Property Site



3 WETLAND AND WETLAND BUFFER AREA DESCRIPTIONS

This section provides a description of the five wetlands within the Project site. Four of these wetlands are within close proximity to the proposed excavation and the existing conditions of wetland buffers are described. Wetlands within the Project site were delineated in 1995 and 2006, as identified in the *Beckwith Property Slag Disposal Site Wetland Delineation Report* (Springwood Associates, Inc. 1995) and the *South 224th Street Extension Wetland Technical Report* (ESA Adolfson 2006). Information on wetlands within the project site is based on the information in these documents. Information on wetland buffer conditions is based on these documents and information collected by Anchor QEA during an April 2010 site visit. The cleanup action will result in approximately 0.13 acre (5,440 sf) of temporary impacts to Wetland I buffer habitat.

Five wetlands were identified within the Project site, identified as Wetlands D, I, L, M, and N. Wetlands and the associated wetland buffers are shown on Figure 2. Wetland D, is a Category II wetland (ESA Adolfson 2006) located more than 200 feet east of the east boundary of Wetland I and over 300 feet from the proposed excavation area. In addition, Wetland D is located in a ravine on the east side of the steep sloped hillside/ridge that borders the east side of Wetland I. The ridge separates the drainage supporting Wetland D from the drainage supporting Wetland I. Due to the distance and topography between Wetland D and the proposed excavation and the landform between the wetland and the Project site, Wetland D is not addressed further in this report.

Of the four remaining wetlands in the Project site, proposed excavation will encroach into the wetland buffer of Wetland I and will avoid the buffers of Wetlands L, M, and N. Since the wetlands are depressional, it is important to note that the grading associated with the removal of the slag will not result in changes to the site drainage patterns that support the wetland hydrology. The existing and proposed drainage patterns, and the area draining to each wetland, will remain the same.

Complete descriptions of the four wetlands and associated wetland buffers identified in the Project site are provided in the following subsections. Wetlands in the Project site were rated using the most current version of Ecology guidance in Washington: *State Wetland*

Rating System for Western Washington: Revised (Ecology 2004) and *Wetland Rating Form – Western Washington, Version 2* (Ecology 2008), and according to City of Kent criteria, as defined in the KCC CAO Chapter 11.06 (City of Kent 2010). Table 1 presents a summary of the four wetlands in the Project site. For more specific information on wetlands within the Project site, including wetland data plots, please refer to the *South 224th Street Extension Wetland Technical Report* (ESA Adolfson 2006).

Table 1
Sizes, Classifications, and Ratings of Wetlands Located in Close Proximity to Proposed Excavation

Wetland	Wetland Size (acres)	USFWS (Cowardin) Classification	Hydrogeomorphic Classification	State Rating (Ecology)	City of Kent Rating	City of Kent Wetland Buffer (feet)
I	0.03	POW	Depressional	IV	IV	50
L	0.04	PEM	Depressional	IV	IV	50
M	0.004	PEM	Depressional	IV	IV	50
N	0.03	PEM	Depressional	IV	IV	50

POW = Palustrine Open Water
 PEM = Palustrine Emergent

3.1 Wetland I

Wetland I is a small (0.03 acre) palustrine open water (POW) wetland dominated by common duckweed (*Lemna minor*). Second-growth forested habitat is located to the east, south, and north. Dominant vegetation in the forested habitat includes western red cedar (*Thuja plicata*), big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), vine maple (*Acer circinatum*), Indian plum (*Oemleria cerasiformis*), salmonberry (*Rubus spectabilis*), and red elderberry (*Sambucus racemosa*). To the west there is a narrow, approximately 25-foot-wide band of young (about 6 to 10 feet tall) western red cedar trees and shrubs such as Indian plum and red elderberry. Most of these plants appear to have been planted following installation of a clay barrier in about 2004. Wetland buffer habitat within this approximately 25-foot area of Wetland I provides good quality buffer habitat for the wetland. The area further than about 25 feet from the wetland boundary is the footprint of the original excavation area. This area is currently dominated by nonnative shrubs such as Himalayan

blackberry (*Rubus armeniacus*) and Scot's broom (*Cytisus scoparius*), and grass and herbaceous species such as tall fescue (*Festuca arundinacea*), reed canarygrass (*Phalaris arundinacea*), common velvet grass (*Holcus lanatus*), colonial bentgrass (*Agrostis capillaris*), common dandelion (*Taraxacum officinale*), American vetch (*Vicia americana*), and red clover (*Trifolium pratense*). Patches of bare ground are also common in the area of the slag fill.

3.2 Wetland L

Wetland L is a small (0.04 acre) palustrine emergent (PEM) wetland associated with a ditch located along the east side of 88th Avenue South. The dominant vegetation in Wetland L is reed canarygrass. Second-growth forested habitat similar to what is described for Wetland I is located to the east, south, and north. The original slag fill area, dominated by grass and herbaceous species and nonnative shrubs as described for Wetland I, is located about 40 to 50 feet east of Wetland L.

3.3 Wetland M

Wetland M is a small (0.004 acre) PEM wetland associated with a ditch located along the east side of 88th Avenue South, south of Wetland L. The dominant vegetation in Wetland M is reed canarygrass and giant horsetail (*Equisetum telmateia*). Second-growth forested habitat similar to what is described for Wetland I is located to the east and north. The original slag fill area, dominated by grass and herbaceous species and nonnative shrubs as described for Wetland I, is located about 40 to 50 feet east of Wetland M. An unpaved access road associated with the site is also located to the south and east.

3.4 Wetland N

Wetland N is a small (0.03 acre) PEM wetland associated with a ditch located along the east side of 88th Avenue South, south of Wetland M, and two small seasonal streams. The dominant vegetation in Wetland N is reed canarygrass, American speedwell (*Veronica americana*), giant horsetail, and some patches of salmonberry. Second-growth forested habitat similar to what is described for Wetland I is located to the east and south. The original slag fill area, dominated by grass and herbaceous species and nonnative shrubs as

described for Wetland I, is located about 50 feet north of Wetland N, and the unpaved access road associated with the site is located to the west and north.

A list of vegetation species observed at the site and the presence of plant species within the buffer areas that would be temporarily disturbed during excavation is identified in Table 2.

Table 2
Summary of Vegetation Species Present within the Project Site and Buffer Areas that Would be Temporarily Disturbed

Scientific Name	Common Name	Vegetation Present within Buffer Areas to be Temporarily Disturbed	Vegetation Present within Project Site
Trees			
<i>Acer macrophyllum</i>	Big-leaf maple	No	Yes
<i>Alnus rubra</i>	Red alder	No	Yes
<i>Populus trichocarpa</i>	Black cottonwood	No	Yes
<i>Salix hookeriana</i>	Hooker willow	No	Yes
<i>Thuja plicata</i>	Western red cedar	No	Yes
Shrubs			
<i>Acer circinatum</i>	Vine maple	No	Yes
<i>Corylus cornuta</i>	Beaked hazelnut	No	Yes
<i>Cytisus scoparius</i>	Scot's broom	Yes	Yes
<i>Lonicera involucrata</i>	Black Twinberry	No	Yes
<i>Oemleria cerasiformis</i>	Indian plum	No	Yes
<i>Rhamnus purshiana</i>	Cascara	No	Yes
<i>Rosa nutkana</i>	Nootka rose	No	Yes
<i>Rubus armeniacus</i>	Himalayan blackberry	Yes	Yes
<i>Rubus parviflorus</i>	Western thimbleberry	No	Yes
<i>Rubus spectabilis</i>	Salmonberry	No	Yes
<i>Symphoricarpos albus</i>	Snowberry	No	Yes
Herbaceous & Ferns			
<i>Agrostis capillaris</i>	Colonial bentgrass	Yes	Yes
<i>Equisetum telmateia</i>	Giant horsetail	Yes	Yes
<i>Festuca arundinacea</i>	Tall fescue	Yes	Yes
<i>Geranium robertianum</i>	Stinky bob	Yes	Yes
<i>Holcus lanatus</i>	Common velvet grass	Yes	Yes
<i>Juncus effusus</i>	Soft rush	Yes	Yes
<i>Phalaris arundinacea</i>	Reed canarygrass	Yes	Yes
<i>Taraxacum officinale</i>	Common dandelion	Yes	Yes
<i>Trifolium pratense</i>	Red clover	Yes	Yes
<i>Veronica americana</i>	American speedwell	No	Yes
<i>Vicia americana</i>	American vetch	Yes	Yes

4 WETLAND BUFER IMPACT AREA AND ENHANCEMENT/RESTORATION

DESCRIPTION

This section provides a description of the proposed wetland buffer impact area and wetland buffer enhancement and restoration. Wetlands and the associated wetland buffers are shown on Figure 2.

As shown on Table 1, Wetlands I, L, M, and N have 50-foot protective buffers per KCC CAO Chapter 11.06 (City of Kent 2010). According to the KCC CAO, buffer enhancement/restoration is required when impacts to wetland buffers occur (KCC Chapter 11.06.600E). Buffer enhancement/restoration report requirements are identified in KCC Chapter 11.06.600F and mitigation and monitoring standards are identified in KCC Chapter 11.06.550.

4.1 Wetland Buffer Impact Area

The wetland buffer habitat within the western portion of the existing 50-foot buffer of Wetland I (where wetland buffer impacts will occur) provides poor quality habitat functions. The wetland buffer within the proposed area of excavation is dominated by a mosaic of native and nonnative grass and herbaceous species with no trees, and shrubs are limited to the nonnative species Scot's broom and Himalayan blackberry (see Section 3). Wetland buffer habitat conditions within or near the proposed buffer impact areas are shown on Photograph 1 and 2.



Photograph 1: Wetland I Buffer on Right Side of Photograph, Facing North



Photograph 2: Wetland I Buffer Proposed to be Impacted on Right Side of Photograph, Facing South

Proposed mitigation for temporary impacts to approximately 0.13 acre (5,440 sf) of the wetland buffer of Wetland I include replanting native trees and shrubs within the 50-foot buffer on the west side of the wetland. The location of the wetland buffer impact area and the buffer mitigation planting plan are shown on Figures 2 and 3, respectively.

Habitat features including snags, downed wood, and brush piles that provide foraging and cover habitat for wildlife such as insects, amphibians, birds, and small mammals are not located within the area of temporary wetland buffer impacts.

4.2 Wetland Buffer Enhancement/Restoration

Wetland buffers are vegetated areas surrounding a wetland boundary that protect wetlands from the effects of adjacent land use. Buffers help wetlands function by filtering storm runoff from surrounding developed land uses, trapping sediment, absorbing nutrients, attenuating high flows, and providing wildlife habitat. Buffers also physically separate wetlands from developed areas in order to lessen noise, light, chemical pollution, and other associated human-related disturbances. Due to the interconnectivity between a wetland and the surrounding uplands, impacts to the buffer can damage the ecological functions of the wetland.

As described previously, the areas in which temporary wetland buffer impacts are proposed include disturbed areas with limited plant variety and no tree cover. Wetland buffer habitats under these conditions are generally poor. Proposed enhancement/restoration includes planting native tree and shrub species not currently present within the buffer area of Wetland I that would be disturbed (see Table 2). Overall, replanting native vegetation within the temporarily disturbed buffer area will provide higher quality wetland buffer habitat than existing conditions.

5 CONCEPTUAL WETLAND BUFFER ENHANCEMENT/RESTORATION PLAN

This report was prepared to address the proposed slag excavation, which will encroach into the 50-foot protective wetland buffer of Wetland I, and near, but not within, the 50-foot protective wetland buffers of Wetlands L and M. This section, addressing a wetland buffer enhancement/restoration plan, was prepared based on the KCC CAO criteria for wetland buffer restoration (Chapters 11.06.600E, 11.06.600F, and Chapter 11.06.550(City of Kent 2010)). The plan proposes to avoid impacts to Wetlands L, M, and N and mitigate all unavoidable temporary wetland buffer impacts to Wetland I associated with proposed construction with enhancement and restoration.

5.1 Mitigation Sequencing

5.1.1 Avoidance and Minimization Measures

Buffer impacts to the Wetland I buffer from slag excavation are unavoidable. Impacts to wetland buffers will be temporary and mitigated by enhancing and restoring disturbed existing degraded wetland buffers.

5.1.2 Enhancement/Restoration Measures

Mitigation enhancement and restoration measures also include wetland buffer replanting as described in the following section. Establishing native tree and shrub vegetation will enhance the existing wetland buffer functions by replacing habitat dominated by nonnative shrubs and grass and herbaceous vegetation with native plants adjacent to existing higher quality wetland buffer habitat. Overall, establishing native vegetation in the area of the proposed temporary impacts will provide higher quality wetland buffer functions than the existing wetland buffer conditions and add to the higher quality buffer habitat that currently exists within about 25 feet of the west side of Wetland I. As mentioned above, this portion of the buffer appears to have been enhanced/restored with native vegetation when the clay barrier was installed. Buffer species include red alder, big-leaf maple, Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), Indian plum, salmonberry, nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), and sword fern (*Polystichum munitum*).

5.2 Wetland Buffer Enhancement/Restoration Mitigation

The mitigation action provides compensatory mitigation for unavoidable temporary impacts to 0.13 acre (5,440 sf) of wetland buffer associated with Project construction. Compensation for these unavoidable temporary impacts to wetland buffer will be accomplished through replanting approximately 0.13 acre (5,440 sf) of wetland buffer within the disturbed wetland buffer area.

As described in Section 4, the wetland buffer of Wetland I that would be temporarily disturbed is generally of poor quality due to the dominance of native and non-native grass and herbaceous vegetation and the general lack of native trees and shrubs. No trees are present in the area of proposed impacts. Vegetation removal as part of the Project is not expected to degrade existing baseline conditions. Replanted native wetland buffer vegetation in the disturbed wetland buffer area will be improved in both quantity and species composition over that found at the area of buffer impacts. Topsoils in the restored area of the buffer will include an 8-inch base layer of on-site stockpiled topsoil, and a 4-inch surface layer of imported topsoil, plus a 6-inch mulch layer. The latter two layers will both help retain moisture and suppress weed growth.

In addition, any non-native invasive species in the portion of Wetland I buffer on east of the impacted area, and west of Wetland I (previously restored/enhanced portion of Wetland I buffer) will be removed as part of the mitigation action.

5.2.1 Wetland Buffer Mitigation Goals and Objectives

The overarching goal of the wetland buffer restoration described in this report is to address replacement of wetland buffer functions impacted by the Project and to increase these functions at the Project site. To achieve this goal, proposed wetland buffer enhancement/restoration will include planting native vegetation to replace wetland buffer vegetation removed during construction. This impact area is currently dominated by grassland habitat with nonnative shrub vegetation. Overall, impacted grassland habitat will be replaced with native shrub and forested vegetation communities.

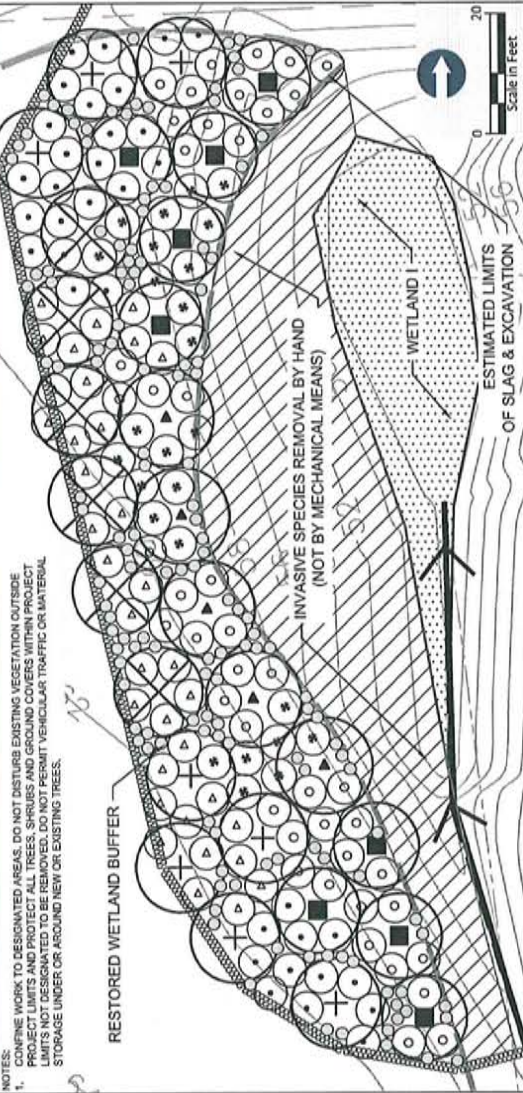
To meet these goals, the following objectives have been used to develop the conceptual planting plan to compensate for loss and damage to the wetland buffer area:

- Provide demonstrable and qualitative replacement of functional elements of the natural system on the site
- Establish native wetland buffer plant communities by planting native species and removing invasive species (completed fall 2010)
- Use native and naturalized plant species commonly found in wetland buffer habitats of the Pacific Northwest (see Figures 3 and 4)
- Simulate, with the plantings, Pacific Northwest native plant communities in terms of composition, cover, and structure
- Replace, at a ratio of at least 1:1, wetland buffer habitat lost due to Project impacts
- Remove any non-native, invasive species (such as Scot's Broom and Himalayan Blackberry) from the portion Wetland I buffer bordering portion to be restored/enhanced (completed fall 2010).

5.2.2 Monitoring Plan

To ensure success of the restoration, per the KCC, a 3-year monitoring and management program will be implemented (City of Kent 2010, Chapter 11.06.600E). The objective of this plan is to ensure the achievement of the prescribed standards of success.

Installed vegetation communities will be monitored annually to assess the performance of the wetland buffer restoration. Prior to the first monitoring visit, an as-built (or Year 0) plan will be prepared to document the implementation of the restoration design. Any minor changes to the approved designs that are required by field conditions present during plan implementation must be documented on the as-built plans. The monitoring period will begin once the as-built plans have been approved. Due to the relatively small size of the wetland buffer restoration area, sample plots will likely not be established and monitoring will include the entire approximately 0.13-acre (5,440-sf) wetland buffer restoration area. Based on as-built plans or record drawings, monitoring will take place near the end of the growing season (summer or early fall) prior to leaf drop.



NOTES:
 1. CONFINED WORK TO DESIGNATED AREAS. DO NOT DISTURB EXISTING VEGETATION OUTSIDE PROJECT LIMITS AND PROTECT ALL TREES, SHRUBS AND GROUND COVERS WITHIN PROJECT LIMITS NOT DESIGNATED TO BE REMOVED. DO NOT PERMIT VEHICULAR TRAFFIC OR MATERIAL STORAGE UNDER OR AROUND NEW OR EXISTING TREES.

PLANTING PLAN

PLANTING SCHEDULE / LEGEND

Common Name	Scientific Name	Size	Spacing	Quantity
TREES				
Red Alder	<i>Alnus rubra</i>	5 gal.	15' O.C.	9
Big leaf Maple	<i>Acer macrophyllum</i>	5 gal.	15' O.C.	8
Douglas Fir	<i>Pseudotsuga menziesii</i>	5 gal.	15' O.C.	8
Western Red Cedar	<i>Thuja plicata</i>	5 gal.	15' O.C.	5
SHRUBS				
Indian Plum	<i>Oenothera cernuiflora</i>	1 gal.	6' O.C.	36
Salmalberry	<i>Rubus spectabilis</i>	1 gal.	6' O.C.	45
Nocosa Rose	<i>Rosa nutkana</i>	1 gal.	6' O.C.	28
Strawberry	<i>Symphoricarpos albus</i>	1 gal.	6' O.C.	35
GROUNDCOVER				
Western Sweet Fern	<i>Polystichum montanum</i>	1 gal.	As Shown	147

EXISTING WETLAND PREVIOUSLY RESTORED WITH NATIVE PLANTS

PLANTING SEQUENCE / NOTES:

1. STRIP ORGANIC SOIL AND STOCKPILE SEPARATELY FROM SLAG AND OVERBURDEN.
2. RIP, DISC, OR SCARIFY SUBGRADE SOILS TO A MINIMUM DEPTH OF 12 INCHES. DO NOT SCARIFY WITHIN DRIP LINE OF EXISTING TREES TO BE RETAINED.
3. PLACE 8" OF STOCKPILED SOILS AND 4" OF IMPORTED TOPSOIL WITHIN WETLAND BUFFER PLANTING AREA.
4. DIG PLANTING PIT THAT IS AT LEAST TWICE THE DIAMETER OF CONTAINER. REMOVE ALL ROCKS, ROOTS, STICKS AND OTHER DEBRIS LARGER THAN 1" DIAMETER. SCARIFY THE PLANTING PIT BOTTOM AND SIDES TO A DEPTH OF 4 INCHES.
5. SET PLANT MATERIAL IN THE PLANTING PIT TO PROPER GRADE AND ALIGNMENT. SET PLANTS UPRIGHT, PLUMB, AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO EACH OTHER. SET CROWN OF PLANT MATERIAL AT THE FINISH GRADE. NO FILLING WILL BE PERMITTED AROUND TRUNKS OR STEMS. BACKFILL THE PLANTING PIT WITH SOIL. DO NOT USE MUDDY MIXTURES FOR BACKFILLING.
6. SPACE PLANTS USING TRIANGULAR SPACING IN ACCORDANCE WITH PLANT SCHEDULE DIMENSIONS. PLANT GROUND COVERS TO WITHIN 18" OF THE TRUNKS OF TREES AND SHRUBS WITHIN PLANTING AREA AND TO WITHIN 12" OF THE EDGE OF PLANTING AREA. PLANT SHRUBS WITHIN 5' OF THE TRUNKS OF TREES WITHIN PLANTING AREA AND TO WITHIN 3' OF THE EDGE OF PLANTING AREA.
7. SHAPE SOIL TO PROVIDE WATERING RING WITH A DIAMETER EQUAL TO 2X THE CONTAINER WIDTH.
8. MULCH PLANTING BEDS IMMEDIATELY AFTER PLANTING. THOROUGHLY WATER MULCHED AREA. AFTER WATERING, RAKE MULCH TO PROVIDE A UNIFORM FINISHED SURFACE.

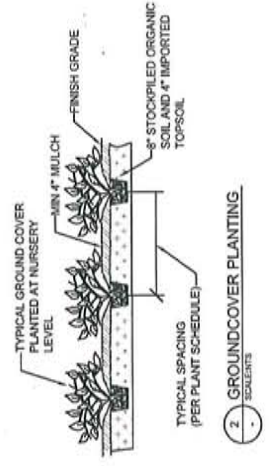
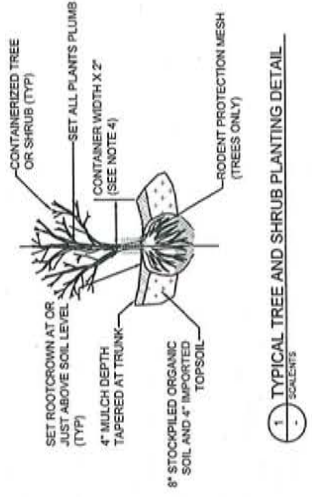


Figure 3
 Planting Plan
 Wetland Buffer Enhancement/Restoration Plan
 Slag Disposal Beckwith Property Site



PLANTING SPECIFICATIONS

- Submittals:
1. Topsoil analysis results of a 5 pound bag from soils testing laboratory, indicate source and obtain Owner's approval before hauling topsoil to site.
 2. One of the match sheets and a 1 gallon sample for approval before installation.
 3. Use of color photographs of all plant species with Name and phone number of contact person. Submit representative color, dated photographs of each plant species.

Notifications:
Notify the Owner at least five working days prior to the installation of plant material.

Products:

The Topsoil shall consist of 60 percent Sand Component and 40 percent Composted Organic Amendment by volume and shall meet or exceed the following specifications:

The Sand Component shall meet the following specifications with reasonable variations:

Screen Size	Percent Passing
6.35 mm	95
#10	85
#20	50
#40	20
#100	10
#200	0

The Composted Organic Soil Amendment shall consist of 100 percent decomposed organic matter material, and shall consist of yard waste, manure, or other organic material that has been composted for at least 6 months. The composting process shall be for at least 6 months and the organic amendment shall have a uniform dark, soil-like appearance and consist of 100 percent recycled content. In addition, the organic amendment shall have the following physical characteristics:

1. Shall be certified by the Process to Further Reduce Pathogens (PFRP) guideline for hot composting as established by EPA. Shall be fully mature and stable in color.
2. Shall be screened using a sieve no finer than 1/4-inch and no greater than 1/2-inch. Based on dry weight of total organic amendment sample, it must comply with the following percent by weight passing:

Sieve Size	Maximum %	Minimum %
12.7 mm (1/2 inch)	0	100
6.35 mm (1/4 inch)	100	95
4.75 mm	100	90
2.38 mm	100	75
1.00 mm	45	70
500 micron	30	0

3. Must "compost material" definition in WIC 173-330 Section 270, available at: <http://www.ecy.wa.gov/programs/water/compost/>
4. Use Organic Matter Content 25 to 65 percent and Carbon to Nitrogen ratio of 22:1 to 30:1
5. Shall have heavy metal concentrations below the Washington State Department of Agriculture (WSDA) per year load limits as follows:

Material	WSDA Maximum Loads per acre per year
Asenic	0.297
Chromium	0.079
Cobalt	0.094
Copper	1.981
Lead	0.019
Manganese	0.079
Molybdenum	0.713
Nickel	0.055
Selenium	7.229
Zinc	

6. Shall be certified by PFRP guidelines for composting as established by the U.S. Environmental Protection Agency (EPA).

PLANTING SPECIFICATIONS CONTINUED

The topsoil mix shall also have the following characteristics:

1. The pH range shall be from 5.5 to 7.5.
2. The soil shall be free of any toxic substances.
3. The Soil Structure Concentration of Boron shall be less than 1.0 part per million (ppm).
4. The Water Percolation Infiltration Rate of the disturbed soil sample shall be a minimum of 0.4 inches per hour.
5. The Soil Structure shall be loose, friable, and not subject to consolidation or compaction.
6. The soil mix shall contain less than 100 plant parasitic nematodes per 100 cubic centimeters (cc) of soil.
7. The soil mix shall be relatively free of soil-borne plant pathogens.
8. Minimal weed seed shall be present, based on germination testing of a representative sample.
9. Non-salt components shall be less than 1 percent by volume (i.e., plastic, sticks, glass, etc.).
10. The Final Topsoil Mix shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium, and magnesium to support plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.

Misc:

Blank or wood chip mulch shall be derived from Douglas fir, pine, or hemlock species. It shall be ground so that a minimum of 80% of the material will pass through a 2-inch sieve and no more than 25%, by loose volume, will pass through a No. 4 sieve. The mulch shall not contain resin, tar, or other compounds in quantities that would be detrimental to plant life. Absorbent woodchips, sawdust or wood shavings shall not be used as mulch.

Plants:

Comply with ebing and grading standards of the latest edition of "American Standards for Nursery Stock."

Protect existing native vegetation from damage caused by landscaping operations.

All plants shall be nursery grown and from a nursery with similar climatic conditions to the locality of the project. Stock furnished shall be at least the minimum size indicated.

Provide only sound, healthy, vigorous plants free from weeds, diseases, sunscald injuries, and abrasions of the bark, plant discoloration, eggs, borers, and all forms of infestation. All plants shall have a fully developed form without roots, open spines, broken branches, broken bark, leaf loss or stain. No plants shall be balled in the container or pot bound.

Plants shall be packed, transported and handled with care. Cover plants transported on open vehicles with a protective covering to prevent damage to the plants. Plants shall be protected from frost, wind, and other weather damage. Plants shall be watered to plant thoroughly upon delivery, promptly protect them with soil, wet plant roots, or in a manner acceptable to the Owner.

Plant material shall be inspected and approved by the Consultant and the Owner on site prior to installation. Remove unsatisfactory material from the site immediately.

Priority vegetation shall be protected during the period between October 1 and April 1.

Stock shall not be installed when ambient temperatures are below 35 degrees F or above 80 degrees, or when wind velocity exceeds 20 miles per hour.

Warmest plant material to remain alive and be in healthy, vigorous condition for a period of one year after the date of Physical Completion.

Special Protection Meets:

Exclude woody limbs of planted trees with this plastic mesh to protect against cambium damage by rodents. Extend mesh cylinder 2" below and 12" above the finished grade line. Assume that the gauge of protective wrap is such that tree growth will split the material if it is not physically removed.

Main Planting:

Main planting will be completed by Owner. Maintenance shall include watering, weeding, weeding (only as directed), and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and diseases.

Reset settled plants to proper grade and position. Restore planting watering ring and adjacent material and remove dead material.

Water trees, shrubs, and ground cover beds within the first 24 hours of final planting, and not less than twice per week (including rain) until Physical Completion.

Physical Completion:

Inspection to determine Physical Completion of planted areas will be made by the Owner, upon the Contractor's request. Provide notification at least 10 working days before requested inspection date.

Planted areas will be accepted provided all requirements, including the maintenance period have been complied with and plant materials are alive and in a healthy vigorous condition.

Upon Physical Completion, the Owner will assume plant maintenance.



Figure 4
Planting Specifications
Wetland Buffer Enhancement/Restoration Plan
Kent Slag Site Excavation Project

Monitoring activities will focus on the collection of vegetation and wildlife data to evaluate, describe, and quantify (to the extent possible) wetland buffer functions and compliance with the performance measures. Monitoring will also include photographic documentation of site features and the development of habitat on the site. General monitoring methods are:

- Survival of planted trees and shrubs will be assessed
- Aerial cover for native trees and shrubs, both planted and colonizing, will be estimated
- Aerial cover for state-listed noxious weeds will be estimated
- Photographic documentation from photo points will be identified on the as-built plans
- Incidental wildlife sightings or signs will be documented
- Intrusions, vandalism, or other actions that impair the intended functions of the mitigation areas will be reported
- Recommendations will be made for maintenance or repair of the restoration areas

Following each year's monitoring visit, a report will be prepared detailing the findings of the visit. A total of four reports (Years 0, 1, 2, and 3) will be prepared as part of ongoing monitoring reporting.

5.2.3 Performance Measures, Standards of Success, and Contingency Plans

Performance measures and success standards describe specific on-site characteristics that indicate a function is being provided. Performance measures are used to guide management of the mitigation area. Success standards are thresholds to be measured during the monitoring period that demonstrate the mitigation has complied with regulatory requirements and is providing intended functions. The proposed restoration will be monitored for 3 years to demonstrate that intended wetland buffer functions have been achieved. Specific performance measures and success standards will be the following:

- 20 percent cover of native trees, shrubs, groundcover, and emergent species after 1 year
- 50 percent cover of native trees, shrubs, groundcover, and emergent species after 2 years
- 80 percent cover of native trees, shrubs, groundcover, and emergent species after 3

- years
- 80 percent survival of native planted and colonizing native trees and shrubs after 3 years
- Less than 20 percent cover of invasive species

Contingency plans describe what actions can be taken to correct site deficiencies. If there is a significant problem with the restoration area meeting its performance standards, a contingency plan will be developed. Contingency plans may include, but are not limited to, the following:

- Plant substitutions of type, species, quantity, and/or location
- Additional plant installation to address survival or cover problems
- Weeding and additional plant installation to address invasive weed cover
- Providing fencing or plant guards around plants to prevent animal damage

Contingency plans will be developed for review and approval by the City of Kent as appropriate. In addition, implemented contingency plans will be described in the monitoring report following each year's visit. Success of the wetland buffer restoration will be based on the mitigation goals, performance standards, and contingency measures.

6 REFERENCES

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- Farallon Consulting, 2010a. *Slag Disposal Beckwith Property Site Excavation Project Design Plans*. Prepared for Earle M. Jorgensen Company, Lynwood, California.
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- Springwood Associates, Inc., 1995. *Beckwith Property Slag Disposal Site Wetland Delineation Report*. Prepared for SECOR International, Inc. Bellevue, Washington.
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