



MEMORANDUM

DATE: October 1, 2019

TO: David Holmes
La Center School District

FROM: Brian Bieger, Sr. Scientist/ Project Manager

PROJECT: La Center Middle School Project, PBS Project number 71282.00

REGARDING: Revised Wetland A-S Remediation/Restoration, USACE RED: NWS-2018-696

Introduction

PBS Engineering and Environmental (PBS) was contracted to prepare a wetland remediation and restoration plan for the proposed La Center Middle School Project. During the course of project planning, site assessment and permitting for the project, it was discovered that a large portion of an emergent wetland on the site (Wetland A-S) was contaminated with dieldrin, a commercial pesticide.

The purpose of this memo is to detail the temporary impacts and restoration activities that will affect Wetland A-S. This memo shall serve as a formal addendum to existing mitigation plans and permitting documents that have been submitted to regulatory authorities. Furthermore, the proposed wetland related activities described in this report shall supersede any previously submitted documents detailing activities within or adjacent to Wetland A-S.

A formal remediation plan to address the contaminated soils on the site has been prepared and submitted to the Washington State Department of Ecology (ECY) as part of their Voluntary Cleanup Program (VCP). Details concerning the specifics of the cleanup are in *PBS's Remedial Action Work Plan, LA Center Middle School Construction* document dated August 22, 2019.

The details of the wetland related project activities, temporary wetland impacts, and restoration efforts are covered below.

Background Information

The 19-acre project site is located at 2001 NE Lockwood Creek Road, La Center, Washington. The property has previously been subject to small scale farming, haying, and grazing. Wetlands on the property were formally delineated by Olson Environmental. The results of the delineation and subsequent verification efforts by the U.S. Army Corps of Engineers (USACE) culminated in the identification of seven separate wetlands on the property. Dieldrin was discovered during routine soil samples taken within Wetland A-S. PBS Engineering and Environmental (PBS) was hired to determine the extent of dieldrin in the area around Wetland A-S and prepare a formal remediation plan. The remedial action work plan referenced above has been submitted to ECY for approval.

Existing Conditions

Wetland A-S exists as an emergent wetland in a relatively flat area in the southern portion of the site. This category IV rated wetland is dominated by a mixture of native and non-native grasses that include: colonial bentrgrass (*Agrostis capillaries*), velvet grass (*Holcus lanatus*), reed canarygrass (*Phalaris aurundinacea*) and soft

rush (*Juncus effuses*). There is no woody vegetation within Wetland A-S. The hydrology within the wetland is supported by sub-surface drainage from adjacent slopes in addition to direct precipitation. The existing hydrology would be best described as seasonally saturated to seasonally flooded.

Temporary Wetland Impacts

In order to remove dieldrin laced soils within the wetland, approximately 6,000 cubic yards of material will be excavated and hauled off the site. Excavation depths range from 12 inches to 24 inches. A cross section showing the limits of excavation is attached to this report. The proposed excavation will temporarily impact the entire wetland (0.62-acres). Earth work and hauling will be performed with common excavators and dump trucks. Common erosion control Best Management Practices (BMPs) such as silt fence, watering to prevent dust, and stabilization of haul routes will be implemented. The proposed construction activities will not impact other wetlands on the property.

Wetland Restoration Activities

Following the removal of contaminated topsoil and any required testing of remaining soil, the restoration activities within Wetland A-S will commence. Restoration will include inspection of the excavation site, importation of topsoil, and hydroseeding of all disturbed areas.

Inspection- Prior to the importation of topsoil to establish final wetland elevations, the excavation areas will be inspected to ensure that the bottom of the wetland still contains clay-loam material. Based on soil samples taken in the field and the Odne silt loam soil descriptions within the Clark County Soil Survey, the clay layer that underlies the surface layers of silt loam and gives the soil its poorly draining rating should extend to approximately 33 inches below the surface. The existence of this clay layer will be critical to ensuring that subsurface water flows that currently maintain the hydrology of the wetland are not allowed to infiltrate through the soil base layers. Common soil texture field indicators will be utilized to determine the composition of the base soil layer. In the unlikely circumstance that it is determined that there is no clay layer remaining in the wetland excavation areas, clean clay will be imported and placed in necessary locations until a depth of 3 inches of clay is achieved. Any imported clay material will be compacted with an excavator to ensure the clay layer is stable prior to importation of fill material.

Topsoil Importation- The proposed finish grades for the wetland restoration areas are shown in the attached cross sections. Importation of top-soil will range from 6 inches to 18 inches. The goal of the restoration plan is to create two different hydrologic regimes so the wetland will have a greater degree of plant diversity compared to existing conditions. The proposed elevations shown in the attached graphic depict that the base elevation of the restored wetland will be slightly lower than existing. This will allow for deeper levels of inundation in the winter months and a longer duration of saturation in order to support a plant community dominated by sedges and rushes. Several small hummocks or "islands" will also be created through importation of topsoil to match the existing elevations of the wetland.

Topsoil to be imported shall be sourced on or off-site and meet the following specifications:

- a) The source of the topsoil should not be taken from a depth below 12 inches
- b) Less than 10% composition of rocks or gravel material and no gravels >1" in diameter.
- c) The source of the soil will be approved prior to importation.
- d) Be classified as a silt loam or silty clay loam as defined below:
 - 1) Silt loam: 50 percent or more silt and 12 to 27 percent clay; or 50 to 80 percent silt and less than 12 percent clay.

2) Silty clay loam: 27 to 40 percent clay and less than 20 percent sand.

The contractor may utilize on-site areas for topsoil harvest that are outside of wetlands and buffers on the site as long as they are subject to inspection by a biologist or botanist prior to harvest to determine the presence of invasive weedy vegetation and suitability of the soil as per the above listed specifications.

Hydroseeding – The restoration area will be hydroseeded immediately following the completion of grading within the wetlands and buffers. The following seed mixes will be applied to the wetland and buffer areas. The attached grading figures and graphic detail the location of the different seed mix applications. Seeding will occur between September 1 and April 30th. If seeding can not occur within this timeframe, a temporary, above-ground irrigation system may be required to ensure germination and establishment of seeded species.

Table 1. Seasonally Inundated / Wetland Depression Area

Seeding rate: 0.50 lbs/ 1,000 sq. ft.

Common Name	Genus Species	Composition of mix
Slough Sedge	<i>Carex obnupta</i>	15%
Smallwing Sedge	<i>Carex microptera</i>	20%
Awlfruit Sedge	<i>Carex stipata</i>	20%
Common Spikerush	<i>Eleocharis palustris</i>	10%
Panicled Bulrush	<i>Scirpus microcarpus</i>	25%
Poverty Rush	<i>Juncus tenuis</i>	10%

Table 2. Seasonally Saturated / Hummock and Wetland Buffer Area Seed Mix

Seeding rate: 1 lb/ 1,000 sq. ft.

Common Name	Genus Species	Composition of mix
Meadow Barley	<i>Hordeum branchyantherum</i>	35%
Northwestern Mannagrass	<i>Glyceria occidentallis</i>	20%
Native Red Fescue	<i>Festuca rubra rubra</i>	20%
Water Foxtail	<i>Alopecurus genicaultius</i>	13%
Common Spikerush	<i>Eleocharis palustris</i>	5%
American Sloughgrass	<i>Beckmannia syziganche</i>	4%
Tufted Hairgrass	<i>Deschampsia caespitosa</i>	2.5%
Spike Bentgrass	<i>Agrostis exarata</i>	0.50%

The hydroseeding slurry will contain an organic tackifier and cellulose hydro mulch to help prevent erosion, increase seed germination and establishment rates.

Monitoring

The goal of the monitoring will be to demonstrate that the wetland area still has primary indicators of wetland hydrology during the growing season and that vegetation has become established at an acceptable rate. The proposed monitoring period will be three years at minimum. Monitoring will be extended if it has been shown that the project has not met the performance standards listed below.

Monitoring will include estimations of vegetative cover in addition to hydrology data collected from five piezometers installed within the wetland area. An illustration of the proposed piezometer is shown in figure 1 below.

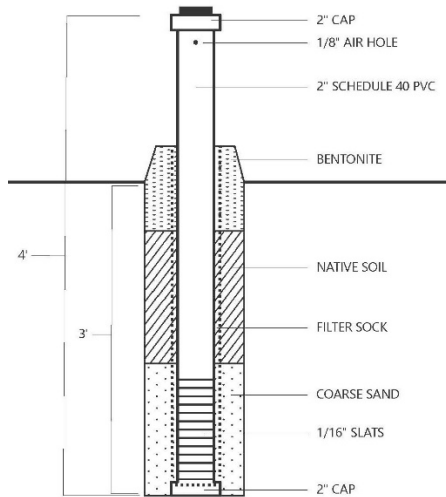


Figure 1- Typical Piezometer

The piezometers will be placed along the north, south, east and west boundary of the wetland and one in the approximate center of the wetland.

Water elevation data will be manually collected from the piezometers once weekly from February to May of each year. A single site visit in the spring of each monitoring year will be conducted to take photographs of the restoration wetland, visually estimate native vegetation coverage amounts, and identify any deficiencies. A brief memo that contains the collected hydrologic data, vegetation coverage estimates and photographs of the site will be forwarded to the USACE and ECY by August of each monitoring period.

Vegetation coverage will be estimated through the establishment of a total of ten vegetation plots randomly placed throughout the restoration wetland. Each plot will have a radius of 10-feet and will be marked in the field with rebar. This will yield a total sampling area equal to approximately 10% of the total site. Cover of native, non-native, and invasive species will be visually estimated and recorded in each plot.

Objectives and Performance Standards

The following performance objectives and performance standards will be utilized to determine if the wetland restoration activities have been successful.

Objective #1 Establish wetland hydrology within all of the wetland restoration areas.

Performance Standard #1 Observation of saturation or inundation within the upper 12 inches of the soil profile within all piezometers for at least 30 consecutive days for all monitoring years.

Objective #2 Establish a native wetland plant community within the restored wetland areas.

Performance Standard #2. Obtain the following coverage percentages of emergent native vegetation for the first 3 years of monitoring:

Year 1 - 80% coverage

Year 2 – 85% coverage

Year 3 - 90% coverage

Objective #3. Ensure that at least 0.62 acres of wetland have been created.

Performance Standard #3. The edge of the wetland restoration area will be mapped in the field with a survey grade GPS unit prior to hydroseeding to quantify the created wetland area.

Objective #4. Ensure that the wetland restoration area is not impacted by invasive vegetation.

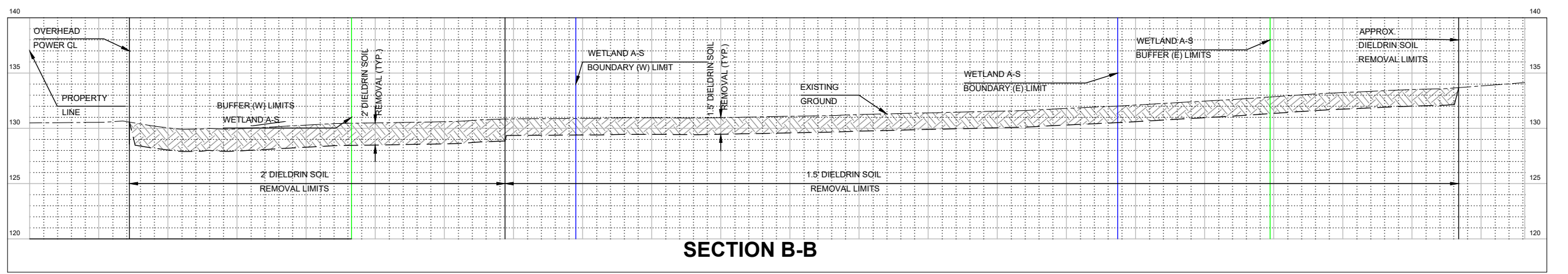
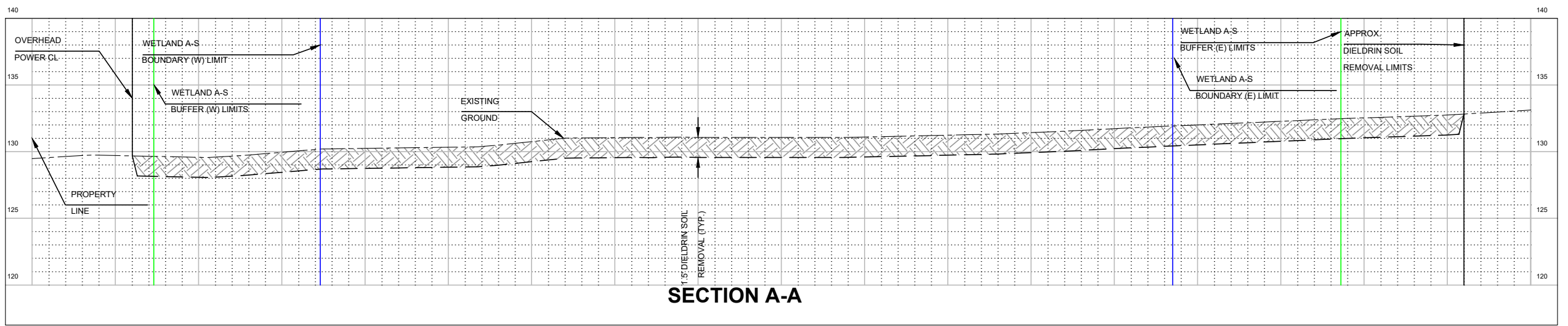
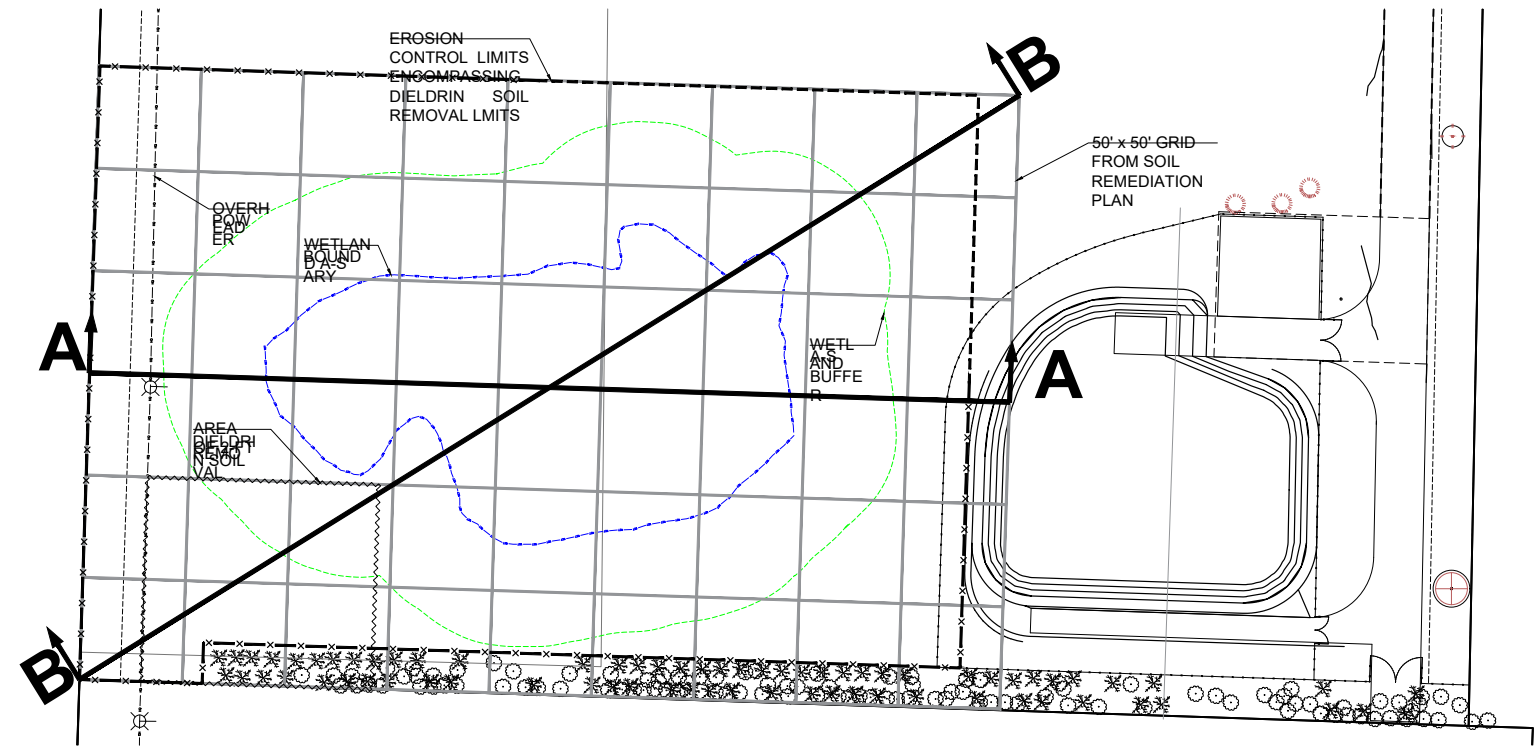
Performance Standard #4. Invasive plant species shall cover less than 10% aerial coverage within any portion of the wetland.

Contingency plans

Contingency plans are designed to identify potential courses of action, and any corrective measures to be taken when monitoring indicates project objectives may not be achieved. The primary concern is that wetland hydrology will not be established due to the grading within the wetland. While this is not anticipated to be a problem, the lack of hydrology will necessitate re-examination of the wetland and contingency actions. If statistically average rainfall is recorded between November and February within the project area and there has not been ground water observed within any of the installed wetland piezometers, further investigation of the lack of hydrology will be conducted. This will likely include extensive test pits, soils borings, and collection of water data deeper within the soil profile.

Invasive vegetation may become established within the restoration area. If invasive vegetation is recorded at greater than 10% of area within the sample plots or if invasive vegetation is observed in areas outside of the sample plots, then species specific corrective actions will be applied to ensure that native coverage goals are met. This may include mechanical removal and re-seeding or planting as deemed appropriate.

Attachment(s): *Grading sheets*



WETLAND A-S DIELDRIN SOIL REMOVAL TYPICAL CROSS-SECTIONS



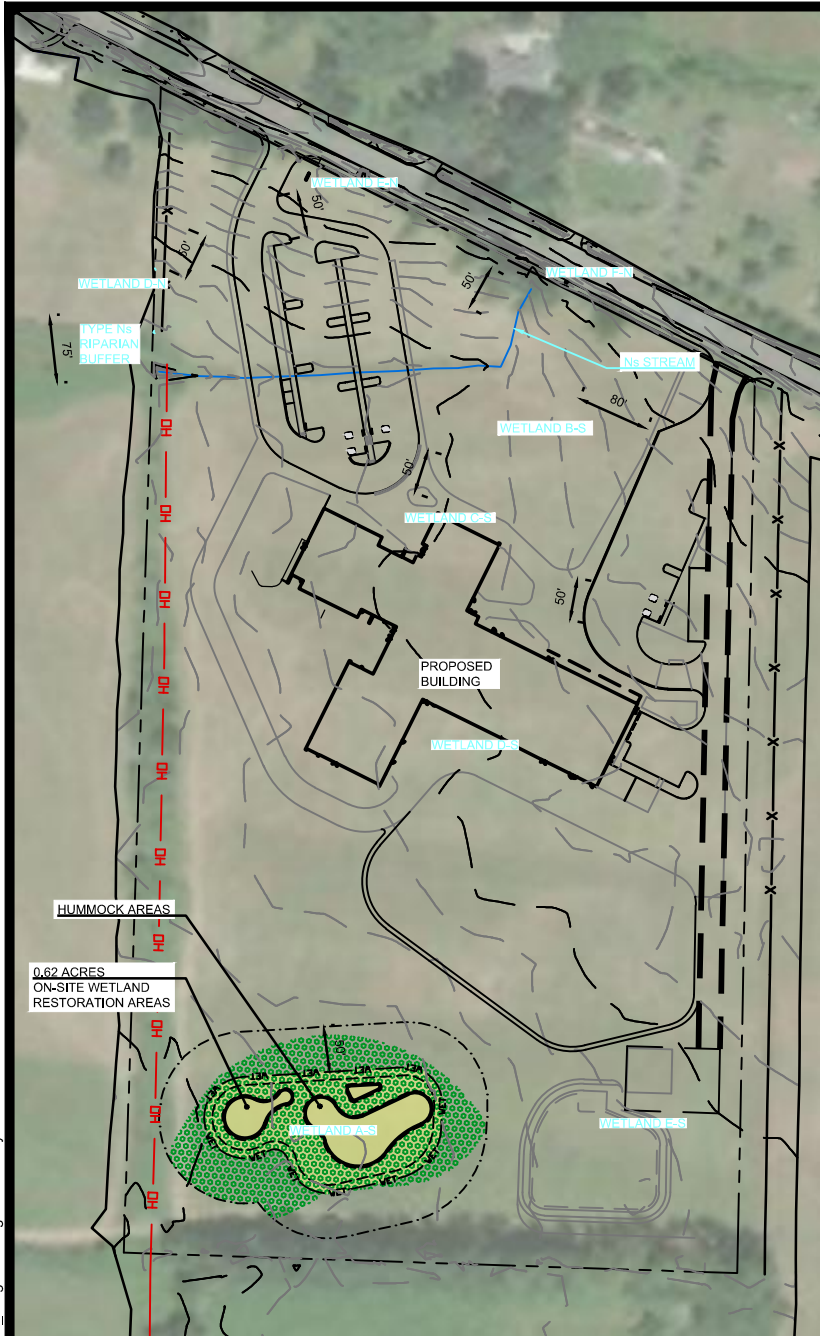
WASHINGTON

SEASONALLY INUNDATED / WETLAND DEPRESSION AREA SEEDING
SEEDING RATE: 0.50 LBS / 1,000 SF

COMMON NAME	GENUS SPECIES	COMPOSITION OF MIX
SLOUGH SEDGE	CAREX OBNUPTA	15%
SMALLWING SEDGE	CAREX MICROPTERA	20%
AWLFRUIT SEDGE	CAREX STIPATA	20%
COMMON SPIKERUSH	ELEOCHARIS PALUSTRIS	10%
PANICLED BULRUSH	SCIPUS MICROCARPUS	25%
POVERTY RUSH	JUNCUS TENUIS	10%

SEASONALLY INUNDATED / HUMMOCK / BUFFER AREA SEEDING
SEEDING RATE: 1.00 LBS / 1,000 SF

COMMON NAME	GENUS SPECIES	COMPOSITION OF MIX
MEADOW BARLEY	HORDEUM BRANCHYANTHERUM	35%
NORTHWESTERN MANNAGRASS	GLYCERIA OCCIDENTALLIS	20%
NATIVE RED FESCUE	FESTUCA RUBRA RUBRA	20%
WATER FOXTAIL	ALOPECURUS GENICAUTIUS	13%
COMMON SPIKERUSH	ELEOCHARIS PALUSTRIS	5%
AMERICAN SLOUGHGRASS	BECKMANNIA SYZIGANCHE	4%
TUFTED HAIRGRASS	DESCHAMPSIA CAESPITOSA	2.5%
SPIKE BENTGRASS	AGROSTIS EXARATA	0.50%



0.62 ACRES
ON-SITE WETLAND
RESTORATION AREAS

*** ISOLATED TEMPORARY BUFFER IMPACTS THAT ARE MINIMAL IN SIZE WILL BE RESEEDED WITH NATIVE GRASS MIX TO PROVIDE PERMANENT EROSION CONTROL COVER AND NATIVE SPECIES INPUT.

LEGEND

Wetland Buffer	
Wetland Boundary	
Existing Contours	
Cut/Fill Limits	
Proposed Pavement	
Proposed Fence	
Overhead Powerline	
Property Line	



SCALE: 1" = 200'



**LA CENTER MIDDLE SCHOOL
BUFFER MITIGATION/ENHANCEMENT PLAN**

Scale: N/A	Date: 8 / 23 / 19	Drawing: 71282_WL_Mitigation
Job #: 71282	Reference:	