



CONFLUENCE

ENVIRONMENTAL COMPANY

Edwards Site RESTORATION PLAN ADDC23-0440

Prepared for:

Edwards Fehu Holdings LLC
January 2025



**Edwards Site
RESTORATION PLAN
ADDC23-0440**

Prepared for:

Edwards Fehu Holdings LLC
18230 240th Avenue SE
Maple Valley, WA 98038

Prepared by:

Confluence Environmental Company
Audrey Michniak, WPIT
Chris Berger, PWS

January 2025

This report should be cited as:

Confluence (Confluence Environmental Company). 2025. Edwards site: Restoration plan. Prepared for Edward Fehu Holdings LLC, Maple Valley, Washington, by Confluence, Seattle, Washington.

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 SUMMARY OF EXISTING CONDITIONS	1
3.0 IMPACT ANALYSIS	3
3.1 Existing Impacts	3
3.2 Proposed Barn	5
4.0 PROPOSED RESTORATION	5
5.0 RESTORATION GOALS	8
6.0 PERFORMANCE STANDARDS	8
7.0 PLANTING PLAN	9
8.0 APPROACH	10
8.1 Restoration Details	10
8.1.1 Stream Restoration	10
8.1.2 Buffer Restoration	11
8.2 Bond	11
8.3 Inspection and Maintenance	11
8.3.1 As-Built Survey	11
8.3.2 Watering	12
8.3.3 Mowing	12
8.3.4 Mulching	12
8.3.5 Dead Plant Removal	12
8.4 Monitoring Plan	13
8.4.1 Monitoring Frequency	13
8.4.2 Monitoring Methods	14
8.4.3 Reports	14
8.5 Contingency Measures	15
8.5.1 Plant Survival	15
8.5.2 Native Species Percent Cover	15
8.5.3 Invasive Species Percent Cover	16
9.0 REFERENCES	17

TABLES

Table 1. Summary of wetland characteristics	1
Table 2. Impact areas	3
Table 3. Performance standards and success criteria	8
Table 4. Planting schedule for stream and wetland buffer restoration areas	9

FIGURES

Figure 1. Wetland A and unnamed stream locations2
Figure 2. Existing impacts and proposed barn4
Figure 3. Proposed restoration areas.....7
Figure 4. Example planting plan..... 10

APPENDICES

Appendix A—Bond Quality Worksheet

1.0 INTRODUCTION

Confluence Environmental Company (Confluence) has prepared this restoration plan to address impacts to and associated restoration of critical areas and buffers on tax parcel 9206700-0170, located at 18230 240th Avenue SE, Maple Valley, Washington 98038 (site).

On August 9, 2023, King County issued a notice of incomplete application (ADDC23-0440 – Environmental Triage RFI #1) in response to building permit application ADDC23-0440 for a proposed barn on the site. King County requested a stream and wetland delineation report (Confluence 2024) to assess a presumed on-site wetland, the removal of any unpermitted structures located within critical area buffers, and corrective restoration for any wetland, stream, or associated buffer that had been impacted by previous clearing or grading.

The King County Environmental Review (ADDC23-0440– Environmental Review RFI #3) issued on September 24, 2024, determined that no wetlands were present on-site. However, impacts to the Type N aquatic area on-site and the buffer of off-site Wetland A have occurred and require restoration per King County Code (KCC) 21A.24.

2.0 SUMMARY OF EXISTING CONDITIONS

The critical areas report prepared for the site provides a detailed description of the existing site conditions (Confluence 2024).

The results of Confluence’s off-site investigation confirmed the presence of Wetland A on the parcel to the southeast of the site (Figure 1). Information on Wetland A is summarized in Table 1.

An unnamed stream begins off-site, flowing from Wetland A southeast of the site; flows in a northerly direction along the eastern boundary of the site; and then meanders to the west through the central portion of the site (Figure 1). The unnamed stream flows into a culvert beneath 240th Avenue SE that connects to a stormwater conveyance system that discharges to a large stormwater detention pond at the end of 240th Avenue SE. This stormwater detention pond eventually connects to a natural stream which flows into Lake Francis. King County classifies this stream as Type N because it eventually physically connects to a Type F stream. Type N aquatic areas that are located outside the Urban Growth Area are assigned 65-foot buffers.

Table 1. Summary of wetland characteristics

Wetland Name	Cowardin Classification ¹	Estimated Size (acres)	Wetland Rating ²					Buffer Width (feet)
			Water Quality	Hydrology	Habitat	Total	Category	
Wetland A	Palustrine forested	4.79	8	8	6	22	II	110
¹ FGDC 2013 ² Hruby and Yahnke 2023								



Figure 1. Wetland A and unnamed stream locations

3.0 IMPACT ANALYSIS

Previous unauthorized construction on the site has resulted in impacts to the unnamed stream and the buffers of the stream and Wetland A. Construction of a barn on the site is proposed and will not result in impacts to critical areas or buffers. The barn will adhere to the prescribed buffers and building setback lines specified in KCC 21A.24.

3.1 Existing Impacts

Impacts on the site include alteration of the Type N stream and associated 65-foot buffer and a small portion of the Wetland A buffer. An unpermitted 18-inch culvert, approximately 36 feet long, was installed, and a gravel driveway was placed over the culvert. Additionally, downstream from the culvert, the stream channel was straightened and rounded rock cobbles and boulders were installed into the channel. Impacts to the stream and Wetland A buffers include forested vegetation clearing and the construction of 2 detached structures and the gravel driveway.

Impact areas are summarized in Table 2, and locations of these impacts are shown on Figure 2. Impacts to the stream buffer were determined based on the historical alignment of the stream (ascertained from aerial photographs), as shown on Figure 2.

The site impacts have altered the site's natural conditions and ecological processes. These impacts include modifying the Type N stream conveyance and hydrological regime, which can affect sediment transport and nutrient cycling. The installation of an unpermitted 18-inch culvert and gravel driveway further constrain stream flow, increasing flow velocity and potentially causing erosion downstream. The channelized section lined with rock cobbles and boulders downstream of the culvert alters the natural flow patterns of the stream. Additionally, the construction of two sheds within the buffers of the stream and Wetland A removed native vegetation, compacted soil, and increased runoff, which reduces the buffers' ability to filter pollutants and provide habitat for wildlife. Collectively, these impacts have decreased the ecological functions of the stream and buffers and reduced habitat quality. Approximately 2,545 square feet of the wetland buffer impacts overlap with the stream buffer impacts. To avoid double-counting, impacts in the overlapping buffers are included in the stream buffer impact total and not in the wetland buffer impact total.

Table 2. Impact areas

Habitat Type	Length or Area of Impacts
Stream	137 feet
Stream Buffer	18,925 square feet
Forested Wetland Buffer	2,471 square feet

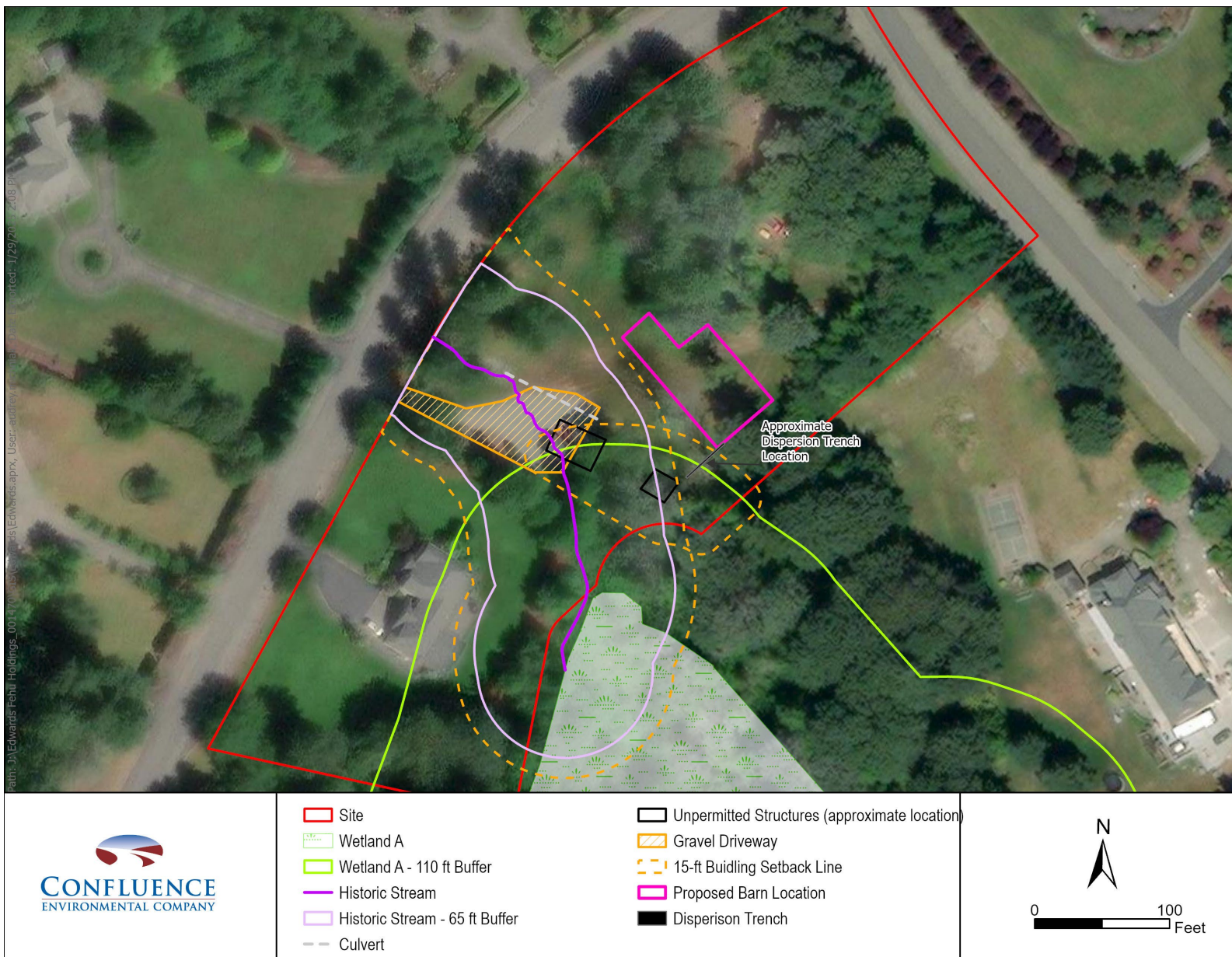


Figure 2. Existing impacts and proposed barn

3.2 Proposed Barn

A barn is proposed outside the wetland and stream buffers with a 15-foot building setback line. Figure 2 shows the proposed location of the barn.

The proposed barn has an associated dispersion trench that will extend approximately 40 feet into the 110 foot wetland buffer. The trench will be dug approximately 18 inches deep and 2 feet wide. Approximately 13 cubic yards of earth within the wetland buffer will be temporarily impacted. Under KCC 21A.06.1271, "surface water conveyance" is defined as a drainage facility designed to collect, contain, and direct the flow of surface water from the highest point of a development site to a receiving water body or another discharge point, connecting any required flow control and water quality treatment features along the way. This includes, but is not limited to, gutters, ditches, pipes, biofiltration swales, and channels. The proposed dispersion trench meets this definition and can be constructed within wetlands or their buffers in compliance with KCC 21A.24.045(C) if specific conditions are met:

1. The surface water discharge into the wetland, aquatic area, or their buffers must have less adverse impact than discharging at the buffer's edge and allowing natural drainage through the buffer.
2. The discharge volume must be minimized by applying low-impact development techniques and water quality measures outlined in the King County Surface Water Design Manual.
3. Installation must be conducted with hand equipment where feasible.
4. The outfall must incorporate bioengineering techniques where feasible.
5. The outfall must be designed to minimize adverse impacts on critical areas.

By adhering to these conditions, the dispersion trench complies with the requirements for constructing a surface water conveyance system within wetlands and their buffers under KCC 21A.24.

4.0 PROPOSED RESTORATION

The proposed restoration plan aims to restore the stream and buffers impacted by the unauthorized alterations, including culverting the unnamed stream, gravel placement for the existing driveway, and construction of detached sheds within buffers. Restoration will adhere to KCC 21A.24.380 for the stream and stream buffer and KCC 21A.24.340 for the wetland buffer. The plan includes the removal of all unauthorized structures and fill within the stream and buffer areas, followed by site restoration through stream realignment and native planting to

reestablish buffer functions. Figure 3 shows the location of the proposed restoration areas, which correspond to the impact areas included in Table 2.

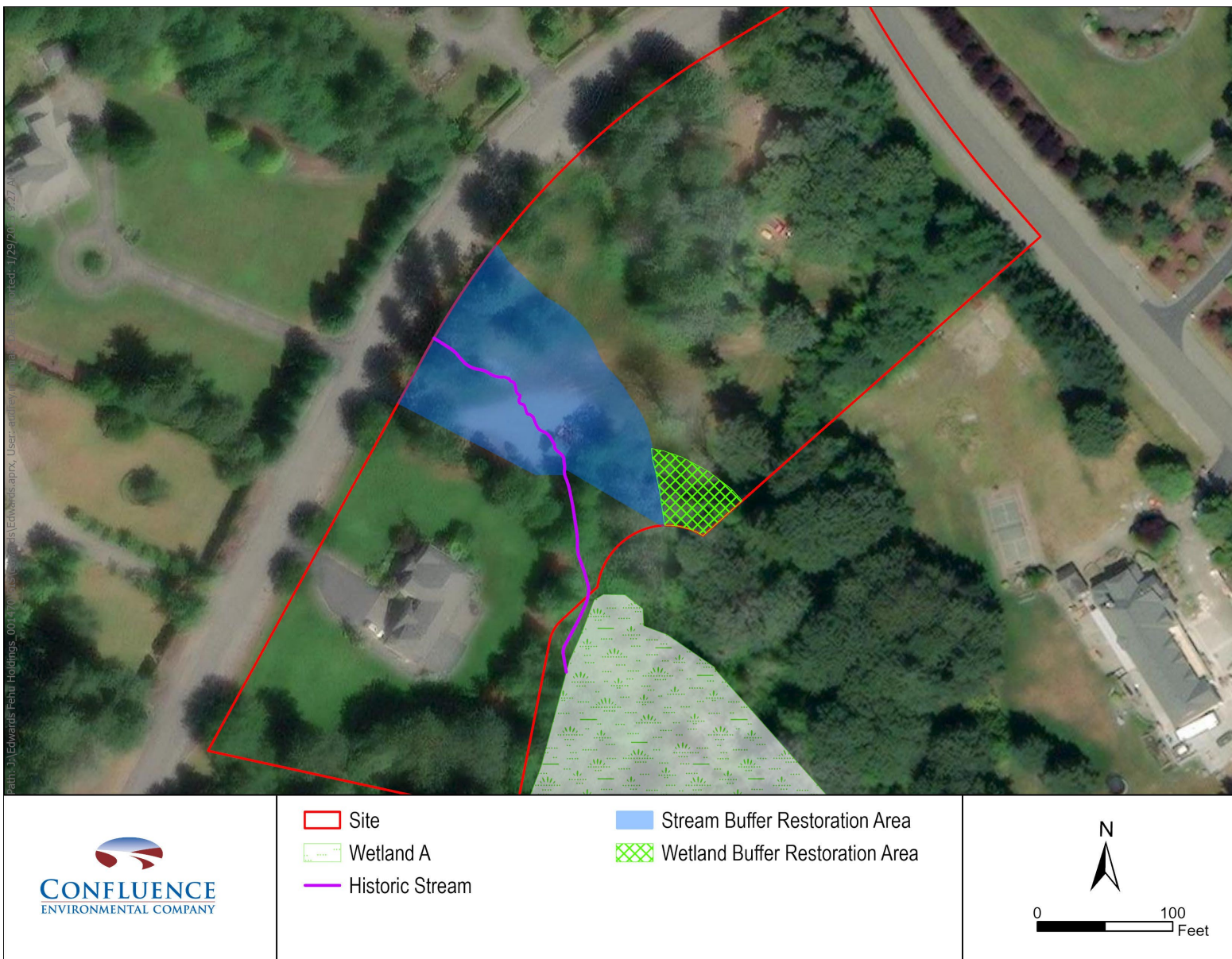


Figure 3. Proposed restoration areas

5.0 RESTORATION GOALS

The goal of the restoration plan is to restore the on-site Type N stream, stream buffer, and Wetland A buffer to pre-disturbance, or better, conditions. The objectives of the restoration plan are as follows:

- Objective 1: Restore natural stream functions to the unnamed stream.
- Objective 2: Restore a total of 21,396 square feet of stream and wetland buffer (18,925 square feet of stream buffer and 2,471 square feet of wetland buffer).

To determine whether the goal and objectives have been met, the restored stream will be monitored during the as-built survey in Year 0, and the stream and wetland buffer restoration areas will be monitored in Year 0 and for 3 years thereafter, as detailed in Sections 6.0 and 8.3.

6.0 PERFORMANCE STANDARDS

Performance standards, success criteria, and possible contingency actions are shown in Table 3.

Table 3. Performance standards and success criteria

Performance Standard	Monitoring Action	Success Criteria				Possible Contingency Actions
		Year 0	Year 1	Year 2	Year 3	
Objective 1: Restore natural stream functions to the unnamed stream						
Restoration completed per plan	Visual inspection	<ul style="list-style-type: none"> ▪ Culvert and fill removed ▪ Channel realigned ▪ Bed and bank material in place 	NM	NM	NM	Corrective actions to bring stream channel into compliance with plan
Objective 2: Restore a total of 21,396 square feet of stream and wetland buffer						
Plant Survival (%)	Plant census	NC	100	80	80	<ul style="list-style-type: none"> ▪ Replace missing or dead plants ▪ Installs plants more suited to site conditions ▪ Remove invasive species
Native Species Cover (%)	Line intercept and percent cover plot	NC	>20	>35	>50	<ul style="list-style-type: none"> ▪ Install additional plants ▪ Remove invasive species ▪ Irrigation ▪ Soil amendment
Invasive Species Cover (%)	Line intercept and percent cover plot	NC	<10	<10	<10	<ul style="list-style-type: none"> ▪ Install additional plants ▪ Remove invasive species
NC No Criterion						
NM No monitoring for that year						

7.0 PLANTING PLAN

The planting plan has been developed to establish a forested stream and wetland buffer community. Plant selection guidance came from existing forested site vegetation and from species considered to be robust performers in restoration plantings. Species and quantities proposed are shown in Table 4.

Table 4. Planting schedule for stream and wetland buffer restoration areas

Common Name	Scientific Name	Container Size	Spacing (feet on center)	Quantity*
Trees				
Red alder	<i>Alnus rubra</i>	2 gallon	9	34
Big-leaf maple	<i>Acer macrophyllum</i>	2 gallon	9	34
Western hemlock	<i>Tsuga heterophylla</i>	2 gallon	9	94
Douglas-fir	<i>Pseudotsuga menziesii</i>	2 gallon	9	94
Total Trees				256
Shrubs				
Nootka rose	<i>Rosa nutkana</i>	1 gallon	6	71
Salal	<i>Gaultheria shallon</i>	1 gallon	6	71
Salmonberry	<i>Rubus spectabilis</i>	1 gallon	6	105
Red-osier dogwood	<i>Cornus Stolonifera</i>	1 gallon	6	105
Red-flowering currant	<i>Ribes sanguineum</i>	1 gallon	6	71
Serviceberry	<i>Amelanchier alnifolia</i>	1 gallon	6	105
Evergreen huckleberry	<i>Vaccinium ovatum</i>	1 gallon	6	71
Total Shrubs				599
* Quantities are based on planting area (21,396 square feet total) and plants installed based on square pattern.				

Planting will be done by a landscaping contractor based on typical spacings (see Figure 4), with a uniformly mixed tree and shrub composition across the restoration areas. Prior to plant installation, final plant locations should be field directed by a qualified wetland biologist to ensure proper natural grouping or clustering of species.

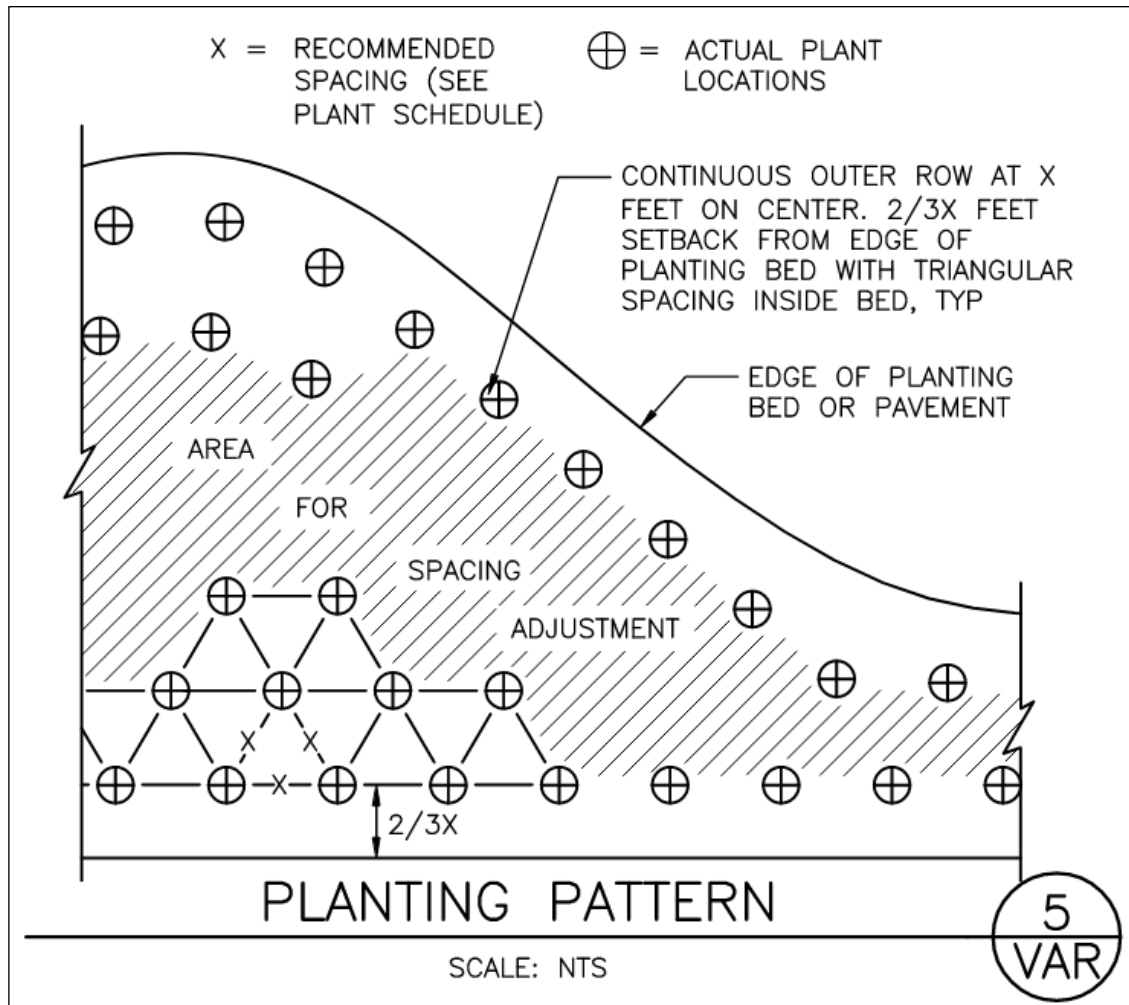


Figure 4. Example planting plan

8.0 APPROACH

8.1 Restoration Details

8.1.1 Stream Restoration

Stream restoration will include removing the existing culvert and cobbles/gravels that have been installed in the unnamed stream and restoring a natural alignment similar to historical conditions. The new channel alignment will be excavated in a sinuous planform to a depth and width consistent with upstream reference sections of the existing stream. Imported bed and bank materials will be placed in the realigned channel. These materials will be sized to prevent erosion and scour of the realigned channel.

8.1.2 Buffer Restoration

8.1.2.1 Site Preparation

The detached sheds constructed in stream and wetland buffers will be removed. Additionally, any invasive species, including Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*), will be removed manually and, if necessary, with targeted herbicide applications to prevent regrowth. The soil will then be amended with a 2- to 3-inch layer of organic compost to improve structure, nutrient content, and moisture retention.

8.1.2.2 Plant Procurement

Native plants selected for restoration will be sourced from local nurseries specializing in species suited for the Puget Lowlands. These nurseries, listed in Appendix A of the King County Critical Areas Restoration and Enhancement Guide (King County 2012), ensure the availability of plants that are ecologically appropriate for wetland and buffer restoration. Species substitution may be necessary if those specified in Table 4 are not available at the time of installation. Species selection will prioritize those that align with the hydrologic and soil conditions of the site, including species for riparian, emergent, and forested buffer zones. All plants will be commercially available and in robust health to maximize establishment success.

8.1.2.3 Planting

Planting will occur in early spring or late fall. Existing native vegetation will be carefully marked and protected. Planting methods will emphasize minimal soil disturbance, with hand planting preferred. A 3-inch layer of weed-free organic mulch or arborist chips will be applied within the dripline of all new plantings to suppress weeds, retain soil moisture, and regulate temperature. Plant spacing will follow standard ecological guidelines to support natural growth patterns, with consideration for hydrologic conditions and buffer restoration requirements.

8.2 Bond

King County requires that a bond be posted to cover the planned restoration and three years of monitoring. The Bond Quantity Worksheet is provided in Appendix A.

8.3 Inspection and Maintenance

8.3.1 As-Built Survey

Once construction and planting of the restoration areas are complete, an as-built survey will be conducted to ensure the restoration areas were constructed per the design and to document any changes or modifications made during construction.

8.3.2 Watering

Watering may be necessary depending on the date of planting and the amount of rainfall that year. No plant installation will occur between December and February. Monitoring of rainfall will be used to determine the need for watering.

Watering will occur so that the plants will receive at least 1.5 inches of water (or equivalent of rainfall) twice per month during the first year following planting. Watering may be necessary in subsequent years to assist survival and establishment of plantings. Watering may be accomplished using a temporary irrigation system or water truck.

Weeding around planted shrubs will be important during the growing seasons to ensure establishment and prevent stress to the plants from competition for resources. Weeding will occur twice a month during the early growing season (typically between March and July) and late growing season (typically September through October). During the remainder of the year, weeding will occur monthly. All invasive species will be weeded. This schedule of weeding will occur until the plants have established themselves and out-compete the invasive species.

Weed whacking will be allowed around plantings with protective tubing. Control of highly invasive species such as Scotch broom (*Cytisus scoparius*), Himalayan blackberry, and reed canarygrass is especially important in the Northwest, and emphasis will be given to their removal to prevent invasion into the planted areas.

8.3.3 Mowing

Mowing will not occur in the restoration areas.

8.3.4 Mulching

Mulching is proposed around plantings to help retain water. Mulch around plantings will be no thicker than 4 inches. Thick layers of mulch (more than 6 inches) may also be used to control reed canarygrass in areas between plantings. Mulch will be placed when plants are installed, and additional mulch may be placed as needed throughout the monitoring period.

8.3.5 Dead Plant Removal

Dead plant material will only be removed after scheduled monitoring. This will allow for the accurate assessment of planting success needed for the monitoring program. Replacement planting will be detailed in a section of the report from the monitoring program. This will include species recommendations to maintain the desired diversity in the plant communities of the buffer areas.

8.4 Monitoring Plan

The following monitoring plan has been developed to comply with KCC 21A.24.130 guidance. The restoration areas will be monitored for 3 years to ensure it is trending toward meeting the goal and objectives described in Section 5.0, based on the performance standards and success criteria shown in Table 3. If final success criteria are not met, the monitoring plan will be amended in consultation with King County Permitting Division and the monitoring period extended, if necessary.

8.4.1 Monitoring Frequency

To comply with KCC 21A.24.130, the restoration areas will be monitored and associated reports will be prepared at the following frequency:

- At completion of construction of the restoration project (Year 0/as-built survey)
- Annual monitoring (Years 1-3)

An additional survey and extended plant survival monitoring may also be required if replanting is necessary.

8.4.1.1 Year 0/As-Built Survey

As noted in Section 8.2.1, an as-built survey will be conducted when the restoration is complete. This as-built survey will also serve as the Year 0 monitoring to determine whether the performance standard has been met for Objective 1 (stream restoration; see Table 3).

8.4.1.2 Annual Monitoring

The annual monitoring events will include a quantitative study of the buffer restoration areas. The performance standards to be monitored during each year are shown in Table 3. Annual monitoring will occur in the fall before deciduous leaves have dropped.

8.4.1.3 Replanting Survey and Extended Plant Survival Monitoring

If replanting is required due to plant survival falling below the 80% criterion, the monitoring period will be extended to ensure the newly installed vegetation meets performance standards. The additional monitoring period will begin upon the completion of replanting and will continue for a minimum of one growing season or until the replanted areas demonstrate adequate establishment and survival, as determined by King County's Permitting Senior Ecologist. Revised monitoring schedules and methods will be included in updated reporting to track the progress of the corrective measures.

8.4.2 Monitoring Methods

8.4.2.1 Photo Points

Permanent photo points will be established at specific locations to ensure consistent and repeatable documentation of site conditions over time. During each monitoring event, photographs will be taken at these points using a fixed-lens digital camera. Each photo point will be marked with a durable stake, such as steel or wood, to facilitate accurate relocation during future monitoring events. The locations and directional orientations of the photo points will be clearly indicated on the site plan.

8.4.2.2 Plant Census

Plant survival in the buffer restoration areas will be calculated by comparing the number and species of plants recorded on the as-built plan to site conditions at the time of monitoring. The percent survival will be calculated by dividing the number of plants (by species) identified as alive during the monitoring event by the number of plants (by species) identified on the as-built map.

8.4.2.3 Line Intercept

The line intercept method will be used to determine the percent cover of native and invasive trees and shrubs along permanently marked transects established in the wetland and stream buffer restoration areas (USDA and USDI 1999). These transects will be 50 feet long. The exact number of transects will be determined during the Year 0 monitoring event, and their locations will be randomly determined during each monitoring event.

After laying a tape measure along a transect, the lengths of tape directly under the branches and foliage of a tree or shrub will be recorded along with the species. The percent cover of each species will then be calculated by dividing the sum of lengths intercepted for that species by the total length of the transect.

8.4.2.4 Percent Cover Plot

Circular plots will be used to determine percent cover of native and invasive herbaceous species. Two 10-foot-diameter circular plots will be established along each transect, with their specific locations determined during each monitoring event using a random number generator. Plots must be at least 20 feet apart. In each circular plot, the percent cover of herbaceous native and invasive species will be estimated and recorded.

8.4.3 Reports

For each monitoring event, the ecologist will prepare a report. One copy of each report will be provided to the County. The sections below document what will be included in each type of monitoring report.

8.4.3.1 As-Built

The as-built report will document the actual construction of the restoration areas and will include the following:

- Drawing showing final grading
- Actual planting density (container size, average offset)
- Description of any changes from the original design

8.4.3.2 Yearly Monitoring

Yearly monitoring reports will include the following:

- Site plan and locations maps
- Date of installation project
- Current year of monitoring
- Goals of the restoration plan
- Performance standards
- Monitoring methodology
- Color photos from each of the photo points
- Results of yearly monitoring
- Contingency actions (if any)

8.5 Contingency Measures

8.5.1 Plant Survival

Plant survival could be negatively affected by improper installation, diseased or infested plants, inadequate watering, or extreme weather. If more than 25 percent of new plantings die in a single year, the cause of the high losses will be investigated and corrected before dead plants are replaced. Dead plant material will only be removed after that year's scheduled monitoring. If less than 80 percent of the total plants installed have survived during the Year 2 monitoring, additional plants suited to site conditions will be installed to bring the planting schedule back into original specifications and yearly monitoring will continue, as indicated in Section 8.3.1.3.

8.5.2 Native Species Percent Cover

Native plant growth, as determined by percent cover, could be negatively affected by improper installation, diseased or infested plants, inadequate watering, or extreme weather. If the native species cover success criterion is not met, the cause will be investigated and corrected.

Correction measures may include increased irrigation, invasive species removal, installation of additional plants, and soil amendments.

8.5.3 Invasive Species Percent Cover

Dominance by invasive species could result from disturbance of the soil, a high mortality rate of the native planted vegetation, or colonization by windborne seeds. To reduce colonization by invasive species, a site maintenance plan is described in Section 8.2. If more than 10 percent of the buffer restoration area is covered by invasive species, the cause of infestation will be investigated, and corrective actions will be taken before weeds are removed. Contingency measures could include increasing the frequency of weeding until native vegetation can grow and dominate the area or increasing the density of native vegetation with additional plantings.

9.0 REFERENCES


Confluence (Confluence Environmental Company). 2024. Edwards site: Critical areas study. Prepared for Edwards Fehu Holdings LLC, Maple Valley, Washington, by Confluence, Seattle, Washington.

King County. 2012. Critical areas restoration and enhancement in King County: Understanding the Process and technical assistance in preparing a plan. King County, department of Development and Environmental Services, Land Use Services Division, Renton, Washington.

USDA and USDI (U.S. Department of Agriculture and U.S. Department of the Interior). 1999. Sampling vegetation attributes. USDI, Bureau of Land Management's National Applied Resource Sciences Center, Interagency Technical Reference BLM/RS/ST-96/002+1730, Denver, Colorado.

Appendix A

Bond Quantity Worksheet

Department of Permitting		Critical Areas Mitigation		C24 09/09/2015	
 Environmental 35030 SE Douglas St, Suite 210 Snoqualmie, WA 98065-9266 206-296-6600 TTY Relay: 711		Bond Quantity Worksheet Is-wks-sensareaBQ.xls Is-wks-sensareaBQ.pdf			
Project Name:	Date:	Prepared by:			
	01/27/25	Audrey Michniak			
Project Number:	Project Description:	Applicant:	Phone:		
	Stream and wetland buffer restoration to address unpermitted land disturbing activities in critical areas.	Eric Edwards	206-308-3430		
Location:	18230 240th Avenue SE, Maple Valley, Washington 98038				
PLANT MATERIALS (includes labor cost for plant installation)					
Type	Unit Price	Unit	Quantity	Description	Cost
PLANTS: Potted, 4" diameter, medium	\$5.00	Each			\$
PLANTS: Container, 1 gallon, medium soil	\$11.50	Each	999		\$ 6,888.50
PLANTS: Container, 2 gallon, medium soil	\$30.00	Each	255		\$ 5,100.00
PLANTS: Container, 5 gallon, medium soil	\$36.00	Each			\$
PLANTS: Seedling, by hand	\$0.50	SY			\$
PLANTS: Slips (willow, red-osier)	\$2.00	Each			\$
PLANTS: Slates (willow)	\$2.00	Each			\$
PLANTS: Slates (yellow)	\$2.00	Each			\$
PLANTS: Flatplug	\$2.00	Each			\$
TOTAL					\$ 12,008.50
INSTALLATION COSTS (LABOR, EQUIPMENT, & OVERHEAD)					
Type	Unit Price	Unit	Quantity	Description	Cost
Compost, vegetable, delivered and spread	\$37.80	CY	30		\$ 1,136.40
Decomposing tillhardpan, medium, to 18" depth	\$15.00	CT	400		\$ 6,000.00
Decomposing tillhardpan, medium, to 12" depth	\$1.57	CT			\$
Hydroseeding	\$0.51	SY			\$
Labor, general (landscaping other than plant installation)	\$40.00	HR			\$
Labor, general (construction)	\$40.00	HR			\$ 320.00
Labor, Consultant, supervising	\$55.00	HR			\$
Labor, Consultant, on-site, as-needed	\$95.00	HR			\$
Rental of decomposing machinery & operator	\$70.00	HR			\$
Stand, coarse builder's, delivered and spread	\$42.00	CY			\$
Staking material (spit per tree)	\$7.00	Each			\$
Surveying line & grade	\$260.00	HR			\$
Surveying, topographical	\$260.00	HR			\$
Watering, 1" of water, 50' scoker hose	\$3.62	MSP			\$
Irrigation - temporary	\$1,500.00	Acres	0.44		\$ 1,470.00
Irrigation - border	\$4,500.00	Acres			\$
Tilling topsoil, disk harrow, 20hp tractor, 4" x 8" deep	\$1.02	SY			\$
TOTAL					\$ 3,554.40
HABITAT STRUCTURES*					
ITEMS	Unit Cost	Unit	Quantity	Description	Cost
Fascines (willow)	\$ 2.00	Each			\$
Logs (cedar), w/ root wads, 16"-24" diam., 30' long	\$1,000.00	Each			\$
Logs (cedar) w/ root wads, 16"-24" diam., 30'	\$400.00	Each			\$
Logs, w/ root wads, 16" 24" diam., 30' long	\$245.00	Each			\$
Logs w/ root wads, 16" 24" diam., 30' long	\$400.00	Each			\$
Rocks, one-man	\$50.00	Each			\$
Rocks, two-man	\$120.00	Each			\$
Root wads	\$163.00	Each			\$
Soil/gravel gravel, type A	\$22.00	CT	10		\$ 220.00
Wear - 1/2"	\$1,500.00	Each			\$
Wear - adjustable	\$2,000.00	Each			\$
Woody debris, large	\$634.00	Each			\$
Snags - attached	\$400.00	Each			\$
Snags - on site	\$50.00	Each			\$
Snags - imported	\$800.00	Each			\$
TOTAL					\$
*All costs include delivery and installation					
EROSION CONTROL					
ITEMS	Unit Cost	Unit	Quantity	Description	Cost
Earth and Compaction embankment	\$ 4.89	CY			\$
Crushed surfacing, 1 1/4" minus	\$30.00	CT			\$
Ditching	\$7.00	CY			\$
Excavation, bulk	\$4.00	CY			\$
Fence, 48"	\$1.60	LF			\$
Auto Mesh	\$1.20	SY			\$
Mulch, by hand, straw, 2" deep	\$1.27	SY			\$
Mulch, by hand, wood chips, 2" deep	\$3.20	SY	850		\$ 2,762.50
Mulch, by machine, straw, 1" deep	\$0.32	SY			\$
Piping, temporary, CPP, 6"	\$9.30	LF			\$
Piping, temporary, CPP, 8"	\$14.00	LF			\$
Piping, temporary, CPP, 12"	\$18.00	LF			\$
Plastic covering, firm, thick, sandbagged	\$2.00	SY			\$
Rip Rap, machine placed, slopes	\$33.98	CY			\$
Rock Concrete, Entrance 100x10x1'	\$3,000.00	Each			\$
Rock Concrete, Entrance 50x10x1'	\$1,000.00	Each			\$
Sediment pond riser assembly	\$1,895.11	Each			\$
Sediment trap, 3' high berm	\$15.57	LF			\$
Sediment trap, 5' high berm, w/way in, 1/2" riprap	\$55.00	LF			\$
Soil, 1" deep, level ground	\$5.24	SY			\$
Soil, 1" deep, sloped ground	\$6.41	SY			\$
Straw bales, place and remove	\$600.00	TON			\$
Staking and disposal	\$50.00	CT			\$
Topsoil, delivered and spread	\$35.73	CY			\$
TOTAL					\$ 2,762.50
GENERAL ITEMS					
ITEMS	Unit Cost	Unit	Quantity	Description	Cost
Fencing, chain link, 6' high	\$18.89	LF			\$
Fencing, chain link, corner posts	\$111.17	Each			\$
Fencing, chain link, gate	\$27.63	Each			\$
Fencing, soft roll, 2' high (2-roll)	\$15.24	LF			\$
Fencing, temporary (NGPE)	\$1.20	LF			\$
Signs, sensitive area boundary (inc. backing, post, install)	\$28.50	Each			\$
TOTAL					\$
OTHER (Construction Cost Subtotal)					
ITEMS	Percentage of Construction Cost	Unit	Quantity	Description	Cost
Mobilization	10%	1			\$
Contingency	30%	1			\$
TOTAL					\$
MAINTENANCE AND MONITORING					
NOTE: Projects with multiple permit requirements may be required to have longer monitoring and maintenance terms. This will be evaluated on a case-by-case basis for development applications. Monitoring and maintenance ranges may be assessed anywhere from 5 to 10 years.					
Maintenance, annual (by owner or consultant)					
Less than 1,000 sq.ft. and buffer mitigation only	\$ 1.08	SF		(3 X SF - total for 3 annual events; includes monitoring)	\$
Less than 1,000 sq.ft. with wetland or aquatic area mitigation	\$ 1.35	SF		(3 X SF - total for 3 annual events; includes monitoring)	\$
Larger than 1,000 sq. ft. but less than 5,000 sq.ft. of buffer mitigation	\$ 180.00	EACH		(8hr @ \$45/hr)	\$
Larger than 1,000 sq. ft. but less than 5,000 sq.ft. of wetland or aquatic area mitigation	\$ 270.00	EACH		(6hr @ \$45/hr)	\$
Larger than 5,000 sq.ft. but < 1 acre - buffer mitigation only	\$ 360.00	EACH	4	(8 hrs @ 45/hr)	\$ 1,440.00
Larger than 5,000 sq.ft. but < 1 acre with wetland or aquatic area mitigation	\$ 450.00	EACH		(10 hrs @ \$45/hr)	\$
Larger than 1 acre but < 5 acres - buffer and / or wetland or aquatic area mitigation	\$ 1,600.00	DAY		(WEC crew)	\$
Larger than 5 acres - buffer and / or wetland or aquatic area mitigation	\$ 2,000.00	DAY		(1.25 X WEC crew)	\$
Monitoring, annual (By owner or consultant)					
Larger than 1,000 sq.ft. but less than 5,000 wetland or buffer mitigation	\$ 720.00	EACH		(8 hrs @ 90/hr)	\$
Larger than 5,000 sq.ft. but < 1 acre with wetland or aquatic area impacts	\$ 900.00	EACH	4	(10 hrs @ \$90/hr)	\$ 3,600.00
Larger than 1 acre but < 5 acres - buffer and / or wetland or aquatic area impacts	\$ 1,440.00	DAY		(16 hrs @ \$90/hr)	\$
Larger than 5 acres - buffer and / or wetland or aquatic area impacts	\$ 2,160.00	DAY		(24 hrs @ \$90/hr)	\$
TOTAL					\$ 6,040.00
Tot al					\$23,365.40

