



**Jurisdictional
Wetland Delineation Report
and
Buffer Reduction and Enhancement
Plan
for the
Bakers Corner Fire Station #22
Longview, Washington**

Prepared for:

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ELS Project #2521.01

April, 2017

SIGNATURES

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.



Sarah Fitzpatrick
Biologist



Francis Naglich
Sr. Wetland Biologist/Principal

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by Rice Fergus Miller to complete a wetland delineation and buffer reduction and enhancement plan, in preparation for construction of the new Bakers Corner Fire Station #22. The site is located in west Longview, Cowlitz County, off Ocean Beach Highway, identified as Cowlitz County tax parcels 107300100 and 107260100, in Section 14, Township 8 North, and Range 3 West of the Willamette Meridian (Figure 1). The site subject to this wetland delineation was assessed on April 5, 2017, is approximately 1.5 acres, and encompasses the entire parcel (Figure 2). This report summarizes the findings of the wetland delineation and buffer reduction and enhancement plan in accordance with the City of Longview Municipal Code (LMC) *Chapter 17.10, Critical Areas Ordinance (2017)*.

METHODOLOGY

Wetlands were delineated using the Routine Determination Method according to the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (2010). The Routine Determination Method examines vegetation, hydrology, and soils to determine if wetlands exist in a given area. The presence of hydrology is critical in determining what qualifies as a wetland; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally) it is necessary to determine if hydrophytic vegetation and hydric soils exist, indicating that water is present long enough to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated by the United States Army Corps of Engineers (Corps) as “Waters of the United States,” by the Washington State Department of Ecology (Ecology) as “Waters of the State,” and locally by the City of Longview, *LMC 17.10*.

Vegetation, soil, and hydrology information were collected at 4 test plots to determine the location and extent of wetlands within the study area. The wetland boundaries were determined through topographic inflections, surface water inundation, and transitions from a hydrophytic plant community to an upland plant community. Wetland boundaries and test plots were mapped using a handheld GPS unit with sub-meter accuracy and are shown on the site map (Figure 2)

SITE DESCRIPTION

The site is characterized by mowed and unmowed vegetation, with the former occupying the northern and eastern portion of the study area adjacent to Ocean Beach Highway, and the latter occupying the southern and western portion of the study area. The study area contains a paved parking lot with existing fire station structure and elevated trailer office to the east, and no structures in the west or south. Surrounding land uses consist of high-intensity commercial to the north, east, and west, and high-intensity residential use to the south. There is a small pocket of moderate-intensity agricultural land use directly south of the study area, separating it from the subdivision.

One depressional, Category IV wetland was delineated during the site visit (Figure 2). It lies in a topographic depression on the southeastern border of the site, receiving water from precipitation and surface runoff. The wetland consists of emergent, scrub-shrub, and forested communities; however, the portion of the wetland that lies adjacent to the site consists of only emergent and scrub-shrub communities. The wetland, as well as its associated uplands, is dominated by invasive species such as reed canarygrass and Himalayan blackberry.

SOILS

Soils within the study area are mapped as Caples silty clay loam, 0 to 3 percent slopes (17) (Figure 3). Caples silty clay loam is described as a somewhat poorly drained soil with an approximate depth to water table of 18 to 24 inches below ground surface (BGS). The soil is generally found in valleys and is formed from alluvium, or a deposit of clay, silt, sand, and gravel left by flowing streams in a river valley or delta. Caples silty clay loam has a typical profile of silty clay loam from 0 to 60 inches BGS. Caples silty clay loam is listed as a hydric soil according to the *Washington State Hydric Soils List* (NRCS 2015). Upon site investigation, upland soils appeared to largely consist of historic fill material.

Wetland soils were not evaluated due to surface inundation of approximately 1 inch. If wetland soils had been sampled, it is likely that they would have demonstrated hydric soils indicators, due to the aforementioned surface inundation and the topographic depression at the wetland test plot location.

Evaluated upland soils ranged from very dark grayish brown (10YR 3/2) to dark yellowish brown (10YR 3/6), and exhibited no redoximorphic features. Upland soil profiles were also indicative of historic fill, as soil samples were filled with angular rocks and gravel.

Mapped hydric soils do not necessarily mean that the area is a wetland—hydrology, wetland vegetation, and hydric soils must all be present to classify an area as a wetland. Conversely, wetlands may be found in areas where the soils are not mapped as hydric. Soils information collected during the field visit can be referenced in the wetland determination forms in Appendix B.

VEGETATION

Wetlands

Dominant vegetation within the wetland consisted of reed canarygrass (*Phalaris arundinacea*, FACW) and Himalayan blackberry (*Rubus armeniacus*, FAC).

Uplands

Dominant vegetation within the uplands consisted of reed canarygrass, stinging nettle (*Urtica dioica*, FAC), hairy cat's ear (*Hypochaeris radicata*, FACU), tall fescue (*Schedonorus arundinaceus*, FAC), Himalayan blackberry, and an *Agrostis* species (indicator status assumed FAC).

The dominant species of vegetation in each test plot have been recorded on the attached wetland delineation data sheets (Appendix B). The indicator categories following the common and scientific names indicate the likelihood of a species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL** (obligate wetland) – Almost always occur in wetlands.
- **FACW** (facultative wetland) – Usually occur in wetlands, but may occur in non-wetlands.
- **FAC** (facultative) – Occur in wetlands and non-wetlands.
- **FACU** (facultative upland) – Usually occur in non-wetlands, but may occur in wetlands.
- **UPL** (obligate upland) – Almost never occur in wetlands.
- **NI** (no indicator) – Status not yet determined.

HYDROLOGY

Wetland A is hydrologically influenced by surface water inundation from a seasonally high groundwater table, precipitation, and surface runoff from surrounding uplands, as well as stormwater runoff from surrounding roads and parking lots. Wetland hydrology indicators observed onsite consisted of surface inundation of approximately 1 inch. Evaluated uplands lacked positive indicators for wetland hydrology (Appendix B).

NATIONAL WETLANDS INVENTORY

The U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) map indicates one wetland, categorized as a permanently flooded, riverine wetland (R5UBH), within the study area (Figure 4). ELS biologists generally agree with NWI mapping; however, the onsite wetland was categorized as depressional, not riverine, as there is no associated stream or river and the wetland unit is situated in a topographic depression. NWI maps are typically used to gather wetland information about a region and, because of the large scale necessary for regional mapping, are limited in accuracy for localized analyses.

FINDINGS

ELS staff delineated one wetland within the study area, identified as Wetland A for the purposes of this report (Figure 2). The wetland was rated according to the Washington State Department of Ecology's *Wetland Rating System for Western Washington: 2014 Update (Rating System)* (Appendix B). According to the *Rating System*, wetlands are rated by assessing their functions and/or special characteristics.

Wetland A

Wetland A is a Category IV depressional, forested, scrub-shrub, emergent wetland located along the southeastern edge of the site. Water is conveyed into Wetland A through surface water runoff from surrounding uplands and roads, as well as a seasonally high groundwater table and precipitation. As Wetland A consists of greater than 95% ungrazed plants and receives stormwater discharge and pollution sources, its main functions include filtering and trapping pollutants. Additionally, Wetland A is large relative to its contributing basin and therefore serves an important function of reducing peak flows from its contributing basin and providing flood

protection. Wetland A has low habitat function, as it lacks species diversity, is dominated by invasive species, and is surrounded by multiple high-intensity land uses.

Wetland Buffer

According to *LMC 17.10.110(4)*, wetland buffer widths are determined based on proposed land use intensity and wetland category per the Rating System. Any commercial or industrial site development is considered high intensity; therefore, as a Category IV wetland with high proposed land use intensity, Wetland A requires a 50-foot buffer. The buffer is topographically elevated 3-4 feet from Wetland A. Buffer soil consists of fill material, and vegetation consists of mowed and un-mowed invasive species, predominantly reed canarygrass with Himalayan blackberry along the boundary between buffer and wetland. The buffer is functionally isolated, per *LMC 17.10.110(4)(c)*, on the eastern portion of the site because of the current fire station building and paved parking lot.

BUFFER REDUCTION AND ENHANCEMENT

According to *LMC 17.10.110(6)*, a buffer may be reduced if the applicant undertakes department-approved buffer enhancements including, but not limited to, planting of noninvasive, native trees or shrubs, diversification of plant cover types, or replacement of invasive exotic species with natives. A planting plan is required, as well as adherence to mitigation standards outlined in *LMC 17.10.160, Mitigation plan performance standards*. This buffer cannot be reduced by greater than 50 percent of the required buffer and cannot be less than the low-intensity land use buffer threshold, as stipulated in *LMC Table 17.10.110(4)(a)* and *LMC 17.10.110(7)*. The applicant proposes to reduce the 50-foot buffer to 25 feet and enhance the remaining 7,613-square feet of the buffer by removal of the invasives, which include reed canarygrass and Himalayan blackberry, and installation of native plants. The proposed buffer enhancement will provide an ecological lift by installing native plants that will increase the buffer function through increase the vegetation quality and diversity. The enhancement plantings will provide screening to Wetland A from surrounding land uses, prevent erosion, as well as create a densely vegetated natural barrier at the edge of Wetland A (Figure 3).

AVOIDANCE

Avoiding the wetland and wetland buffer was a primary consideration when designing the fire station; however, to maximize available building space on the relatively small property, complete avoidance of the wetland buffer was not feasible. The wetland has been completely avoided, and the buffer has been narrowed through buffer reduction and enhancement as a way to avoid and minimize substantial impacts to the wetland buffer.

COMPENSATION MEASURES

Buffer enhancement is proposed to compensate for the reduction. The goal of the enhancement plan is to ensure no net loss of ecological function of wetland buffers within the project by improving the functions of the remaining portion of the buffer through native planting of low and high shrubs. As the buffer is currently dominated by invasive species, the introduction of diverse, native plantings will provide better buffer functions than existing conditions.

PLANTING PLAN

Site Specifications

1. Stake or flag the reduced buffer/enhancement area boundaries.
2. Install silt fencing at the edge of disturbance.
3. Remove invasive species via mowing or hand removal.
4. Install native plantings according to plant specifications.
5. Install signage.
6. Remove silt fencing once bare area has been stabilized.

Planting Specifications

The planting plan proposes to install common native lower growing shrub species within the reduced buffer to encourage the development of a dense herbaceous and shrub community as well as a varied habitat opportunity. The shrubs selected for installation within the buffer include Oregon grape (*Mahonia aquifolium*), red flowering currant (*Ribes sanguineum*), oceanspray (*Holodiscus discolor*), snowberry (*Symphoricarpos albus*), and Scouler's willow (*Salix scouleriana*). Plants will be installed in the late fall to early spring when the site conditions are wettest and the plants are dormant. Plants will be installed in mono-specific groups to better mimic the natural environment and enhance plant survival. One gallon container stock was selected over bare root stock due to better developed root systems and planting mediums, as the soil conditions (mostly fill) of the buffer are generally poor. Potted gallon stock will be more successful. The following table summarizes the plant species, spacing, and quantities for the buffer enhancement area (Table 2).

Table 2. Shrub Specifications for the Buffer Enhancement Area.

Common Name	Scientific Name	Stock	Spacing (feet)	Quantity
Shrub				
Oregon grape	<i>Mahonia aquifolium</i>	Gallon	5	54
Red flowering currant	<i>Ribes sanguineum</i>		5	54
Oceanspray	<i>Holodiscus discolor</i>		5	54
Snowberry	<i>Symphoricarpos albus</i>		5	54
Scouler's willow	<i>Salix scouleriana</i>		5	54
			Total	270

Plant Material Specifications

1. 1-gallon potted species will be purchased from a native plant nursery.
2. 1-gallon potted plants will be a minimum size of 18- to 36-inches tall.
3. 1-gallon potted stock will be kept cool and moist prior to being planted.
4. 1-gallon potted stock will have well-developed roots and sturdy stems, with an appropriate root-to-shoot ratio.
5. Unplanted potted stock will be properly stored at the end of each day.
6. The environmental consultant will be responsible for inspecting potted plant stock prior to and during planting, culling unacceptable plant materials.

Planting Implementation

1. Plant the specified shrubs in the fall (October-November) or early spring (March-April) at the intervals listed in Table 2. Space the plants somewhat irregularly and in groups to create heterogeneity in the density and appearance of the enhancement areas. Plant the 1-gallon potted stock with a tree shovel or comparable tool.
2. Remove the plant from the pot and work the roots free from majority of potted soil.
3. Place the potted plant species in the planting holes so that their roots are able to extend down entirely and do not bend upward or circle inside the hole (no “J” or “U” roots).
4. Position the root crowns so that they are at or slightly above the level of the surrounding soil.
5. Compact the soil around the planted species to eliminate air spaces.
6. Irrigate all newly installed plants as site and weather conditions warrant.

GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

The goal of this buffer enhancement is to provide an ecological functional lift to the remaining, reduced buffer of Wetland A. The buffer will be enhanced by removing invasive plant species and planting of native shrubs to achieve overall higher functions than those provided by the existing conditions. To accomplish this goal, the following objectives and performance standards are appropriate to ensure the success of the buffer enhancement area:

Vegetation

Objective 1: Control invasive species.

Performance Standard 1(a): During monitoring Years 1 through 5, invasive species will be removed and suppressed in the enhanced areas as often as necessary to meet a performance standard of no greater than 10 percent cover by invasive species, with the exception of reed canary grass, which will cover no greater than 25 percent of the enhancement area. Invasive species include, but are not limited to, Himalayan blackberry and reed canary grass. Percent cover will be recorded annually and included in monitoring reports.

Objective 2: Improve native plant cover and buffer function.

Performance Standard 2 (a): Native shrubs will be installed at spacing intervals of 5-foot centers to provide shading and nutrient competition.

Performance Standard 2(b): In Year 1, planted species will achieve 100 percent survival. If dead plants are replaced, this performance standard will be met.

Performance Standard 2(c): In Year 2, planted species will achieve 90 percent survival. If dead plants are replaced, this performance standard will be met.

Performance Standard 2(d): In Year 3, planted species will achieve 80 percent survival. If dead plants are replaced, this performance standard will be met.

Performance Standard 2(e): The cover by native plants within the buffer, which includes installed and native volunteers, will increase over the 5-year monitoring period. The yearly percent cover in the planting areas will be:

- Year 1 - 15 percent;

- Year 2 - 20 percent;
- Year 3 - 25 percent; and
- Year 5 – minimum of 35 percent.

Plant species percentages will be recorded annually and compared with as-built conditions to determine overall success of the plantings. The existing native plants will be included in the percent cover estimates.

MONITORING PLAN

The enhancement area will be monitored for a 5-year period following implementation of the plan, in Years 1, 2, 3, and 5. Monitoring reports will be submitted to the city by December 31 of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The planting plan will serve as a baseline for the Year 1 monitoring to assess whether its performance standards have been met, and will be called either Year 0 or as-built. The enhancement areas will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

Each plant installed will be flagged at the time of installation. At this time photo stations will also be established to document the establishment of planted species over time. During monitoring events, planted species will be counted and their survival rate determined. Observations about their overall health and size will also be noted. Cover of invasive reed canary grass and Himalayan blackberry present in the buffer area will also be documented for maintenance purposes and photographs will be taken at the established photo stations.

Monitoring Report Contents

A monitoring report is required for buffer reduction and enhancement, and may be supplied by the applicant or a qualified expert. The annual monitoring reports will contain at least the following:

- Location map and as-built drawing
- Historic description of project, including dates of plant installation, current year of monitoring, and restatement of mitigation goals, objectives, and performance standards
- Description of monitoring methods
- Documentation of plant survival and overall development of the plant communities
- Assessment of non-native, invasive plant species and recommendations for management
- Observations of wildlife, including invertebrates, amphibians, reptiles, fish, birds, and mammals
- Photo documentation from permanent photo points
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season

SITE PROTECTION

The buffer enhancement area will be owned, maintained, and managed by the applicant, unless otherwise assigned. They will be responsible for maintenance and monitoring of the buffer enhancement area for the 5-year period. Signage and fencing may be installed along the reduced buffer boundary to raise awareness and help limit access disturbances.

MAINTENANCE AND CONTINGENCY PLANS

Maintenance Plan

Maintenance of the buffer enhancement area will involve removing invasive plant species, watering, and re-installing failed plants as necessary. The maintenance will include the following:

1. The removal and control of non-native vegetation as needed during the growing season for the first five years or as site conditions warrant. During the entire monitoring period Himalayan blackberry and reed canary grass will be removed and suppressed as often as necessary to meet the performance standard of no greater than 10 percent invasive cover, with the exception of reed canary grass, which will cover no greater than 25 percent of the enhancement area.
2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15.

If the enhancement area plantings are failing or the performance standards are not met, steps will be taken to rectify the situation in a timely manner. The following steps will be implemented when an area is identified as failing or potentially failing:

1. Identify the cause(s) of the failure or potential failure.
2. Identify the extent of the failure or potential failure.
3. Implement corrective actions by replanting.
4. Document the activities and include this data in the annual monitoring and maintenance reports.
5. Consult with the appropriate agencies in the event that a routine corrective action will not correct the problem.
6. Evaluate recommendations from resource agency staff and implement recommendations in a timely manner.

Contingency Plan

If the performance standards are not met by the third year following project completion, or at an earlier time if specified above, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Longview. This project will be required to complete a contingency plan that describes: (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

CONSTRUCTION IMPLEMENTATION SCHEDULE

The following schedule reflects the anticipated timing for completing the tasks outlined in this plan if the plan is implemented in 2018.

Construction Year (Spring 2018-Spring 2019)

Sept-October	Perform mitigation site construction tasks
October-March	Plant vegetation

May 1, 2018 As-built plan submitted with copy of recorded conservation covenant

Year 1 (2019)

Aug-Sept Vegetative monitoring
May-October On-going maintenance and watering as needed
December 31 Monitoring report submitted

Year 2 (2020)

Aug-Sept Vegetative monitoring
May-October On-going maintenance and watering as needed
December 31 Monitoring report submitted

Year 3 (2021)

Aug-Sept Vegetative monitoring
May-October On-going maintenance and watering as needed
December 31 Monitoring report submitted

Year 5 (2023)

Aug-Sept Vegetative monitoring
May-October On-going maintenance
December 31 Monitoring report submitted

LIMITATIONS

ELS personnel base the conclusions contained within this report on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with the findings presented in this report.

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. There are no other warranties, express or implied. The services performed were consistent with our agreement with our client. This report is prepared solely for the use of our client and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk.

The opinions and recommendations contained in this report apply to conditions existing when services were performed. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. ELS does not warrant the accuracy of supplemental information incorporated in this report that was supplied by others.

REFERENCES

- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Corps of Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. (Publication #14-06-029). Olympia, WA: Washington Department of Ecology.
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- Natural Resource Conservation Service (NRCS). 2015. *National Hydric Soils List*. Accessed April 2017.
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- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands Mapper. November 2016. Online document: <http://www.fws.gov/wetlands/Data/Mapper.html>. Accessed April 2017.

Figures

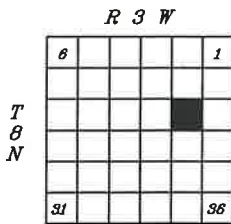
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WASHINGTON



46.172281° Latitude
-123.018258° Longitude

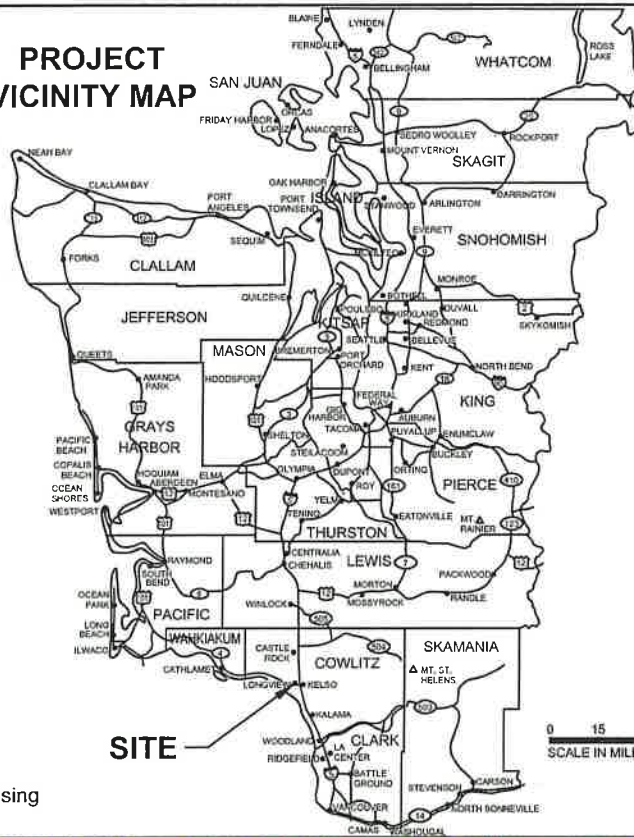
LOCATION MAP



NOTE:

USGS topographic quadrangle map reproduced using
MAPTECH Inc., Terrain Navigator Pro software.

**PROJECT
VICINITY MAP**



SITE

Figure 1
VICINITY MAP

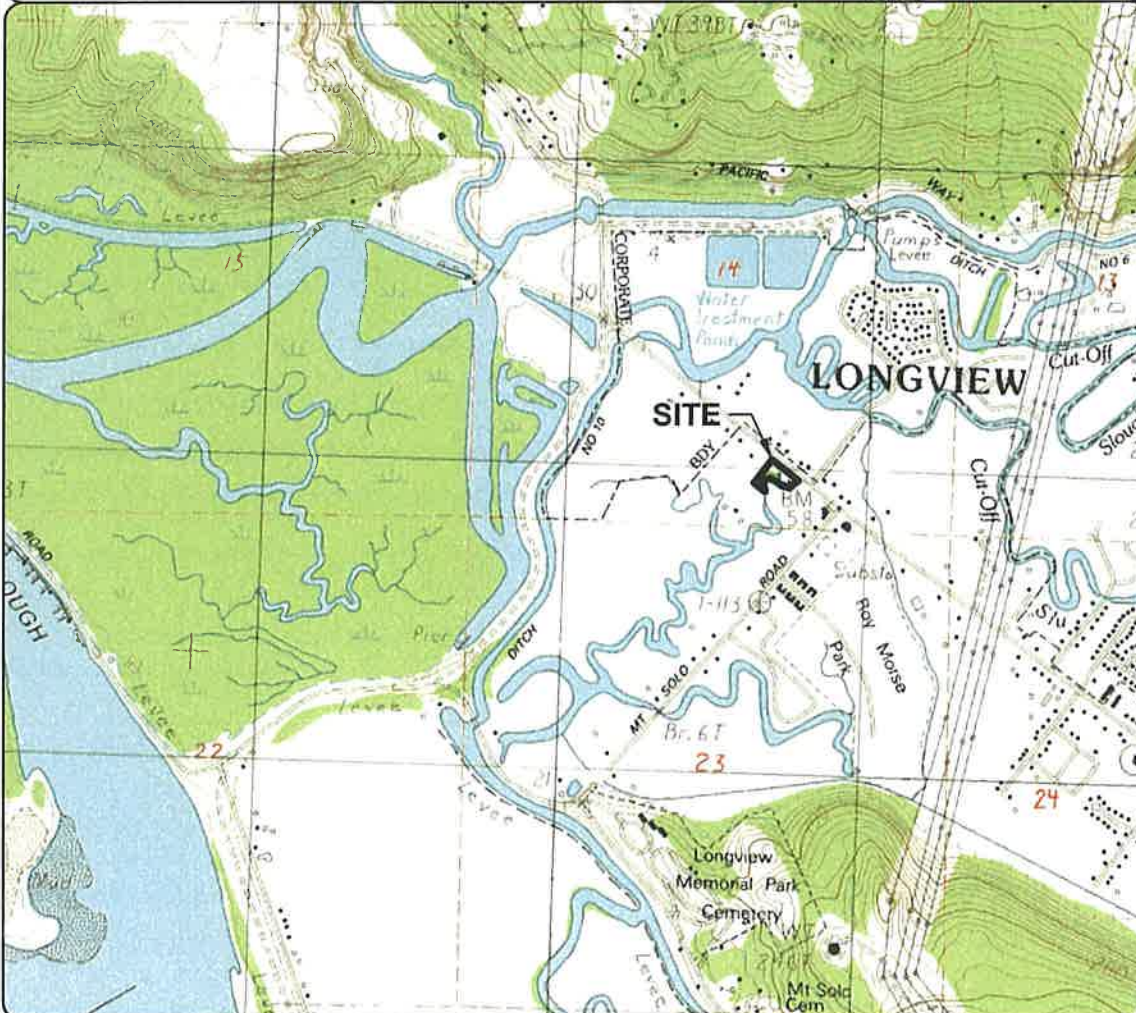
Bakers Corner Fire Station
Rice Fergus Miller
City of Longview, Cowlitz County, Washington
Section 14, Township 8N, Range 3W, W.M.

DATE: 4/26/17
DWN: BCB
REQ. BY: SF
PRJ. MGR: FN
CHK: JB
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SCALE IN FEET



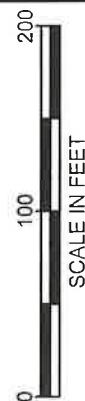
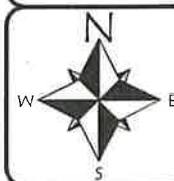


LEGEND:

- Site Boundary
- Wetland
- Existing 50' Wetland Buffer
- TP-1 ● Test Plot Location

NOTE(S):

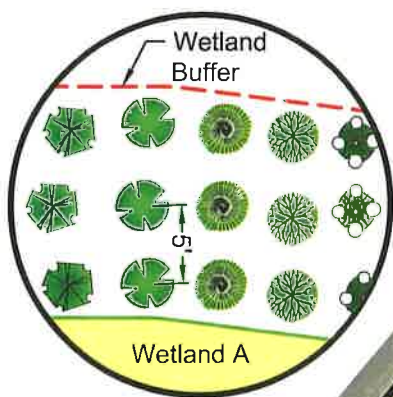
1. Aerial photograph from Google Earth™.



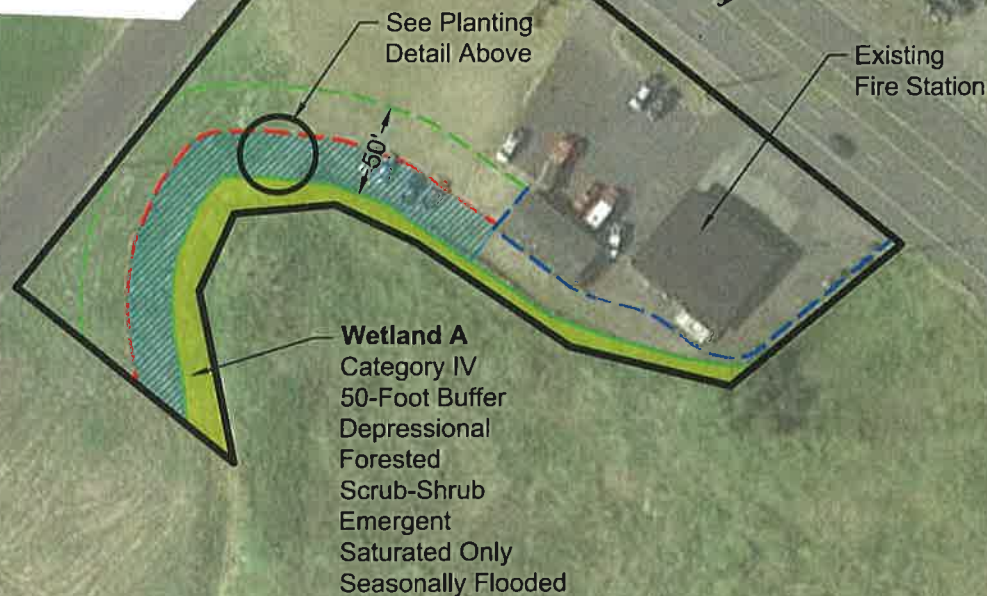
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Figure 2
EXISTING CONDITIONS SITE MAP
Bakers Corner Fire Station
Rice Fergus Miller
City of Longview, Cowlitz County, Washington
Section 14, Township 8N, Range 3W, W.M.



Planting Detail



LEGEND:

- Site Boundary
- Wetland
- Existing 50' Wetland Buffer
- Functionally Isolated Wetland Buffer
- Proposed Buffer Reduced to 25'
- Proposed Buffer Enhancement (7,613 sq. ft.)

NOTE(S):

1. Aerial photograph from Google Earth™.
2. Plants are not to scale and location are approximate as shown. Actual planting locations will be determined in the field, with consideration to the listed spacing and density to produce the most natural appearance possible.

Table 2. Shrub Specifications for the Buffer Enhancement Area.

Common Name	Scientific Name	Stock	Spacing (feet)	Quantity
Shrub				
Oregon grape	<i>Mahonia aquifolium</i>	Gallon	5	54
Red flowering currant	<i>Holodiscus discolor</i>		5	54
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Snowberry	<i>Symphoricarpos albus</i>		5	54
Scouler's willow	<i>Salix scouleriana</i>		5	54
			Total	270



Figure 3
PROPOSED CONDITIONS AND PLANTING PLAN
 Bakers Corner Fire Station
 Rice Fergus Miller
 City of Longview, Cowlitz County, Washington
 Section 14, Township 8N, Range 3W, W.M.

DATE: 4/26/17
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