AECOM

Puget Sound Energy Sammamish-Juanita Transmission Line Critical Areas Impact Assessment Revised Final (February 2021)

Puget Sound Energy

February 2021

Prepared for:

PUGET SOUND ENERGY

Prepared by:

Kim Anderson, PWS

Reviewed by:

Paul Hamidi, PWS, CPSS

AECOM
1111 3rd Avenue
Suite 1600
Seattle, WA 98101
aecom.com

Executive Summary

Puget Sound Energy (PSE) proposes to construct approximately 5 miles of new 115 kV transmission line between Sammamish Substation in the City of Redmond and Juanita Substation in the City of Kirkland. The proposed Sammamish – Juanita transmission line project (Project) route crosses through three jurisdictions: the City of Redmond, unincorporated King County, and the City of Kirkland. As part of the project, PSE proposes to construct a 1.6-mile gravel construction access and maintenance road by widening an existing rail ballast and replacing culverts under the existing ballast. Regulated critical areas in the project area include wetlands, FWHCAs (including streams), and geologically hazardous areas (discussed in the *Revised Geotechnical Engineering Report, Sammamish – Juanita Transmission Line*, Kleinfelder 2020), and associated buffers. Project activities have the potential to impact these critical areas.

The Project was designed to avoid and minimize impacts to critical areas and buffers. Pole locations have been adjusted to avoid critical areas and their buffers, and are located to utilize existing paved areas and gravel access to the degree possible. No poles will be located in streams. Temporary work areas will be located to result in the least amount of overlap with critical areas and their buffers. Access routes will avoid critical areas and buffers to the degree possible. The gravel construction access and maintenance road has been designed to utilize the existing railbed and avoid streams, wetlands, and their buffers to the degree possible. Impact minimization techniques will include conducting Project work during the dry season, laying mats over wetland vegetation to prevent damage associated with heavy equipment, implementing best management practices to control erosion and sedimentation, incorporating retaining walls into the access road design, and restoring disturbed work areas in critical areas and buffers following construction.

Unavoidable Project impacts will include permanent and temporary impacts to wetlands and regulatory buffers within three jurisdictions, as summarized in the tables that follow. Sources for information about these wetlands and streams include *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report* (AECOM 2016) and a subsequent redelineation, the *Willows Road Culvert Replacement Critical Areas Report* (Parametrix 2018), and the *Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report* (AECOM 2020).

Table ES-1. Summary of City of Redmond Wetland and Stream Impacts

		Wetland and Stream Impacts			**Buffer Impacts**		
Wetland/ Stream	Category/ Class	Permanent Impact Area (square feet)	Tree Removals	Temporary Impact Area (square feet)	Permanent Impact Area (square feet)	Tree Removals	Temporary Impact Area (square feet)
Substn C	Category II	130	0	61,440	40	0	3,780
R-GCA	Category III	0	0	565	1,055	0	310
R-C	Category III	30	0	265	465	0	3,580
ROS-A	Category III*	0	0	0	100	0	2,630
R-D	Category III	0	0	1,050	60	0	1,180
ROS-B	Category III*	0	0	0	0	0	1,155
R-E	Category II	0	0	180	0	0	1,855
R-2	Class III	0	0	150	0	0	0
124th St Stream	Class III	0	0	0	0	0	485
York Creek	Class III	0	0	0	235	17	0
Total		**160**	**0**	**63,650**	**1,955**	**17**	**14,975**

* Estimated rating for off-site wetland
Note: Impact areas for combined wetland/stream buffers are only listed once.

Table ES-2. Summary of Unincorporated King County Wetland and Stream Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Type	Net Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Net Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
KC-A	Category II	0	0	340	0	0	5,100
KC-B	Category III	0	0	190	0	0	345
KC-1	Type N	0	0	40	0	0	0
124th Street Stream	Type F	0	0	0	0	1	1,615
Total		**0**	**0**	**570**	**0**	**1**	**7,060**

Table ES-3. Summary of City of Kirkland Wetland and Stream Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Type	Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
K-B/K-7	Category IV/ Type Np	0	0	0	15	1	400
K-D	Category III	25	1	600	15	0	0
K-G	Category III	10	0	600	0	0	0
K-J/K-3	Category II/ Type F	5	9	600	10	27	200
K-K/K-6	Category III/ Type F	0	7	0	20	24	1,850
K-L/K-5	Category II/ Type F	15	0	5,215	0	6	2,050
K-HF	Category II	0	0	0	0	11	0
Total		**55**	**17***	**7,015**	**60**	**69***	**4,500**

* Includes trees (17 in wetlands and 52 in buffers) that will be compensated for through a fee in lieu payment to the City of Kirkland, associated with the master trail plan.

Proposed mitigation to compensate for permanent impacts to wetlands and buffers regulated by the City of Redmond will occur on site, south of the Sammamish Substation as part of the Willows Creek Stream Relocation Project. The Willows Creek Stream Relocation Project will establish a new stream channel in proximity to the historic Willows Creek stream channel, and connect the upper and lower segments of Willows Creek, to improve watershed function and riparian habitat. PSE will use a portion of the wetland enhancement planting area within the Willows Creek Stream Relocation Project limits as mitigation for Sammamish-Juanita Project impacts within the City of Redmond. More information is provided in the *Conceptual Mitigation Plan for the Sammamish – Juanita Transmission Line Project*, HDR 2020).

Proposed mitigation to compensate for permanent impacts to City of Kirkland wetlands and buffers (including removal of trees that will not be compensated for by a fee in lieu payment to the City of Kirkland) is to purchase mitigation bank credits at the Keller Farm Wetland Mitigation Bank. Permanent wetland and buffer impacts within unincorporated King County have been avoided.

Table of Contents

Appendices

Figures

Tables

1. Project Description

1.1 Introduction

Customer energy usage is straining the capacity of the existing electric system in the areas of Kirkland and Redmond, reducing the ability to provide dependable power to area residents and businesses. Puget Sound Energy (PSE) is proposing to construct a new 115 kV transmission line between Sammamish Substation in the City of Redmond (9221 Willows Road NE – parcel #0325059002) and Juanita Substation in the City of Kirkland (10910 NE 132nd Street – parcel #2926059007) to increase system capacity and reliability. The transmission line will be approximately 5 miles in length (Figure 1). The project crosses through three jurisdictions, including the City of Redmond, unincorporated King County, and the City of Kirkland. Within the City of Kirkland, the transmission line will loop through Totem Substation (13211 NE 123rd Street – parcel #2726059084) south of NE 124th Street. Within the City of Redmond and unincorporated King County, PSE will install a 1.6-mile gravel construction access and maintenance road. PSE will replace seven culverts under the existing rail ballast as part of the ballast widening for the access road construction.

The proposed transmission line is located in heavily altered urban areas, and runs for most of its length along a former railroad ballast and street right-of-way. Adjacent land uses include commercial, industrial, residential, agriculture, open space, and transportation right-of-way. While the project design has allowed for avoidance of wetlands and streams and their associated buffers along most of the route, the project will result in unavoidable temporary and permanent impacts to wetlands and buffers along portions of the route.

This report assesses potential Project-associated impacts to wetland and stream critical areas and their associated buffers, in accordance with applicable regulations for the three jurisdictions in which the project is located. These include Redmond Zoning Code (RZC) Section 21.64 (Critical Areas Regulations) and Appendix 1 (Critical Areas Reporting Requirements); King County Code (KCC) Chapter 21A.24 (Critical Areas Ordinance); and Kirkland Zoning Code (KZC) Chapter 90. This impact assessment is based on critical areas and buffers identified in the *Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report* (AECOM 2020) and a subsequent redelineation, the *Willows Road Culvert Replacement Critical Areas Report* (Parametrix 2018), and the *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report* (AECOM 2016). This impact assessment report also summarizes proposed mitigation in relation to applicable mitigation sequencing requirements.

PSE proposes to mitigate for unavoidable permanent impacts to wetlands and buffers within the City of Kirkland through a fee in lieu payment to the City of Kirkland associated with the master trail plan, and by purchasing credits at a local wetland mitigation bank (the Keller Farm Bank). Permanent wetland, stream, and buffer impacts have been avoided within unincorporated King County. All temporary Project-related impacts will be restored on site upon Project completion. PSE proposes to mitigate for impacts within the City of Redmond with on-site mitigation at the Sammamish Substation site as part of the Willows Creek Stream Relocation Project. Decisions about mitigation methods consider constraints for on-site mitigation opportunities associated with the Project's location and current and future land uses, and were made after seeking input from the planning departments of the three jurisdictions within which Project activities will occur, as well as the property owners and other corridor users per the conditions of PSE's easements.

1.2 General Information

Name of Proposal:	Sammamish-Juanita Transmission Line Project
Name of Applicant:	Puget Sound Energy 355 110th Avenue NE Bellevue, Washington 98004

Report Prepared by: Kim Anderson, PWS
Paul Hamidi, PWS, CPSS
AECOM
1111 Third Avenue, Suite 1600
Seattle, Washington 98101

1.3 Study Area

The Project study area is the planned, 50-foot-wide, 5-mile transmission corridor that extends from Sammamish Substation in the City of Redmond to Juanita Substation in the City of Kirkland. The study area also includes most of the PSE-owned parcel south of Sammamish Substation where additional Project work will be located (Figure 1). The total size of the study area is approximately 47 acres. It is located in portions of Township 25 North, Range 5 East, Sections 3 and 10, in the Sammamish River and Lake Washington/Cedar River Watersheds (Water Resource Inventory Area 8). The transmission corridor traverses predominantly developed areas. Adjacent land uses include commercial and industrial development, a golf course, transportation (roads), single and multi-family residential development, and park/open space. In the southern end of the study area in the City of Redmond, rail ballast along Willows Road NE has been converted to the paved Redmond Central Connector (RCC) Trail, which ends at NE 100th Court. In the City of Kirkland portion of the study area, a former rail corridor has been converted into the Cross Kirkland Corridor (CKC) trail. The planned transmission line corridor generally runs along the CKC trail from near the study area's eastern end in the City of Kirkland to I-405.

1.4 Project Description

Project elements that have the potential to impact critical areas in the study area include the following:

- Transmission line construction (installation of new transmission poles, guys, and insulators)
- Stringing sites
- Vegetation management for line clearance
- Construction of a gravel construction access and maintenance road by widening a rail ballast (includes associated culvert replacement)
- Temporary access routes to pole locations during construction

1.4.1 Transmission Line Construction

The planned project involves the installation of new transmission poles (wood, glulam and steel), and the stringing of wire between the poles. The total project will entail installation of 74 new poles, replacement of 30 poles, and removal of 5 poles that are no longer needed. Eighteen poles will be at least partially located in critical areas or their buffers (Table 1-1). These poles are depicted in the maps provided in Appendix A. Table 1-1 is based on assumptions about pole and foundation types, which could change for some poles as the project is refined. For the purposes of impact calculations in this report (Chapter 5), the maximum potential impact area for each pole is considered.

The different pole installation methods will result in different areas of permanent disturbance associated with the amount of associated fill. Wood poles and light duty steel poles will be directly embedded into the ground. For each pole, a hole approximately 4 feet wide and up to 12 feet deep will be excavated using a line truck with an auger. Wood and light duty steel poles will be installed directly into the hole by the line truck, and the hole will be backfilled with gravel. For poles requiring cassions due to soil conditions, a steel cassion will be vibrated into the ground, and displaced soil removed with a vac truck. The pole will be installed within the cassion, and the hole will be backfilled with gravel. For heavier steel poles being

installed south of Sammamish Substation, a drilled pier foundation will be used. The excavated hole for the drilled pier foundation will be approximately 7 feet wide and up to 50 feet deep. After the hole is dug, reinforced-steel anchor bolt cages will be installed in the hole and then filled with concrete. Once the foundation has cured, the steel pole will then be placed on the foundation by a line truck. In the area around Totem Lake in Kirkland, steel poles with micropile foundations could be installed (although no poles of this construction have been identified in the current design). These foundations consist of ten piles with a diameter of approximately 12 inches each that would be driven into the ground using a vibratory hammer. Steel poles will be placed on the foundation by a line truck.

Table 1-1. Number of Poles in Critical Areas and Buffers, by Jurisdiction

Jurisdiction	Number of Wood Poles – Direct Embed	Number of Steel Poles – Drilled Pier Foundation	Number of Steel Poles – Direct Embed	Number of Steel Poles – Micro Pile	Total Number of Poles
City of Redmond	**5**	**3**	**0**	**0**	**8**
New	2	--	--	--	2
Replacement	3	3	--	--	6
Unincorporated King County	**0**	**0**	**0**	**0**	**0**
New	--	--	--	--	0
Replacement	--	--	--	--	0
City of Kirkland	**9**	**0**	**1**	**0**	**10**
New	8	--	1	--	9
Replacement	1	--	--	--	1
Project Total	14	3	1	0	18

South of Sammamish Substation pole replacement will occur to support substation improvements to connect the new transmission line to an existing 115 kV bay in the substation. Seven existing single or H-frame poles (one to three wood poles per location) in critical areas and buffers will be removed as part of the project, three of which will be replaced with new steel poles in the same location or nearby. Wood poles being removed from critical areas and buffers will either be cut at ground level and left in place or pulled from the ground and backfilled with spoils from an excavation for one of the new poles, or native soils from another appropriate source.

The temporary work area around each pole installation site will be dependent on the type of foundation and site conditions. These temporary disturbance areas are estimated as follows:

- Poles with micropile foundations – minimal temporary disturbance area, as piles will be driven into the ground and no digging is required.
- Wood poles located in a critical area buffer adjacent to a paved area or gravel access road – approximately 400 square feet.
- Steel poles with concrete foundations (poles south of Sammamish substation and Pole 4/11 located adjacent to the Wetland K-L buffer) – approximately 2,500 square feet for all pole installations and removals.
- Pole 4/10 (Wetland K-L) – 900 square feet.

To some degree, the shape of the work area can be adjusted to exclude or minimize overlap with critical areas and other sensitive features. Temporary access routes to poles in wetlands are discussed in Section 1.4.5. Construction buffers will be established between work areas and critical areas using appropriate best management practices (BMPs). Following pole installation/removal, all disturbed areas will be stabilized and left to return to their natural state.

Potential impacts to critical areas from pole replacement are as follows:

- **Permanent Impacts** – Installation of new poles and gravel backfill or foundations. The permanent direct impact area varies by the size of the pole/foundation. Trees removed at or near pole installation sites are also permanent impacts. No permanent indirect impacts are anticipated.
- **Temporary Impacts** – Pole construction work areas and pole buffer areas that do not require removal of trees. These areas will be disturbed during construction and then revegetated as needed and left to return to their natural state. Temporary indirect impacts could occur from sedimentation into wetlands from adjacent work areas; BMPs would be used to prevent these impacts. All temporary impacts are expected to be short term.

1.4.2 Stringing Sites

Following pole installation, stringing of wire will occur. This activity will require pulling and tensioning sites to be located along the transmission line route where the transmission line turns and wire cannot be pulled at an angle. Equipment staged at the pulling and tensioning sites will include tractors and trailers with spooled reels that hold the conductors (wire), and trucks with tensioning equipment. With the exception of one stringing site located in the wetland south of Sammamish Substation, all stringing sites will be located on existing paved or gravel surfaces, and will not result in new disturbance. South of Sammamish Substation the stringing site will be located in a flat wetland area where vegetation will be covered by mats. Vegetation in this area consists of predominantly non-native species. Typically, crushed vegetation rebounds within one growing season and impacts to vegetation are only temporary. Once equipment is staged, the act of stringing wire will not result in surface disturbance. The temporary disturbance area associated with the stringing site will be approximately 7,500 square feet.

Potential impacts from stringing sites are further analyzed and quantified in Chapter 5 of this report.

1.4.3 Tree Removal/Vegetation Management for Line Clearance

Vegetation within the transmission line corridor must be compatible with the new 115 kV line, and will be routinely managed to comply with federal requirements for vegetation clearance. Prior to construction of the transmission line, trees with the potential for a mature height of 25 feet or taller will be permanently removed from the project corridor to provide clearance for the new transmission line. Additional vegetation management will likely be needed to allow construction work to occur. Where feasible, trees will be trimmed to maintain clearance rather than removed. Three additional trees along the corridor will be removed to accommodate the culvert replacement activities described in the next section.

Potential impacts to critical areas from tree removals are further analyzed and quantified in Chapter 5 of this report.

1.4.4 Permanent Gravel Construction Access and Maintenance Road

Along a 1.6-mile portion of the project corridor in the City of Redmond and unincorporated King County, PSE will construct a gravel construction access and maintenance road by widening a former rail ballast. The existing railroad bed east of Willows Road NE is not wide enough to be safely used by construction equipment to construct and maintain the proposed power transmission line. The new access road will be used during project construction, and will remain in place as a maintenance road. Therefore, some impacts to critical areas and their buffers associated with the gravel access road will be permanent impacts. Culvert replacement under the construction access road will result in permanent and temporary impacts to stream channels and adjacent buffers, as well as long-term benefits associated with functional habitat and stormwater improvements.

The new construction access and maintenance road will be 17 feet wide and will consist of gravel surfacing. The access road section will be designed to support the weight of PSE construction and maintenance vehicles. The vertical profile of the access road will be established to utilize the existing railbed, to minimize impacts to adjacent wetlands, streams, and buffers, and to provide adequate clearance/cover for proposed culvert replacements. Side slopes will generally be provided at a 3:1 slope

to match existing grade. Retaining walls will be provided adjacent to existing wetland, streams, and buffers to minimize impacts. Where retaining walls are provided, railings or fencing will also be provided as required by local codes.

Stormwater improvements will include the replacement of four existing undersized culverts (three in the City of Redmond and one in unincorporated King County) with larger fish passable culverts (per WDFW guidelines). The new fish passage culverts will include stream grading and improvements to integrate the new culvert with the existing stream channel. Three stormwater culverts in the City of Redmond will also be replaced to provide improved conveyance. Other stormwater improvements will include furnishing infiltration trenches and vegetated slopes to disperse surface flows and to provide overall flow control.

Construction of the gravel construction access and maintenance road will be completed utilizing standard construction equipment including excavators, dozers, dump trucks, graders, and compaction equipment. A small crane may be utilized to place the proposed prefabricated fish passage culverts. A watering truck may be required during periods of dry weather. Concrete trucks may be required to place concrete for footings, headwalls, and retaining walls.

Earthwork will be balanced as much as is practical. Existing materials, particularly the existing railbed ballast spoils, will remain on site and be utilized in place or regraded within the project limits. The existing material will be supplemented with imported gravel base material that is expected to come from local sources.

The general construction sequence will be as follows:

- Install perimeter protection and TESC measures.
- Grade and install temporary construction entrances.
- Clear vegetation within designated project limits, using excavator and dozer.
- Grade site per plan. Install imported gravel borrow and crushed surfacing per plan.
- Construct retaining walls per plan.
- Install fish passage culverts per plan, including stream grading and improvements and dewatering, as required.
- Replace existing storm drainage culverts as required.
- Install proposed storm drainage improvements per plan.
- Provide curb improvements per plan.
- Install utility conduits per plan.
- Provide final construction access and maintenance road surfacing and compaction.
- Provide restoration of all disturbed areas, including wetlands, streams, and buffers by stabilizing the site.
- Complete cleanup and project closeout.

In-water work will include replacement of the four existing stream culverts with fish passage culverts and associated stream grading and improvements. This work will result in unavoidable impacts to streams and stream buffers; however, there will be no loss of stream channel area below the ordinary high water mark. The improvements will result in a net benefit to stream functions and fish habitat.

1.4.5 Temporary Access Routes

Wherever possible, pole locations will be accessed from roads, trails, or other paved or gravel areas. Where such access is not feasible, access routes that avoid critical areas and associated buffers and that are temporary have been identified. It is assumed that access routes will be approximately 17 feet in width to support travel by large construction equipment. Where access routes cannot avoid critical areas and buffers, BMPs will be used to minimize ground disturbance.

All other access routes aside from the proposed gravel construction access and maintenance road in the City of Redmond and unincorporated King County will be temporary, used only during the construction

period. These routes have been identified to avoid streams and removal of trees. To access poles in wetlands south of Sammamish Substation in the City of Redmond and pole 4/10 at Wetland K-L in the City of Kirkland, mats will be placed over existing vegetation, resulting in temporary impacts associated with crushed vegetation. At one location in the City of Kirkland (access to Pole 4/10 in Wetland K-L) where stream crossing is not avoidable, PSE will lay fiberglass or timber matting across the stream channel to allow construction equipment to cross. Mats will be removed after use. It is expected that vegetation covered by mats will rebound within one growing season and impacts to vegetation will be temporary. Herbaceous vegetation in areas that will require mats for construction is predominantly reed canarygrass (*Phalaris arundinacea*). Recovery of vegetation may be longer in areas where shrubs must be cut in order to lay mats south of Sammamish Substation in the City of Redmond.

Following construction, disturbed access route areas will be stabilized as needed and left to return to their natural state. As most access routes are in areas where non-native species are prevalent, stabilization will typically consist of seeding to prevent erosion.

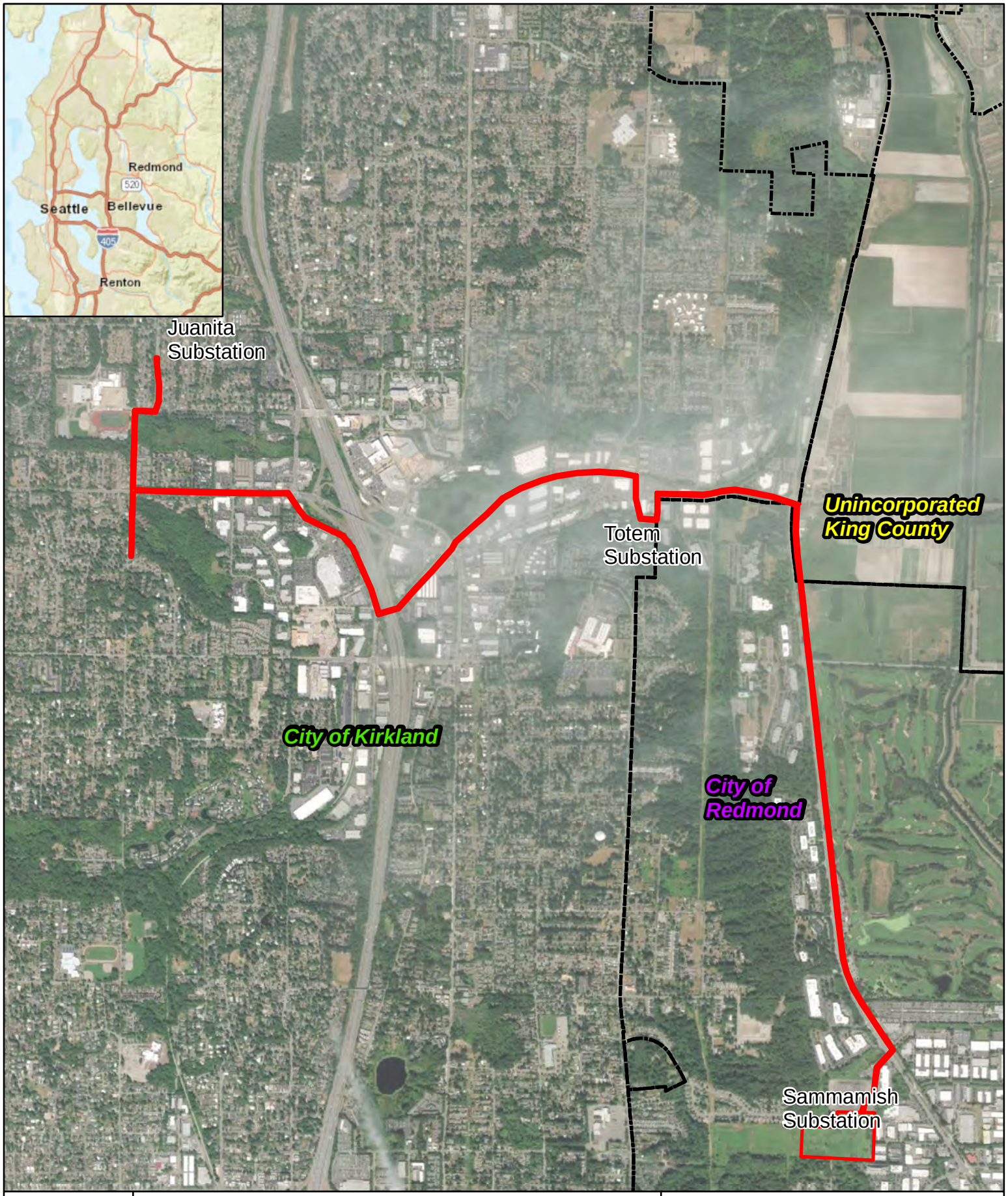
Potential impacts to critical areas from access routes are further analyzed and quantified in Chapter 5 of this report.

1.5 Limitations

Analyses provided in this report rely on information obtained from other sources, including the following:

- Information (delineations, descriptions, ratings) on two wetlands in the City of Redmond (R-GCA and R-GC-B) from the 2018 *Parametrix Willows Road Culvert Replacement Critical Areas Report*.
- Tree survey GIS data, provided by DEA, showing the locations of trees that will be trimmed or removed as part of the project.
- CAD files or other drawings showing the location of proposed pole locations, pole removals and replacements, and other project features, provided by PSE.
- Information from PSE about project construction (including diameter of excavated holes, access route widths, size of work areas and stringing sites). This information is used to estimate likely temporary and permanent impact areas in the study area.
- CAD files and project details for the planned gravel construction access and maintenance road and culvert replacements from Otak.
- Spatial data from Otak showing the limits of the railroad ballast in the City of Redmond and unincorporated King County, which is used to identify the limits of critical area buffers.
- Spatial data from DEA showing the limits of the former rail embankment in the City of Kirkland, which is used to identify the limits of critical area buffers.
- General information about construction of the gravel access road, provided by Otak.
- Preliminary information from HDR about planned on-site mitigation to be conducted under the Willows Creek Stream Relocation Project

This report assumes that these sources are correct and provide the best available information for use in analyzing impacts to critical areas and their buffers.



N

1:24,000

Study Area

Jurisdictional Boundary

0 0.25 0.5

Miles

Figure 1
Vicinity Map

Sammamish-Juanita
Transmission Line Project
Redmond, Kirkland, and King County, WA

2. Existing Conditions

Figures 2 through 7 show an overview of the Project in relation to study area critical areas and buffers in the three jurisdictions. Note that the pole symbols on these figures are not to scale, and are much larger than the actual pole footprints. More detailed maps showing portions of the study area where Project components are located near critical areas and buffers are provided in Appendix A.

2.1 City of Redmond Existing Conditions

The City of Redmond defines critical areas as any of the following areas or ecosystems: fish and wildlife habitat conservation areas (FWHCAs), wetlands, frequently flooded areas, critical aquifer recharge areas, and geologically hazardous areas, as defined in RCW Chapter 30.70A and RZC 21.64. Critical areas that occur in the project area include wetlands, FWHCAs (including streams), and geologically hazardous areas (erosion hazard areas and seismic hazard areas). Geologically hazardous areas in the City of Redmond are addressed in two geotechnical reports that have been prepared for the Project (Kleinfelder 2020, GeoEngineers 2020), and are therefore not discussed in this report.

2.1.1 Wetlands and Streams

Three reports summarize the wetland and stream delineations that were conducted in the project area. The *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report* (AECOM 2016) identifies wetlands and streams that were delineated and mapped on the Sammamish Substation property, and the *Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report* (AECOM 2020) identifies wetlands and streams that were delineated and mapped over the remainder of the City of Redmond study area. The latter report has been updated to include verification and boundary modifications to wetlands and streams that were originally delineated more than 5 years ago. The boundary of Wetland Substation C was revised in May 2019 and is different from the mapped boundary shown in the 2016 delineation report. These two reports include all wetlands and streams in the project area, with the exception of two wetlands associated with Gun Club Creek (Wetlands R-GCA and R-GCB). These two wetlands were not delineated during the original delineation, and prior to a field verification of wetland boundaries in 2019 they were delineated by Parametrix in associated with another project (the Willows Road Culvert Replacement Project). AECOM obtained GIS data of these wetland boundaries from the City of Redmond for use in this impact assessment. Descriptions of Wetlands R-GCA and R-GCB in Section 2.1.1.4 come from the *Willows Road Culvert Replacement Critical Areas Report* (Parametrix 2018).

Where stream classifications presented in the delineation reports differ from the classifications listed in the City of Redmond GIS data, the City's determination has been used to determine regulatory buffer widths for the purpose of the impact assessment.

A total of 8 wetlands and 5 streams were mapped in or near the City of Redmond study area that are considered in this impact assessment (Table 2-1; Figures 2 through 4). Field surveys to map wetlands and streams covered a larger area than the Project study area. The wetlands and streams listed in Table 2-1 are partially or wholly within the study area, or close enough to the study area that they could potentially be affected by project activities. Table 2-1 provides details about wetlands and streams and their associated standard buffers regulated under the RZC, generally listed from the southeast to the northwest ends of the transmission line route. Wetland areas include the total area delineated. Descriptions of wetlands and streams are based on or copied from the delineation reports previously referenced.

2.1.1.1 Wetland Substation B

Wetland Substation B is a Category III PFO/PSS/PEM slope wetland, approximately 0.7 acre in size. It occurs along the southwest edge of the substation, on a steep slope. It receives water via hillslope seep from the west, and carries this water to the east, where it tapers into a narrow ditch south of the substation. It is also connected to a drainage ditch that runs north-south along the edge of substation fill. This wetland consists of two forested areas, which are broken by a PSS/PEM area associated with the cleared transmission line right-of-way. Wetland Substation B provides moderate levels of water quality, hydrologic, and habitat functions.

The proposed transmission line route will not include this wetland or its buffer; therefore, this wetland is not discussed as part of the impact assessment.

Table 2-1. Field-Identified City of Redmond Wetlands and Streams and Associated Buffer Areas

Wetland	Area of Wetland Delineated	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
Substn B[6]	32,059 ft^2 (0.7 AC)	Category III Slope PFO/PSS/PEM	NA	110 feet
Substn C[7]	535,657 ft^2 (12.3 ac)	Category II Slope PFO/PSS/PEM	Upper Willows Creek – Class III Lower Willows Creek – Class II Peter's Creek Tributary – Class III	Wetland: 225 feet Streams: 100 or 150 feet
R-A	13,248 (0.3 ac)	Category II Riverine PEM/PSS/PFO	Gun Club Creek – Class III	Wetland: 110 feet Stream: 100 feet
R-GCB	4,617 ft^2 (0.11 ac)	Category III Riverine PEM/RAB	Gun Club Creek – Class III	Wetland: 60 feet Stream: 100 feet
R-GCA	2,831 ft^2 (0.07 ac)	Category III Riverine PEM/RAB	Gun Club Creek – Class III	Wetland: 60 feet Stream: 100 feet
R-C	305 ft^2 (0.01 ac)	Category III Depressional PEM	NA	60 feet
R-D	4,210 ft^2 (0.10 ac)	Category III Depressional PEM	Stream R-3 – Class III	Wetland: 60 feet Stream: 100 feet
R-E[1]	9,975 ft^2 (0.23 ac)	Category II Depressional PEM	York Creek – Class III	Wetland: 75 feet Stream: 100 feet
--	--	--	124th Street Stream – Class III	100 feet

HGM = hydrogeomorphic; substn = substation; ft^2 = square feet; ac = acre; NA = not applicable.
[1] Wetland is predominantly located outside the area surveyed. The delineated acreage is given here.
[2] HGM classification and Washington Department of Ecology (Ecology) wetland ratings were determined according to Hruby 2014 in City of Redmond and City of Kirkland, and according to Hruby 2004 in unincorporated King County.
[3] Cowardin Classification: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PFO=Palustrine Forest, POW=Palustrine Open Water; RAB = Riverine Aquatic Bottom (Cowardin et al. 1979).
[4] Stream classifications are based on City of Redmond GIS mapping.
[5] Sources: RZC 21.64.020.B.3; RZC 21.64.030.B.2.
[6] Called Wetland B in the *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report*
[7] Called Wetland C in the *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report*

2.1.1.2 Wetland Substation C

Wetland Substation C is a large, Category II wetland with a mix of PEM, PSS, and PFO Cowardin classes, which covers 12.3 acres on the substation property. Wetland Substation C appears to receive groundwater from several points along a steep section of the hillslope, conveying water along and just below the ground surface toward the lower gradient eastern half of the property. The general direction of water flow in the eastern portion of the site is southwest to northeast, with most water leaving the site via Willows Creek at the southeast end of the substation. Wetland Substation C has riverine components associated with the stream channels that run through the site, but inputs of water appear to be more associated with hillslope seepage and runoff than overtopping stream channels, so it was rated as a slope wetland. The hydrology of the site has been altered from earlier conditions, when Willows Creek ran in a defined channel through the wetland. The amount of water inputs into the wetland appear to have increased, and following rain events, water flows in a complex network of temporary, shallow, braided channels across the site. It is likely that Wetland Substation C was much larger prior to fill associated with construction of the substation and other adjacent development.

The PEM component, dominated by reed canarygrass, occurs in the wetter, flatter portion of the site, with an upland “island” surrounded by shrub vegetation in the center of this PEM component. The PSS component generally occurs on the steeper hillslope and in the vicinity of the upland island. The PFO component occurs in the riparian areas along the southern boundary of the study site, and in an isolated patch near the east edge of the wetland, south of the substation.

Wetland Substation C generally provides low levels of water quality functions, moderate levels of hydrologic functions, and high levels of habitat functions. It is important from a flood control perspective, and is associated with multiple riparian and instream habitats.

The proposed route for the new transmission line will not cross this wetland or its buffer. However, associated project work involving pole removal/installation/replacement to support connecting the new line with the substation and access to work areas will occur throughout this wetland.

2.1.1.3 Substation Streams

Four stream segments occur on the substation property, including two segments of Willows Creek that are no longer connected (Upper and Lower Willows Creek), a small stretch of Gun Club Creek west of the substation, and Peter’s Creek Tributary at the southern end of the site. Gun Club Creek will be described further in this section in association with wetlands located north of the substation.

Willows Creek

Two segments of Willows Creek are associated with Wetland Substation C (referred to as Upper and Lower Willows Creek in the *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report*, AECOM 2016). As previously described, the main channel of Willows Creek in the central portion of the substation property was not apparent during field investigations, and evidence of a stream bed or bank was not observed beyond the mapped locations shown in Figure 2. Based on City of Redmond GIS mapping, it appears that a contiguous, defined stream channel once ran through the southern half of the study site. Currently, in the absence of a channel connection between the two segments of Willows Creek, water flows across the site, generally from southwest to northeast, in a network of shallow channels that appear after rain events. The two mapped segments of Willows Creek remain hydrologically connected, although there is no longer a single defined channel to join them.

Lower Willows Creek is a Class II perennial tributary to the Sammamish River that crosses under Willows Road NE and is channelized through office park development for almost a mile before reaching the river. Within the substation property, this segment of the stream has been modified and now consists of steep banks with a confined linear channel. Two drainage ditches and two remnant channels drain into the linear channel. Bank slopes of the main channel are 6 feet high, and the confined linear channel is

approximately 3 feet wide. The westernmost remnant channel is about 1 foot wide with low banks and an almost flat gradient, but is set in a broad valley form that is about 10 feet wide. The easternmost remnant channel is about 6 inches wide, with steep, tall banks and a low gradient of less than 2 percent.

The substrate of Lower Willows Creek within the study area is primarily silt/sediment. No large woody material was observed during field investigations, and there is little opportunity for its future recruitment. Although the stream is documented as supporting coho salmon, fish habitat is limited, with no tree canopy cover and little shade to maintain cooler water temperatures. Turbidity is moderate, with unstable stream banks. No evidence of fish presence was observed during site visits. Streambank vegetation predominantly consists of the invasive species Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass. Wildlife habitat in the riparian corridor is of moderate quality, but it is located near commercial and residential developments, where wildlife are likely affected by roads, background noise, and artificial lighting. Because of these attributes, most wildlife species found in the riparian corridor are birds and small mammals.

The Upper Willows Creek segment is a perennial stretch of stream located along the southern property boundary, at the base of a hillslope. It is unconfined, with a broad, 3-foot-wide channel with low banks that are overtopped frequently. The gradient varies between 2 and 5 percent. The stream bed substrate is a mix of gravel with some cobble and silt/sediment. Bank stability is variable, with evidence of erosion and turbidity observed during site visits. Overbank flooding has resulted in new channels emerging in adjacent scrub-shrub areas. The combination of unstable stream bank, moderate stream gradient and high velocity low flows limits fish habitat. No evidence of fish presence was observed during site visits. Upper Willows Creek is fragmented from Lower Willows Creek where salmonid occurrence is documented. However, based on City GIS mapping this stretch of Willows Creek is considered a Class II stream. Riparian vegetation on the south side of the channel is mixed conifer forest dominated by western redcedar (*Thuja plicata*) and Douglas-fir (*Pseudotsuga menziesii*). On the north side, riparian vegetation is red alder (*Alnus rubra*) forest and deciduous scrub-shrub dominated by salmonberry (*Rubus spectabilis*). Some large woody material is present in the channel. Wildlife habitat in the riparian corridor is of moderate quality, and is connected to a relatively large contiguous patch of forest habitat upstream of the study area. No work associated with the Sammamish – Juanita Project will impact Upper or Lower Willows Creek; however, the mitigation for Sammamish – Juanita Project impacts within the City of Redmond will occur as part of the Willows Creek Stream Relocation Project (see Conceptual Mitigation Plan, HDR 2020).

Peter's Creek Tributary

Peter's Creek Tributary is a perennial Class III stream located along the southern Sammamish Substation property boundary. This small stream has been modified and is confined to a narrow channel that parallels the parking lot off site to the south. The channel most likely flowed north to the main channel of Willows Creek but now drains east into a constructed drainage ditch that extends beyond the study site. Based on City of Redmond GIS data, this stream receives stormwater inputs from residential development to the south via a pipe. The channel is 2 feet wide with 2-foot almost vertical banks that likely overflow into the adjacent parking lot. The substrate is mostly silt/sediment with some scoured gravel. The gradient varies from relatively flat to 5 percent. Peter's Creek Tributary enters the substation property from the south, and based on aerial photos this upstream area is in a relatively larger patch of forest. As the stream enters the study area, it flows through a forested stand of red alder and western redcedar, then becomes confined to a narrow linear channel. Toward the east property boundary, the riparian buffer has been degraded by development, including the parking lot that occurs south of the stream. Fish habitat in Peter's Creek Tributary is limited due to low flows and lack of pool habitat. Wildlife habitat in riparian corridor is of low quality and highly fragmented by commercial development. Peter's Creek Tributary and its associated buffer are outside the project study area and will not be affected by the project activities. Therefore, this stream is not discussed in the impact assessment.

2.1.1.4 Wetlands R-A, R-GCA, R-GCB and Gun Club Creek

Wetland R-A

Wetland R-A is a linear, Category II PEM/PSS/PFO riverine wetland located along Gun Club Creek on the west side of Willows Road NE north of Sammamish Substation. It is approximately 0.3 acre in size. The wetland appears to receive water from overbank flow from the stream channel, which runs roughly west to east. Vegetation primarily consists of trees and tall shrubs, with some small PEM areas. The predominant hydroperiod is saturated, with a few areas that are occasionally flooded. Wetland R-A generally provides high levels of water quality functions and moderate levels of hydrologic and habitat functions.

This wetland and its buffer are located outside the study area and will not be affected by planned project activities. Therefore, this stream is not discussed in the impact assessment.

Wetlands R-GCA and R-GCB

Wetlands R-GCA and R-GCB are narrow Category III PEM/RAB riverine, ditched wetlands located between Willows Road NE and the former rail ballast. Both wetlands are associated with Gun Club Creek. Within Wetland R-GCB, Gun Club Creek receives flow from a culvert under Willows Road NE, and flows northwestward into a culvert under NE 100th Court that discharges into Wetland R-GCA. Within Wetland R-GCB the stream continues to flow northwestward and into a culvert under the Overlake Christian Church parking lot driveway. In both wetlands, the aquatic bed vegetation community is dominated by watercress (*Nasturtium officinale*). The emergent community of Wetland R-GCA, located along the wetland fringe, consists primarily of Baltic rush (*Juncus balticus*) and reed canarygrass. The emergent community of Wetland R-GCB, located along the wetland fringe and south of Gun Club Creek, consists primarily of reed canarygrass and common cattail (*Typha latifolia*). The existing vegetated buffer of both wetlands is narrow (approximately 10 feet wide) and consists primarily of mowed grass. Several recently planted western red cedar and Douglas-fir saplings are located in the buffer area west of Wetland R-GCB. Both wetlands provide moderate levels of water quality and hydrologic functions and low levels of habitat functions.

The proposed transmission line will avoid these wetlands and their buffers, with poles installed on the opposite side of the existing RCC paved trail and unimproved rail ballast.

Gun Club Creek

Gun Club Creek is a perennially flowing Class III tributary to the Sammamish River. Based on the City's map of stormwater features, this stream receives inputs of stormwater from upslope residential development west of the study area via a pipe. The segment of Gun Club Creek west of Sammamish Substation is a natural stream course, with some sinuosity and natural meanders. This portion of the stream channel/riparian corridor and associated buffer will not be affected by Project activities.

The segment of Gun Club Creek north of Sammamish Substation and on the west side of Willows Road NE is adjacent to commercial developments and has been modified with a series of check dam structures and placement of rock to stabilize the channel and banks. This portion of the stream channel/riparian corridor and associated buffer will also not be affected by Project activities.

Gun Club Creek flows through a culvert under Willows Road NE into a linear ditch between the road and the paved trail/unimproved rail ballast. At the time of the initial surveys in 2014 through 2016, this segment of the stream had no flowing water in it, and no defined channel, and was not mapped as a stream. However, following a ditch-cleaning project in 2017 (described in Parametrix 2018), these features were observed. During the 2019 surveys, the stream channel ranged from 2 feet to 4 feet wide, with low flow and approximately 4 inches of water in the channel. The channel in this area is split into two sections by a driveway with a culvert underneath for water flow. In both sections, the substrate is silt/mud.

The riparian corridor on the west side of Willows Road NE is fragmented and truncated by adjacent business and associated parking areas. Riparian vegetation consists of trees and tall shrubs, and also includes landscaping associated with the adjacent commercial developments. The riparian area is approximately 25 feet wide. Wildlife species found in the riparian corridor are primarily birds. The riparian corridor on the east side of Willows Road NE consists of mowed vegetation, predominantly reed canarygrass, with some cattail and blackberry. A few scattered trees are present near the south end of the mapped stream.

There is no documentation of salmon in the segments of Gun Club Stream within the study area. Salmonid access to this area is blocked by multiple fish barriers, although the planned Willows Road Culvert Replacement Project (City of Redmond 2019) will replace the existing culverts under Willows Road NE.

The proposed transmission line route avoids this stream and its buffer, with poles to be installed on the opposite (east) side of the existing RCC paved trail and unimproved rail ballast.

2.1.1.5 Wetland R-C, Wetland R-D, Stream R-2, and Stream R-3

Wetlands R-C and R-D are small, Category III PEM depressional wetlands located in a ditch between Willows Road NE and the former rail ballast. The primary source of hydrology is channelized flow that enters the wetland through a culvert under Willows Road NE. Water leaves the wetland through a culvert under the embankment. Water from Wetland R-C enters an unnamed seasonal stream, referred to as Stream R-2 in this report. Both wetlands are highly degraded because of their location adjacent to a major street, and there is evidence that they receive regular vegetation maintenance. The dominant vegetation in both wetlands is reed canarygrass. Wetlands R-C and R-D generally provide moderate levels of water quality and hydrologic functions and low levels of habitat functions.

Stream R-2 is a Class III intermittent stream that extends beyond the study area boundary, into the adjacent Willows Run Golf Complex property. This tributary receives stormwater runoff from Willows Road NE and the golf course property. Washington Department of Fish and Wildlife (WDFW) mapping shows this stream flowing into ponds and other stream channels on the golf course property, before eventually draining into the Sammamish River, although the accuracy of this mapping is unknown.

The segment of Stream R-2 located near the planned transmission line corridor has a low gradient with low flow. The active stream channel is 12 inches wide and has steep vertical banks. The stream bed substrate is primarily silt/sediment. The stream appears to lack the aquatic habitat complexity necessary to support fish, including salmon species, and there is no documentation of salmonids in this segment of the stream. However, modeled presence of multiple salmonid species has been mapped in this stream just east of the study area boundary.

Stream R-3 is a very small intermittent stream located between two culverts and associated with Wetland R-D. This stream has a low gradient with low flow, and is approximately 18 inches wide with a vegetated bottom (reed canarygrass). It does not have a defined channel, but based on its connection to fish-bearing surface waters outside the study area, the City of Redmond considers it to be a Class III stream. Within the study area, there is no defined riparian corridor. The stream appears to lack the aquatic habitat complexity necessary to support fish, including salmon species, and there is no documentation of salmonids in this segment of the stream. However, based on information from the City of Redmond (GIS data and personal communication with Tom Hardy, the City's stream and habitat planner), this stream is hydrologically connected to salmon-bearing stream segments outside the study area.

The planned transmission line will avoid Wetlands R-C and R-D and Stream R-3 and their buffers, with poles installed on the opposite (east) side of the rail ballast. The transmission line will cross Stream R-2, with Pole 0/19 installed outside the stream buffer near the edge of the construction access road. The planned access road will be constructed directly adjacent to Wetland R-D and will result in minimal permanent impacts to the eastern edge of the wetland, and temporary impacts to the wetland and buffer.

The project will include replacement of culverts at Streams R-2 and R-3, which will result in minimal permanent impacts to Wetlands R-C and R-D, and temporary impacts to Stream R-2.

2.1.1.6 Wetland R-E and York Creek

Wetland R-E is a large, Category II PEM depressional wetland located in the diked 100-year floodplain of the Sammamish River. Only the west edge of the wetland, which is outside of the floodplain, occurs within the planned transmission line corridor. Site topography is generally flat with minor depressions. Elevations range from approximately 30 to 40 feet. The primary sources of hydrology are precipitation and high groundwater across the site. Additionally, surface and subsurface flows enter the wetland along its west side. Further to the north, in the unincorporated King County portion of the wetland, Stream KC-1 (see Section 2.3.2) flows into the wetland through a culvert under the decommissioned railroad tracks. Seepage was also observed entering the wetland near the southwest boundary. Hydrology regimes vary across the wetland from semi-permanently flooded in an oxbow to seasonally saturated areas along the wetland periphery. The dominant hydroperiod is seasonally flooded. Portions of the larger wetland are actively being used for hay or other seasonal crops outside of the Project area. Reed canarygrass is dominant in areas not currently under cultivation. It is also dominant in the portion of the wetland within the area that was surveyed for the Project. Wetland R-E generally provides high levels of water quality and hydrologic functions and low levels of habitat functions.

York Creek is a Class III perennial stream that runs along the east side of the gravel rail ballast and into Wetland R-E. The stream crosses beneath the ballast via a culvert, with a small stretch of stream between this culvert and a culvert leading underneath Willows Road NE. Based on its connection to surface waters outside the study area, the City of Redmond considers York Creek to be a Class III stream. The segments within the study area have low flow or stagnant water, with no defined channel and a vegetated bottom (reed canarygrass) or silt bottom (in the impounded area). In the segment adjacent to Willows Road NE, riparian vegetation consists of predominantly reed canarygrass and Himalayan blackberry, with one alder present. The segment on the east side of the rail ballast, between the culvert and an existing access road heading east off the rail ballast (approximately 170 feet north of NE 116th Street) is surrounded by reed canarygrass that apparently receives regularly maintenance (mowing). South of the access road heading east off the rail ballast, alders are present along one side of the riparian corridor. Because the riparian corridor is contiguous with a relatively large area of undeveloped land and includes a mix of wetlands and grassland with scattered shrubs, wildlife use could include small mammals and deer, as well as a variety of birds.

Neither segment of the stream within the study area appears to have the habitat complexity necessary to support fish, including salmon species. There is no documentation of salmon in this segment of York Creek. However, based on information from the City of Redmond (GIS data and personal communication with Tom Hardy, the City's stream and habitat planner), it has connections to salmon-bearing stream segments outside the study area.

The planned transmission line will run adjacent to Wetland E and York Creek, crossing over the stream where it is piped through a culvert. The Project avoids the wetland and stream, but there will be minimal temporary impacts associated with work zones at the edge of the buffer next to the gravel access road, in an area dominated by reed canarygrass. The planned access road will be constructed adjacent to Wetland E and will replace a culvert at York Creek, and will result in temporary stream and wetland impacts. A total of 17 trees will be removed from the York Creek buffer to meet transmission line clearance standards or as part of the culvert replacement.

2.1.1.7 124th Street Stream

The 124th Street Stream is likely an intermittent stream that runs adjacent to Willows Road NE, occurring in both the City of Redmond and unincorporated King County. Based on its connection to surface waters outside the study area, the City of Redmond considers it to be a Class III stream. The segment in the City of Redmond runs along the base of a slope leading down from the road shoulder and is functioning

similar to a roadside ditch that collects stormwater runoff from Willows Road NE. This segment of the stream has a low gradient with low flow, with 4 inches of water observed during the site visit. The stream is approximately 2 feet wide, with no defined channel and a silt bottom. The stream currently lacks the aquatic habitat complexity necessary to support fish, including salmon species. However, the stream is connected downstream to a larger watercourse where fish are documented outside the study area.

Vegetation along the stream consists of predominantly reed canarygrass and Himalayan blackberry, with alders present at the top of the slope. The corridor is narrow and confined by Willow Road NE and the railroad embankment. The corridor is somewhat connected to a relatively large area of undeveloped land and includes a mix of wetlands and grassland with scattered shrubs; wildlife use of this area could include small mammals and deer, as well as a variety of birds.

The planned transmission line route avoids 124th Street Stream, with three poles (1/8 through 1/10) to be installed on the opposite (east) side of the construction access road from the stream and its buffer. The planned access road will run directly adjacent to the 124th Street Stream and will result in temporary impacts to the stream buffer within the City of Redmond.

2.1.1.8 Offsite Wetlands

Two offsite wetlands (ROS-A and ROS-B) have been mapped just outside the study area boundary on the Willows Run Golf Complex property. These wetlands were identified based on observations about hydrology and vegetation made from within the study area, aerial photos, and the City of Redmond mapping of wetlands. They were not confirmed with sample plots, as biologists did not have access rights to enter the golf course property. These offsite wetlands have been included in this report because proposed Project activities have the potential to impact their regulatory buffers.

The planned transmission line corridor will run through the buffer of offsite wetland ROS-A, and one pole (0/20) will extend into the buffer. The planned transmission corridor will avoid the buffer of offsite wetland ROS-B, with one pole (1/4) installed just outside (approximately 6 feet west of) the buffer. Construction of the planned access road will result in minimal permanent impacts to the Wetland ROS-A buffer and temporary impacts to the buffers of both offsite wetlands.

2.1.2 Fish and Wildlife Habitat Conservation Areas

FWHCAs are lands and streams critically important to maintaining specific types of fish, wildlife, and plant species, as described in RZC 21.64.020. They help prevent isolation, fragmentation, and degradation of habitat and species populations by protecting the natural ecosystems. Many of these areas serve as migratory and unique habitat for bird nesting, fish spawning, and other wildlife activity. FHWCAs commonly provide refuge for endangered and threatened species.

Apart from riparian stream corridors (streams and their buffers) discussed in Section 2.1.1, there are no additional FHWCAs mapped in the City of Redmond's GIS data within the study area. Open Space Easements adjacent to the study area include a Native Growth Protection Area (NGPA) associated with a portion of Gun Club Creek on the west side of Willows Road NE and Transfer of Development Rights (TDR) easements associated with the Sammamish Valley Park and six parcels that make up Willows Run Golf Course. NGPAs and TDRs are classified as Core Preservation Areas under the FWHCA regulations in RZC 21.64.020. These Core Preservation Areas are governed through conservation easement provisions tied to the land. The transmission line Project has been designed to avoid these easement areas, including tree removal and trimming.

2.1.3 Frequently Flooded Areas

Frequently flooded areas include floodplains, flood fringes, FEMA floodways, and zero-rise floodways (RZC 21.64.040). The 100-year floodplain of the Sammamish River is generally mapped just outside the City of Redmond study area, to the east of the planned transmission line corridor. Based on FEMA

mapping of this area, the floodplain does not cross into the study area and would not be impacted by the Project. Therefore, frequently flooded areas are not discussed further in this report.

2.1.4 Critical Aquifer Recharge Areas

No critical aquifer recharge areas are mapped in or near the study area.

2.2 Unincorporated King County Existing Conditions

Based on King County iMap data, the following critical areas are mapped within the unincorporated King County study area: wetlands, aquatic areas (streams), and seismic hazard areas. Critical Areas are addressed in KCC 21A.24. Seismic hazard areas in unincorporated King County are addressed in a geotechnical report that has been prepared for the Project (Kleinfelder 2020), and are therefore not discussed in this report.

2.2.1 Wetlands and Streams

The *Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation and Stream Report* (AECOM 2020) identifies wetlands and streams that were delineated and mapped in the unincorporated King County study area. The delineation report has been updated to include verification of wetlands and streams originally delineated more than 5 years ago.

Two wetlands and two streams were mapped in or near the unincorporated King County study area (Figure 4). Both mapped wetlands are associated with streams. Table 2-2 provides details about study area wetlands and streams and their associated standard buffers regulated under the KCC. Detailed descriptions are based on the delineation report.

Table 2-2. Field-Identified Unincorporated King County Wetlands and Streams and Associated Buffer Areas

Wetland	Area of Wetland Delineated	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
KC-A	8,799 ft^2 (0.20 ac)	Category II Depressional PEM	Stream KC-1 – Type N	Wetland: 100 feet Stream: 65 feet
KC-B	1,029 ft^2 (0.02 ac)	Category III Depressional PEM	124th St Stream – Type F	Wetland: 60 feet Stream: 165 feet

HGM = hydrogeomorphic; ft^2 = square feet; ac = acre; NA = not applicable.
[1] Wetland KC-A is located predominantly outside the area surveyed. The delineated acreage is given here.
[2] HGM classifications and Ecology wetland ratings were determined according to Hruby 2004.
[3] Cowardin Classification: PEM = Palustrine Emergent (Cowardin et al. 1979).
[4] Stream classifications are based on the aquatic area definitions in KCC 21A.24.355.
[5] Sources: KCC 21A.24.325; KCC 21A.24.358.

2.2.1.1 Wetland KC-A and Stream KC-1

Wetland KC-A is the same wetland as City of Redmond Wetland R-E, discussed in Section 2.1.1.6 above, which crosses jurisdictional boundaries. It is a large, Category II PEM depressional wetland located in the diked 100-year floodplain of the Sammamish River. Only portions of the west edge of the wetland, which is outside of the floodplain, cross over into the planned transmission line corridor. Site topography is generally flat with minor depressions. Elevations range from approximately 30 to 40 feet. The primary sources of hydrology are precipitation and high groundwater across the property where the wetland is present. Additionally, surface and subsurface flows enter the wetland along its west side. Stream KC-1 (see Section 2.3.2) flows into the wetland through a culvert under the rail ballast. Seepage was also

observed entering the wetland near the southwest boundary. Hydrology regimes vary across the wetland from semi-permanently flooded in an oxbow to seasonally saturated areas along the wetland periphery. The dominant hydroperiod is seasonally flooded. Portions of the larger wetland are actively being used for hay or other seasonal crops outside the study area. Reed canarygrass is dominant in areas not currently under cultivation. It is also dominant in the portion of the wetland within the area that was surveyed for the Project, with low amounts of other weedy species. Wetland KC-A generally provides high levels of water quality and hydrologic functions and low levels of habitat functions.

Stream KC-1 is a Type N intermittent stream that extends beyond the study area boundary. Both King County mapping and WDFW Salmonscape show this stream flowing through an agricultural property and into a series of ditches that eventually lead to the Sammamish River. It receives stormwater runoff from Willows Road NE and agricultural fields. The stream segment within the study area has a low gradient with low flow, and the channel width is 12 inches. The stream bed substrate is primarily silt/sediment. The condition of the stream has been impaired by the surrounding agricultural lands and has low habitat quality and diversity. The stream currently is non-fish bearing, and appears to lack the aquatic habitat complexity necessary to support fish, including salmonid species. However, it likely connects, outside of the study area, to a stream channel that has been mapped by WDFW Salmonscape as modeled presence of salmonids. The riparian corridor is fragmented and truncated by agricultural fields. Riparian vegetation consists of reed canarygrass and blackberry thickets. Wildlife species found in the riparian corridor are primarily birds, although two deer were observed in the study area.

The planned transmission line corridor will cross Wetland KC-A, and will avoid impacts to the wetland and its buffer. The transmission line will cross over Stream KC-1 where it is piped through a culvert. The planned access road will be constructed adjacent to Wetland KC-A and will require replacement of a culvert at Stream KC-1, which will result in minor temporary stream and wetland impacts.

2.2.1.2 Wetland KC-B and 124th Street Stream

Wetland KC-B is a small, Category III depressional PEM wetland located within the swale between Willows Road NE and the railroad embankment. The primary source of hydrology is concentrated flow that enters the wetland through a culvert outlet at the north end of the wetland. The wetland is seasonally and occasionally ponded. High flows discharge into a drainage ditch that appears to flow south at very low gradient. The dominant vegetation is reed canarygrass, with lesser amounts of red alder, Himalayan blackberry, common horsetail, and lady fern. Wetland KC-B generally provides high levels of water quality functions, moderate hydrologic functions, and low levels of habitat functions.

The 124th Street Stream is likely an intermittent stream that runs adjacent to Willows Road NE, and is associated with Wetland KC-B at its northern end. The segment of the stream in unincorporated King County runs along the base of a slope leading down from the road shoulder. This segment of the stream has a low gradient with low flow, with 4 inches of water observed during the site visit. The stream is approximately 2 feet wide, with no defined channel and a silt bottom. Fish habitat suitability is low. The stream lacks the aquatic habitat complexity necessary to support fish, including salmon species. However, the stream is connected downstream to a larger watercourse where fish are documented. Riparian vegetation is primarily Himalayan blackberry, with some reed canarygrass and Japanese knotweed also present. When not actively controlled, this aggressively weedy vegetation grows up over the stream, forming a dense thicket.

The planned transmission line will avoid impacts to Wetland KC-A and 124th Street Stream, with two poles (1/9 and 1/10) located on the east side of the railroad ballast avoiding the critical areas and their buffers. The planned access road and culvert replacement in this area will result in minor, temporary impacts to the edges of Wetlands KC-A and KC-B, as well as temporary impacts to the buffers of both wetlands and the stream. Additionally, one tree will be removed from the stream buffer.

2.3 City of Kirkland Existing Conditions

Critical areas regulated by the City of Kirkland include wetlands, streams, minor lakes, FWHCAs, and frequently flooded areas (KZC Chapter 90), and geologically hazardous areas (KZC Chapter 85). Critical areas that occur in the Project area include wetlands, streams, and geologically hazardous areas. Totem Lake is a minor lake located north of the study area that will not be affected by the planned transmission line Project. Geologically hazardous areas in the City of Kirkland are addressed in a geotechnical report that has been prepared for the Project (Kleinfelder 2020), and are therefore not discussed in this report.

2.3.1 Wetlands and Streams

The *Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation and Stream Report* (AECOM 2020) identifies wetlands and streams that were delineated and mapped in the City of Kirkland study area. The delineation report has been updated to include verification/redelineation of wetlands and streams originally delineated more than 5 years ago.

Twelve wetlands and four streams were mapped in or near the City of Kirkland study area that are considered in this impact assessment (Table 2-3; Figures 5 through 7). Field surveys to map wetlands and streams covered a larger area than the Project study area. The wetlands and streams listed in Table 2-1 are partially or wholly within the study area, or close enough to the study area that they could potentially be affected by Project activities. Table 2-3 provides details about study area wetlands and streams and their associated standard buffers under the KZC. Detailed descriptions are based on the delineation report.

Table 2-3. Field-Identified City of Kirkland Wetlands and Streams and Associated Buffer Areas

Wetland	Area	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
K-B	3,047 ft^2 (0.07 ac)	Category IV Depressional PEM	Stream K-7 – Type Np	Wetland: 40 feet Stream: 50 feet
K-C	3,634 ft^2 (0.08 ac)	Category III Depressional PEM	NA	60 feet
K-D	28,254 ft^2 (0.65 ac)	Category III Depressional PEM	NA	60 feet
K-DD	225 ft^2 (0.01 ac)	Category III Depressional PEM	NA	60 feet
K-E	1,992 ft^2 (0.05 ac)	Category IV Depressional PEM	NA	40 feet
K-F[1]	19,251 ft^2 (0.44 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-G	10,119 ft^2 (0.23 ac)	Category III Depressional PEM	NA	60 feet
K-H	1,486 ft^2 (0.03 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-J[1]	49,807 ft^2 (1.14 ac)	Category II Depressional PEM/PSS/PFO/POW	Stream K-3 – Type F	Wetland: 165 feet Stream: 100 feet
K-K[1]	16,563 ft^2 (0.38 ac)	Category III Depressional PFO	Stream K-6 – Type F	Wetland: 60 feet Stream: 100 feet
K-L[1]	15,130 ft^2 (0.35 ac)	Category II Depressional + Riverine PEM/PSS/PFO/POW	Stream K-5 – Type F	Wetland: 165 feet Stream: 100 feet

Wetland	Area	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
K-HF[1]	25,937 ft^2 (0.60 ac)	Category II Depressional PEM/PSS/PFO	NA	105 feet

HGM = hydrogeomorphic; ft^2 = square feet; ac = acre; NA = not applicable.
[1] Wetland extends beyond the area surveyed. The delineated acreage is given here.
[2] HGM classification and Ecology wetland ratings were determined according to Hruby 2014.
[3]Cowardin Classification: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PFO=Palustrine Forest, POW=Palustrine Open Water (Cowardin et al. 1979).
[4] Stream classifications are based on WAC 222-16-030, as specified in KZC 90.110.
[5] Sources: KZC 90.55 and KZC 90.65.

2.3.1.1 Wetland K-B and Stream K-7

Wetland K-B is a vegetated ditch on the south side of the railroad embankment, near the east end of the City of Kirkland study area. It is a linear, PEM Category IV depressional wetland that receives surface water runoff from adjacent upslope development. It is underlain by rock from the railroad embankment, primarily cobble more than 4 inches in diameter. The dominant plant species in this wetland are reed canarygrass and cattail, with a variety of other herbaceous species. Wetland K-B provides moderate levels of water quality and hydrologic functions, and low levels of habitat functions. It has a single wetland class, few wildlife habitat features, and minimal adjoining upland buffer. However, it is part of a narrow corridor that provides cover and connectivity to other nearby habitat areas.

Stream K-7 is a small, 1- to 2-foot wide, Type Np water. It is a perennial unnamed tributary that receives water from Wetland K-B. The stream forms at the top of the railroad embankment and drops along a moderately steep gradient, then slopes gently to a culvert. The substrate is dominated by sediment and silt. Medium-sized bigleaf maples provide canopy cover for the upper portion of the stream on the moderately steep slope, but the riparian vegetation transitions to dense blackberry. No salmon presence is documented in this stream, and it is not connected to fish-bearing waters.

The planned transmission line will avoid Wetland K-B and stream K-7. However, Pole 2/3 will be located in the buffer within the NE 124th Street right-of-way south of the rail corridor, and will result in permanent impact to a buffer area dominated by dense blackberry.

2.3.1.2 Wetland K-C

Like Wetland K-B described in the previous section, Wetland K-C is a vegetated ditch adjacent to the railroad embankment, just east of 135th Ave NE. It is located across the railroad embankment from Wetland K-B, on the north side. It is a linear, Category III PEM depressional wetland that receives surface water runoff from upslope development to the north and the railroad tracks to the south. It also receives seepage from the adjacent slope to the north. Wetland K-C is underlain by rock from the railroad embankment, primarily cobble more than 4 inches in diameter. Reed canarygrass is prevalent, along with smartweed (*Polygonum* sp.), softstem bulrush (*Schoenoplectus tabernaemontani*), cattail (*Typha* sp.), and common rush (*Juncus effusus*). The wetland is abutted to the north by a thin strip of trees and Himalayan blackberry, which provide a narrow buffer between the wetland and the parking lot to the north. Wetland K-C provides moderate levels of water quality and hydrologic functions, and low levels of habitat functions. It has a single wetland class, few habitat features, and no surface water connectivity to streams. However, it is connected by a narrow corridor to other wetlands and habitat areas further to the north.

The planned transmission line will avoid Wetland K-C and its buffer.

2.3.1.3 Wetland K-D

Wetland K-D is a Category III PEM depressional wetland associated with a ditch north of the railroad embankment, west of 135th Ave NE. This wetland is widest at its central portion, where it extends beyond the study area to the north. It receives runoff from upland areas to the north and south, and is connected via a culvert under 132nd Ave NE to Wetland K-G to the west. Dominant plant species in this wetland are reed canarygrass, and cattail, with scattered Douglas spirea (*Spirea douglasii*), and patches of common rush and softstem bulrush. Himalayan blackberry is also present, though its coverage in the wetland is limited. A few Pacific willow (*Salix lucida* ssp. *lasiandra*) and red alder trees are scattered throughout the wetland, but a forested class is not present. Wetland K-D provides moderate levels of water quality and hydrologic functions and low levels of habitat functions. It has one wetland class and very few habitat features, and minimal adjoining upland buffer.

The planned transmission line corridor will cross the west end of Wetland K-D, with Poles 2/14 and 2/15 and 2/14 stub pole partially extending into the wetland, resulting in a very small area of permanent impact at the wetland edge, as well as temporary impacts at the work areas around the poles. One tree in Wetland K-D has been identified for removal.

2.3.1.4 Wetland K-DD

Wetland K-DD is a Category III PEM depressional wetland that is hydrologically connected to Wetland K-D. A berm with a utility box separates the two wetlands. Wetland DD drains via a culvert under 132nd Place NE to Wetland K-G to the west. The dominant plant species is reed canarygrass, with lesser amounts of field horsetail, bird's-foot trefoil, and Himalayan blackberry also present. The vegetation in the wetland is disturbed and periodically mowed. Wetland K-D provides moderate levels of water quality and hydrologic functions and low levels of habitat functions. It has one wetland class and very few habitat features, and minimal adjoining upland buffer.

The planned transmission line will avoid Wetland K-DD and its buffer.

2.3.1.5 Wetland K-E

Wetland K-E is a linear, Category IV PEM depressional wetland located south of the rail ballast. Unlike other ditch wetlands in the general vicinity, it covers only the central portion of the area spanning two roads. The portions of the ditch extending to the east and west of wetland do not support wetland vegetation. Like other ditch wetlands in the area, Wetland K-E receives surface water runoff from adjacent upslope development. The wetland is underlain by rock from the railroad embankment, primarily cobble more than 4 inches in diameter. The dominant vegetation in this wetland as reed canarygrass and cattail, with lesser amounts of other herbaceous species. Wetland K-E provides moderate levels of water quality and hydrologic functions and low levels of habitat functions. It has one wetland class and very few habitat features, and minimal adjoining upland buffer. However, it is part of a narrow corridor that provides cover and connectivity to other nearby habitat areas.

The planned transmission line will run west of the west end of Wetland K-E, avoiding the wetland. The nearest pole (2/14) will be installed northwest of the wetland, on the other side of the railroad ballast.

2.3.1.6 Wetland K-F

Wetland K-F is a linear, Category III PEM/PFO depressional wetland located south of the CKC trail, just east of 132nd Ave NE. It receives stormwater runoff from adjacent developed areas, and functions as a ditch, similar to other wetlands in the area. It is underlain by rock from the former railroad embankment (now gravel trail), primarily cobble more than 4 inches in diameter. The dominant tree species are black cottonwood and Pacific willow. The dominant herbaceous species are reed canarygrass and common rush. Wetland K-F provides moderate levels of water quality and hydrologic functions, and low levels of

habitat functions. It has high structural diversity because of the multi-layer forested component, but low interspersion between classes. It also has few habitat features and no surrounding buffer.

The planned transmission line will avoid wetland K-F. Poles 2/16 and 2/17 will be installed north of the wetland, on the other (north) side of the gravel trail and adjacent to Wetland K-G.

2.3.1.7 Wetland K-G

Wetland K-G is located on the north side of the CKC trail, across from Wetland K-F, between 132nd Ave NE and 128th Ln NE. It is a linear, Category III PEM depressional wetland located in a ditch. The wetland receives stormwater water runoff from upslope adjacent developed areas and conveys it west toward 128th Ln NE, where a culvert runs under the road to Wetland K-J and Stream K-3 (see Section 2.3.1.9). The dominant vegetation in this wetland is reed canarygrass and cattail, with patches of common rush and a few scattered Douglas spirea shrubs. The wetland is bounded along its north edge by blackberry. Wetland K-G provides moderate levels of water quality and hydrologic functions, and low levels of habitat functions. It has a single wetland class and low structural diversity and few habitat features.

The planned transmission line will run directly adjacent to Wetland K-G, with Pole 2/16 partially extending into the wetland and resulting in a very small amount of permanent impact to the wetland edge, as well as minor temporary impacts associated with the work area. Poles 2/17 and 2/18 will be installed adjacent to the wetland but will avoid the wetland and the wetland buffer.

2.3.1.8 Wetland K-H

Wetland K-H is located just outside the study area, but was delineated because it was accessible to biologists during site visits, and because its buffer extends into the study area. It is a small, Category III PEM/PFO depressional wetland south of the CKC trail. It appears to collect water during the wet season, and has no surface water inlets or outlets. The dominant species in the PEM portion of the wetland, as well as in the forest understory, is reed canarygrass. The PFO component has low structural diversity, with an overstory of trees (cottonwood and Pacific willow) between 20 and 50 feet tall and an herbaceous understory. Wetland K-H provides high levels of water quality functions, moderate levels of hydrologic functions, and low levels of habitat functions. It has two wetland classes, but otherwise low habitat diversity, and has few habitat features. However, it does have a narrow vegetated buffer around most of its boundary.

The planned transmission line will avoid Wetland K-H and its associated buffer.

2.3.1.9 Wetland K-J and Stream K-3

Wetland K-J is a large, Category II PEM/PSS/PFO/POW wetland that is associated with Totem Lake. According to City of Kirkland GIS mapping, this wetland is 20.3 acres in size and extends well outside of the study area. Just west of 128th Ln NE, the wetland is a narrow, vegetated ditch with some overhanging trees. The water in this ditch flows southwest, then turns into a meandering stream (Stream K-3) that heads off to the north, as shown on City maps, opening up to the larger wetland associated with Totem Lake. A culvert provides a hydrologic connection underneath the gravel trail between this wetland and Wetland K-K to the south.

Several different vegetation communities were observed within or were visible from the study area. In the easternmost portion of the wetland, a narrow PEM wetland is present in the ditch between the CKC gravel trail and adjacent upland development to the north. The dominant species are reed canarygrass and field horsetail. Aquatic plants were observed in some areas of standing water. Further to the southwest, where the wetland opens up toward Totem Lake, blocks of PFO, PSS, and PEM habitat were observed. Numerous birds were observed in this wetland during field visits, including willow flycatcher, Oregon junco, and crow. Wetland K-J provides high levels of water quality and hydrologic functions, and moderate levels of habitat functions. Based on the portions of the rating form that biologists were able to

complete, the wetland has high structural diversity and interspersion between classes, and numerous habitat features, and is connected to a stream with fish (Stream K-3).

Stream K-3 is a Type F unnamed tributary to Totem Lake that is mapped by the City of Kirkland as non-salmon bearing. During a field visit on August 21, 2015, about 10 small 3-inch long juvenile fish were observed in the stream channel. The fish were difficult to identify to species but were in the minnow family (Cyprindae). Therefore, the stream does support non-salmonid fish.

The planned transmission line will run directly adjacent to the east end of Wetland K-J, with one pole (2/19) installed just outside the wetland and the wetland buffer, one pole (2/20) partially extending into the narrow, degraded buffer between the wetland and the trail, and one pole (2/21) partially extending into the wetland. These pole encroachments will result in very small areas of permanent impacts at the edges of wetland and buffer. There will also be temporary impacts associated with work areas around the poles. The transmission line will avoid Stream K-3. Nine trees within the wetland and 27 trees within the buffer have been identified for removal.

2.3.1.10 Wetland K-K and Stream K-6

Wetland K-K is a Category III PFO depressional wetland located on the south side of the CKC gravel trail, across from Wetland K-J. A culvert running beneath the trail provides a hydrologic connection between the two wetlands. The dominant tree species in this wetland are red alder, Pacific and other willows, and cottonwood. The most prevalent species in the shrub layer is Himalayan blackberry. Common herbaceous layer species include field horsetail and fireweed. Wetland K-K provides a moderate level of water quality and hydrologic functions and a low level of habitat functions. It has a single wetland class, but high structural diversity with a multi-layer canopy and shrub layer. Snags, downed logs, and other habitat features were observed within the wetland. It has a very small undeveloped upland buffer, but it is across the CKC trail from Wetland K-J, which is a significant habitat area. Numerous birds were observed in this wetland during field visits, including cedar waxwing, willow flycatcher, chickadee, winter wren, rufous hummingbird, and downy woodpecker.

Stream K-6 is a Type F stream that receives water from adjacent commercial developments and drains into Wetland K-K. During the June 4, 2019 field visit, there was little to no flow, with patches of stagnant water, and the water depth ranging from 0.5 inch to 4 inches. Stream K-6 is channelized in places and confined by adjacent commercial developments and loses an active channel signature within Wetland K-K. Salmon presence has not been documented in this stream, and based on its stagnant flow, turbidity, sediment, and subsequent low oxygen, it is unlikely to support fish. However, based on information from The Watershed Company (2020), this stream has surface water connectivity to fish-bearing aquatic habitats north of the CKC trail and outside the study area.

The planned transmission line will cross the west corner of Wetland K-K and Stream K-6. Poles 3/1, 3/2, and 3/3 will be located just outside the buffer. Poles 3/1 and 3/2 will be located at the edge of the buffer adjacent to a paved storage area for the business to the south. Pole 3/3 will be located directly adjacent to the paved trail entrance in an area covered with grass and gravel where Stream K-6 is located within a pipe. Seven trees have been identified for removal within Wetland K-K and 24 trees have been identified for removal in the Wetland K-K and Stream K-6 buffer.

2.3.1.11 Wetland K-L and Stream K-5

Wetland K-L is a large, Category II depressional/riverine wetland with multiple Cowardin classes that is associated with Stream K-5. According to City of Kirkland GIS data, the full wetland is 21.8 acres and includes a large open water component. Within the study area, only a PEM class was observed, although the forested edge was visible to the east. In the study area, reed canarygrass is the dominant species, with some cattail and scattered purple loosestrife plants also observed. Wetland K-L provides moderate levels of water quality, hydrologic, and habitat functions. A variety of birds were observed using the wetland within or near the study area, including chickadee, willow flycatcher, spotted towhee, and winter

wren. Snags were observed in the adjacent forested area that showed evidence of use by downy/pileated woodpeckers.

Stream K-5 is a Type F unnamed tributary that drains into Juanita Creek about 0.6 mile downstream of the study area. It consists of three separate secondary channels that generally flow from east to west and converge offsite. No salmon presence is documented in these channels by WDFW or the City of Kirkland, and based on low to stagnant flow, high turbidity, substrate dominated by excess sediment, and absence of habitat structure such as riffles and pool they are unlikely to support fish. However, fish have been documented in the main stream channel west of the study area.

The existing transmission line corridor crosses Wetland K-L and three segments of Stream K-5. Pole 4/10 will be replaced within the PEM wetland, resulting in permanent and temporary impacts to an area dominated by reed canarygrass. Six trees will be removed from the buffer.

2.3.1.12 Wetland K-HF (Heronfield Wetlands)

Wetland K-HF is a large, Category II depressional wetland with multiple Cowardin classes. However, only the northwest edge of the wetland is within the study area. In this area, a PFO wetland class was observed, with PSS and PEM classes present outside of the study corridor in other portions of the wetland. The forested class within the study corridor is dominated by mature Pacific willow and red alder in the tree stratum. Douglas spirea is common in the shrub stratum. Creeping buttercup, stinging nettle, willowherb (*Epilobium ciliatum*), and lady fern are common in the herbaceous stratum. Wetland K-HF provides high levels of water quality and hydrologic functions, and moderate levels of habitat functions.

An existing transmission line crosses a paved driveway west of Wetland K-HF and crosses through its buffer. The new transmission line will tie into the existing transmission line and poles will be replaced within the existing corridor. No poles or temporary work areas are located within the buffer; however, 11 trees have been identified for removal from the wetland buffer to meet clearance standards.

2.3.2 Fish and Wildlife Habitat Conservation Areas

FWHCAs areas meet one or more of the following (KZC 90.95):

- State or federally designated endangered, threatened, and sensitive species have a primary association with the habitat area.
- State priority habitats and habitats with which State priority species have a primary association. Such habitat areas in the City of Kirkland are deemed to be Habitats and Species of Local Importance.

FWHCAs include the streams discussed in Section 2.3.1. Based on a review of PHS data (WDFW 2019), there are no other priority habitats or species within the study area in the City of Kirkland. Coho salmon, sockeye salmon, fall Chinook salmon, and resident coastal cutthroat trout occur in Juanita Creek, west of Juanita High School and outside of the study area.

N

1:6,000

Study Area
New 115kV Pole
Replacement 115kV Pole
New Gravel Access Rd
Wetland
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 2
Critical Areas Overview
1 of 6

City of Redmond

N

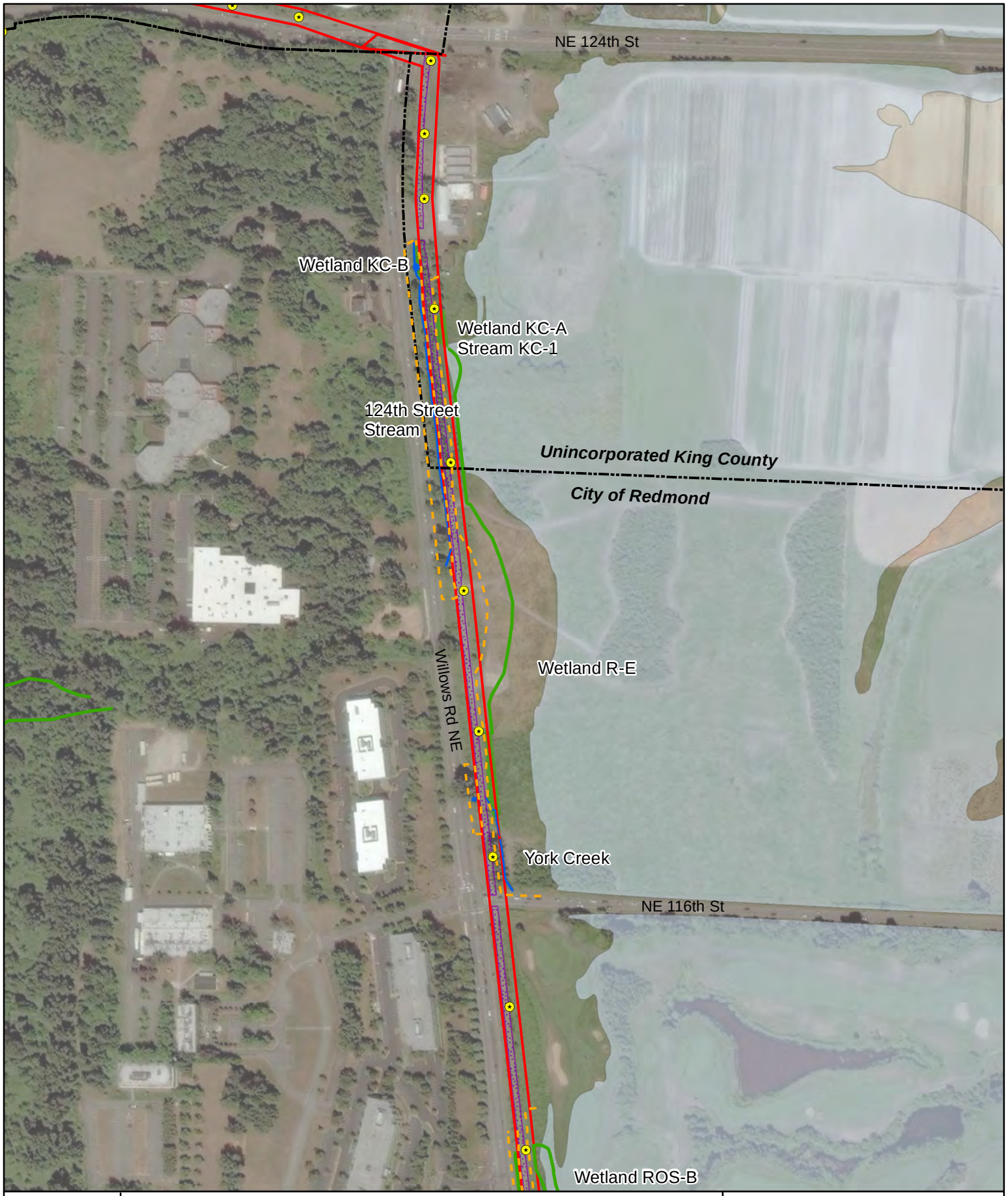
1:4,500

Study Area
New 115kV Pole
Replacement 115kV Pole
New Gravel Access Rd
Estimated Wetland Edge
Wetland
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 3
Critical Areas Overview
2 of 6

City of Redmond



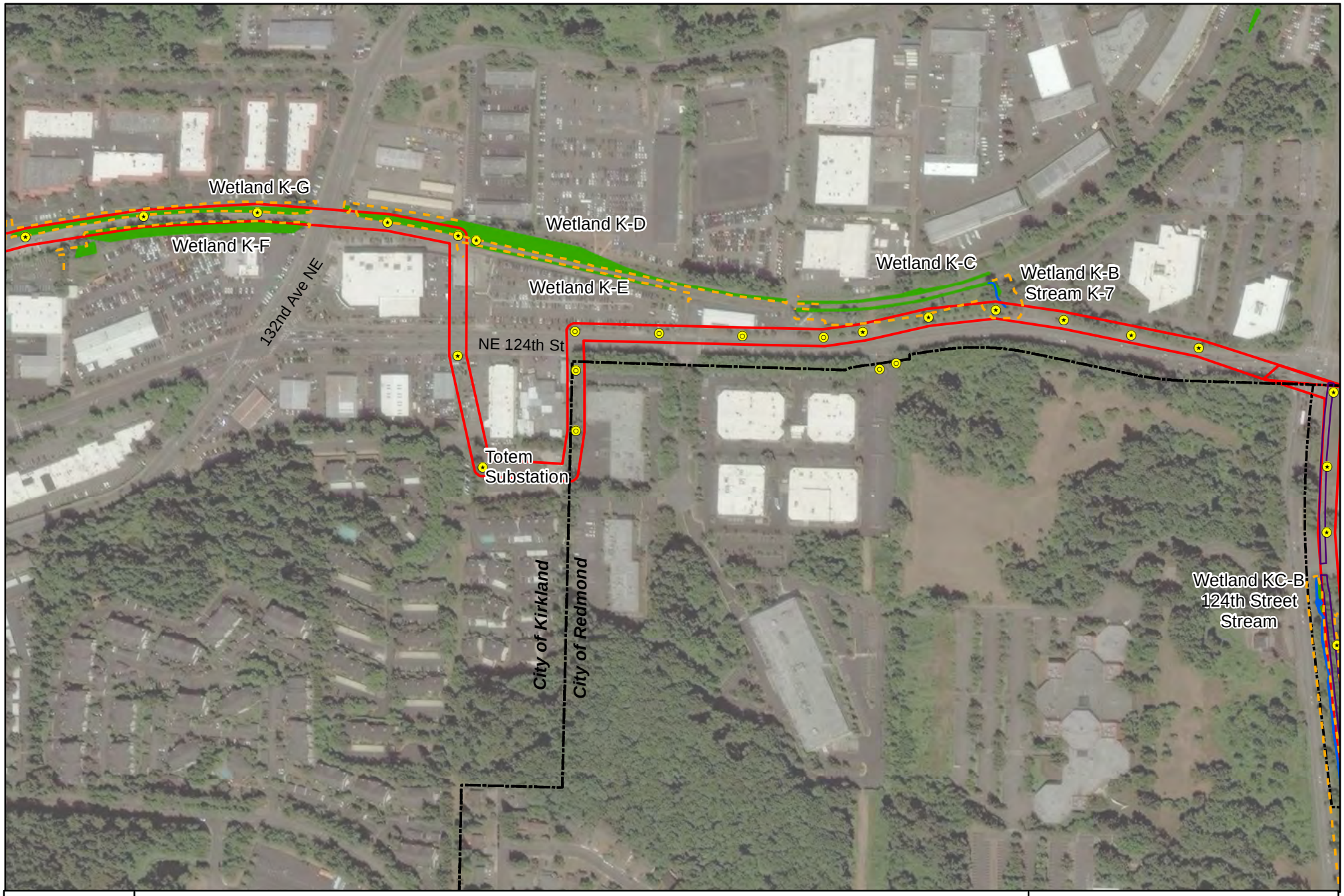
N

1:4,500

Study Area
New 115kV Pole
Replacement 115kV Pole
New Gravel Access Rd
Jurisdictional Boundary
Wetland
Estimated Wetland Edge
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 4
Critical Areas Overview
3 of 6
City of Redmond and
Unincorporated King County



N

1:4,500

Study Area
New 115kV Pole
Replacement 115kV Pole
Jurisdictional Boundary
Wetland
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 5
Critical Areas Overview
4 of 6
City of Redmond and
City of Kirkland

N

1:4,500

Study Area
New 115kV Pole
Replacement 115kV Pole
Jurisdictional Boundary
Wetland
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 6
Critical Areas Overview
5 of 6

City of Kirkland

N

1:5,500

New 115kV Pole
Replacement 115kV Pole
Jurisdictional Boundary
Wetland
Stream
Wetland/Stream Buffer
FEMA 100-Year Floodplain

0 300 600
Feet

Figure 7
Critical Areas Overview
6 of 6

City of Kirkland

3. Regulatory Review

Proposed Project activities were reviewed for their compliance with local environmental regulations. The following sections summarize City of Redmond, City of Kirkland, and King County regulations that are applicable to the Project. This report discusses regulations pertaining to critical areas and their buffers in the context of transmission line construction, impact avoidance, and mitigation. For each jurisdiction, pertinent information from the applicable code is presented, with a discussion of how the Project meets the regulations.

3.1 City of Redmond Critical Areas Regulations

Regulations protecting critical areas are outlined in RZC 21.64, Critical Areas Regulations. This section presents pertinent regulatory information for the types of critical areas that will be impacted by the planned transmission line Project.

3.1.1 Wetlands and Streams

3.1.1.1 Wetland and Stream Buffers

Regulatory wetland buffers vary depending on the wetland category assigned on the wetland rating form, the habitat score on the wetland rating form, and whether all measures to minimize impacts to wetlands specified in RZC Table 21.64.030A.3 are implemented. Table 3-1 lists these required measures and documents how the Project would comply with each of them.

Table 3-1. Project Compliance with City of Redmond Requirement Measures to Minimize Impacts to Wetlands

Disturbance Element	Required Measure	Project Compliance
Lights	Direct lights away from wetland	The Project will not include installation of lighting
Noise	Locate activity that generates noise away from wetland If warranted, enhance existing buffer with native vegetation plantings adjacent to noise source For activities that generate relatively continuous, potentially disruptive noise, such as certain heavy industry, establish an additional 10-foot heavily vegetated buffer strip immediately adjacent to the outer wetland buffer	The Project will not include new long-term noise sources.
Toxic Runoff	Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered Establish covenants limiting use of pesticides within 150 feet of wetland Apply integrated pest management	The Project will not result in new, untreated runoff. Apart from the Sammamish substation parcel, the transmission line will be located on easement and PSE is not the underlying property owner and cannot establish covenants on those properties. PSE will only use herbicides approved for aquatic use as appropriate and implement integrated pest management.

Disturbance Element	Required Measure	Project Compliance
Stormwater Runoff	Retrofit stormwater detention and treatment for roads and existing adjacent development Prevent channelized flow from lawns that directly enters the buffer Use Low Impact Development techniques	The Project will not provide increased impervious surface from the transmission line. Stormwater runoff containment and treatment will be accomplished through infiltration trenches and dispersion. Replacement of three stormwater culverts and three stream culverts as part of the Project will help improve stormwater flow in the vicinity of the gravel construction access and maintenance road. The Project will not include new lawns that would produce channelized flow. Low Impact Development techniques are being employed through the use of infiltration trenches to contain and release stormwater associated with widening the ballast for the gravel construction access road.
Change in Water Regime	Infiltrate or treat, detain, and disperse into buffer runoff from impervious surfaces and new lawns	The Project will not provide increased impervious surface from the transmission line. Stormwater runoff containment and treatment will be accomplished through infiltration trenches and dispersion associated with the gravel construction access road.
Pets and Human Disturbance	Use fencing or plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for ecoregion	The Project will not create new opportunities for disturbance by pets or humans.
Dust	Use best management practices to control dust	BMPs would be implemented during construction to control dust, as described in Section 4.2.

Because the Project will comply with the required measures listed above in Table 3-1, the wetland buffers shown in Table 3-2 will apply to the wetlands in the City of Redmond associated with the project per RZC 21.64.030(B).

Table 3-2. Buffer Widths for City of Redmond Wetlands with Measures to Minimize Impacts

Name	Category	Habitat Score	Water Quality Score	Buffer Width with Measures to Minimize Impacts
Substation B	III	7	6	110 feet
Substation C	II	8	5	225 feet
Wetland R-A	II	6	8	110 feet
Wetland R-GCA	III	4	6	60 feet
Wetland R-GCB	III	4	6	60 feet
Wetland R-C	III	3	7	60 feet
Wetland R-D	III	3	7	60 feet
Wetland R-E	II	4	8	75 feet

Source: RZC 21.64.030.B.2

Buffers to protect Class II and Class III riparian stream corridors are 150 feet and 100 feet, respectively (RZC 21.64.020.B.3).

Table 3-3 shows the regulatory buffers for each stream in the study area.

Table 3-3. Standard Buffer Widths for City of Redmond Streams

Stream	Classification	Standard Regulatory Stream Buffer
Upper Willows Creek	Class II	100 feet + 50-foot outer buffer
Lower Willows Creek	Class II	100 feet + 50-foot outer buffer
Peter's Creek Tributary	Class III	100 feet
Gun Club Creek	Class III	100 feet
Stream R-2	Class III	100 feet
Stream R-3	Class III	100 feet
York Creek	Class III	100 feet
124th St Stream	Class III	100 feet

Source: RZC 21.64.030.B.2.

Where stream and wetland buffers overlap, a combined buffer that represents the largest buffer distance has been shown on the figures in this report and used for the analysis of Project impacts. Therefore, the type of critical area buffer is not distinguished when referencing buffer impacts.

Buffers were truncated at existing paved areas and at the limits of the existing railroad ballast. RZC 21.64.030(B)(6)(b) states that reductions in buffer widths may be allowed where existing roads or structures lie within the buffer. The railroad ballast is an existing alteration of wetland buffers that persists although the railroad has been decommissioned. Therefore, excluding the ballast from the buffer will not reduce the buffer functions, as no buffer functions are provided in this area.

3.1.1.2 Alterations

Wetlands

As stated in RZC 21.64.030.C.4, any proposed alterations to Category II, III, and IV wetlands must comply with all applicable mitigation performance standards, and no net loss of wetland function and value may occur.

Mitigation for alterations to wetlands must achieve equivalent or greater biological functions, and mitigation plans must be consistent with the most recent Ecology guidance (RZC 21.64.030.C.5). Per RZC 21.64.030.C.6), mitigation actions must address functions affected by the alteration to achieve functional equivalency or improvement, and must provide similar wetland functions as those lost, except under the following circumstances:

- The filled/impacted wetland provides minimal functions, and the proposed mitigation actions will provide equal or greater functions, or will provide functions shown to be limiting within a watershed through a formal watershed assessment plan or protocol.
- Out-of-kind replacement will best meet formerly identified regional goals, such as replacement of historically diminished wetland types.

Chapter 6 of this report discusses the proposed mitigation for unavoidable impacts to wetlands and their buffers, which is a stream restoration project south of Sammamish Substation. A separate mitigation plan (*Conceptual Mitigation Plan, Sammamish-Juanita Transmission Line Project*, HDR 2020) documents how the proposed mitigation meets the regulatory requirements for achieving functional equivalency or improvement, as well as all required performance standards listed in RZC 21.64.030.D.

Additional regulations pertaining to critical area mitigation are provided in Section 3.2.

Streams

RZC 21.64.020.B.9 states that no structures or improvements shall be permitted within the stream buffer, except as otherwise permitted or required under the City of Redmond's adopted Shoreline Master Program, or under certain circumstances. This Project is not located within regulated shoreline jurisdiction. RZC 21.64.020.B.9.c allows construction of new road crossings and utilities, and accessory structures, when no feasible alternative location exists. PSE has done a thorough assessment of site alternatives within the corridor, and has determined that no feasible alternative location exists for the planned transmission line Project. A discussed of Project design to minimize impacts to streams and their buffers is provided in Section 4.1.1.

RZC 21.64.020.D states that culverts are allowed in Class II, III, and IV streams provided that fish passage will not be impaired, WDFW culvert design criteria are used, and the applicant keeps the culvert free of debris and sediment to allow free passage of water and fish. Culvert replacements for regulated streams planned as part of the Project gravel construction access and maintenance road are box culverts that follow WDFW design criteria and allow for fish passage beneath the former railroad ballast.

3.1.2 Fish and Wildlife Habitat Conservation Areas

RZC 21.64.020 specifies regulatory stream buffer widths to protect riparian corridors, which were discussed in Section 3.1.1. Protective buffers for other kinds of FWHCAs are not provided in the RZC. While FWHCAs occur adjacent to the Project corridor (see Section 2.1.2), riparian corridors (discussed in Section 3.1.1) are the only regulated FWHCAs that occur within Project areas and will be impacted by Project activities as described in Section 5.2.

3.2 City of Redmond Mitigation Regulations

Regulations pertaining to mitigation for impacts to critical areas are outlined in RZC 21.64. This section presents regulatory information pertaining to mitigation for all critical areas, followed by information specific to the critical areas that are located in the study area and would be impacted by Project activities. Information on Project-specific avoidance and minimization is provided in Chapter 4, and information on proposed compensatory mitigation is provided in Chapter 6.

3.2.1 Mitigation Sequencing

RZC 21.64.010.I requires all significant adverse impacts to critical area functions and values to be mitigated, with mitigation actions occurring in the following sequence:

1. Avoiding the impact altogether by not taking a certain action or parts of actions.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as Project redesign, relocation, or timing, to avoid or reduce impacts.
3. Rectifying the impact to the critical area by repairing, rehabilitating, or restoring the affected environment to the conditions existing at the time of the initiation of the Project.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.
6. Monitoring the hazard or other required mitigation and taking remedial action when necessary.

PSE will meet these mitigation sequencing requirements through Project design, implementing best practices during construction, restoring disturbed areas, and implementing compensatory mitigation for impacts to wetlands and buffers that cannot be avoided. Pertinent information regarding avoidance and minimization measures and compensatory mitigation is provided in Chapters 4 and 6 of this report, respectively.

3.2.2 Location of Mitigation

RZC 21.64.010.L.2 requires mitigation to be provided on site, unless on-site mitigation is not scientifically feasible due to physical features of the property. If mitigation cannot be provided on site, it must be provided in the immediate vicinity of the permitted activity on property owned or controlled by the applicant, such as an easement, provided such mitigation is beneficial to the critical area and associated resources. In-kind mitigation must be provided, unless the applicant demonstrates and the Department concurs that greater functional and habitat value can be achieved through out-of-kind mitigation. Only when it is determined by the Department that on-site mitigation and in-kind mitigation are inappropriate and impractical, shall off-site, out-of-kind mitigation be considered. All off-site mitigation must be within Redmond city limits.

PSE will be providing on-site mitigation for unavoidable impacts to wetlands and buffers through enhancement at Wetland Substation C within the Willows Creek Stream Relocation Project, as described further in Chapter 6 of this report.

3.2.3 Mitigation Requirements for Wetlands

RZC 21.64.030.C.7 provides the following order of preference for wetland mitigation actions that require compensation by replacing, enhancing, or substitution:

1. Preserving high-quality wetlands that are under imminent threat.
2. Restoring wetlands on upland sites that were formerly wetlands.
3. Creating wetlands on disturbed upland sites, such as those with vegetative cover consisting primarily of introduced species.
4. Enhancing significantly degraded wetlands.

Standard City of Redmond wetland mitigation ratios for creating or enhancing wetlands are presented in Table 3-4. No specific ratios or other information pertaining to preservation of high-quality wetlands is provided in the RZC.

Table 3-4. City of Redmond Wetland Acreage Replacement Ratios

Wetland Type/Category	Creation or Reestablishment	Rehabilitation (Restoration)	Enhancement Only
Category I Forested	6:1	12:1	24:1
Category I based on Score	4:1	8:1	16:1
Category II	3:1	6:1	12:1
Category III	2:1	4:1	8:1
Category IV	1.5:1	3:1	6:1

Source: RZC 21.64.030 (Table 21.64.030B).

These ratios do not apply to use of credits from a state certified wetland mitigation bank. When credits from a certified bank are used, replacement ratios shall be consistent with the requirements of the mitigation banking instrument.

RZC 21.64.030.D lists wetland performance/design standards for wetland mitigation. The proposed mitigation approach for this Project is discussed in Chapter 6. The Project mitigation plan (*Conceptual Mitigation Plan, Sammamish-Juanita Transmission Line Project*, HDR 2020) provides details about how mitigation for Project impacts will occur within the Willows Creek Stream Relocation Project by meeting wetland performance/design standards and other wetland mitigation requirements.

3.2.4 Riparian Stream Corridor Performance Standards

Mitigation proposed for alterations to riparian stream corridors must meet the performance standards and mitigation requirements specified in RZC 21.64.020.F. No alterations to riparian stream corridors will

occur as a result of the Project, except for functional lift provided by culvert replacement for three regulated streams under the proposed construction access and maintenance road.

3.3 King County Critical Areas Regulations

Regulations protecting critical areas (wetlands, aquatic areas, fish and wildlife conservation areas, flood and geological associated hazard areas) are outlined in KCC: Title 21A Zoning, Section 24 Critical Areas Ordinance (formerly Environmental Sensitive Areas), most recently updated in August 2019. This section presents pertinent regulatory information for the types of critical areas that will be impacted by the Project.

3.3.1 Wetlands and Streams

3.3.1.1 Protective Buffers

Regulatory buffers to protect wetlands in unincorporated King County are determined based the overall wetland category and habitat score, as determined by the wetland rating form (note that the KCC 21.24.318.318 requires the 2004 version of the rating form to be used to rate wetlands), and whether the wetland is located within the Urban Growth Area (UGA). The study area and planned transmission line route are located just inside the UGA (although most of Wetland KC-A is located outside the UGA). Therefore, buffers for inside the UGA are appropriate. Table 3-5 shows the standard regulatory buffers for the two wetlands in the unincorporated King County study area.

Table 3-5. Standard Buffer Widths for King County Wetlands

Wetland	Wetland Rating	Standard Regulatory Wetland Buffer
KC-A	Category II Habitat score 13	100 feet
KC-B	Category III Habitat score 7	75 feet

Source: KCC 21A.24.325(A)(1).

Regulatory buffers to protect aquatic areas in unincorporated King County are determined based on whether the aquatic area is located within the Urban Growth Area (UGA). Based on the study area location just inside the UGA, Table 3-6 shows the standard regulatory buffers for the two streams in the unincorporated King County study area.

Table 3-6. Standard Buffer Widths for King County Aquatic Areas

Stream	Classification	Standard Regulatory Aquatic Area Buffer
KC-1	Type N	65 feet
124th Street Stream	Type F	115 feet

Source: KCC 21A.24.358(B).

Where wetland buffers overlap with aquatic area buffers, a combined buffer that represents the largest buffer distance has been mapped in the figures in this report and used for the analysis of Project impacts.

Combined buffers were truncated at paved areas and at the limits of the railroad ballast. KCC 21A.24.325(D)(4) and KCC 21A.24.358(E)(d) state that modifications to buffer widths may be allowed where a legally established roadway transects the wetland or aquatic area buffer, provided the following apply:

- For wetlands: the part of the buffer on the other side of the roadway does not provide additional protection of the proposed development or wetland, and provides insignificant biological, geological,

or hydrological buffer functions in relation to the other portion of the buffer adjacent to the wetland (KCC 21A.24.325(D)(4)).

- For aquatic areas: the part of the buffer on the other side of the roadway provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the aquatic area (KCC 21A.24.358(E)(d)).

Although not a roadway, the railroad ballast was part of a legally established railroad corridor that transected the current identified buffer, such that the undeveloped area on the opposite side of the buffer no longer provided significant buffer functions. Currently, the portions of buffers on the opposite side of the railroad ballast from mapped wetlands and streams are generally disturbed and/or lacking in woody vegetation, provide insignificant biological, geological, and hydrological buffer functions, and do not provide additional protection to the wetlands or streams on the other side of the ballast.

3.3.1.2 Development Standards and Alterations

Allowable alterations to King County-regulated wetlands, aquatic areas, and their protective buffers are outlined in Section 21A.24.045 of KCC. Alterations are permitted in association with construction of a new utility corridor or utility or utility facility, subject to the following conditions:

- Allowed in an existing roadway if conducted consistent with the regional road maintenance guidelines.
- Limited to the pipelines, cables, wires, and structures within utility corridors if:
  - There is no alternative location with less adverse impact on critical areas and buffers.
  - The new utility corridors meet all of the following to the maximum extent practical.
    - Not located over habitat used for salmonid rearing or spawning oy by species listed as endangered or threatened by the state or federal government unless the department determines that there is no other feasible crossing site.
    - The mean annual flow rate is less than 20 cubic feet per second.
    - Avoids paralleling the channel or following a down-valley route near the channel.
  - To the maximum extent practical; the corridor is located so that the width is minimized, removal of trees greater than 12 inches diameter at breast height is minimized; and an additional contiguous and undisturbed critical area buffer, equal in area to the disturbed critical area buffer (including maintenance roads) is provided.
  - To the maximum extent practical, access for maintenance is at limited access points into the critical area buffer rather than by a parallel maintenance road. If a parallel maintenance road is necessary the following standards are met: to the maximum extent practical the width of the maintenance road is minimized and in no event greater than 15 feet; and the location of the maintenance road is contiguous to the utility corridor on the side of the utility corridor farthest from the critical area.
  - The utility corridor or facility will not adversely impact the overall critical area hydrology or diminish flood storage capacity.
  - The construction occurs during approved periods for instream work.
  - The utility corridor serves multiple purposes and properties to the maximum extent practical.
  - Bridges or other construction techniques that do not disturb the critical areas are used to the maximum extent practical.
  - Bored, drilled, or other trenchless crossing is laterally constructed at least 4 feet below the maximum depth of source for the base flood.
  - Bridge piers or abutments for bridge crossing are not placed within the FEMA floodway or ordinary high water mark;
  - Open trenching is only used during low flow periods or only within aquatic areas when they are dry.

Chapter 4 of this report presents information on the Project avoidance and minimization measures that will meet the conditions listed above. PSE project planning as described in Section 4.1 has confirmed that no alternative location exists with less adverse impact on critical areas and buffers. The new utility corridor will not be located over salmonid habitat, does not impact streams with mean annual flow over 20 cubic feet per

second, and does not parallel any stream channels. Minimization measures are described in Section 4.2, and include keeping the corridor width to the minimum necessary; only removing trees when necessary; using existing access roads or disturbed areas and limiting new access roads; and keeping the width of new access roads to a width necessary to safely accommodate construction equipment. The new corridor will not adversely impact wetland or stream hydrology or flood storage. Culvert replacements will improve stream function. Retaining walls will be used to minimize grading in critical areas and buffers.

Culvert replacement is allowed in wetlands and aquatic areas when performed by, at the direction of, or authorized by a government agency in accordance with regional road maintenance guidelines. In aquatic areas, the culvert replacement must also meet both of the following:

- The new construction or replacement is made fish passable in accordance with the most recent WDFW manuals or with National Marine Fisheries Service guidelines for federally listed salmonid species
- The site is restored with appropriate native vegetation.

The planned culvert replacement at Stream KC-1 associated with the access road for the Project will be a fish-passable culvert constructed under a widened rail ballast, not a public road. Culvert replacement work will occur during applicable in-water work construction windows to prevent impacts to fish. The area temporarily disturbed during culvert replacement will be restored with appropriate native vegetation.

Additional development standards specific to wetlands that are applicable to the Project include the following (KCC 21A.24.335):

- The applicant shall not introduce any plant or wildlife that is not indigenous to the Puget Sound lowland into any wetland or wetland buffer unless authorized by a state or federal permit approval.

PSE will not introduce non-native plants into wetlands or their buffers, and will restore disturbed areas with native species.

Additional development standards specific to aquatic areas that are applicable to the Project include the following (KCC 21A.24.365):

- Grading for allowed alterations in aquatic area buffers is only allowed from May 1 to October 1.
- The moisture-holding capacity of the topsoil layer on all areas of the site not covered by impervious surface should be maintained by minimizing soil compaction or re-establishing natural soil structure and the capacity to infiltrate.
- To the maximum extent practical:
    - The soil duff layer should not be disturbed, but if disturbed should be redistributed to other areas of the project site, where feasible.
    - A spatial connection should be provided between vegetation within and outside the aquatic area buffer to prevent creation of windthrow hazards.
    - Hazard trees should be retained in aquatic area buffers and either topped or pushed over toward the aquatic area.

PSE will adhere to these development standards by grading in aquatic area buffers during the approved work period, and following practices to minimize soil compaction and preserve infiltration functions. Trees will be retained to the degree possible. The one tree that has been identified for removal from a stream buffer is a small red alder. This tree will be removed from the site rather than topped or pushed over because it provides limited value from a habitat perspective; unless the property owner choses to retain the downed tree onsite.

3.4 King County Mitigation Regulations

Regulations pertaining to mitigation for impacts to critical areas are outlined in KCC 21A.24. This section presents regulatory information relevant to mitigation for all critical areas, followed by information specific to the critical areas that are located in the study area and would be impacted by Project activities. Information on project-specific avoidance and minimization is provided in Chapter 4, and information on proposed compensatory mitigation is provided in Chapter 6.

3.4.1 Avoidance and Minimization of Impacts

For applications for alterations of critical areas, King County requires the use of the following mitigation sequencing (KCC 21A.24.125):

1. Avoiding the impact by not taking a certain action.
2. Minimizing the impact or hazard by limiting the degree or magnitude of the action with appropriate technology or taking affirmative steps, such as project redesign, relocation or timing.
3. Rectifying the impact to the critical area by restoring or stabilizing the hazard area through engineered or other methods.
4. Minimizing or eliminating the impact or hazard by stabilizing the hazard area through engineered or other methods.
5. Reducing or eliminating the impact or hazard over time by preservation or maintenance operations during the life of the development proposal or alteration.
6. Compensating for the adverse impact by enhancing critical areas and their buffers or creating substitute critical areas and their buffers.
7. Monitoring the impact, hazard, or success of required mitigation and taking remedial action.

PSE will meet these mitigation sequencing requirements through project design, implementing best practices during construction, restoring disturbed areas, and implementing compensatory mitigation for impacts to wetlands and buffers that cannot be avoided. Pertinent information regarding avoidance and minimization measures and compensatory mitigation is provided in Chapters 4 and 6 of this report.

3.4.2 Location of Mitigation

KCC states that mitigation actions should occur on or contiguous to the development site, to the maximum extent practical. Off-site mitigation may be approved if it is not practical to mitigate on or contiguous to the development proposal site, and the proposed off-site mitigation will achieve equivalent or greater hydrological, water quality, and wetland or aquatic area habitat functions.

In the event that off-site mitigation is authorized, priority will be given to locations within the same drainage subbasin as the development proposal site that are one of the following:

- Mitigation banking sites and resource mitigation reserves.
- Private mitigation sites established in compliance with KCC and approved by the county.
- Public mitigation sites that have been ranked by the process described in KCC 21A.24.133.

King County has developed a program to allow the payment of a fee in lieu of providing mitigation on a development site, as described in KCC 21A.24.133.

The department may approve mitigation to compensate for the adverse impacts of a development proposal to critical areas through the King County mitigation reserves program (KCC 21A.24.137).

PSE's planned transmission line Project does not result in permanent impacts to wetland or stream critical areas or buffers within unincorporated King County. Therefore, compensatory mitigation is not proposed under King County regulations.

3.5 City of Kirkland Critical Areas Regulations

Regulations pertaining to critical areas are outlined in KZC Chapter 90, Critical Areas: Wetlands, Streams, Minor Lakes, FWHCAs, and Frequently Flooded Areas. Additionally, regulations pertaining to Geologically Hazardous Areas are outlined in KZC Chapter 85, Critical Areas: Geologically Hazardous Areas, which are covered in a separate report (Kleinfelder, 2020). This section presents pertinent regulatory information for the types of critical areas that will be impacted by the planned Project.

3.5.1 Wetlands and Streams

3.5.1.1 Protective Buffers

Regulatory buffers to protect wetlands in the City of Kirkland are determined based on the overall wetland category and the number of habitat points, as determined using the 2014 wetland rating form. Table 3-7 shows the standard regulatory buffers for wetlands in the City of Kirkland study area.

Table 3-7. Standard Buffer Widths for City of Kirkland Wetlands

Wetland	Wetland Rating	Standard Regulatory Wetland Buffer
K-B	Category IV	40 feet
K-C	Category III Habitat score 3	60 feet
K-D	Category III Habitat score 3	60 feet
K-DD	Category III Habitat score 3	60 feet
K-E	Category IV	40 feet
K-F	Category III Habitat score 3	60 feet
K-G	Category III Habitat score 3	60 feet
K-H	Category III Habitat score 3	60 feet
K-J	Category II Habitat score 6	165 feet
K-K	Category III Habitat score 3	60 feet
K-L	Category II Habitat score 6	165 feet
K-HF	Category II Habitat score 5	105 feet

Source: KZC 90.55.

Regulatory buffers to protect streams in the City of Kirkland are determined based on the stream type. Stream typing takes into account whether the stream is fish bearing (Type F), or if it is not fish bearing whether it is perennial or seasonal (Type Np or Ns) (KZC 90.65). Table 3-8 shows the standard regulatory buffers for streams in the City of Kirkland study area.

Table 3-8. Standard Buffer Widths for City of Kirkland Streams

Stream	Type	Standard Regulatory Stream Buffer
K-3	Type F	100 feet
K-5	Type F	100 feet
K-6	Type F	100 feet
K-7	Type Np	50 feet

Source: KZC 90.65.

Where wetland buffers overlap with aquatic area buffers, a combined buffer that represents the largest buffer distance has been mapped in the figures in this report and used for the analysis of Project impacts.

Buffers were truncated at paved areas and at the limits of the former railroad ballast along the CKC trail and an unimproved trail east of 132nd Avenue NE. KZC 90.120 allows an interrupted buffer waiver if the following criteria are met (KZC 90.120.1.d):

1. The existing legal improvement creates a substantial barrier to the buffer function;
2. The interrupted buffer does not provide additional protection of the critical area from the proposed development; and
3. The interrupted buffer does not provide significant hydrological, water quality, and wildlife buffer functions relating to the portion of the buffer adjacent to the critical area.

The railroad ballast/gravel trail creates a substantial barrier to buffer function since it restricts development of woody vegetation for screening functions, and soil development to provide water quality functions. Fill material is generally 2 feet or more of coarse gravel. The railroad ballast/trail will not provide additional protection to critical areas from the proposed utility line. Additionally, the railroad ballast does not provide significant hydrological, water quality or wildlife buffer functions. The coarse, compacted rock does not retain or filter runoff as would native soils, and provides minimal buffer for wildlife. Therefore, the interrupted buffer waiver is applicable in this circumstance.

3.5.1.2 Modifications

Regulations pertaining to wetland modification are outlined in KZC 90.60. Modifications to wetlands and associated buffers may be approved in certain circumstances under a reasonable use exception (KZC 90.180); permitted activities, improvements, or uses subject to development standards (KZC 90.40); public agency and public utility exceptions (KZC 90.45); or under a programmatic permit for a public agency or public utility (KZC 90.50). The Planning Director will only approve a modification to a wetland and buffer if all of the following criteria are met (KZC 90.60.5):

- The mitigation sequencing requirements (KZC 90.145) have been met.
- Compensatory mitigation and mitigation plan requirements (KZC 90.150) are approved.
- The modification will not adversely affect fish, wildlife, or their habitat, including habitat for endangered, threatened, or sensitive species, or species of local significance (KZC 90.95).
- The modification will not adversely affect water quality.
- The modification will not have an adverse effect on drainage and/or stormwater detention capabilities either on site or to the adjacent areas.
- The modification will not result in unstable geologic and soil conditions or create an erosion hazard.
- The modification will not have fill material that contains organic or inorganic material that would be detrimental to water quality or fish and wildlife habitat.
- All exposed areas will be stabilized with native vegetation normally associated with wetlands and/or buffers, as appropriate.

Chapter 4 discusses how all the preceding criteria will be met by the planned transmission line Project. Project mitigation sequencing is discussed in Section 3.6.1 with proposed mitigation discussed in Chapter 6.

Regulations pertaining to stream modification are outlined in KZC 90.70. Modifications to streams and associated buffers may be approved in certain circumstances under permitted activities, improvements, or uses subject to development standards (KZC 90.40); public agency and public utility exceptions (KZC 90.45); under a programmatic permit for a public agency or public utility (KZC 90.50); or reasonable use exception (KZC 90.180). The Planning Director will only approve a modification to a stream and impact to a buffer if all of the following criteria are met (KZC 90.70.4):

- The mitigation sequencing requirements (KZC 90.145) have been met.
- The applicant has demonstrated, where applicable, based on information provided by a civil engineer and a qualified critical area professional approved by Kirkland, that:
    - The modification will not be detrimental to fish habitat, including fill material that contains inorganic or organic material.
    - The modification will not have an adverse effect on drainage, stormwater detention capabilities, and base flood storage volume and function.
    - The modification will not have an adverse effect on water quality or frequently flooded areas.
    - The modification will not increase velocity upstream or downstream.
    - The modification will not result in unstable geologic and soil conditions and slope conditions or create an erosion hazard or contribute to scoring actions.
    - All exposed areas are stabilized with vegetation normally associated with native stream buffers, as appropriate.
    - Existing native trees and other native vegetation are retained to the maximum extent feasible given site conditions and the proposal.
    - The stream modification plan is sufficient to mitigate identified impacts.
    - For streams placed in culverts or stream crossings, fish passage will not be impaired and the WDFW's design criteria for road culverts for fish passage are met.
    - For change in meandering course for the stream, demonstrate that the change is the only feasible option to stop excessive erosion to protect legally established buildings that cannot be achieved through streambank stabilization and will improve the overall function and value of the stream.
    - For stream crossings, demonstrate that relocation would improve stream functions.
    - With the exception of meandering a stream, submit a statement signed by each owner of all adjacent affected properties consenting to the modification if it results in creation or expansion of a stream or stream buffer on their properties.

The Project will not modify a stream but will impact stream buffer. Chapter 4 discusses how the Project will meet all the preceding criteria.

The transmission line is subject to the public utility exemption process outlined in KZC 90.45.3. The following criteria form the basis of the Planning Director's decision about whether to issue a public utility exception:

- There is no other practical alternative to the proposed project with less impact on the critical areas or buffer;
- Strict application of regulations pertaining to critical areas (KZC Chapter 90) would unreasonably restrict or prohibit the ability to provide public utilities or public agency services to the public;
- The proposal minimizes impacts to the critical area through mitigation sequencing, and through type and location of mitigation, pursuant to KZC 90.145 and 90.150, if applicable, including such installation measures as locating facilities in previously disturbed areas, boring rather than trenching, and using pervious or other low impact materials; and
- The proposal protects and/or enhances critical area and buffer functions and values, consistent with the best available science and with the objective of no net loss of critical area functions and values.

As discussed further in Chapter 4, PSE has designed the Project to avoid critical areas and buffers, and will utilize construction practices that minimize impacts to critical areas and their buffers. Within the corridor where the transmission line will be located, there is no practicable alternative for placement of Project elements that would result in less impact to critical areas or buffers. Unavoidable impacts to

wetlands and buffers (described in more detail in Chapter 5) will be mitigated as described in Chapter 6, to achieve no net loss of critical area functions and values.

3.5.2 Fish and Wildlife Habitat Conservation Areas

Modification to FWHCAs areas may only be approved if all of the following criteria are met (KZC 90.95.5):

- Mitigation sequencing is met (KZC 90.145).
- It can be demonstrated that the required habitat areas can be protected through implementation of protection measures in accordance with a management plan.
- It can be demonstrated that the management plan and requirements in KZC 90.145.6 and KZC 90.145.7 can be met with the proposed project.

The planned transmission line Project will not affect FWHCAs beyond the stream buffers discussed in Section 3.5.1.2. As discussed further in Chapter 4, construction work will include BMPs to protect aquatic habitats. Additionally, streams and associated riparian areas in the study area are predominantly degraded habitats in an urban setting that have been altered from their original conditions and generally provide low levels of functions.

3.6 City of Kirkland Mitigation Regulations

Regulations pertaining to mitigation for impacts to critical areas are outlined in KZC 90.145. This section presents regulatory information regarding mitigation for all critical areas, followed by information specific to the critical areas that are located in the study area and would be impacted by Project activities. Information on Project-specific avoidance and minimization is provided in Chapter 4, and information on proposed compensatory mitigation is provided in Chapter 6.

3.6.1 Avoidance and Minimization of Impacts

If a modification is proposed to a critical area or buffer, the KZC 90.145 requires an evaluation of the proposal using mitigation sequencing. The intent of mitigation sequencing is to evaluate and implement opportunities to avoid, minimize, eliminate, or compensate for impacts to critical areas while still meeting the objectives of the Project. The following is the order of preference (based on WAC 197-11-768):

1. Avoiding the impact altogether by not taking a certain action or parts of the actions.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.
6. Monitoring the impacts and compensation projects and taking appropriate corrective measures.

PSE will meet these mitigation sequencing requirements through project design, implementing best practices during construction, restoring disturbed areas, and implementing compensatory mitigation for impacts to wetlands and buffers that cannot be avoided. Pertinent information regarding avoidance and minimization measures and compensatory mitigation is provided in Chapters 4 and 6 of this report.

3.6.2 Location of Mitigation

Based on KZC 90.145.3, the following is the order of preference for mitigation, unless it can be demonstrated that off-site-in-kind mitigation is ecologically preferable:

1. On-site in-kind.

2. Off-site in City in-kind.

3. Off-site in-kind within the Lake Washington/Cedar/Sammamish Watershed.

Mitigation shall occur on site, except when the City determines that all of the following criteria have been met:

- There is no opportunity for on-site mitigation or on-site opportunities do not have a high likelihood of success due to the size of the property, site constraints, or size and quality of the wetland or location and quality of the stream.
- Off-site mitigation has a greater likelihood of providing equal or improved critical area functions than the impacted critical area.
- Off-site locations are in the same watershed (Lake Washington/Cedar/Sammamish Watershed (WRIA 8)) as the impacted critical area.
- The off-site mitigation will best meet formally established watershed goals for water quality, flood or conveyance, habitat, or other wetland functions that have been established and strongly justify location of mitigation at another site.

When considering mitigation outside the City, preference must be given to using mitigation banking or an in-lieu fee program.

Mitigation for lost or diminished critical area functions and values for either wetlands or streams will use the following options: applicant-responsible mitigation, non applicant-responsible mitigation (mitigation bank or in-lieu fee mitigation), or City-responsible mitigation.

The Project in the City of Kirkland is located entirely within a narrow corridor that provides very limited opportunities for wetland and buffer mitigation. The transmission line is one of many uses in the corridor, and PSE is not the property owner. Besides the City of Kirkland and King County retaining ownership of the corridor for use as a regional trail, other utilities have easements in the corridor and PSE cannot control the success of long-term mitigation within the corridor. Therefore, on-site mitigation is not practical. PSE proposes to mitigate for impacts to wetlands and buffers by purchasing credits at a local mitigation bank (Keller Farm Wetland Mitigation Bank), as described in more detail in Chapter 6. However, PSE will compensate the City of Kirkland for the removal of trees within the CKC corridor which provide the majority of the habitat function that will be lost. This will allow the City to plant replacement trees on site within comparable wetland or buffer environments in the foreseeable future once the CKC master trail plan improvements are implemented. PSE is working with the City Transportation Department to implement an agreement to ensure the trees will be planted on site to provide functional replacement for trees removed.

3.6.3 Mitigation Requirements

Specific wetland mitigation requirements are outlined in KZC 90.150. Compensatory mitigation for unavoidable modifications to wetlands and related impacts to buffers must achieve equivalent or greater wetland functions.

Standard City of Kirkland mitigation ratios are provided in KZC 90.150. These ratios do not apply to the use of credits from a state-certified wetland mitigation bank or in-lieu fee program. Since use of a mitigation bank is the proposed method of mitigation for impacts within the City of Kirkland, mitigation ratios and information about other specific compensatory mitigation requirements are not provided in this report.

Additional information about compensatory mitigation and achievement of equivalent of greater wetland and aquatic area functions is provided in the Project mitigation bank use plan (Appendix B).

4. Avoidance and Minimization Measures

This section discusses Project impact avoidance and minimization measures in critical areas and their buffers for the three jurisdictions. The measures listed in this chapter demonstrate how PSE will meet the mitigation sequencing requirements, performance standards, and other requirements listed in Sections 3.2, 3.4, and 3.6 through engineering design, construction best practices, and restoration of temporarily disturbed areas.

4.1 Impact Avoidance

Engineering and environmental constraints were evaluated by PSE during Project design to avoid impacts associated with the transmission line, including the construction access and maintenance road. The planned transmission line route runs along existing road and former rail corridor rights-of-way, which are multi-use corridors in which PSE is an easement or franchise holder.

PSE engineers used information from the delineations to adjust pole locations to avoid wetlands, streams, and buffers wherever feasible. The following avoidance measures were followed:

- New pole locations are located near existing accessible routes to minimize construction impacts.
- Pole locations avoid areas that require significant access disturbance. For replacement poles in the existing corridor south of Sammamish Substation in the City of Redmond and south of Juanita Substation in the City of Kirkland, temporary matting will be used for access.
- Small adjustments to pole locations were made to avoid wetlands, streams, and their buffers, while avoiding conflicts with existing and future planned uses in the corridors as required under the conditions of PSE's easements.

The Project design avoids permanent and temporary impacts to most of the wetlands within the study area. The Project has been designed to utilize existing roads or other paved areas, and the railroad ballast to transport supplies and ground-operated equipment for new pole installation. Location of most poles close to the edge of paved or gravel areas will allow work to occur predominantly on one side of the pole, avoiding the need to enter adjacent wetlands with equipment and associated temporary impacts. In areas where pole installation sites are close to a wetland edge, a high visibility fence will be installed at the wetland boundary to prevent access by equipment. Where access from an adjacent paved or gravel area is not feasible for replacement poles south of Sammamish Substation in the City of Redmond and south of Juanita Substation in the City of Kirkland, access routes have been designed to avoid critical areas and associated buffers to the degree possible.

The gravel construction access and maintenance road in the City of Redmond and unincorporated King County was designed to utilize the existing railbed and avoid streams and wetlands and their buffers to the degree possible. The original design of the road was shifted to avoid permanent alteration to the 124th Street Stream channel. The design of the access road and replacement culverts also minimizes cut and fill quantities.

To the degree possible, work areas will be located for the least amount of overlap with Project area wetlands and buffers. Temporary staging areas will be located in upland areas outside of critical area buffers. With the exception of one stringing site located in the wetland south of Sammamish Substation, stringing sites will be located on existing paved or gravel surfaces, and will not result in new disturbance. Generally, access routes, work areas, and stringing site locations will avoid native shrubs.

City of Redmond – The Project avoids permanent impacts to all except two wetlands in the City of Redmond. No poles will be located in streams. Apart from five replacement and one new pole in Wetland Substation C, poles will not be located in wetlands. The gravel construction access and maintenance road avoids permanent impacts to streams and permanent impacts to all wetlands except for a minor area of fill in Wetland R-C. The Project avoids removal of trees. The Project avoidance measures described above follow the mitigation sequencing requirements in RZC 21.64.010.I.

Unincorporated King County – The Project avoids all permanent impacts to wetlands, streams, and buffers. Tree removal is limited to one 12-inch diameter red alder from a stream buffer. No poles will be located in wetlands or aquatic areas. The construction access and maintenance road avoids permanent impacts to wetlands and aquatic areas. The Project avoidance measures described above follow the mitigation sequencing requirements in KCC 21A.24.125 and substantially avoid impacts.

City of Kirkland – The Project avoids permanent and temporary impacts to Wetlands K-C, K-DD, K-E, K-F, and K-H. Apart from necessary tree removals along the transmission corridor, no permanent or temporary Project-associated disturbances are planned within Wetland K-HF. No poles will be located in streams. Poles that will encroach into wetlands and buffers have been located to minimize the amount of encroachment. Replacement Pole 4/10 in Wetland K-L is the only pole that will be located completely in a wetland, as its location is dictated by the existing transmission line corridor.

4.2 Minimization Measures

To minimize impacts to wetlands and streams, work will be conducted during the dry season, when soils will be at their driest and water levels will be at their lowest. Temporary access routes have been designed to minimize temporary impacts to wetlands, streams, and their buffers. The design of the gravel construction access and maintenance road in the City of Redmond and unincorporated King County includes retaining walls to minimize impacts to wetlands and streams. The wall type was selected to maintain the required loading capacity while minimizing the footprint.

BMPs, as outlined in the latest version of the *Stormwater Management Manual for Western Washington*[1], and as required by the respective local jurisdictions, will be implemented during construction to minimize potential impacts to critical areas and buffers. Such practices may include the use of ground equipment with low pressurized rubber tires and the placement of mats to cover the ground surface where tracked equipment is used in critical areas. A Stormwater Pollution Prevention Plan (SWPPP), including TESC, will be prepared for the Project. Straw bales, wattles, and/or silt fencing and dispersion measures will be implemented, as necessary. In many locations along the planned transmission line route, poles will be installed just outside a wetland boundary. In these areas, silt fencing will be placed between the work area and the wetland to prevent sedimentation into wetlands. Temporarily exposed soils resulting from Project activities in wetlands or protective buffer areas will be re-seeded with a mixed native seed mix and/or covered with mulch to reduce the potential for sedimentation into aquatic resource areas.

The study area does not support habitat for rare plant or animal species. However, Puget Sound Chinook salmon and Puget Sound steelhead occur in streams within the project watershed that are hydrologically connected to streams in the study area. Due to the implementation of BMPs during construction and other measures to avoid and minimize impacts in study area drainages, no impacts to listed fish or other fish populations are anticipated to occur as a result of transmission line construction, including widening of the ballast to create the construction access and maintenance road in the City of Redmond and unincorporated King County. Project construction will be timed to avoid saturated/inundated wetland and drainage conditions, and BMPs will be implemented to control potential erosion or sedimentation in aquatic areas.

City of Redmond – In Wetland Substation C, timber mats will be laid down temporarily over wetland vegetation (predominantly reed canarygrass) to provide temporary access routes to poles and prevent damage associated with heavy equipment. Access routes to poles south of the substation will avoid crossing stream channels, and will minimize removal of vegetation. The proposed gravel construction access and maintenance road will be used for equipment transport and staging along the corridor east of Willows Road NE. Poles will be installed with minimal temporary and permanent disturbance to critical area buffers, which are dominated by invasive blackberry and reed canarygrass. Use of retaining walls in the gravel access road design will minimize impacts to adjacent wetlands and streams by reducing the amount of grading needed and the need for engineered slopes within critical areas and buffers.

[1] Currently, the most recent version is dated 2014 (Washington Department of Ecology 2014), subject to future updates prior to project construction.

Unincorporated King County – Use of retaining walls in the gravel construction access and maintenance road design will avoid all permanent impacts to adjacent wetlands and streams by reducing the amount of grading needed and the need for engineered slopes within critical areas and buffers. Impacts from the road are limited to temporary disturbance from construction. Since the access road will be used to construct the transmission line, no equipment staging will occur within critical areas or buffers.

City of Kirkland – Access and equipment staging for pole installation will occur from existing gravel or paved surfaces. In Wetland K-L, timber mats will be laid down temporarily over wetland vegetation (predominantly reed canarygrass) to provide a temporary access route to Pole 4/10 and prevent damage associated with heavy equipment. To cross the stream channel in this location, PSE will lay temporary fiberglass or timber matting across the stream channel to allow construction equipment to cross and prevent entry into or disturbance of the stream channel. One of two temporary routes will be used to access Pole 4/10. Access from the south is preferred to limit the extent of temporary wetland impacts. However, an access route from the west has also been included in the impact analysis in case its use is needed during construction.

5. Unavoidable Project Impacts

5.1 Impact Analysis Methodology

For each jurisdiction the critical areas impact analysis was done by placing points, lines, and polygons representing Project elements (new pole locations, gravel construction access and maintenance road, trees to be removed, temporary access routes, stringing sites, and temporary work areas) on a georeferenced base map showing the extent of critical areas and their buffers. As discussed previously, paved surfaces, the existing rail ballast in the City of Redmond, unincorporated King County, and east of 132nd Ave NE in the City of Kirkland, as well as the gravel trail in the City of Kirkland, and other areas characterized as developed were removed from regulated buffer areas.

Where Project elements overlapped critical areas or their buffers, impacts were quantified based on area (square footage) of overlap. In the case of tree removals, impacts were quantified based on number and type of trees removed. Quantified impacts include permanent and temporary impacts.

The map book in Appendix A provides illustrations of areas within the study area where Project components are located in or near critical areas or their buffers. Because the symbols used to represent Project poles are not to scale, detail maps for select poles have also been included to provide more precise information about the location of these poles in relation to critical areas and their buffers.

5.2 Unavoidable Project Impacts – City of Redmond

Construction of the Project will result in unavoidable impacts to wetlands, streams, and buffers in the City of Redmond. Permanent impacts will occur in Wetlands Substation C, and R-C. Temporary impacts will occur in Wetlands Substation C, R-GCA, R-C, R-D, and R-E, and Stream R-2. Permanent and temporary impacts will occur in the regulatory buffers of Wetland Substation C, R-GCA, R-C, ROS-A, R-D, and York Creek. Additionally, temporary impacts will occur in the regulatory buffers of Wetlands R-E and ROS-B, and 124th Street Stream and Stream R-2.

5.2.1 Wetland and Stream Impacts

Project activities will result in unavoidable permanent impacts associated with placement of six poles in wetland areas. Construction of the gravel construction access and maintenance road will result in a very small amount (approximately 30 square feet) of permanent wetland impact associated with grading and placement of fill material to support the maintenance access roadway.

Project activities will also result in unavoidable temporary impacts to wetlands and streams associated with access routes, work areas around poles, and stringing sites, grading, construction of retaining walls, and culvert replacement. No trees will be removed from wetlands within the City of Redmond.

5.2.1.1 Permanent wetland impacts – Pole Installation and Removal

Permanent impacts associated with replacement of five poles and the installation of one new pole will occur within Wetland Substation C, a large, Category II slope wetland (see Section 2.1.1.2). For the purposes of calculations, all pole installations, whether new poles or replacements, are presented in Table 5-1. The permanent wetland impact area associated with pole installations will be approximately 130 square feet (0.003 acre), and the volume of fill will be approximately 35 cubic yards. Impacts will occur predominantly in areas where non-native reed canarygrass is the dominant vegetation, although areas with native shrubs will also be impacted.

Table 5-1. Permanent Pole Impacts in City of Redmond Wetlands

Pole Number	Hole Diameter (feet)	Depth of Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
0/2A-MOR	4	15	13	2
0/3-LOC	7	50	39	13
0/5-LOC	4	15	13	2
0/4-LOC	4	15	13	2
0/3-NOB	7	50	39	13
0/1-NOV	4	15	13	2
Total			**130**	**34**

Note: all impacts will occur in Wetland Substation C, a Category II wetland.

5.2.1.2 Permanent Wetland Impacts – Gravel Construction Access and Maintenance Road

Permanent wetland impacts associated with the construction access and maintenance road will consist of approximately 30 square feet (0.0007 acre) of fill in Wetland R-C, a Category III wetland.

5.2.1.3 Temporary Wetland and Stream Impacts

Temporary impacts from access routes, work areas, stringing sites, and construction of the permanent gravel construction access and maintenance road will occur in portions of Wetlands Substation C, R-GCA, R-C, R-D, and R-E, and Stream R-2. The estimated total temporary wetland impact area will be approximately 63,500 square feet (1.5 acres) and the temporary stream impact area will be approximately 150 square feet (0.003 acre).

5.2.2 Wetland and Stream Buffer Impacts

Project activities will result in unavoidable permanent impacts associated with installation/replacement of two poles in buffers.

Construction of the gravel construction access and maintenance road will result in permanent buffer impacts associated with grading and placement of fill material. Additionally, a total of 17 trees will be removed from buffer east of Willows Road NE along the gravel construction access and maintenance road.

Project activities will also result in unavoidable temporary impacts to buffers associated with access routes, work areas around poles, and stringing sites, grading, construction of retaining walls, and culvert replacement.

5.2.2.1 Permanent Buffer Impacts – Pole Installation and Removal

Permanent impacts associated with the replacement of one pole will occur within the buffer of Wetland Substation C and permanent impacts associated with the installation of a new pole will occur in the buffer of Wetland ROS-A, as summarized in Table 5-2. The total permanent buffer impact area will be approximately 45 square feet (0.001 acre). Impacts to the buffer of Wetland Substation C will occur in a disturbed area of upland fill near the center of the wetland, where Himalayan blackberry and other non-native species are dominant. Impacts to the buffer of Wetland ROS-A will occur at the degraded buffer edge, adjacent to the rail ballast.

Table 5-2. Permanent Pole Impacts in City of Redmond Buffers

Wetland/ Stream	Pole Number	Hole Diameter (feet)	Portion in Buffer (feet)	Depth of Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
Substation C	0/2-MOR	7	7	50	40	75
ROS-A	0/20	4	1.5	11	5	5
Total					**45**	**80**

5.2.2.2 Permanent Buffer Impacts – Gravel Construction Access and Maintenance Road

Permanent impacts to buffers associated with the gravel construction access and maintenance road are summarized in Table 5-3. The total permanent buffer impact area will be approximately 1,910 square feet (0.04 acre).

Table 5-3. Permanent Impacts to City of Redmond Buffers from Access Road Construction

Buffer	Permanent Impact Area
Wetland R-GCA	1,055
Wetland R-C/Stream R-2	465
Wetland ROS-A	95
Wetland R-D/Stream R-3	60
Wetland R-E/York Creek	235
Total	**1,910**

Source: Otak 2019

5.2.2.3 Permanent Buffer Impacts – Tree Removals

Permanent impacts associated with tree removal in buffers will occur in the buffer of York Creek. A total of 17 trees have been identified for removal, as listed in Table 5-4.

Table 5-4. Tree Removals from City of Redmond Buffers

Buffer	Species	Size (inches dbh)	Number Removed
York Creek	Black cottonwood	6 to 24	15
York Creek	Paper birch	7	1
York Creek	Red alder	12	1
Total			**17**

5.2.2.4 Temporary Buffer Impacts

Temporary impacts from access routes, work areas around poles, and widening the ballast for the gravel construction access and maintenance road will occur in portions of buffers. The estimated total temporary impact area will be approximately 14,975 square feet (0.34 acres).

5.2.3 Summary of Wetland and Stream Impacts – City of Redmond

Table 5-5 summarizes the estimated permanent and temporary impacts from the Project within the City of Redmond, broken down by wetland and stream location.

Table 5-5. Summary of City of Redmond Wetland and Stream Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Class	Permanent Impact Area (square feet)	Tree Removals	Temporary Impact Area (square feet)	Permanent Impact Area (square feet)	Tree Removals	Temporary Impact Area (square feet)
Substn C	Category II	130	0	61,440	40	0	3,780
R-GCA	Category III	0	0	565	1,055	0	310
R-C	Category III	30	0	265	465	0	3,580
ROS-A	Category III*	0	0	0	100	0	2,630
R-D	Category III	0	0	1,050	60	0	1,180
ROS-B	Category III*	0	0	0	0	0	1,155
R-E	Category II	0	0	180	0	0	1,855
R-2	Class III	0	0	150	0	0	0
124th St Stream	Class III	0	0	0	0	0	485
York Creek	Class III	0	0	0	235	17	0
Total		**160**	**0**	**63,650**	**1,955**	**17**	**14,975**

* Estimated rating for off-site wetland

Note: impact areas for combined wetland/stream buffers are only listed once.

5.3 Unavoidable Project Impacts – Unincorporated King County

Construction of the Project will result in unavoidable temporary impacts to Wetlands KC-A and KC-B, and Stream KC-1. The project will also result in unavoidable temporary impacts to buffers in the project area.

5.3.1 Wetland and Stream Impacts

Project activities will not result in any permanent impacts to wetlands or streams in the unincorporated King County portion of the project area.

Project activities will result in unavoidable temporary impacts to wetlands and streams associated with the construction of the gravel construction access and maintenance road. Temporary impacts will occur in portions of Wetlands KC-A and KC-B and Stream KC-1, and will total approximately 530 square feet (0.012 acre). The estimated temporary stream impact area will be approximately 40 square feet (0.0009). No project poles will be located in buffers.

5.3.2 Wetland and Stream Buffer Impacts

5.3.2.1 Permanent Buffer Impacts

The Project will avoid all permanent impacts to buffers. Project activities within buffers will be limited to the removal of 1 tree, a 12-inch dbh red alder.

5.3.2.2 Unincorporated King County Temporary Buffer Impacts

Temporary impacts from widening of the ballast for the gravel construction access and maintenance road will occur in the buffers of Wetlands KC-A and KC-B and 124th Street Stream. No temporary impacts from work areas around poles will occur. The estimated total temporary impact area will be 7,060 square feet (0.16 acre).

5.3.3 Summary of Wetland and Stream Impacts – Unincorporated King County

Table 5-6 summarizes permanent and temporary impacts from the Project within unincorporated King County, broken down by wetland and stream.

Table 5-6. Summary of Unincorporated King County Wetland and Stream Impacts

		Wetland and Stream Impacts			**Buffer Impacts**		
Wetland/ Stream	Category/ Type	Net Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Net Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
KC-A	Category II	0	0	340	0	0	5,100
KC-B	Category III	0	0	190	0	0	345
KC-1	Type N	0	0	40	0	0	0
124th Street Stream	Type F	0	0	0	0	1	1,615
Total		**0**	**0**	**570**	**0**	**1**	**7,060**

5.4 Unavoidable Project Impacts – City of Kirkland

Construction of the Project will result in unavoidable permanent and temporary impacts to Wetland K-L for the replacement of Pole 4/10, and to Wetlands K-G, K-D, and K-J for installation of new poles. Additional impacts associated with removal of trees will occur in Wetlands K-D, K-J, and K-K. The Project will also result in unavoidable permanent and temporary impacts to the buffers of Wetland K-B/Stream K-7, Wetland K-D, Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, and Wetland K-L/Stream K-5. Additional impacts associated with removal of trees will occur in the buffers of Wetland K-B, Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5.

5.4.1 Wetland Impacts

Project activities will result in unavoidable permanent impacts associated with replacement of one pole in a wetland, encroachment of five poles into wetlands and removal of 17 trees from wetlands. Project activities will also result in unavoidable temporary impacts to wetlands associated with temporary access routes and work areas around poles.

5.4.1.1 Permanent wetland impacts – Pole Installation

Permanent impacts associated with installation of five poles and replacement of one pole will occur in four wetlands in the City of Kirkland, as summarized in Table 5-7. The permanent wetland impact area associated with pole installations will be approximately 55 square feet (0.001 acre). The volume of fill is not yet known. Impacts in Wetlands K-D, K-G, and K-J will occur at the very edge of the wetland adjacent to the rail ballast and CKC gravel trail. The detail maps in Appendix A provide detailed representations of areas where pole holes will encroach on wetland edges. Impacts in Wetland K-L will occur near the western edge of the large wetland, in a degraded area within an existing transmission line corridor that is dominated by the non-native species reed canarygrass.

Table 5-7. Permanent Pole Impacts in City of Kirkland Wetlands

Wetland/ Stream	Pole Number	Hole Diameter (feet)	Portion in Wetland (feet)	Depth of Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
Wetland K-D	2/14	5	2	tbd	10	tbd
Wetland K-D	2/14 stub pole	5	2	tbd	10	tbd
Wetland K-D	2/15	5	1	tbd	5	tbd
Wetland K-G	2/16	5	2.5	tbd	10	tbd
Wetland K-J	2/21	5	1	tbd	5	tbd
Wetland K-L	4/10	4	4	11	15	6
Total					**55**	**tbd**

Tbd = to be determined

5.4.1.2 Permanent Wetland Impacts – Tree Removals

Permanent impacts associated with tree removal will occur in Wetlands K-D, K-J, and K-K. A total of 17 trees have been identified for removal, as listed in Table 5-8.

Table 5-8. Tree Removals from City of Kirkland Wetlands

Wetland	Category	Species	Size (inches dbh)	Number Removed
K-D	Category III	Red alder	12	1
K-J	Category I	Black cottonwood	8,19	2
K-J	Category I	Western red-cedar	8	1
K-J	Category I	Pacific willow	7, 10	2
K-J	Category I	Scouler's willow	6	1
K-J	Category I	Red alder	6	2
K-J	Category I	English hawthorn	9	1
K-K	Category III	Black cottonwood	10, 11	2
K-K	Category III	Red alder	7-16	5
Total				**17**

5.4.1.3 Temporary Wetland Impacts

Temporary impacts from access routes to pole 4/10 and the work areas around seven poles (2/14 stub pole, and poles 2/14 through 2/21) will occur in portions of Wetlands K-D, K-G, K-J, and K-L. The estimated total temporary impact area will be approximately 7,015 square feet.

5.4.2 Wetland and Stream Buffer Impacts

5.4.2.1 Permanent Buffer Impacts – Pole Installation

Permanent impacts associated with installation of new poles will occur within the buffer of several wetlands and streams within the City of Kirkland, as summarized in Table 5-9. The total area of permanent impact will be approximately 60 square feet (0.001 acre). The permanent impacts will occur predominantly in degraded, low functioning buffer strips between the wetland and the railroad ballast and CKC gravel trail.

Table 5-9. Permanent Pole Impacts in City of Kirkland Buffers

Pole Number	Impacted Buffer	Hole Diameter (feet)	Portion in Buffer (feet)	Depth of Pole or Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
2/3	Stream K-7	4	4	10	15	5
2/15	Wetland K-D	5	2	tbd	15	tbd
2/20	Wetland K-J	5	1	tbd	5	tbd
2/21	Wetland K-J	5	1	tbd	5	tbd
3/2	Wetland K-K Stream K-6	5	5	tbd	20	tbd
Total					**60**	**tbd**

Tbd = to be determined

5.4.2.2 Permanent Buffer Impacts – Tree Removals

Permanent impacts associated with tree removal will occur in the buffers of Wetland K-B, Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5. A total of 69 trees have been identified for removal, as listed in Table 5-10.

Table 5-10. Tree Removals from City of Kirkland Buffers

Buffer	Species	Size (inches dbh)	Number Removed
K-B	Douglas-fir	14	1
K-J/K-3	Black cottonwood	6-32	11
K-J/K-3	Red alder (2 snags)	6-16 + 2 snags	15
K-J/K-3	Scouler's willow	8	1
K-K/K-6	Red alder	6-14	4
K-K/K-6	Black cottonwood	7-20, 44	14
K-K/K-6	Pacific willow	6-12	5
K-K/K-6	Deciduous	14	1
K-HF	Red alder	7-17	8
K-HF	Douglas-fir	14	1
K-HF	Pine	21	2
K-L/K-5	Western redcedar	10-12	3
K-L/K-5	Douglas-fir	12	1
K-L/K-5	Red alder	8	1
K-L/K-5	Pine	9	1
Total			**69**

5.4.2.3 Temporary Buffer Impacts

Temporary impacts from work areas will occur in portions of the buffers for Stream K-7, Wetland K-J, Wetland K-K/Stream K-6, and Wetland K-L/Stream K-5. Temporary access will also be provided through the Wetland K-L/Stream K-5 buffer for pole replacement. The estimated total temporary impact area will be 4,500 square feet (0.10 acre).

5.4.3 Summary of Wetland and Stream Impacts – City of Kirkland

Table 5-11 summarizes permanent and temporary impacts from the Project within the City of Kirkland, broken down by wetlands and associated streams.

Table 5-11. Summary of City of Kirkland Wetland and Stream Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Type	Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
K-B/K-7	Category IV/ Type Np	0	0	0	15	1	400
K-D	Category III	25	1	600	15	0	0
K-G	Category III	10	0	600	0	0	0
K-J/K-3	Category II/ Type F	5	9	600	10	27	200
K-K/K-6	Category III/ Type F	0	7	0	20	24	1,850
K-L/K-5	Category II/ Type F	15	0	5,215	0	6	2,050
K-HF	Category II	0	0	0	0	11	0
Total		**55**	**17***	**7,015**	**60**	**69***	**4,500**

* Includes trees (17 in wetlands and 52 in buffers) that will be compensated for through a fee in lieu payment to the City of Kirkland, associated with the master trail plan.

6. Proposed Compensatory Mitigation

6.1 City of Redmond – Willows Creek Stream Relocation Project

On-site mitigation will occur south of Sammamish Substation as a component of the Willows Creek Stream Relocation Project, where the majority of project wetland impacts will occur. This property is owned by PSE and is therefore available for a suitable mitigation project that allows PSE to continue to use this property for its transmission needs.

The primary goals of the proposed compensatory mitigation are as follows:

- Provide compensatory mitigation for wetland area and functions impacted by the Sammamish-Juanita Project through wetland enhancement on the Sammamish Substation site as a component of the Willows Creek Stream Relocation Project.
- Provide consolidated mitigation for linear project impacts to ensure greater habitat functional lift and more viability of success than spot mitigation along the project route.
- Provide compensatory mitigation on a site controlled long-term by PSE.

The above goals will be met by:

- Enhancing 3,260 square feet acre of Wetland Substation C through invasive species control and native species installation to compensate for permanent wetland and wetland buffer impacts.
- Managing invasive species and establishing communities of native vegetation in the vicinity of the enhanced wetland and new stream channel.

In addition to meeting the required mitigation ratio for unavoidable wetland impacts through wetland enhancement, the project will benefit the Sammamish River Watershed and, specifically, the Willows Creek Sub-watershed through enhanced habitat, water quality, and hydrologic functions to a large portion of wetland directly connected to Willows Creek.

Wetland Substation C south of Sammamish Substation currently provides low water quality and hydrologic functions and high habitat functions; however, significant portions of Wetland Substation C have limited plant diversity and are dominated by invasive species. As a result, the overall level of structural habitat complexity in the wetland could be improved. Water quality and hydrologic functions would be further improved by the reconnection of portions of the wetland with the floodplain of Willows Creek, as well as the addition of trees, shrubs, and large woody debris to trap sediment and slow flood flows.

The proposed enhancement plantings include approximately 10 native woody species within the wetland, which would provide a wide variety of additional sources of food for wildlife, additional cover and habitat complexity, as well as additional water quality and hydrologic benefits from increased dense and rigid vegetation which would serve to trap sediments and slow flood flows.

This will also improve plant diversity by adding new species that are not present in the existing wetland and increase vertical and horizontal habitat complexity by establishing a new area of scrub-shrub habitat types.

The details of the mitigation project are discussed in a separate mitigation plan (*Conceptual Mitigation Plan, Sammamish-Juanita Transmission Line Project*, HDR 2020).

6.2 Unincorporated King County

The Project will avoid permanent impacts to wetlands, streams and buffers within unincorporated King County. Therefore, no compensatory mitigation is proposed.

6.3 City of Kirkland – Wetland Mitigation Bank

The unavoidable removal of 17 trees combined from Wetlands K-D, K-J, and K-K, and 52 trees from the buffers of Wetland K-B/Stream K-7, Wetland K-J/Stream K-3 and Wetland K-K/Stream K-6 will be compensated for through a fee in lieu payment to the City of Kirkland, as these trees are located within the City's CKC trail corridor. PSE does not own the trail corridor and any mitigation planting will likely be disturbed when the City of Kirkland implements their CKC master plan and widens and paves the interim trail in the foreseeable future. At such time as the improvements occur, the City of Kirkland will plant mitigation trees in appropriate wetland or buffer environments along the corridor. PSE is in the process of developing a payment and implementation agreement with the City of Kirkland Transportation Department. The remaining 17 tree removals from buffer areas on private property will be mitigated for in combination with other project impacts, as described below.

PSE proposes to mitigate for the remaining unavoidable permanent impacts to wetlands and buffers associated with the transmission line project in the City of Kirkland through purchase of credits at the Keller Farm Wetland Mitigation Bank (Appendix B). This approach meets the regulatory requirements in KZC 90.145. The permanent wetland impact area is approximately 55 square feet, and not feasibly mitigated for on site because PSE does not own the property within the corridor and does not have control over the long-term success of the mitigation sites. Additionally, permanent buffer impacts are also very small and spread out among four buffers along the Project corridor located within degraded environments dominated by invasive species. Off-site mitigation at the Bank is therefore considered ecologically preferable to multiple very small mitigation sites located along the actively maintained Project corridor. Bank mitigation has a higher likelihood for success, and occurs within a strategic watershed location within the same Water Resource Inventory Area (WRIA) 8 as the impacts.

The Wetland Mitigation Bank Use Plan (Appendix B) provides a summary of mitigation actions and ecological functions at the Keller Farm Bank, and proposed mitigation ratios for determining appropriate credits for purchase. Purchase of 0.045 bank credit will compensate for permanent impacts within the City of Kirkland.

7. References

AECOM. 2016. Sammamish Substation Wetland Delineation and Stream Reconnaissance Report. Prepared for Puget Sound Energy by AECOM, Seattle, Washington.

AECOM. 2020. Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report. Prepared for Puget Sound Energy by AECOM, Seattle, Washington. February 2020.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Performed for the U.S. Department of the Interior Fish and Wildlife Service Office of Biological Services. Washington, D.C.

City of Redmond. 2017. Redmond Zoning Code (RMC Title 21). Available at: http://online.encodeplus.com/regs/redmond-wa/index.aspx. Accessed on March 10. 2017.

City of Kirkland. 2017. Kirkland Zoning Code Chapter 90, as amended by Ordinance 4551. Available at: http://www.codepublishing.com/WA/Kirkland/. Accessed on March 10, 2017.

City of Redmond. 2019. Willows Road Culvert Replacement. Available on-line at: https://www.redmond.gov/846/Willows-Road-Culvert-Replacement. Accessed August 12, 2019.

GeoEngineers. 2020. Limited Geotechnical Assessment, Sammamish Substation Transmission Line Corridor. Prepared for Puget Sound Energy by GeoEngineers, Bellevue, Washington. January 2020.

HDR. 2020. Conceptual Mitigation Plan, Sammamish-Juanita Transmission Line Project. Prepared for PSE by HDR, Bellevue, Washington. January 2020.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update (Publication #14-06-029). Washington Department of Ecology. Olympia, Washington.

King County. 2016. Surface Water Design Manual. Available at: https://www.kingcounty.gov/services/environment/water-and-land/stormwater/documents/surface-water-design-manual.aspx.

King County. 2017. Title 21A Zoning. Updated January 17, 2017. Available at: http://www.kingcounty.gov/council/legislation/kc_code/24_30_Title_21A.aspx. Accessed on March 10, 2017.

Kleinfelder. 2020. Revised Geotechnical Engineering Report Sammamish-Juanita Transmission Line, King County, Washington. Prepared for Puget Sound Energy by Kleinfelder, Redmond, Washington. January 2020.

Otak. 2019. Sammamish-Juanita 115kV Transmission Line Access Road Preliminary Critical Areas Impact data. Prepared for Puget Sound Energy by Otak, Redmond, Washington. December 2019.

Parametrix. 2018. Willows Road Culvert Replacement Critical Areas Report. Prepared for City of Redmond by Parametrix, Seattle, Washington.

The Watershed Company, 2020. PSE Transmission Line, Confirmation of Wetland and Stream Boundaries – Peer Review Letter. January 28, 2020 Memorandum from Peter Heltzel to Jon Regala of the City of Kirkland Department of Planning and Community Development.

U.S. Army Corps of Engineers (USACE) and Environmental Protection Agency (EPA). 2008. Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. Federal Register 73(70):19593-19703.

Washington Department of Fish and Wildlife. 2019. Priority Habitats and Species on the Web Interactive Mapping. Available at: http://apps.wdfw.wa.gov/phsontheweb/. Last accessed October 23, 2019.

Appendix A Critical Areas Impact Assessment Map Book

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

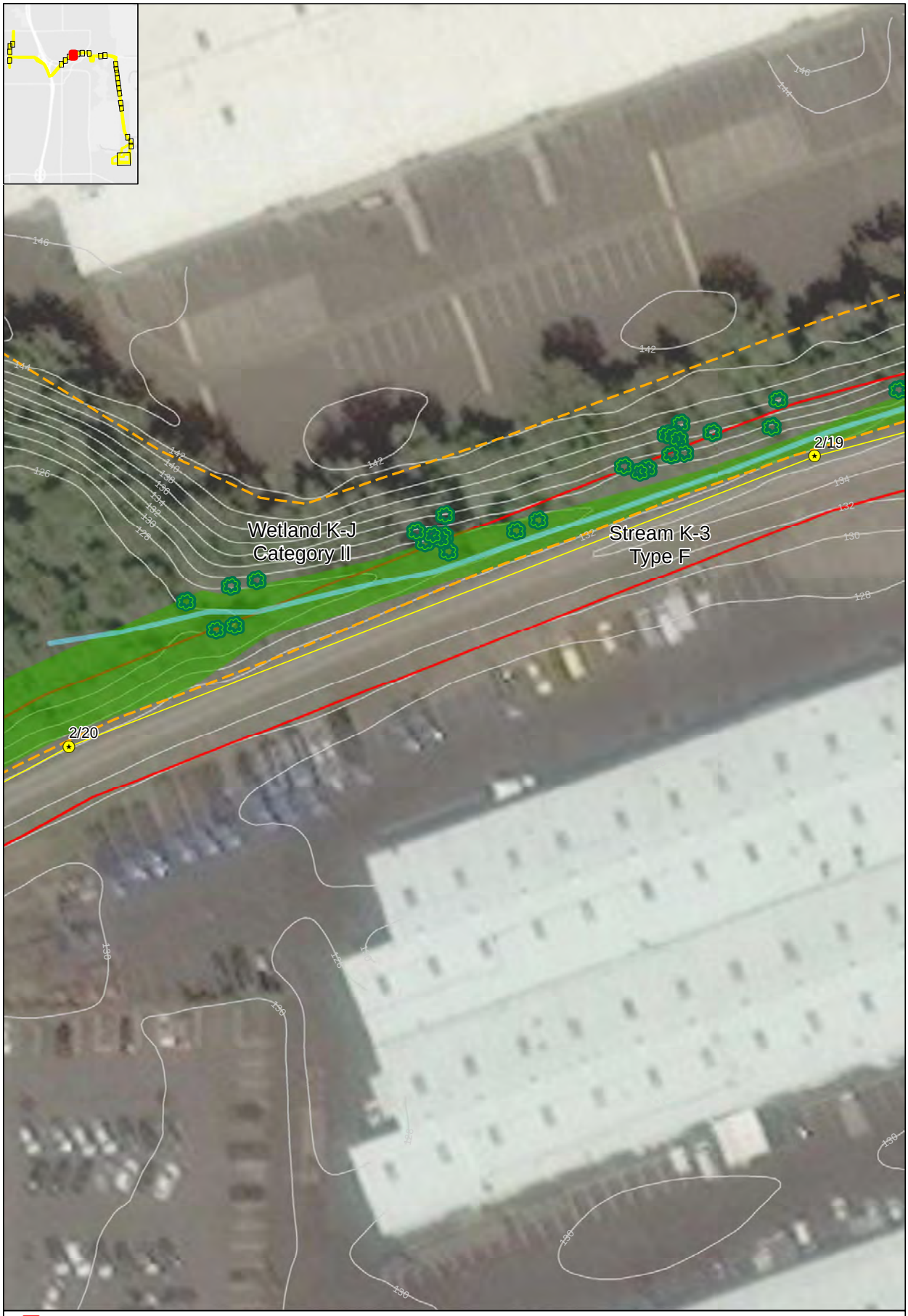
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

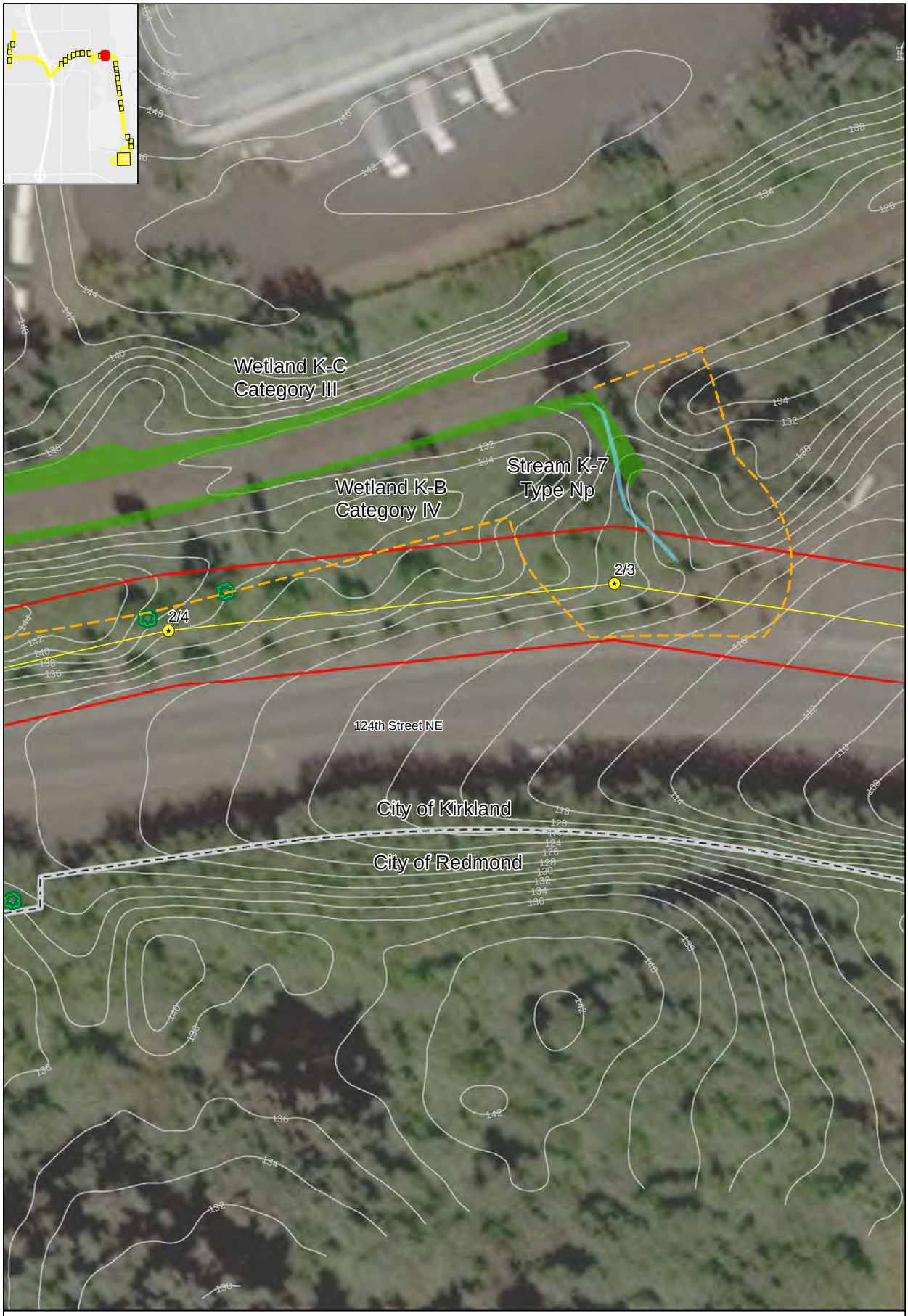
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland and City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



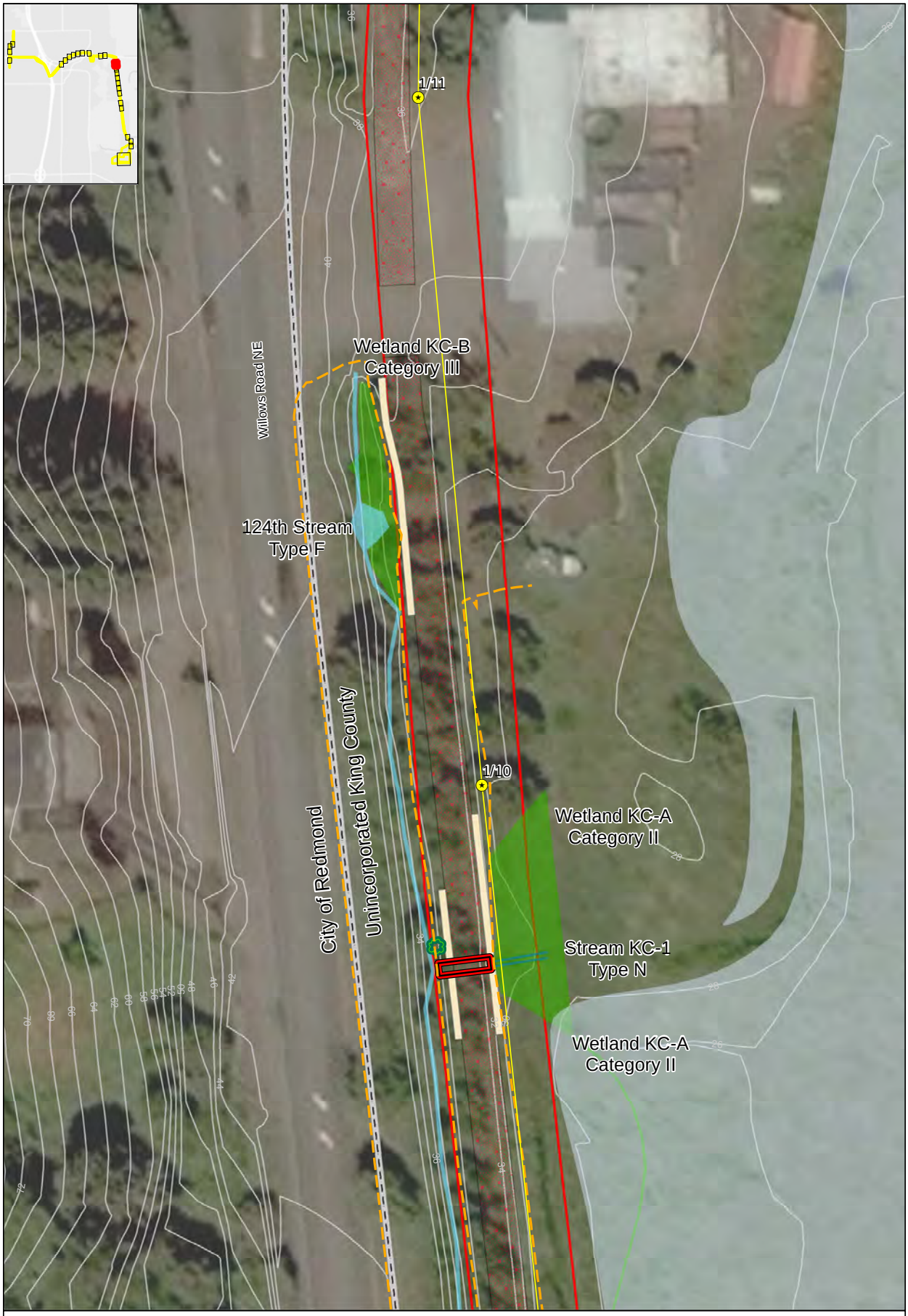
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland and City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
Unincorporated King County and City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
Unincorporated King County and City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

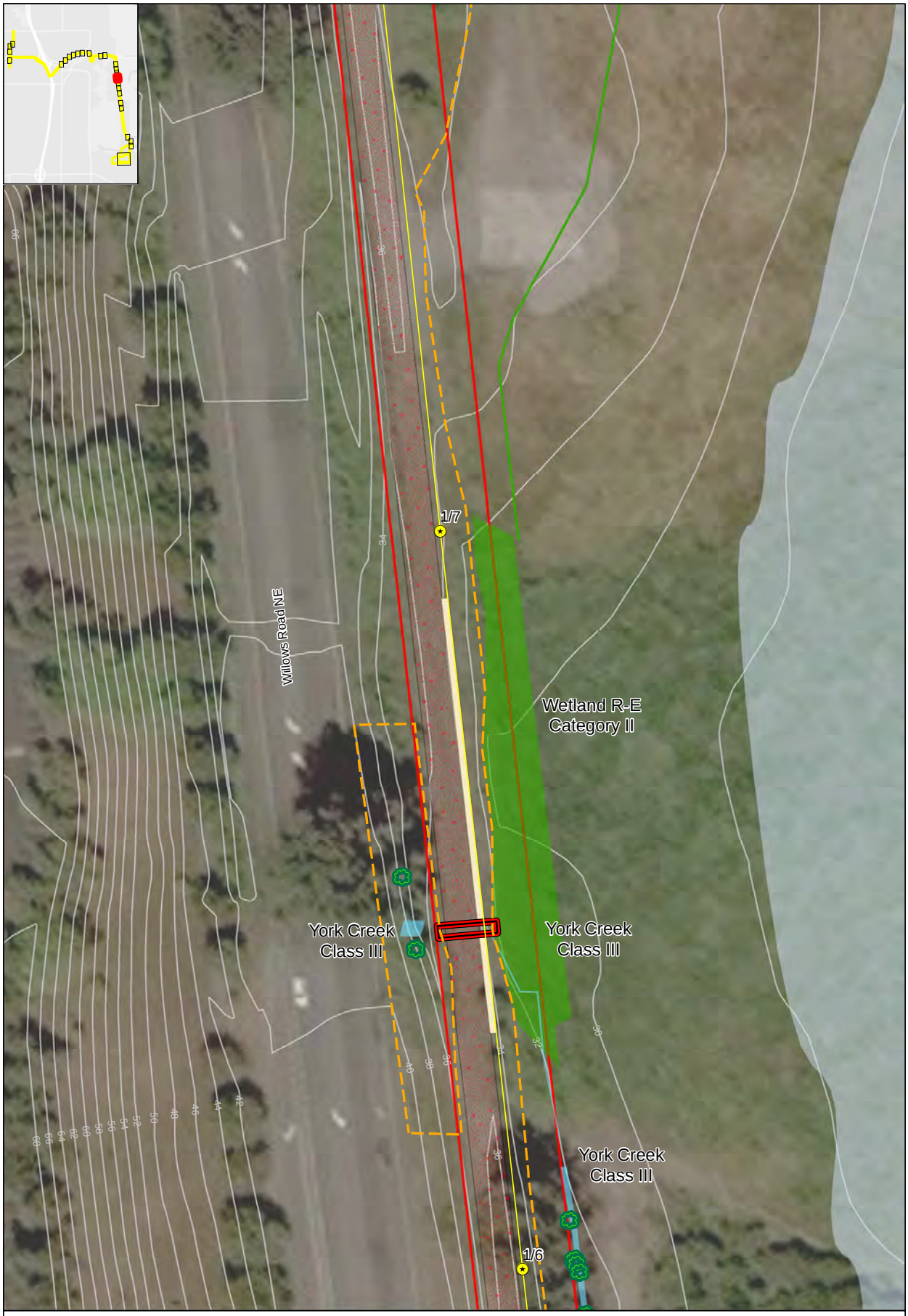
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

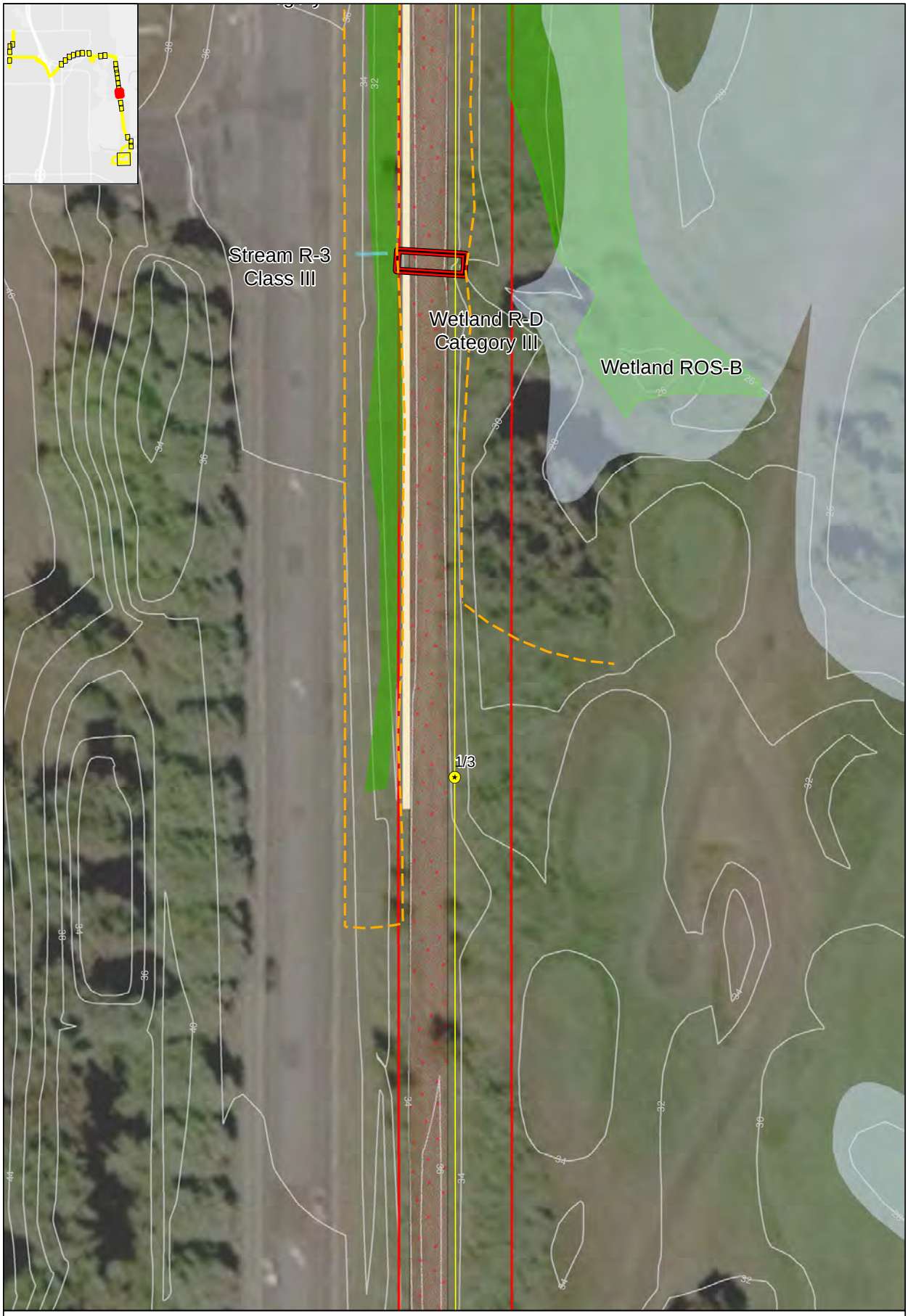
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

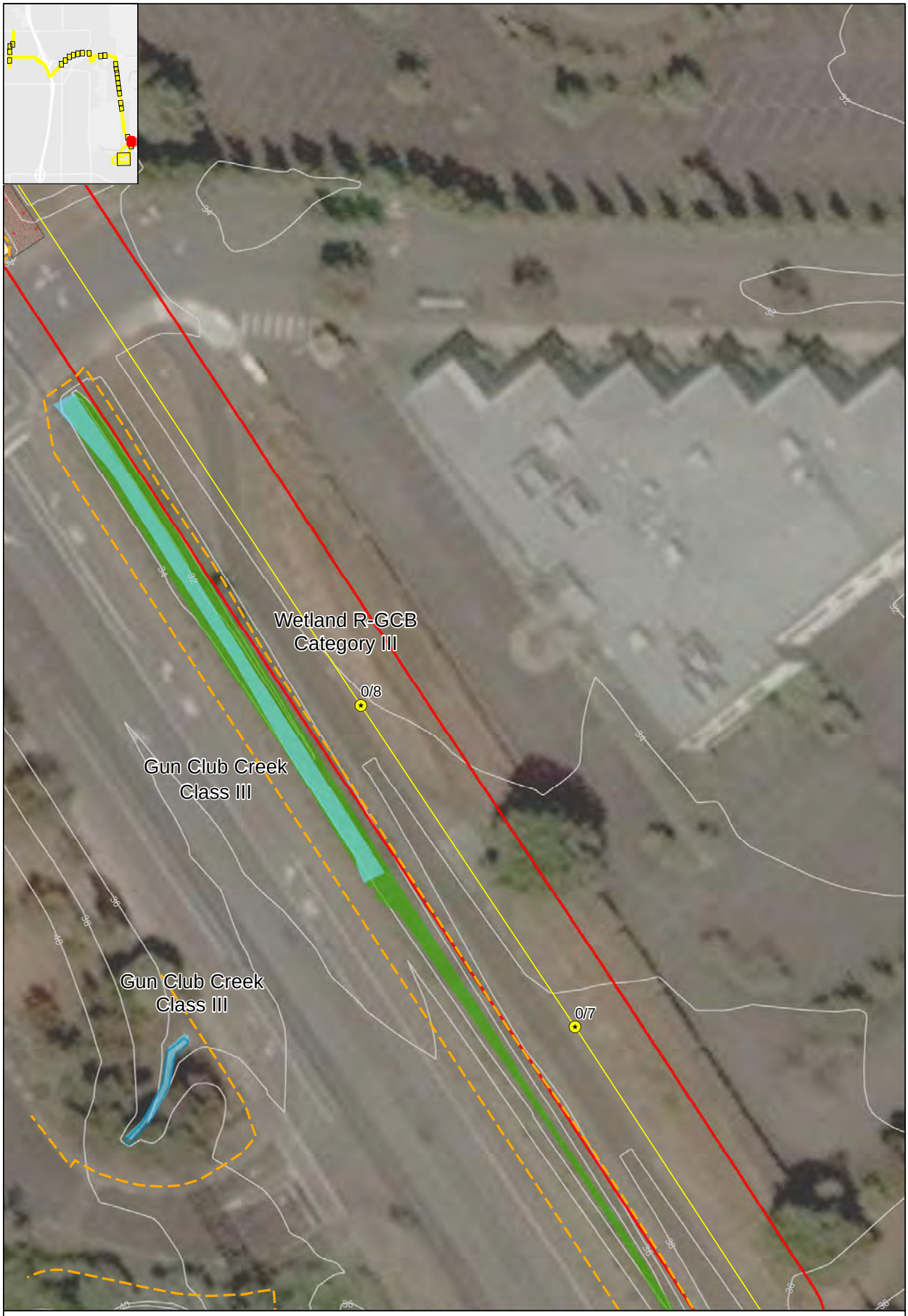
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.



Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 40

Note: Project maps have been ordered from Juanita Substation to Sammamish Substation to improve readability.

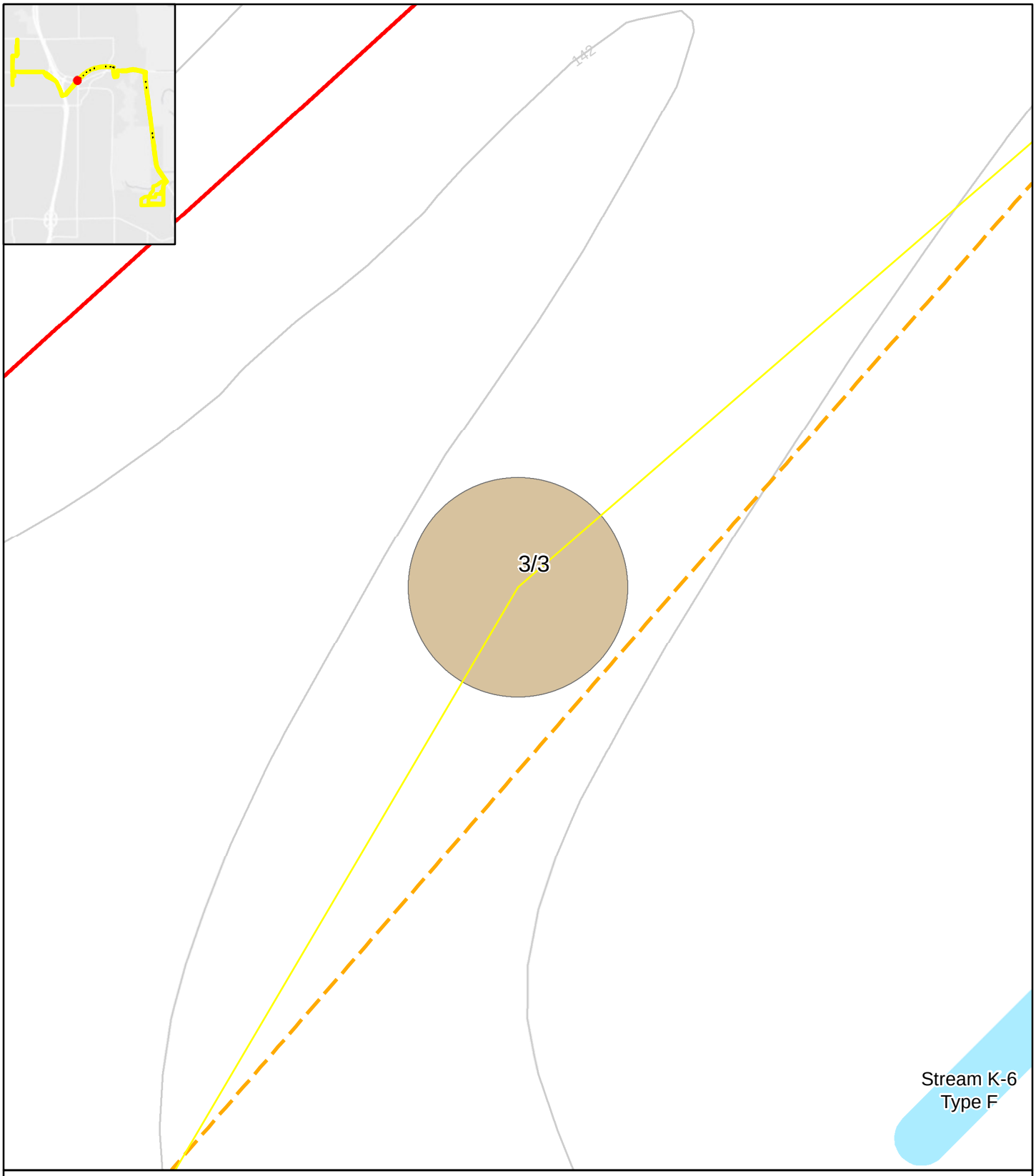
Study Area
City Limits
New 115kV Pole
Replacement 115kV Pole
Remove 115kV Pole
Existing 115kV Pole
Replacement Distribution Pole
115kV Transmission Line
Proposed Gravel Access Road
Proposed Wall
Proposed Culvert Replacement
Stream
Wetland
Estimated Wetland Edge
Wetland/Stream Buffer
FEMA 100-Year Floodplain
Existing Culvert Outlet
Tree to be Removed
2-Foot Contours

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
Revised February 2021

N

Feet
0 120

Detail Pole Maps



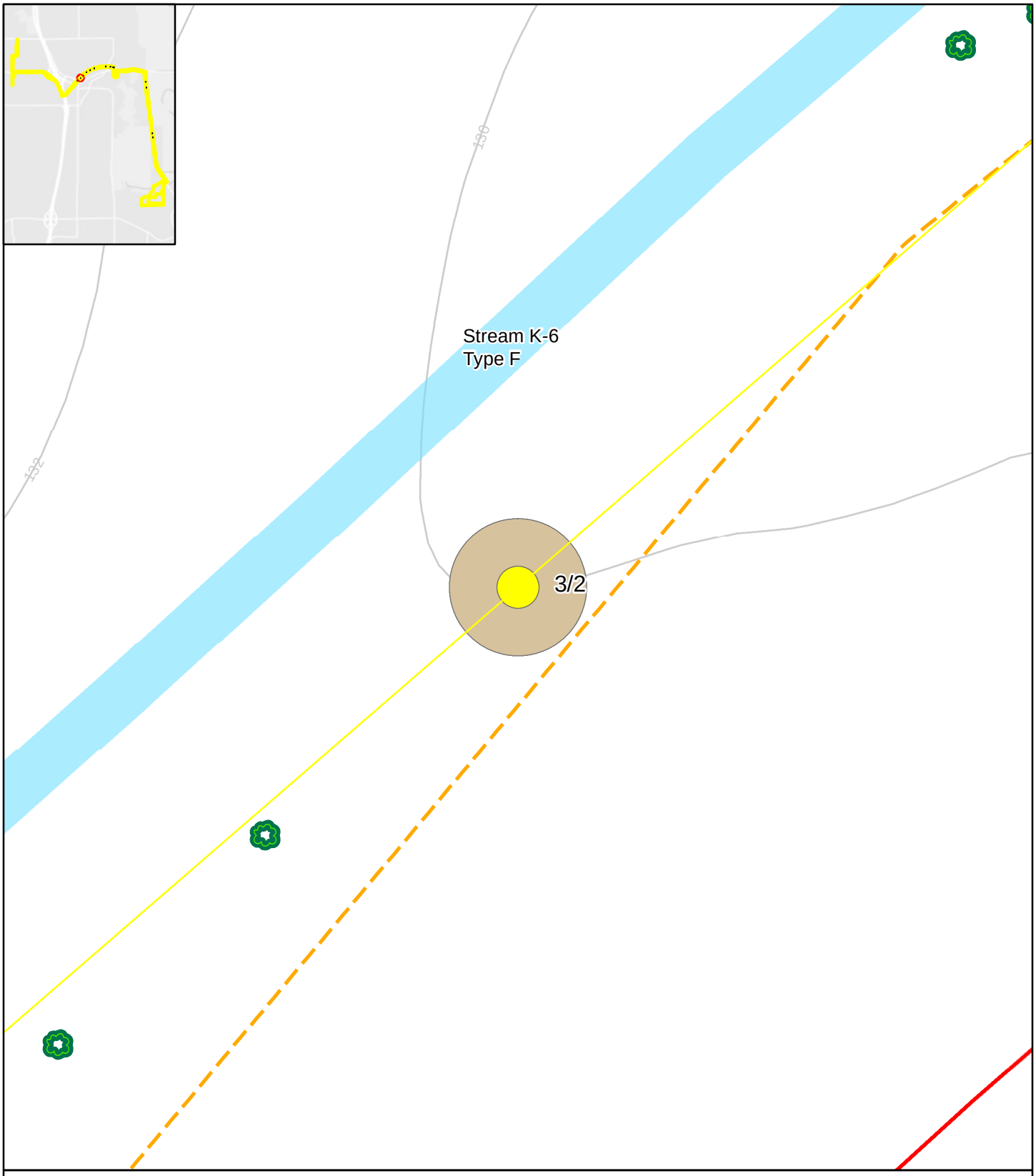
Study Area
City Limits
115kV Transmission Line
Pole Hole Area
Stream
Wetland/Stream Buffer
2-Foot Contours

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 1 of 14



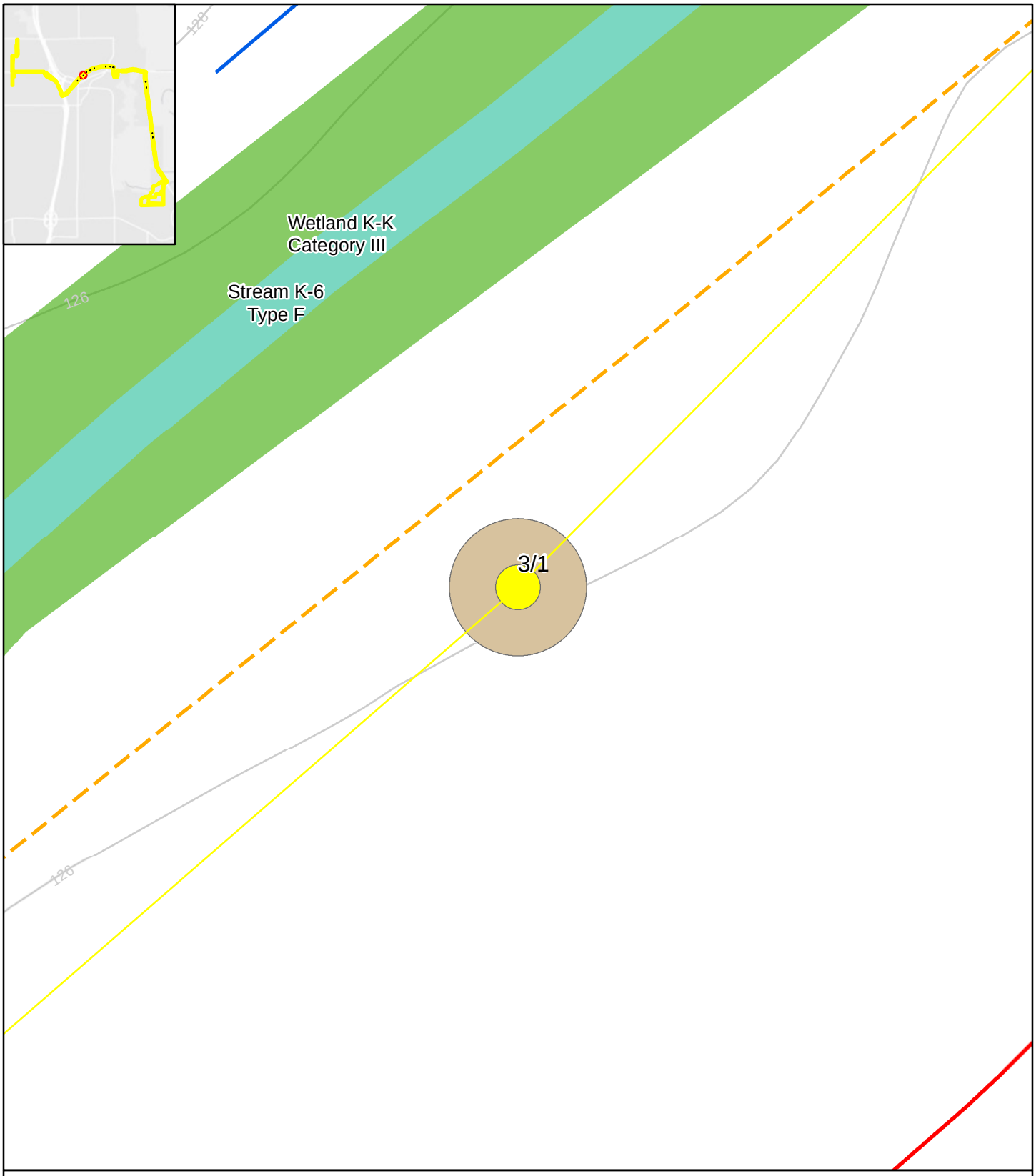
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Stream
Wetland/Stream Buffer
Tree to be Removed
2-Foot Contours

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 2 of 14



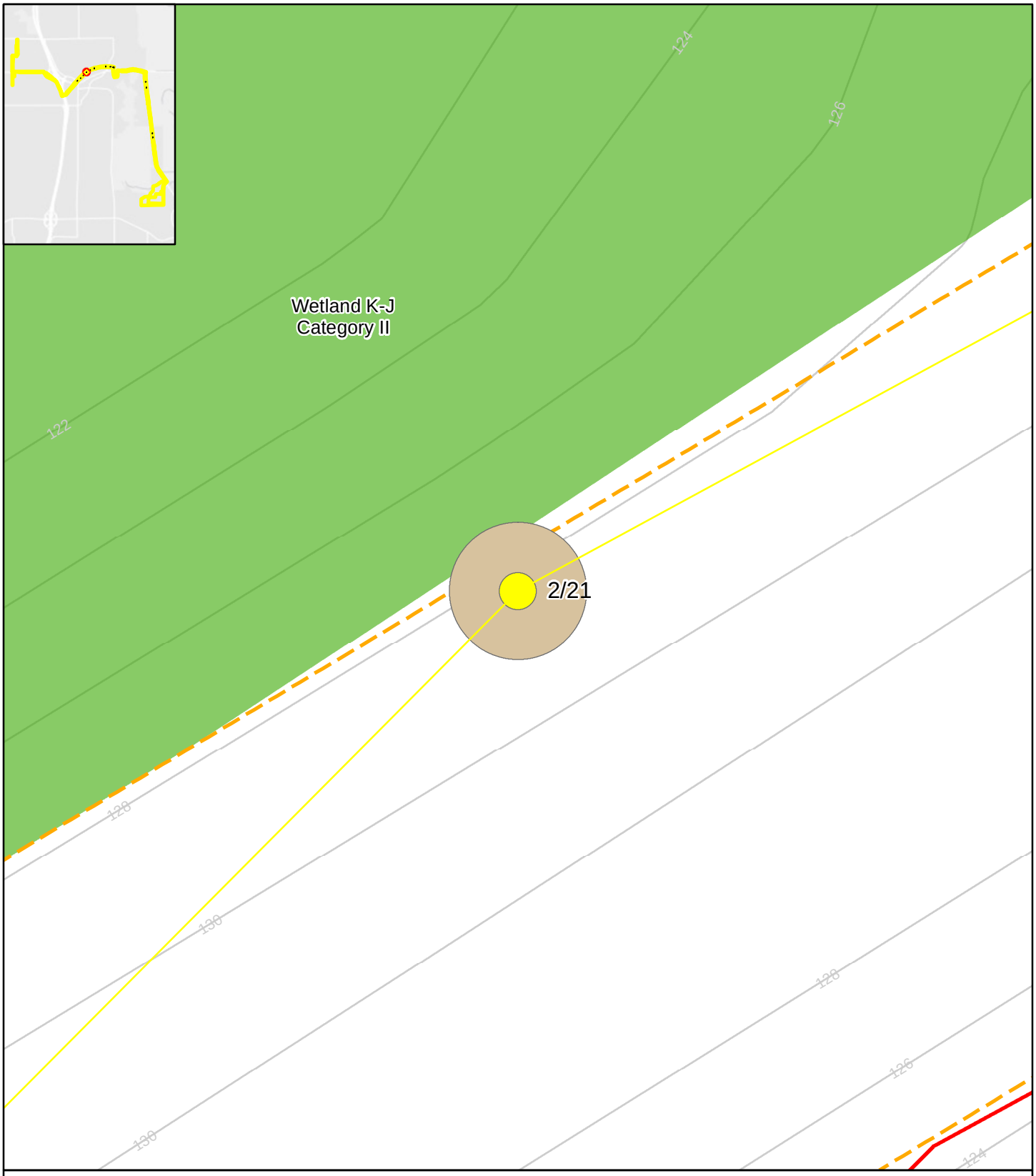
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Stream
Wetland/Stream Buffer
Flow Direction
2-Foot Contours

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 3 of 14



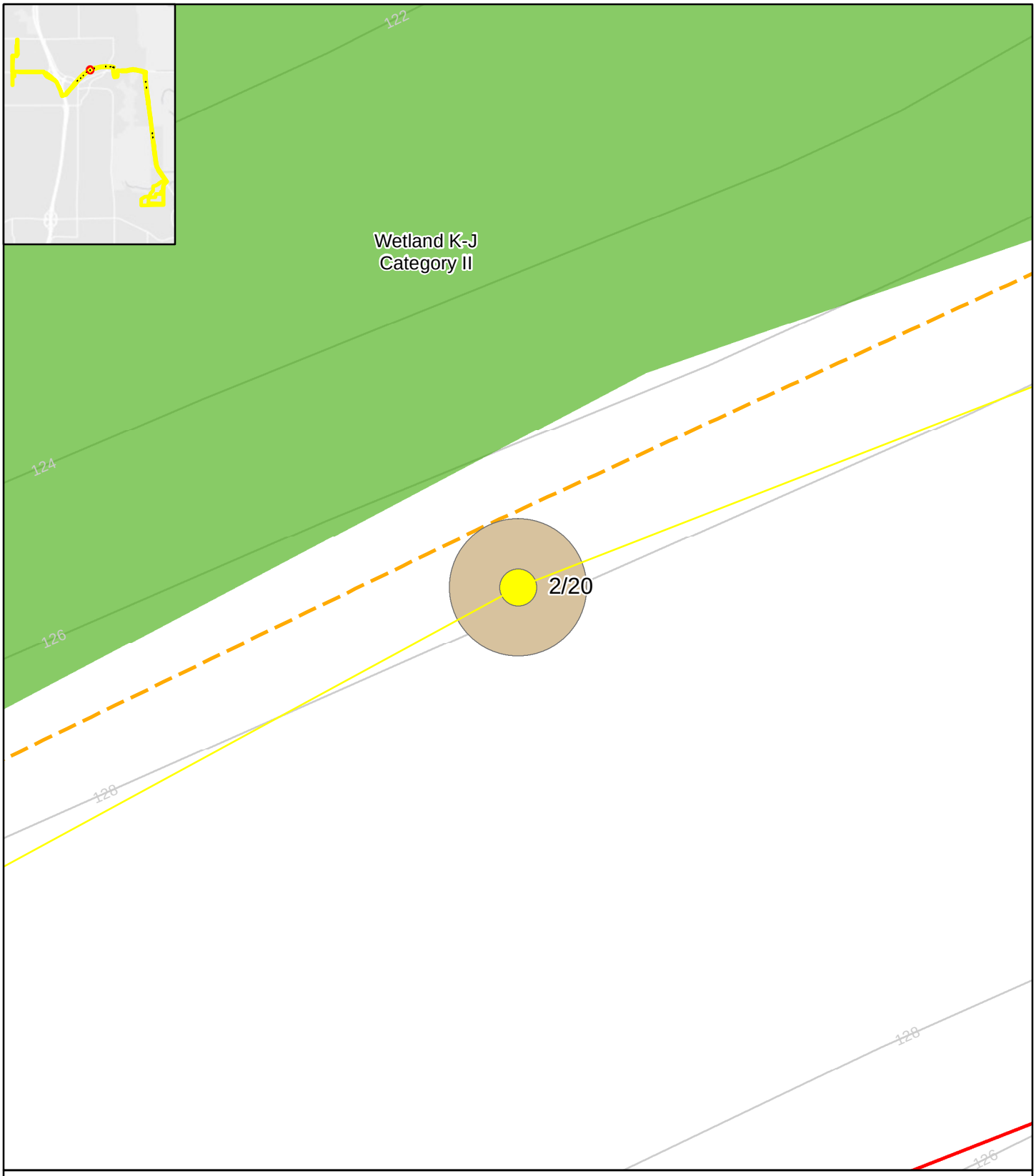
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 4 of 14



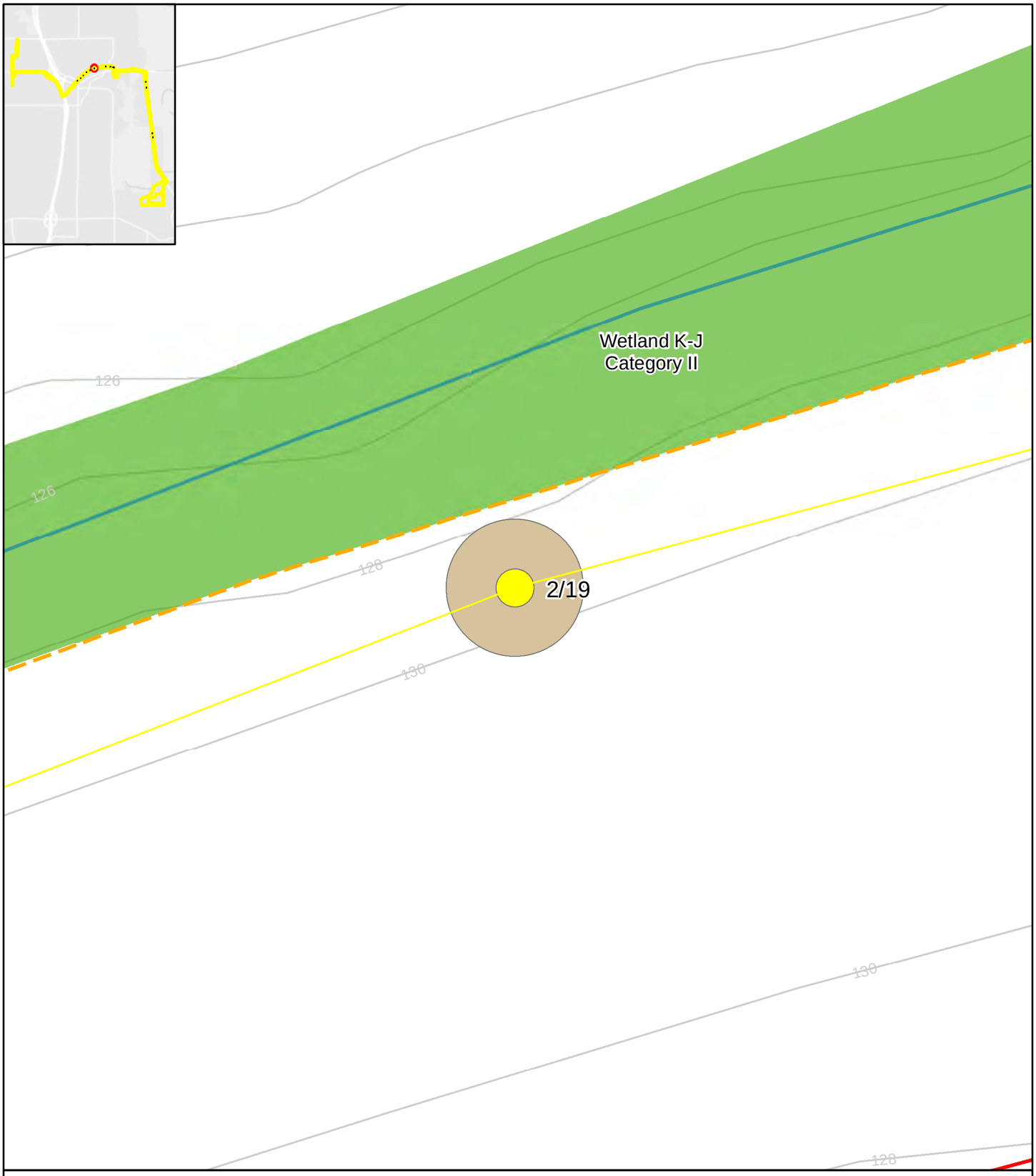
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 5 of 14

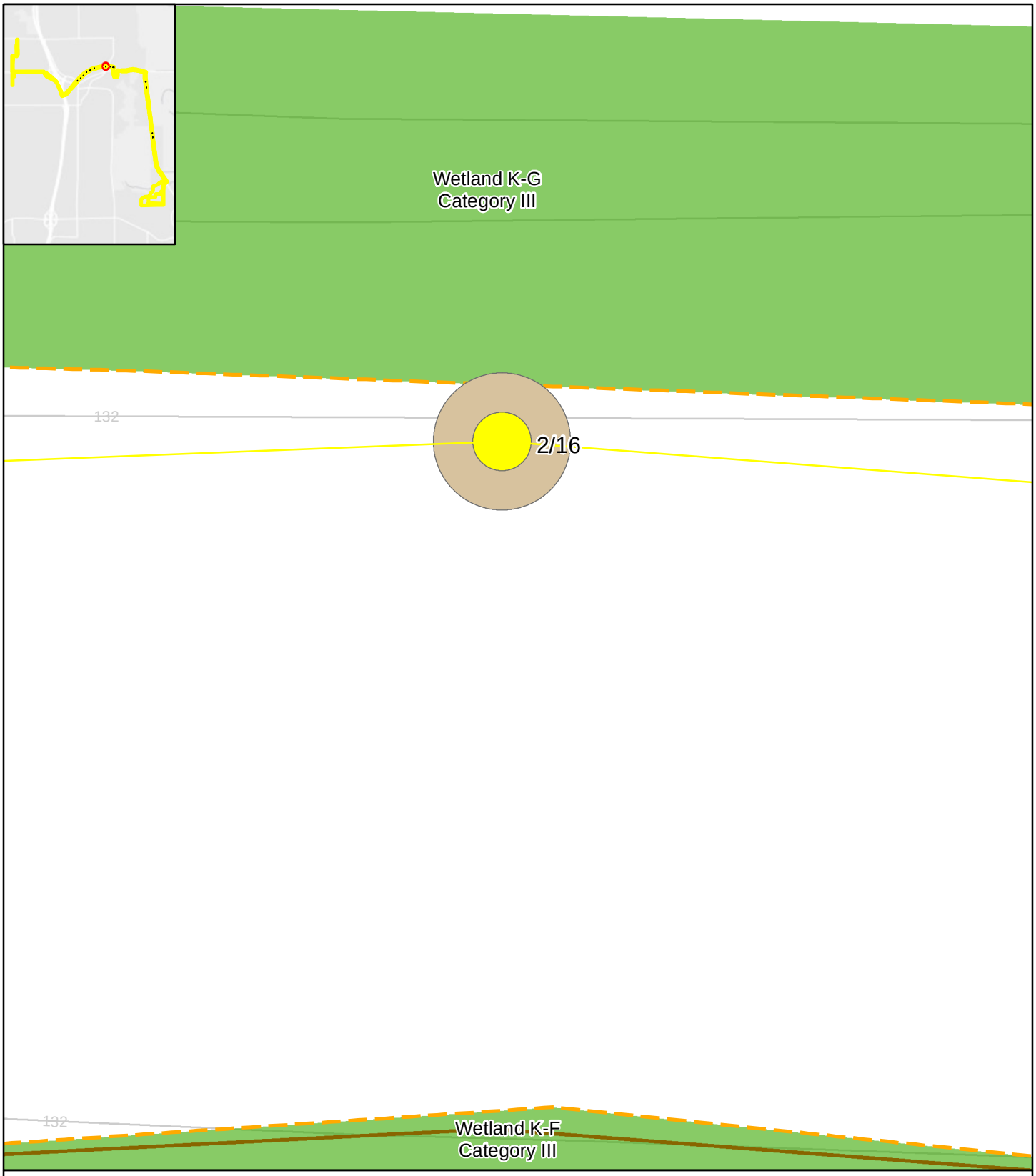


Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer
Tree to be Removed

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021



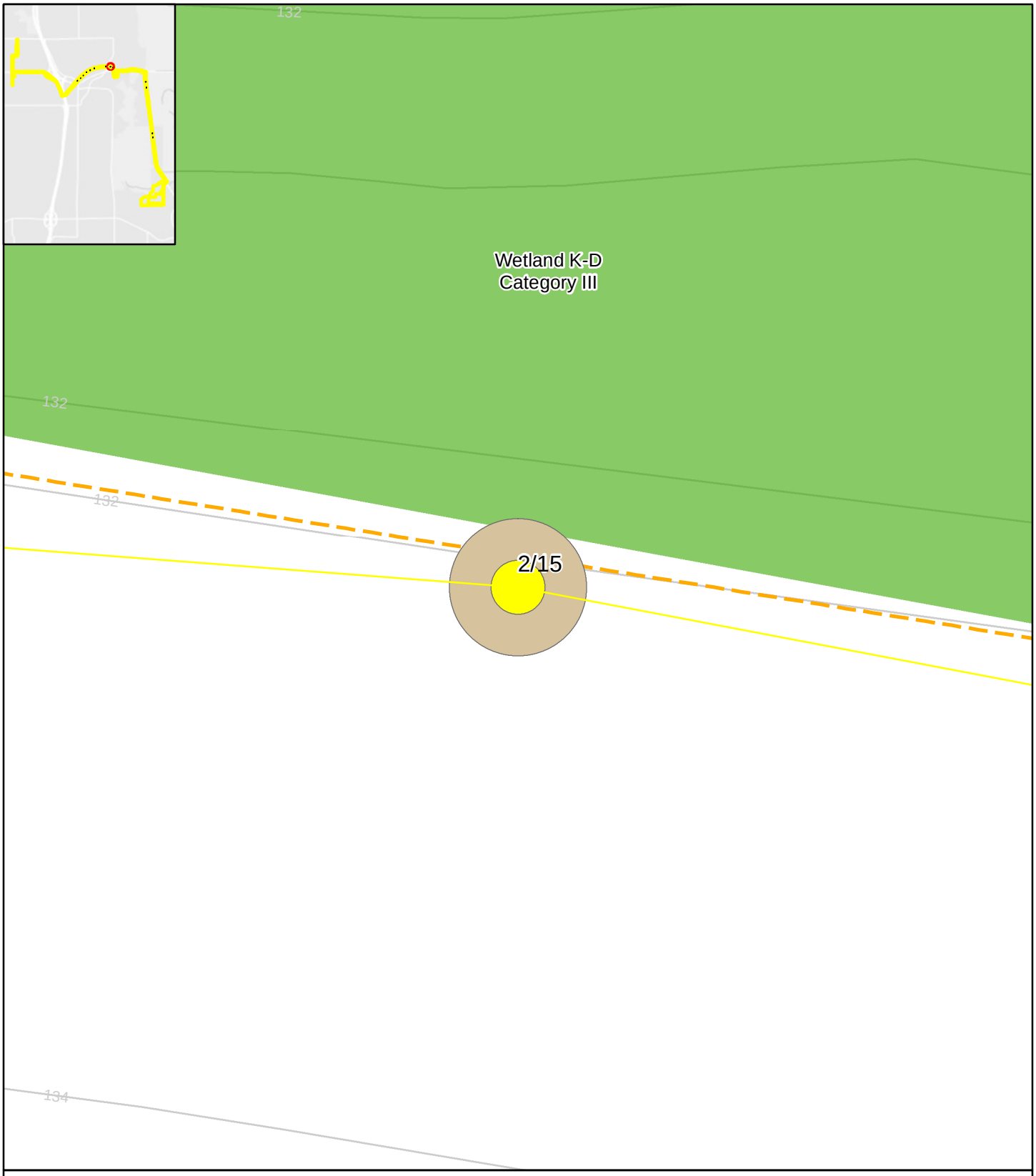
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 7 of 14



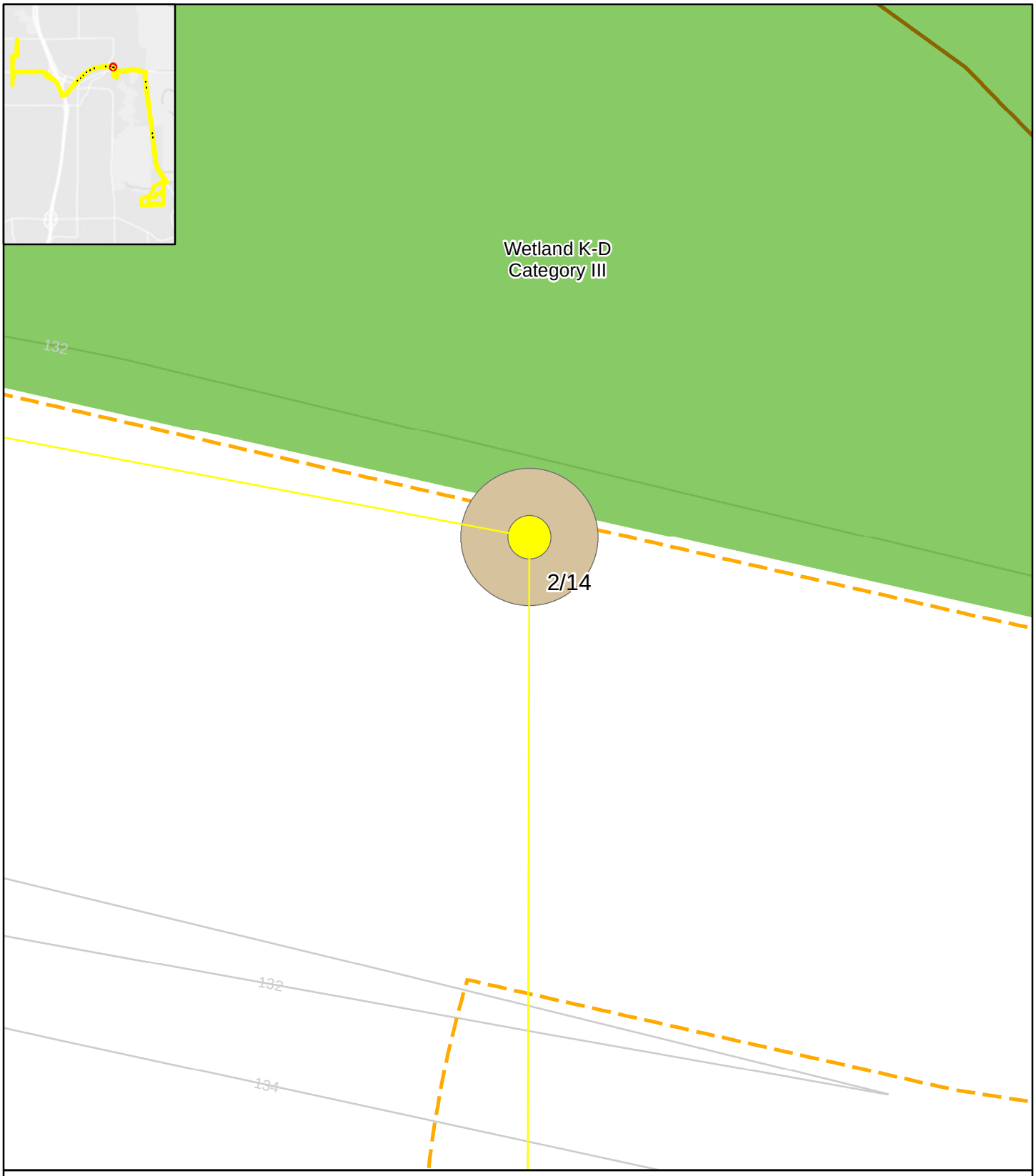
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 8 of 14



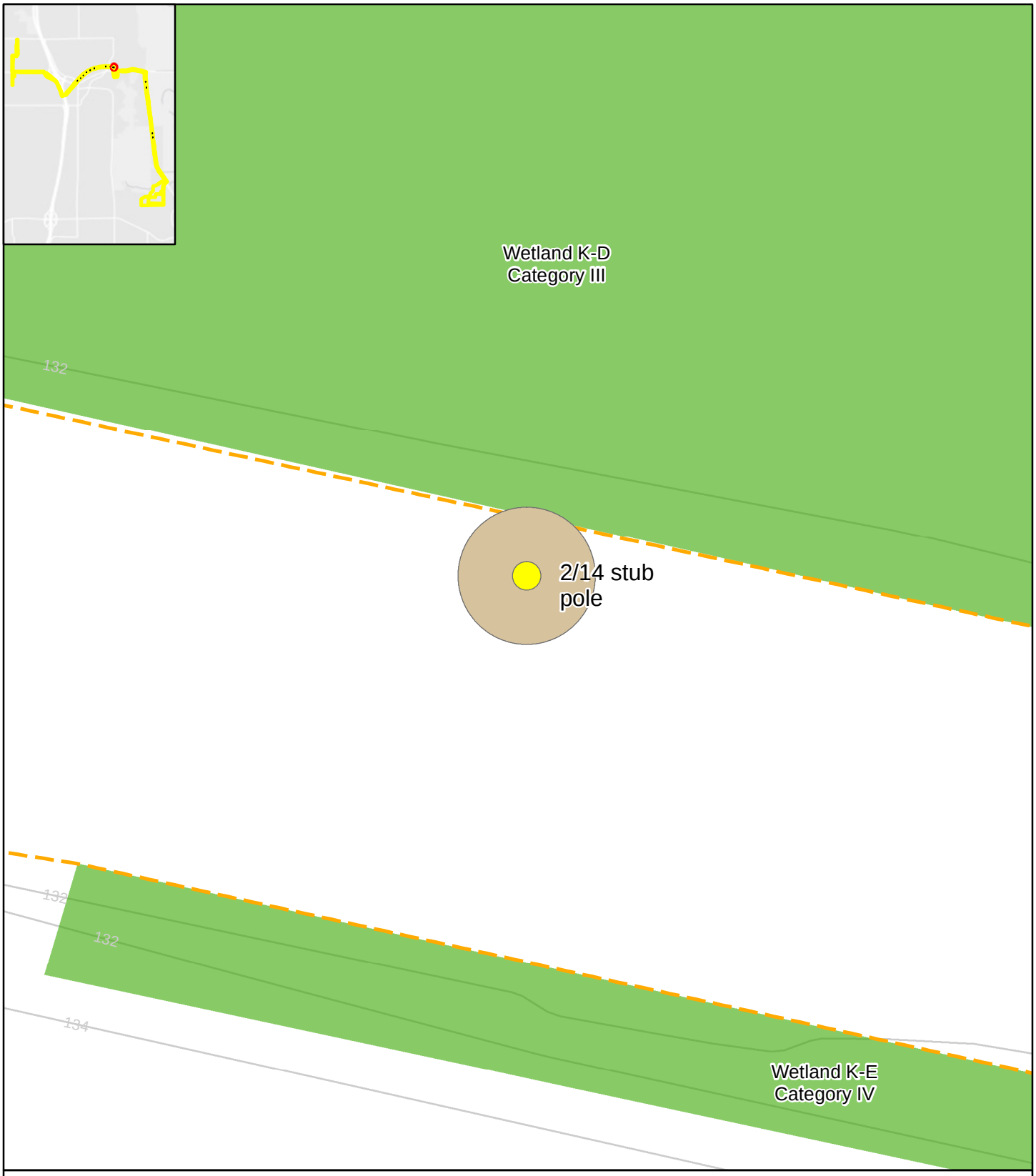
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 9 of 14



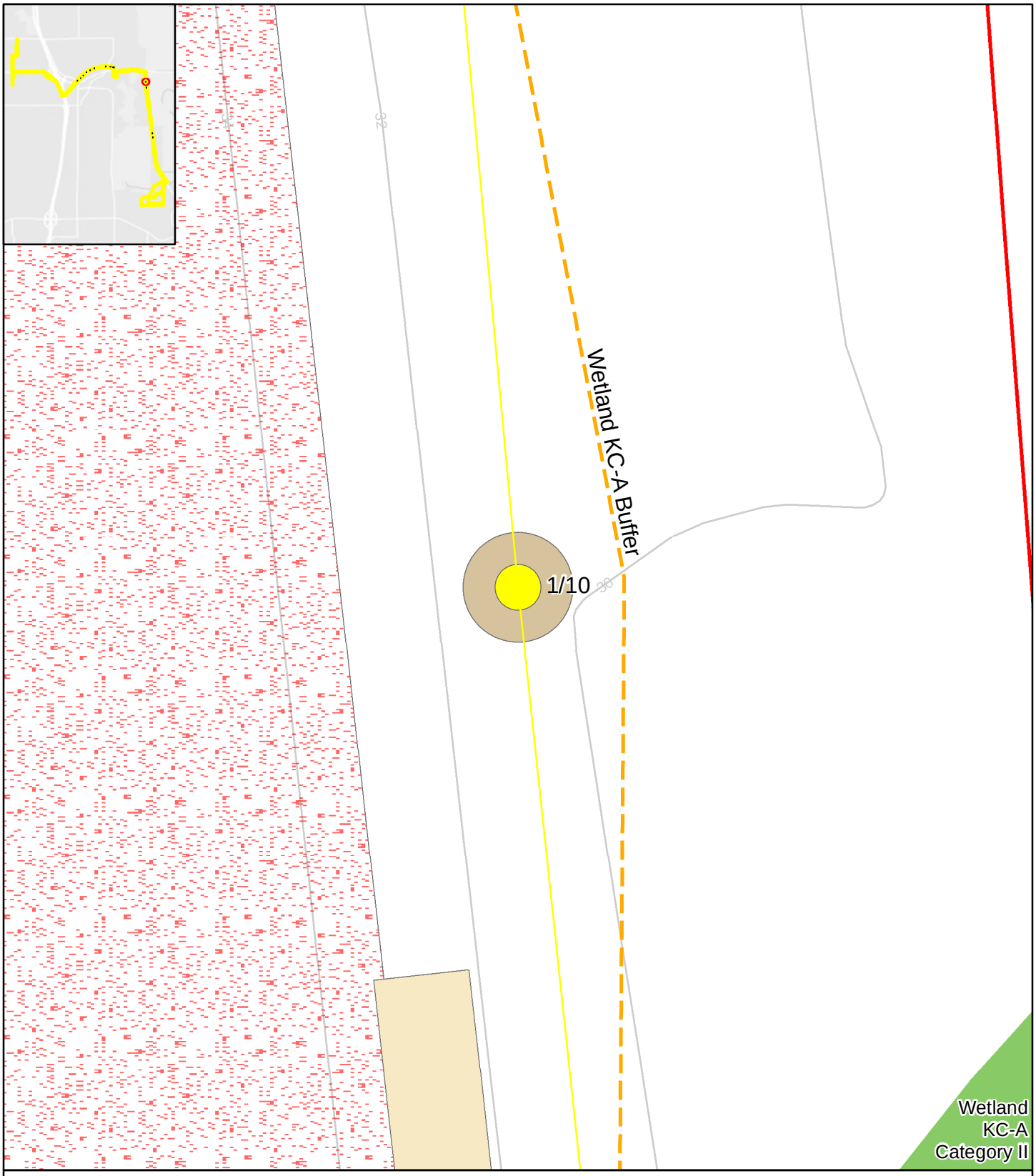
City Limits
Pole Base Area
Pole Hole Area
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Kirkland
February 2021

Map 10 of 14

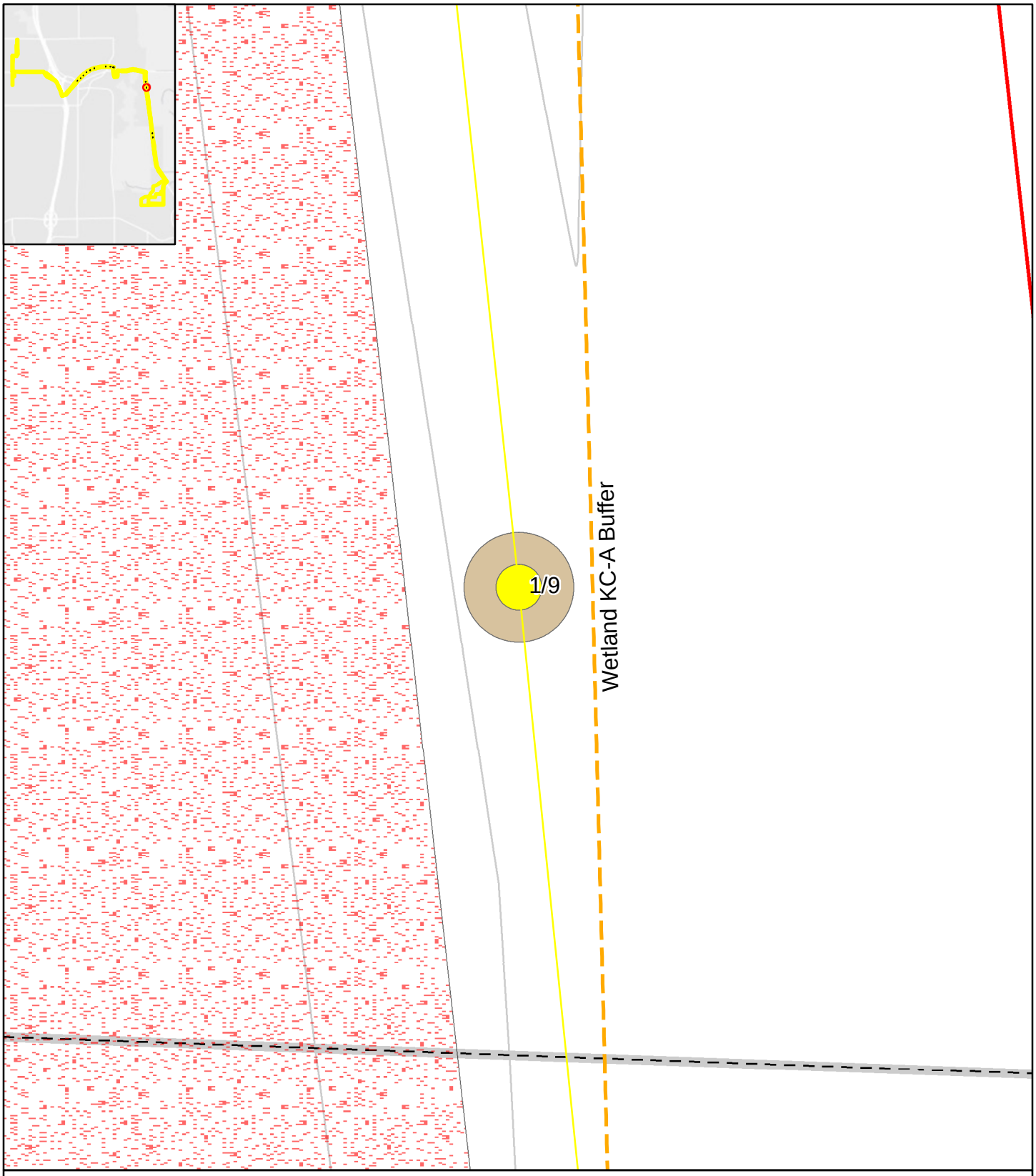


Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Proposed Gravel Access Road
Proposed Wall
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
Unincorporated King County
February 2021

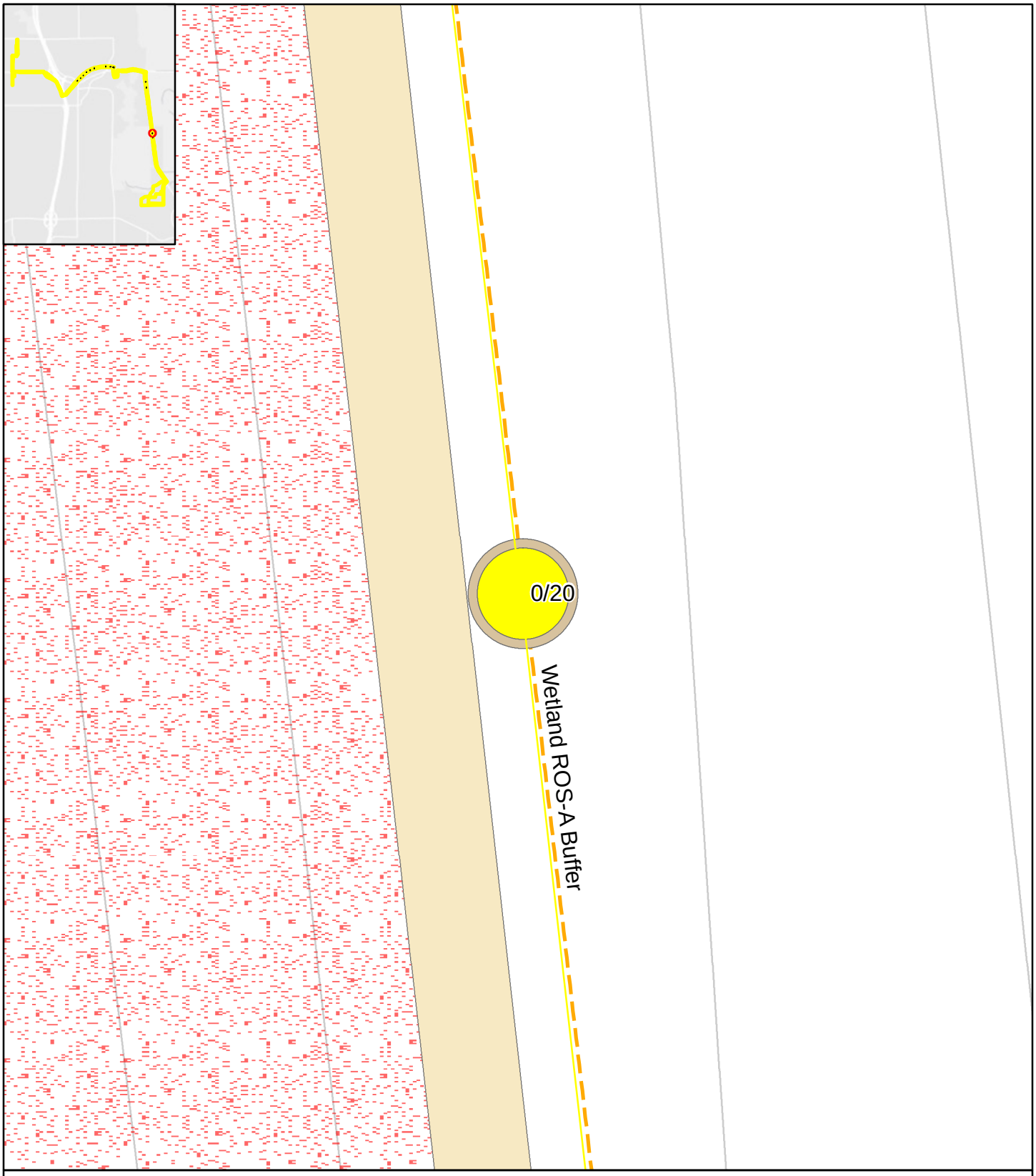


Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Proposed Gravel Access Road
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
Unincorporated King County
February 2021



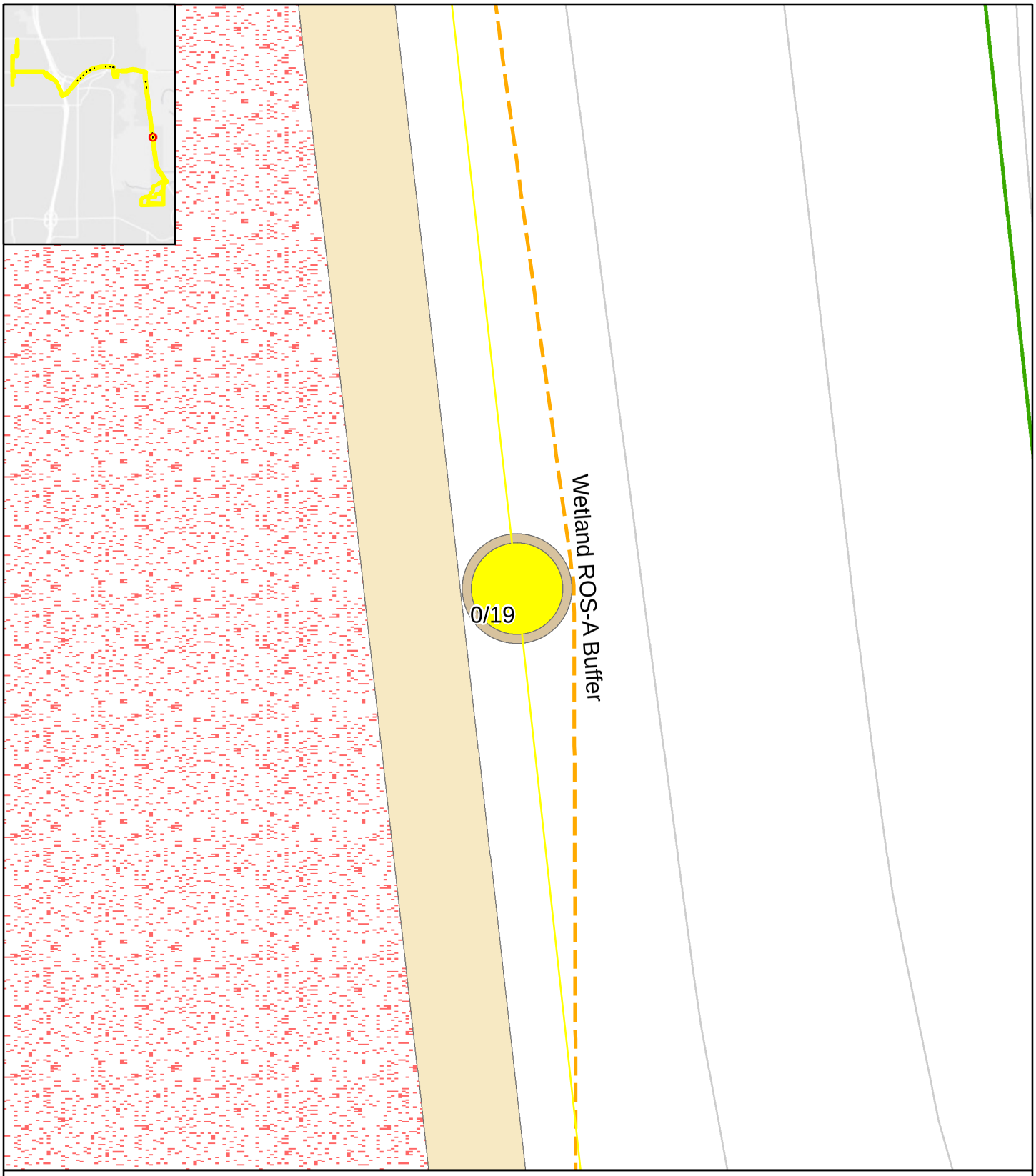
Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Proposed Gravel Access Road
Proposed Wall
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
February 2021

Map 13 of 14



Study Area
City Limits
115kV Transmission Line
Pole Base Area
Pole Hole Area
Proposed Gravel Access Road
Proposed Wall
Estimated Wetland Edge
Wetland/Stream Buffer

N

Feet
0 5

Sammamish-Juanita Project
Critical Areas Impact Assessment
City of Redmond
February 2021

Map 14 of 14

Appendix B Wetland Mitigation Bank Use Plan

Puget Sound Energy Sammamish-Juanita Transmission Line Wetland Mitigation Bank Use Plan

Revised Final (February 2021)

Puget Sound Energy

February 2021

1717

Prepared for:

PUGET SOUND ENERGY

Prepared by:

Paul Hamidi, PWS, CPSS

Michelle Brownell, WPIT

Reviewed by:

Kim Anderson, PWS

AECOM
1111 3rd Avenue
Suite 1600
Seattle, WA 98101
aecom.com

Executive Summary

Puget Sound Energy (PSE) proposes to construct approximately 5 miles of new 115 kV transmission line between Sammamish Substation in the City of Redmond and Juanita Substation in the City of Kirkland. The proposed Sammamish – Juanita transmission line project (Project) route crosses through three jurisdictions: the City of Redmond, unincorporated King County, and the City of Kirkland. The route is generally located on easement within the former BNSF rail corridor parcels and in franchise right-of-way. As part of the Project, PSE proposes to construct a 1.6-mile gravel access road by widening a former rail ballast due to access limitations for construction vehicles and equipment east of Willows Road NE in the City of Redmond and unincorporated King County. Four culverts under the existing railroad ballast (three in the City of Redmond and one in unincorporated King County) will be replaced with fish passage culverts under the access road. Within the City of Kirkland, impacts will be limited to pole placement, as access can occur from existing gravel and paved areas. Regulated critical areas in the project area include wetlands and fish and wildlife habitat conservation areas (including streams), and associated buffers. Project activities will have unavoidable impacts to critical areas and buffers along the route. This Bank Use Plan addresses wetland and buffer impacts and mitigation within the City of Kirkland only, as impacts within the City of Redmond are being compensated for by permittee-responsible mitigation, and there will be no permanent impacts requiring mitigation in unincorporated King County (AECOM 2019a).

The Project has been designed to avoid and minimize wetland, stream, and buffer impacts to the maximum extent feasible. PSE engineers used information from the delineations to adjust pole locations to avoid wetlands, streams, and buffers wherever feasible. Existing paved or gravel access will be used to reach pole locations within or adjacent to wetlands or buffers, limiting temporary and permanent impacts to pole placement where unavoidable. Temporary stringing sites will be located on existing paved or gravel surfaces. Temporary staging areas will be located on pavement or gravel and in upland areas outside of critical area buffers.

Permanent impacts to wetlands in the City of Kirkland will include 55 square feet of fill for the replacement of one pole in a wetland and partial encroachment of five new poles into the edges of three additional wetlands. While 17 trees will be removed from wetlands, they will be compensated for by a fee in lieu payment to the City of Kirkland and are not addressed in this bank use plan. There will be no permanent impacts to streams. Unavoidable temporary impacts to wetlands are associated with work areas around poles and access routes to Pole 4/10. This work will temporarily impact approximately 7,015 square feet of wetlands in the City of Kirkland.

Approximately 60 square feet of buffer in the City of Kirkland will be permanently impacted for the installation of new poles. Temporary buffer impacts of approximately 4,500 square feet will occur. In addition, 17 trees on private property will be removed from buffers to provide the required clearance for the transmission lines. While 52 additional trees will be removed from buffers, they will be mitigated for on site by the City of Kirkland using in lieu fee funds paid by PSE and are not addressed in this bank use plan.

Permanent wetland and buffer impacts will be compensated for by the purchase of credits at a certified mitigation bank in King County, the Keller Farm Mitigation Bank. Credit-debit ratios will follow guidance in the approved mitigation banking instrument of the selected bank (Habitat Bank 2018). The ratios in the mitigation banking instrument are set at **0.85:1** (mitigation bank credits to project impact area) for direct and indirect permanent impacts to Category IV wetlands, **1:1** for Category III wetlands, and **1.2:1** for Category II wetlands (Habitat Bank 2018). The ratio for impacts to buffers in the mitigation banking instrument is **0.3:1**. All short-term temporary wetland and buffer impacts will be restored on site within one complete growing season after completion of the Project and will not require compensatory mitigation and therefore are not addressed in this plan.

Table of Contents

Figures

Tables

1. Project Description

1.1 Project Background

Puget Sound Energy (PSE) is proposing to construct a new 115 kV transmission line between Sammamish Substation in the City of Redmond (9221 Willows Road NE – parcel #0325059002) and Juanita Substation in the City of Kirkland (10910 NE 132nd Street – parcel #2926059007) to increase system capacity and reliability. The proposed Sammamish – Juanita transmission line project (Project) will be approximately 5 miles in length (**Figure 1)**. The Project area crosses through three jurisdictions: the City of Redmond, unincorporated King County, and the City of Kirkland. PSE proposes to mitigate for impacts within the City of Redmond with permittee-responsible on-site mitigation at the Sammamish Substation site as part of the Willows Creek Stream Relocation Project (see Conceptual Mitigation Plan, HDR 2020). Additionally, there will be no permanent impacts to wetlands, streams, or buffers that will require compensatory mitigation in unincorporated King County. Therefore, mitigation for impacts within the City of Redmond and unincorporated King County will not be discussed in this bank use plan.

Existing conditions of wetlands, streams and buffers near the Project site are described in Section 2. Project actions intended to avoid, minimize and restore wetlands, streams and buffers are described in Section 3. Unavoidable permanent and temporary impacts to wetlands and buffers resulting from construction of the Project are described in Section 4. In order to fulfill mitigation requirements and the regulations of Kirkland Zoning Code (KZC) Chapter 90, PSE is proposing to mitigate for Project impacts by using bank credits purchased from the Keller Farm Wetland Mitigation Bank (KFWMB), which is described in Section 5.

1.2 Project Design

The Project and construction methods are described in detail in the *Sammamish-Juanita Transmission Line Critical Areas Impact Assessment* (Impact Assessment Report; AECOM 2020a). The Project involves the installation of transmission poles (wood, glulam and steel), and the stringing of wire between the poles. A majority of the poles will be new poles; however along certain segments of the 3.2 miles of transmission line within the City of Kirkland that interconnect with existing transmission, poles will be replaced. Only impacts in the City of Kirkland are addressed in this Plan.

Project elements that have the potential to impact critical areas in the City of Kirkland include the following:

- Transmission line construction (installation of new transmission poles, guys, and insulators)
- Vegetation management for line clearance
- Temporary access routes to pole locations and temporary work areas during construction

No permanent indirect impacts are anticipated from pole installation or stringing of wire. Temporary indirect impacts could occur from sedimentation into wetlands from adjacent work areas; best management practices (BMPs), described below, would be used to prevent these impacts. All temporary impacts are expected to be short term. All stringing sites will be located on existing paved or gravel surfaces and will not result in new disturbance.

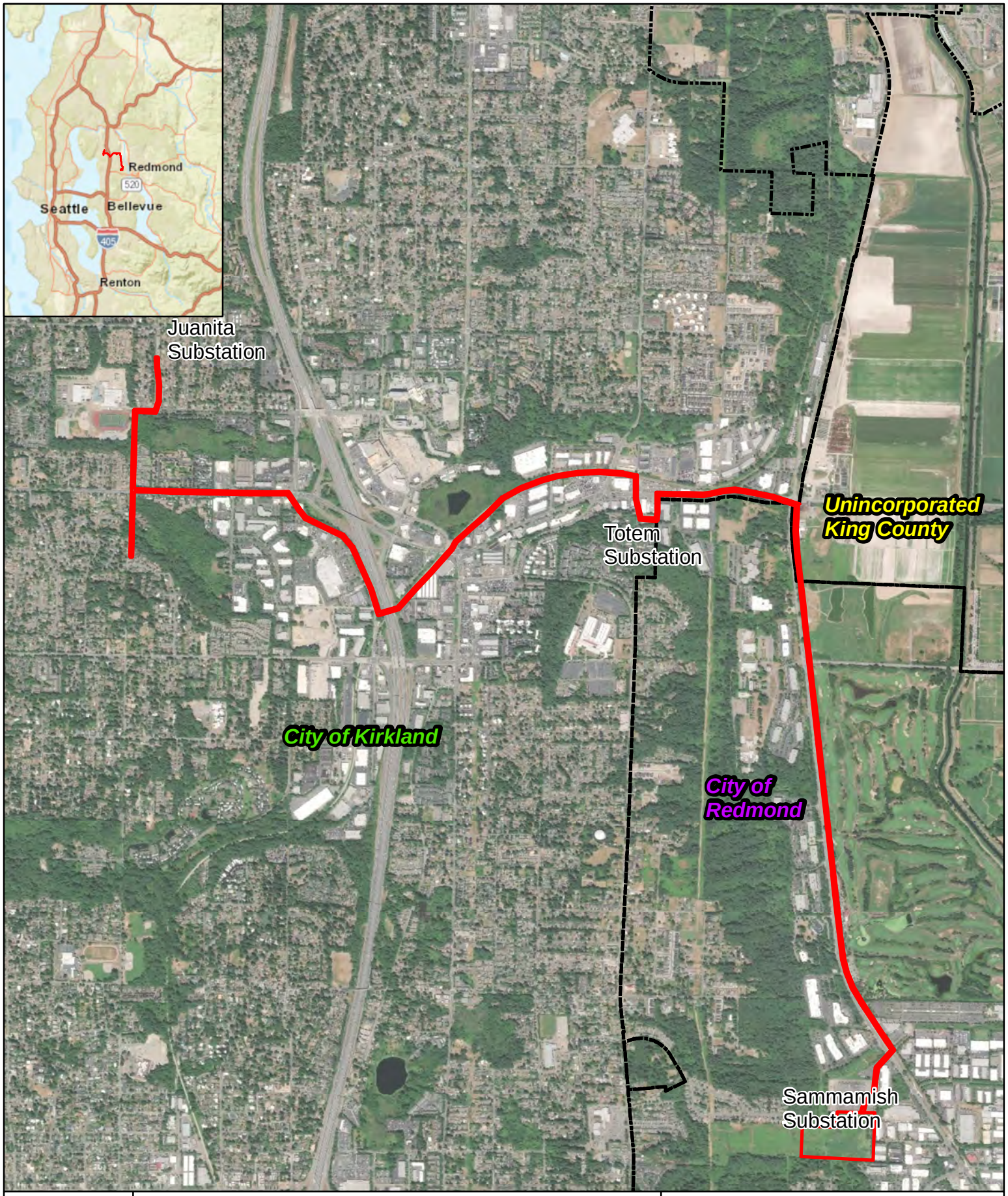
The temporary work area around each pole installation site will be dependent on the type of foundation and site conditions. The disturbance areas that pertain to poles in/near wetlands and buffers and that will result in temporary impacts are estimated as follows:

- Poles with micropile foundations – minimal temporary disturbance area, as piles will be driven into the ground and no digging is required.
- Wood poles located in a critical area buffer adjacent to a paved or gravel access road – approximately 400 square feet.

- Pole 4/11 (steel pole with concrete foundation partially located adjacent to the Wetland K-L buffer) – approximately 2,500 square feet.
- Pole 4/10 (Wetland K-L) – 900 square feet.

Temporary access across Wetland K-L and Stream K-5 will be required at one pole location (4/10) in the City of Kirkland. Along this access route, fiberglass or timber matting will be placed over existing vegetation and the stream channel for use by construction equipment. Mats will be removed after use. The remaining pole locations are accessible from roads, trails, or other paved or gravel areas.

Prior to construction of the transmission line, trees with the potential for a mature height of 25 feet or taller will be permanently removed from the Project corridor (including wetlands and buffers) to provide clearance for the new transmission line.



N

1:24,000

Jurisdictional Boundary

0 0.25 0.5

Miles

Figure 1
Vicinity Map

Sammamish-Juanita
Transmission Line Project
Redmond, Kirkland, and King County, WA

2. Existing Conditions

2.1 Impact Area

The Sammamish-Juanita study area is the planned, 50-foot-wide, 5-mile transmission corridor that extends from the Sammamish Substation in the City of Redmond to the Juanita Substation in the City of Kirkland. The study area also includes most of the PSE-owned parcel south of the Sammamish Substation where additional Project work will be located (**Figure 1**). The study area is approximately 47 acres. It is located in portions of Township 25 North, Range 5 East, Sections 3 and 10, in the Sammamish River and Lake Washington/Cedar River Watersheds (Water Resource Inventory Area 8). The transmission corridor traverses predominantly developed areas and runs for most of its length along former railroad ballast and street right-of-way. Adjacent land uses include commercial and industrial development, a golf course, transportation (roads), single and multi-family residential development, and park/open space.

Within the City of Kirkland, the study area is 31.3 acres. It includes mostly developed land in an urban setting. In the developed areas, weedy species and ornamental trees are prevalent. Undeveloped lands partially within the study area include the Totem Lake wetlands, Wetland K-L south of Juanita Substation, and the Heronfield wetlands (Wetland K-HF) east of PSE's existing north/south transmission corridor south of NE 124th Street. Adjacent land uses include commercial/industrial development on the north side of NE 124th Street, on both sides of the Cross Kirkland Corridor (CKC) trail, and near I-405; residential development west of I-405; and park/open space associated with Totem Lake and the Heronfield wetlands. Within the City of Kirkland, the transmission line runs along the north side of NE 124th Street in the street right-of-way, loops through Totem Substation south of NE 124th Street, and then heads back north to run along the former rail corridor (parcel 2826059202 owned by King County). Within this section of the transmission line, only one pole is located within a buffer in the NE 124th Street right-of-way, and two poles are located within wetland buffer within the King County owned parcel. The former rail corridor west of 132nd Avenue NE has been converted into the CKC gravel trail and is owned by the City of Kirkland. The transmission line follows the CKC trail corridor to I-405 and then crosses I-405 to the 120th Avenue NE right-of-way. The transmission corridor heads north until 120th Avenue NE intersects with NE 124th Street. The transmission line route then heads west on the north side of NE 124th Street until intersecting with an existing north/south transmission line corridor that connects to Juanita Substation. Pole replacement will occur within the existing corridor. There are no critical areas or buffers west of I-405, except north of NE 124th Street within the existing transmission corridor.

2.2 Wetlands and Streams

During field surveys conducted by AECOM, a total of 12 wetlands and 4 streams were delineated in the City of Kirkland portions of a field survey area that includes the Project study area as well as some adjacent areas. These wetlands and streams are described in detail in the *Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report* (AECOM 2020b). Table 1 lists the square footage/acreage of wetlands and streams delineated within the City of Kirkland field survey area.

Table 1. Field-Identified City of Kirkland Wetlands and Streams and Associated Buffer Areas

Wetland	Delineated Area	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
K-B	3,047 ft^2 (0.07 ac)	Category IV Depressional PEM	Stream K-7 – Type Np	Wetland: 40 feet Stream: 50 feet
K-C	3,634 ft^2 (0.08 ac)	Category III Depressional PEM	NA	60 feet
K-D	28,254 ft^2 (0.65 ac)	Category III Depressional PEM	NA	60 feet
K-DD	225 ft^2 (0.01 ac)	Category III Depressional PEM	NA	60 feet
K-E	1,992 ft^2 (0.05 ac)	Category IV Depressional PEM	NA	40 feet
K-F[1]	19,251 ft^2 (0.44 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-G	10,119 ft^2 (0.23 ac)	Category III Depressional PEM	NA	60 feet
K-H	1,486 ft^2 (0.03 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-J[1]	49,807 ft^2 (1.14 ac)	Category II Depressional PEM/PSS/PFO/POW	Stream K-3 – Type F	Wetland: 165 feet Stream: 100 feet
K-K[1]	16,563 ft^2 (0.38 ac)	Category III Depressional PFO	Stream K-6 – Type F	Wetland: 60 feet Stream: 100 feet
K-L[1]	15,130 ft^2 (0.35 ac)	Category II Depressional + Riverine PEM/PSS/PFO/POW	Stream K-5 – Type F	Wetland: 165 feet Stream: 100 feet
K-HF[1]	25,937 ft^2 (0.60 ac)	Category II Depressional PEM/PSS/PFO	NA	105 feet

HGM = hydrogeomorphic; ft^2 = square feet; ac = acre; NA = not applicable.
[1] Wetland extends beyond the field survey area. The delineated acreage is given here.
[2] HGM classification and Ecology wetland ratings were determined according to Hruby 2014.
[3] Cowardin Classification: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PFO=Palustrine Forest, POW=Palustrine Open Water (Cowardin et al. 1979).
[4] Stream classifications are based on WAC 222-16-030, as specified in KZC 90.110.
[5] Sources: KZC 90.55 and KZC 90.65.

2.3 Buffers

Table 1 summarizes the standard regulatory buffer widths for wetlands and streams mapped in the City of Kirkland, based on their classification. Buffer widths and regulations are described in detail in the Impact Assessment Report (AECOM 2020a).

The functional buffers are generally below the standard width and are constrained by roads, sidewalks, railroad ballast and other development. Therefore, they have been reduced to their functional widths to reflect field conditions in order to determine impacts per City of Kirkland code (KZC 90.120.1.d). Buffers are dominated by invasive species including reed canarygrass and non-native blackberries.

3. Mitigation Sequencing

The Project is designed to mitigate impacts to wetlands and buffers by following the standard mitigation sequence as required by the City of Kirkland (KZC 90.145). This sequence is described in detail in the Impact Assessment Report (AECOM 2020a).

3.1 Avoidance

PSE engineers used information from the delineations to adjust pole locations to avoid wetlands, streams, and buffers wherever feasible within the Project corridor. The following avoidance measures were followed:

> Pole locations are adjacent to existing gravel and paved surfaces where equipment can be staged to avoid or minimize impacts to critical areas and buffers. The exception is the replacement of Pole 4/10, which is located within a wetland in an existing transmission line corridor south of Juanita Substation. Temporary matting will be used for access to minimize construction impacts.

The Project design avoids permanent and temporary impacts to most of the wetlands within the study area. The Project construction will utilize existing roads, other paved areas, and the gravel trail and railroad ballast to transport supplies and ground-operated equipment. Location of the poles close to the edge of paved or gravel areas will allow work to occur predominantly on one side of the pole, avoiding the need to enter adjacent wetlands with equipment and associated temporary impacts. In areas where pole installation sites are close to a wetland edge, a high visibility fence will be installed at the wetland boundary to prevent access by equipment. At the site of replacement Pole 4/10, which will be replaced within a wetland in an existing cross-country transmission line corridor, temporary matting will be used to access the construction area and minimize impacts to the critical area.

Temporary equipment staging will be located in upland areas outside of critical areas and buffers, except for a temporary work area around Pole 4/10. Temporary stringing sites will be located on existing paved or gravel surfaces and will not result in new disturbance.

The Project avoids impacts to Wetlands K-C, K-DD, K-E, K-F, and K-H and their associated buffers. Apart from necessary tree removals along the transmission corridor, no permanent or temporary Project-associated disturbances are planned within Wetland K-HF. No poles will be located in streams. Poles that will encroach into wetlands and buffers have been located to minimize the amount of encroachment. Replacement Pole 4/10 in Wetland K-L is the only pole that will be located completely in a wetland, as its location is dictated by the existing transmission line corridor.

3.2 Minimization

To minimize impacts to wetlands and streams, work will be conducted during the dry season, when soils will be at their driest and water levels will be at their lowest. Use of existing paved and gravel surfaces for temporary access routes will minimize temporary impacts to wetlands, streams, and their buffers.

BMPs have been developed that will further minimize indirect impacts to wetlands, waterways and other resources during construction. These BMPs include:

- Demarcating and maintaining construction fencing through stages of construction as appropriate to protect and avoid wetlands and streams.
- Leaving a vegetative buffer zone between wetlands and upland construction areas.
- Installing and maintaining erosion control measures, such as silt fences and straw wattles, to minimize sediment transport into otherwise unaffected wetlands.
- To access Pole 4/10, use of ground equipment with low pressurized rubber tires and placement of mats to cover the ground surface where tracked equipment is used.

In Wetland K-L, timber or fiberglass mats will be laid down temporarily over wetland vegetation (predominantly reed canarygrass) to provide temporary access routes to poles and prevent damage associated with heavy equipment. To cross the stream channel in this location, PSE will also lay temporary fiberglass or timber matting across the stream channel to allow construction equipment to cross and prevent entry into or disturbance of the stream channel.

3.3 Restoration

Temporarily exposed soils resulting from Project activities (primarily construction access) in wetlands or buffers will be re-seeded with a mixed native seed mix and/or covered with mulch to reduce the potential for sediment to enter aquatic resource areas.

3.4 Compensation

The unavoidable removal of 17 trees combined from Wetlands K-D, K-J, and K-K, and 52 trees combined from the buffers of Wetland K-B/Stream K-7, Wetland K-J/Stream K-3 and Wetland K-K/Stream K-6 will be compensated for through a fee in lieu payment to the City of Kirkland. PSE does not own the trail corridor and any mitigation planting would likely be disturbed when the City implements their CKC master plan and widens and paves the interim trail in the foreseeable future. At such time as the improvements occur, the City will plant mitigation trees in appropriate wetland or buffer environments along the corridor. PSE is in the process of developing a payment and implementation agreement with the City of Kirkland Transportation Department.

All remaining unavoidable permanent impacts to wetlands and buffers associated with the Project will be compensated for through purchase of appropriate credits at the Keller Farm Wetland Mitigation Bank (described in Sections 5 and 6).

4. Wetland, Stream and Buffer Impacts

Proposed Project impacts to wetlands, streams and buffers in the City of Kirkland are described fully in the Impact Assessment Report (AECOM 2020a) and summarized below.

4.1 Wetlands

Construction of the Project will result in unavoidable permanent and temporary impacts to Wetlands K-D, K-G, K-J, and K-L from installation of new poles and replacement of Pole 4/10 (Table 2). The permanent wetland impact area will be approximately **55 square feet (0.001 acre).** Impacts in Wetlands K-D, K-G, and K-J will occur at the very edge of the wetlands adjacent to the rail ballast and gravel trail. Impacts in Wetland K-L will occur near the western edge of the large wetland, in a degraded area within an existing transmission line corridor that is dominated by the non-native species reed canarygrass. Pole installation and replacement should have negligible impacts on overall wetland function.

Table 2. Permanent Pole Impacts in City of Kirkland Wetlands

Wetland/ Stream	Pole Number	Hole Diameter (feet)	Portion in Wetland (feet)	Depth of Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
Wetland K-D	2/14	5	2	tbd	10	tbd
Wetland K-D	2/14 stub pole	5	2	tbd	10	tbd
Wetland K-D	2/15	5	1	tbd	5	tbd
Wetland K-G	2/16	5	2.5	tbd	10	tbd
Wetland K-J	2/21	5	1	tbd	5	tbd
Wetland K-L	4/10	4	4	11	15	6
Total					**55**	**tbd**

Tbd = to be determined

Permanent impacts associated with tree removal will occur in Wetlands K-D, K-J, and K-K. A total of 17 trees will be removed. As noted previously, these trees will be compensated for through a fee in lieu agreement with the City of Kirkland who will replant trees in comparable wetland areas upon completion of their CKC master plan trail improvements in the foreseeable future.

Unavoidable temporary impacts will also occur in portions of Wetlands K-D, K-G, K-J, and K-L. The estimated total temporary impact area will be approximately **7,015 square feet (0.16 acre)** for access routes to Pole 4/10 and areas around the poles listed in Table 2. Temporary impacts will be restored on site.

4.2 Buffers

The Project will result in unavoidable permanent and temporary impacts to the regulatory buffers of Wetland K-B/Stream K-7, Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5. Permanent impacts associated with installation of five new poles will occur within buffers, as summarized in Table 3. The total area of permanent impact will be approximately **60 square feet (0.002 acre).** The permanent impacts will occur predominantly in degraded, low functioning buffer strips between the wetland and the railroad ballast and gravel trail.

Table 3. Permanent Pole Impacts in City of Kirkland Stream/Wetland Buffer

Pole Number	Impacted Buffer	Hole Diameter (feet)	Portion in Buffer (feet)	Depth of Pole or Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
2/3	Stream K-7	4	4	10	15	5
2/15	Wetland K-D	5	2	tbd	15	tbd
2/20	Wetland K-J	5	1	tbd	5	tbd
2/21	Wetland K-J	5	1	tbd	5	tbd
3/2	Wetland K-K Stream K-6	5	5	tbd	20	tbd
Total					**60**	**tbd**

Tbd = to be determined

Additional impacts associated with removal of trees will occur in the buffers of Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5. A total of 69 trees have been identified for removal; however, 52 trees will be replanted on site by the City of Kirkland (see Section 3.4). Therefore,17 private property trees (as listed in Table 4) will be mitigated for through purchase of bank credits.

Table 4. Tree Removals from City of Kirkland Wetland and Stream Buffers Requiring Mitigation

Wetland/Stream Buffer	Species	Size (inches dbh)	Number Removed
Wetland K-HF	Red alder	7-17	8
Wetland K-HF	Douglas-fir	14	1
Wetland K-HF	Pine	21	2
Wetland K-L/Stream K-5	Western redcedar	10-12	3
Wetland K-L/Stream K-5	Douglas-fir	12	1
Wetland K-L/Stream K-5	Red alder	8	1
Wetland K-L/Stream K-5	Pine	9	1
Total			**17**

Temporary impacts from access routes and work areas will occur in portions of the buffers of Stream K-7, Wetland K-J, Wetland K-K/Stream K-6, and Wetland K-L/Stream K-5. The estimated total temporary impact area will be approximately **4,500 square feet (0.10 acre)**. Temporary impacts will be restored on site.

The permanent and temporary impacts from the Project within the City of Kirkland are summarized in Table 5.

Table 5. Summary of City of Kirkland Wetland, Stream and Buffer Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Type	Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
K-B/K-7	Category IV/ Type Np	0	0	0	15	1	400
K-D	Category III	25	1	600	15	0	0
K-G	Category III	10	0	600	0	0	0
K-J/K-3	Category II/ Type F	5	9	600	10	27	200
K-K/K-6	Category III/ Type F	0	7	0	20	24	1,850
K-L/K-5	Category II/ Type F	15	0	5,215	0	6	2,050
K-HF	Category II	0	0	0	0	11	0
Total		**55**	**17***	**7,015**	**60**	**69***	**4,500**

* Includes trees (17 in wetlands and 52 in wetland/stream buffers) that will be compensated for through a fee in lieu payment to the City of Kirkland, associated with the master trail plan.

5. Mitigation Bank

5.1 Mitigation Bank Site Overview and History

The Keller Farm Mitigation Bank (KFMB) is located along Bear Creek in the City of Redmond, (Section 6 Township 25N, Range 6E and Section 1, Township 25N, Range 5E) in King County, Washington (**Figure 2**). Credits are expected to be available as soon as January 2020 (Z. Woodward, personal communication, December 13, 2019).

The KFMB site has been used for agriculture, predominantly dairy farming, for the last 120 years (Habitat Bank 2018). The Keller family, the original homesteading family, operated a dairy farm until the 1990's and rented portions of the property for crop production.

The KFMB site is approximately 75 acres and is approved to provide wetland and buffer mitigation credit for both the Lake Sammamish Service Area and the Lake Washington Service Area, both within Water Resource Inventory Area (WRIA) 8. The bank is anticipated to provide 51.1 acres of re-established wetland area, 7.9 acres of rehabilitated wetland area, 4.3 acres of rehabilitated stream channel and associated wetlands and 11.9 acres of enhanced riparian upland forested area. The bank site includes additional areas that will not generate bank credits, including a 20-foot City waterline easement, a 30-foot City pedestrian trail easement and buffers along the bank boundary that are intended to protect the bank project from adjacent land uses.

The site is located 2.1 miles above Bear Creek's confluence with the Sammamish River. Bear Creek runs along the southern and eastern boundary of the bank site. The bank area is located within the 100-year floodplain of Bear Creek. Most of the riparian areas adjacent to Bear Creek lack native tree or shrub cover and are dominated by blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). The bank site is at the confluence of Bear, Evans, and Perrigo Creeks. An additional 5,400 linear feet of ditches is included within the bank property. Restoration actions will add an additional 2,800 feet of stream channel habitat which will have a direct, year-round connection to Bear Creek and be accessible for resident and anadromous fish species.

Nine depressional, seasonally flooded wetlands were delineated on the KFMB site totaling 7.9 acres. All have been heavily disturbed by past logging and agricultural activities. These wetlands are actively farmed. Vegetation consists of non-native pasture grasses, row crops and invasive species. Efforts to control invasive poison hemlock (*Conium maculatum*), blackberry, and reed canarygrass were conducted in summer of 2016. The fields were planted with a mixture of native grasses to provide erosion control and reduce the spread of invasive species. The wetlands are now dominated by tufted hairgrass (*Deschampsia cepitosa*) and water foxtail (*Alopecurus geniculatus*).

Restoration actions intend to address the loss of wetland and aquatic area hydrology and functions related to water quantity, quality and temperature limitations on the bank property. Restoration also intends to improve anadromous fish habitat by creating new stream channels, forested and shrub wetlands and connectivity between Bear Creek, Perrigo Creek, and floodplain wetlands.

5.2 Site Selection Rationale

On-site mitigation for Project impacts within the City of Kirkland is not a feasible option because the Project is being built in a multi-use corridor that contains a public trail, a sewer easement and rights for potential future expansion to include bus rapid transit or light rail. Other significant factors include the fact that PSE is not the property owner and only has rights to operate utility facilities within the corridor under the reciprocal easement agreement with the property owner and other corridor users. However, PSE will be compensating the City of Kirkland for the loss of trees within the corridor so they can be planted on site in a location that does not conflict with the transmission line once the CKC master plan improvements are fully implemented in the foreseeable future. As for impacts in the existing cross-country transmission

corridor due to pole replacement, PSE cannot mitigate in an actively maintained transmission corridor with native tree species that will survive in a wetland setting. In addition, PSE is not the property owner of the corridor and does not have rights to mitigate in the corridor under the transmission line easement rights, and more significantly, the impact areas are small and negligible with little ability for success amongst a larger area of invasive species. The very small scale of Project-related permanent wetland and buffer impacts, 85 square feet and 90 square feet, respectively, are much more efficiently mitigated for by use of a mitigation bank than permittee-responsible mitigation. Bank credits will also be used to mitigate for permanent impacts from tree removal. Because replanting of native tree species cannot occur below the new transmission lines, and because there may be issues with obtaining permission to replant and maintain mitigation long-term through a permanent encumbrance on private property outside of the transmission line corridor, PSE will use bank credits to mitigate for tree removal impacts.

The KFMB site was selected for mitigation in conformance with Kirkland's Zoning Code Chapter 90.145, which lists preferred criteria for mitigation sites when on-site mitigation is not feasible, or the likelihood for success of on-site mitigation is low. Project impacts are nearby and within the same watershed as the mitigation bank site. Bank activities will re-establish and rehabilitate farmed wetlands and enhance buffers which have disturbed vegetation types which are similar to the wetlands and buffers being impacted by the Project. Mitigation at the bank has a much greater likelihood for success and for providing improved functions compared to the impacted wetlands and buffers.

In addition, the Federal Rule on Compensatory Mitigation (33 CFR part 332, July 2012) lists mitigation banks as the preferred option for compensatory mitigation when Project impacts occur within a bank's service area.

5.3 Wetland Functions Provided at the Keller Farm Bank Site

The wetlands on the KFMB site were rated using the Washington Department of Ecology's Washington State Wetland Rating System for Western Washington, Revised (Hruby 2014) by Essency Environmental in 2016.

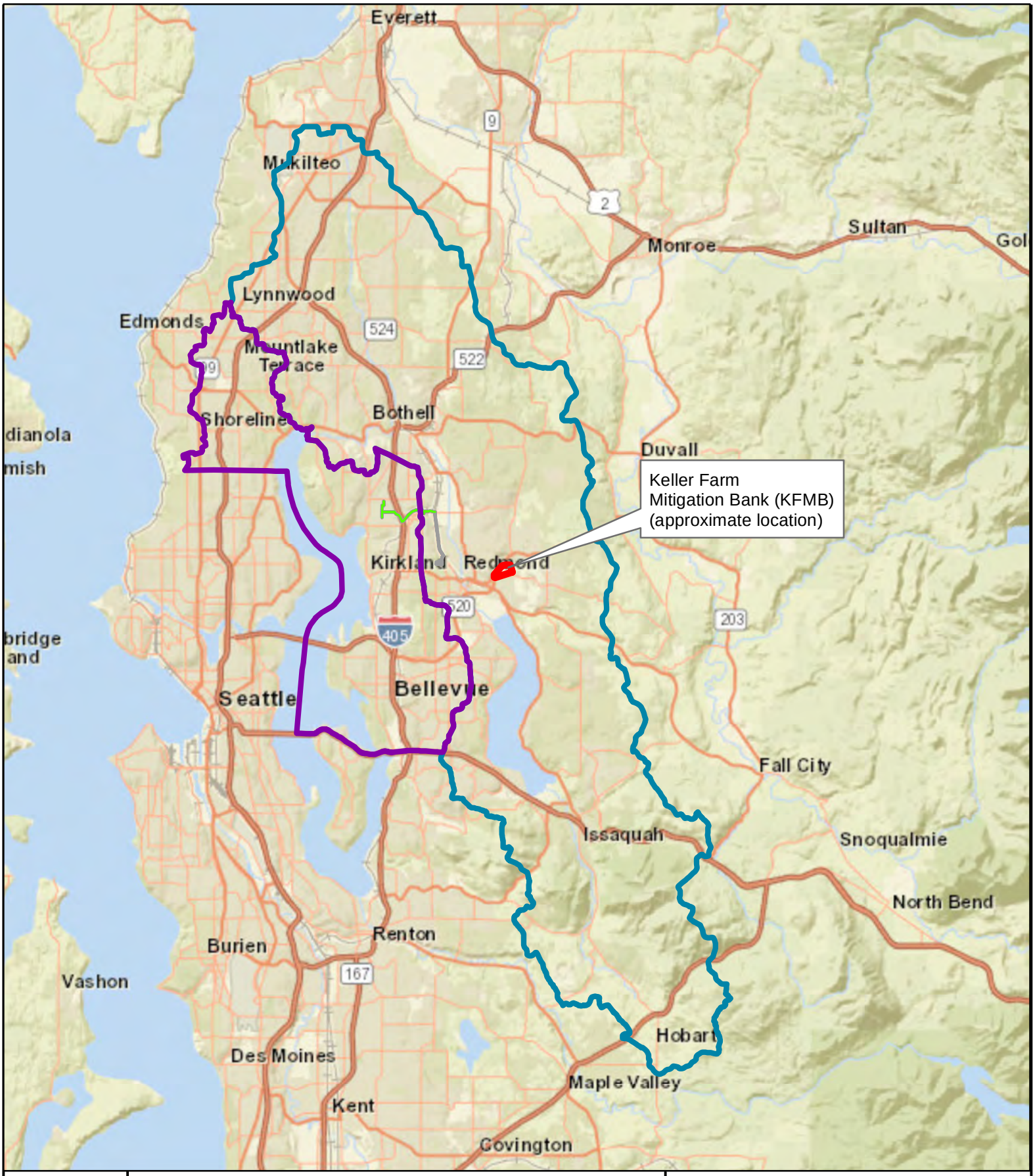
The wetlands on the KFMB site provide a medium level of water quality functions. Lack of surface channel connections and limited ponding restrict the site potential to provide water quality functions. In addition, the filtering capability of vegetation of the wetlands is limited because of a lack of native vegetation and the wetland's current use for agriculture.

The wetlands have medium landscape potential to provide water quality functions because the surrounding agricultural land use generate pollutants. Bear Creek and Perrigo Creek are listed on the Washington 303(d) list.

The wetlands provide a medium level of hydrologic functions. The depressional wetlands have medium potential to reduce flooding and erosion and provide up to 2 feet of storage during flooding events. The wetlands have a high level of hydrologic function that is valuable to society, and capture surface water that reduces downstream flooding.

The wetlands provide a medium level of habitat functions. There is low site potential to provide habitat because the plant communities lack special habitat features, and invasive species are present. The wetlands have been identified as being valuable to society in City of Redmond and regional planning documents.

The general goals of the KFMB are to restore hydrology and connectivity, increase habitat function, and re-establish native wetland and riparian vegetation communities. Restoration will improve water quality through capture and filtration of sediments, heavy metals, and nutrients, and will reduce flood impacts to the immediate area. Fish and wildlife habitat will be improved by restoring habitat connectivity and creating aquatic features including stream channels and wetlands.



N

1:450,000

KFMB Lake Washington Service Area

KFMB Lake Sammamish Service Area

Project Corridor

Kirkland Project Corridor

0 5 10

Miles

Figure 2
Mitigation Bank Location

Sammamish-Juanita
Transmission Line Project
Redmond, Kirkland, and King County, WA

6. Proposed Credit Use

Unavoidable permanent wetland and buffer impacts from the Project not compensated for through permittee-responsible mitigation within the City of Kirkland will be compensated for by the purchase of credits from the Keller Farm Wetland Mitigation Bank. The removal of one 12-inch diameter red alder from a buffer in unincorporated King County will have negligible impacts to critical areas. Therefore, the use of mitigation bank credits will only be required for impacts within the City of Kirkland.

6.1 Wetlands

Mitigation bank credits will be used to compensate for permanent impacts from pole replacement to **55 square feet** of wetland (35 square feet of Category III wetland and 20 square feet of Category II wetland). The Keller Farm Mitigation Banking Instrument suggests mitigation ratios for each wetland category (I through IV) shown in Table 6.

Table 6. Relevant Credit Ratios Recommended in the KFMB Instrument

Category of Impacted Wetland	Credit Recommended per Impact Acre
I	Case-by-Case
II	1.2:1
III	1:1
IV	0.85:1

Based on these recommendations and a maximum impact area of 0.002 acre, **0.002 bank credit** is proposed to compensate for permanent wetland impacts.

6.2 Buffers

Mitigation bank credits will be used to compensate for permanent impacts from installation and replacement of poles within **60 square feet (0.0014 acre)** of buffers.

In addition, bank credits will also be used to compensate for impacts from tree removals within buffers that are necessary to provide adequate clearance for the transmission lines on private property within the City of Kirkland. These 17 tree removals from buffers will be compensated for by purchase of bank credits. The majority of these trees are red alder. Alders can have very sparse canopies in terms of habitat value. Tree diameters at breast height (dbh) range from 7 to 21 inches. There are four native conifers (Douglas-fir and western redcedar) with dbhs of 10 to 14 inches.

To translate tree removal to wetland impact area, a hypothetical average tree canopy spread of 30 feet was used as a surrogate for permanent impact area. This value was based on general field observations as well as crown diameter to stem diameter relationships developed in the forestry literature (Hemery et al. 2005; Pretzsch et al. 2015). Using this value, each tree would have a canopy cover area of approximately 700 square feet. Thus, the 17 trees to be removed translate to approximately **11,900 square feet (0.273 acre)** of impacts. The banking instrument does not specify a credit ratio for tree removal impacts alone in buffers. Since the impacted buffers will remain in native herbaceous and shrub vegetation, a ratio one-half that used for permanent buffer impacts is used for this project.

One bank credit is generated by every 5 acres of wetland or riparian upland buffer that is created at the bank site, which yields a ratio of **0.3:1** for permanent critical area buffer impacts, and **0.15:1** for tree removal impacts. Thus, **0.041 bank credit** will be required for tree removal impacts, and **0.043 bank credit** for the combined buffer mitigation.

Compensation for the combined wetland and buffer impacts will require **0.045 bank credit**.

6.3 Credit Purchase

Bank credits are currently available for purchase. PSE will communicate with the KFMB to hold the appropriate number of credits during the permitting process. Once permits have been issued, and prior to any impacts to wetlands or buffers, PSE will purchase the agreed-upon bank credits. Proof of purchase will then be provided to the City of Kirkland.

7. References

AECOM. 2020a. Puget Sound Energy Sammamish-Juanita Transmission Line Critical Areas Impact Assessment. Prepared for Puget Sound Energy by AECOM, Seattle, Washington.

AECOM. 2020b. Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report. Prepared for Puget Sound Energy by AECOM, Seattle, Washington.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Performed for the U.S. Department of the Interior Fish and Wildlife Service Office of Biological Services. Washington, D.C.

City of Kirkland. 2017. Kirkland Zoning Code Chapter 90, as amended by Ordinance 4551. Available at: http://www.codepublishing.com/WA/Kirkland/. Accessed on March 10, 2017.

Habitat Bank, LLC.. 2018. Mitigation Banking Instrument: Keller Farm Mitigation Bank. December 2018. Available at: https://fortress.wa.gov/ecy/ezshare/sea/MitigationBanking/Keller/KellerFarmPNMBI.pdf. Accessed on December 13, 2019.

HDR. 2020. Conceptual Mitigation Plan, Sammamish-Juanita Transmission Line Project. Prepared for PSE by HDR, Bellevue, Washington. January 2020.

Hemery, G.E., P.S. Savill and S.N. Pryor. 2005. “Applications of the crown diameter – stem diameter relationship for different species of broadleaved trees” In: *Forest Ecology and Management* 215:285-294.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update (Publication #14-06-029). Washington Department of Ecology. Olympia, Washington.

King County. 2017. Title 21A Zoning. Updated January 17, 2017. Available at: http://www.kingcounty.gov/council/legislation/kc_code/24_30_Title_21A.aspx. Accessed on March 10, 2017.

Pretzsch, H., P. Biber, E. Uhl, J. Dahlhausen, T. Rötzer, J. Caldentey, T. Koike, T. van Con, A. Chavanne, T. Seifert, B. du Toit, C. Farnden, and S. Pauleit. 2015. “Crown size and growing space requirement of common tree species in urban centres, parks, and forests” In: *Urban Forestry & Urban Greening* 14:466-479.

AECOM

Puget Sound Energy Sammamish-Juanita Transmission Line Wetland Mitigation Bank Use Plan

Revised Final (February 2021)

Puget Sound Energy

February 2021

Prepared for:

PUGET SOUND ENERGY

Prepared by:

Paul Hamidi, PWS, CPSS

Michelle Brownell, WPIT

Reviewed by:

Kim Anderson, PWS

AECOM
1111 3rd Avenue
Suite 1600
Seattle, WA 98101
aecom.com

Executive Summary

Puget Sound Energy (PSE) proposes to construct approximately 5 miles of new 115 kV transmission line between Sammamish Substation in the City of Redmond and Juanita Substation in the City of Kirkland. The proposed Sammamish – Juanita transmission line project (Project) route crosses through three jurisdictions: the City of Redmond, unincorporated King County, and the City of Kirkland. The route is generally located on easement within the former BNSF rail corridor parcels and in franchise right-of-way. As part of the Project, PSE proposes to construct a 1.6-mile gravel access road by widening a former rail ballast due to access limitations for construction vehicles and equipment east of Willows Road NE in the City of Redmond and unincorporated King County. Four culverts under the existing railroad ballast (three in the City of Redmond and one in unincorporated King County) will be replaced with fish passage culverts under the access road. Within the City of Kirkland, impacts will be limited to pole placement, as access can occur from existing gravel and paved areas. Regulated critical areas in the project area include wetlands and fish and wildlife habitat conservation areas (including streams), and associated buffers. Project activities will have unavoidable impacts to critical areas and buffers along the route. This Bank Use Plan addresses wetland and buffer impacts and mitigation within the City of Kirkland only, as impacts within the City of Redmond are being compensated for by permittee-responsible mitigation, and there will be no permanent impacts requiring mitigation in unincorporated King County (AECOM 2019a).

The Project has been designed to avoid and minimize wetland, stream, and buffer impacts to the maximum extent feasible. PSE engineers used information from the delineations to adjust pole locations to avoid wetlands, streams, and buffers wherever feasible. Existing paved or gravel access will be used to reach pole locations within or adjacent to wetlands or buffers, limiting temporary and permanent impacts to pole placement where unavoidable. Temporary stringing sites will be located on existing paved or gravel surfaces. Temporary staging areas will be located on pavement or gravel and in upland areas outside of critical area buffers.

Permanent impacts to wetlands in the City of Kirkland will include 55 square feet of fill for the replacement of one pole in a wetland and partial encroachment of five new poles into the edges of three additional wetlands. While 17 trees will be removed from wetlands, they will be compensated for by a fee in lieu payment to the City of Kirkland and are not addressed in this bank use plan. There will be no permanent impacts to streams. Unavoidable temporary impacts to wetlands are associated with work areas around poles and access routes to Pole 4/10. This work will temporarily impact approximately 7,015 square feet of wetlands in the City of Kirkland.

Approximately 60 square feet of buffer in the City of Kirkland will be permanently impacted for the installation of new poles. Temporary buffer impacts of approximately 4,500 square feet will occur. In addition, 17 trees on private property will be removed from buffers to provide the required clearance for the transmission lines. While 52 additional trees will be removed from buffers, they will be mitigated for on site by the City of Kirkland using in lieu fee funds paid by PSE and are not addressed in this bank use plan.

Permanent wetland and buffer impacts will be compensated for by the purchase of credits at a certified mitigation bank in King County, the Keller Farm Mitigation Bank. Credit-debit ratios will follow guidance in the approved mitigation banking instrument of the selected bank (Habitat Bank 2018). The ratios in the mitigation banking instrument are set at **0.85:1** (mitigation bank credits to project impact area) for direct and indirect permanent impacts to Category IV wetlands, **1:1** for Category III wetlands, and **1.2:1** for Category II wetlands (Habitat Bank 2018). The ratio for impacts to buffers in the mitigation banking instrument is **0.3:1**. All short-term temporary wetland and buffer impacts will be restored on site within one complete growing season after completion of the Project and will not require compensatory mitigation and therefore are not addressed in this plan.

Table of Contents

Figures

Tables

1. Project Description

1.1 Project Background

Puget Sound Energy (PSE) is proposing to construct a new 115 kV transmission line between Sammamish Substation in the City of Redmond (9221 Willows Road NE – parcel #0325059002) and Juanita Substation in the City of Kirkland (10910 NE 132nd Street – parcel #2926059007) to increase system capacity and reliability. The proposed Sammamish – Juanita transmission line project (Project) will be approximately 5 miles in length (**Figure 1)**. The Project area crosses through three jurisdictions: the City of Redmond, unincorporated King County, and the City of Kirkland. PSE proposes to mitigate for impacts within the City of Redmond with permittee-responsible on-site mitigation at the Sammamish Substation site as part of the Willows Creek Stream Relocation Project (see Conceptual Mitigation Plan, HDR 2020). Additionally, there will be no permanent impacts to wetlands, streams, or buffers that will require compensatory mitigation in unincorporated King County. Therefore, mitigation for impacts within the City of Redmond and unincorporated King County will not be discussed in this bank use plan.

Existing conditions of wetlands, streams and buffers near the Project site are described in Section 2. Project actions intended to avoid, minimize and restore wetlands, streams and buffers are described in Section 3. Unavoidable permanent and temporary impacts to wetlands and buffers resulting from construction of the Project are described in Section 4. In order to fulfill mitigation requirements and the regulations of Kirkland Zoning Code (KZC) Chapter 90, PSE is proposing to mitigate for Project impacts by using bank credits purchased from the Keller Farm Wetland Mitigation Bank (KFWMB), which is described in Section 5.

1.2 Project Design

The Project and construction methods are described in detail in the *Sammamish-Juanita Transmission Line Critical Areas Impact Assessment* (Impact Assessment Report; AECOM 2020a). The Project involves the installation of transmission poles (wood, glulam and steel), and the stringing of wire between the poles. A majority of the poles will be new poles; however along certain segments of the 3.2 miles of transmission line within the City of Kirkland that interconnect with existing transmission, poles will be replaced. Only impacts in the City of Kirkland are addressed in this Plan.

Project elements that have the potential to impact critical areas in the City of Kirkland include the following:

- Transmission line construction (installation of new transmission poles, guys, and insulators)
- Vegetation management for line clearance
- Temporary access routes to pole locations and temporary work areas during construction

No permanent indirect impacts are anticipated from pole installation or stringing of wire. Temporary indirect impacts could occur from sedimentation into wetlands from adjacent work areas; best management practices (BMPs), described below, would be used to prevent these impacts. All temporary impacts are expected to be short term. All stringing sites will be located on existing paved or gravel surfaces and will not result in new disturbance.

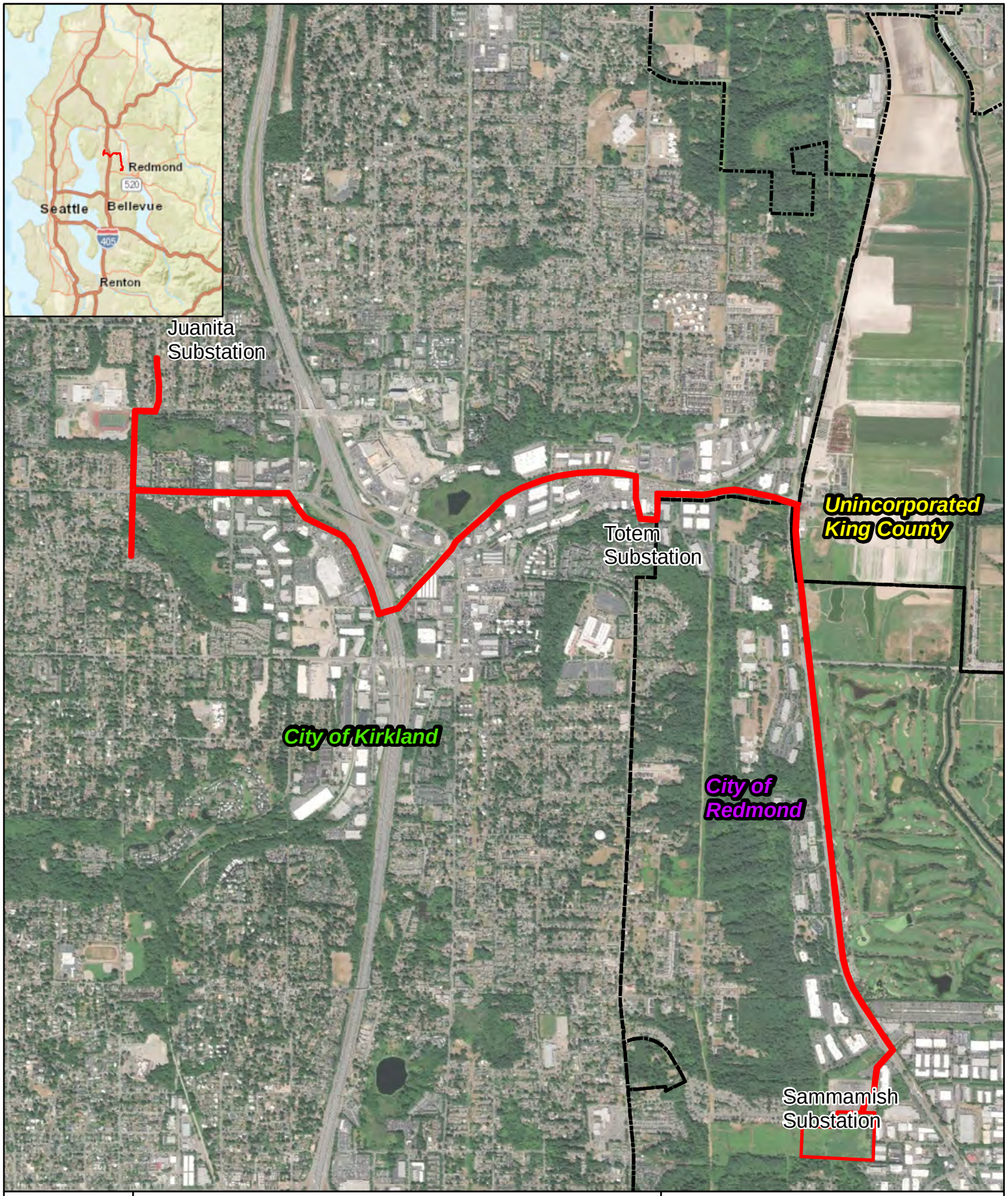
The temporary work area around each pole installation site will be dependent on the type of foundation and site conditions. The disturbance areas that pertain to poles in/near wetlands and buffers and that will result in temporary impacts are estimated as follows:

- Poles with micropile foundations – minimal temporary disturbance area, as piles will be driven into the ground and no digging is required.
- Wood poles located in a critical area buffer adjacent to a paved or gravel access road – approximately 400 square feet.

- Pole 4/11 (steel pole with concrete foundation partially located adjacent to the Wetland K-L buffer) – approximately 2,500 square feet.
- Pole 4/10 (Wetland K-L) – 900 square feet.

Temporary access across Wetland K-L and Stream K-5 will be required at one pole location (4/10) in the City of Kirkland. Along this access route, fiberglass or timber matting will be placed over existing vegetation and the stream channel for use by construction equipment. Mats will be removed after use. The remaining pole locations are accessible from roads, trails, or other paved or gravel areas.

Prior to construction of the transmission line, trees with the potential for a mature height of 25 feet or taller will be permanently removed from the Project corridor (including wetlands and buffers) to provide clearance for the new transmission line.



N

1:24,000

Jurisdictional Boundary

0 0.25 0.5

Miles

Figure 1
Vicinity Map

Sammamish-Juanita
Transmission Line Project
Redmond, Kirkland, and King County, WA

2. Existing Conditions

2.1 Impact Area

The Sammamish-Juanita study area is the planned, 50-foot-wide, 5-mile transmission corridor that extends from the Sammamish Substation in the City of Redmond to the Juanita Substation in the City of Kirkland. The study area also includes most of the PSE-owned parcel south of the Sammamish Substation where additional Project work will be located (**Figure 1**). The study area is approximately 47 acres. It is located in portions of Township 25 North, Range 5 East, Sections 3 and 10, in the Sammamish River and Lake Washington/Cedar River Watersheds (Water Resource Inventory Area 8). The transmission corridor traverses predominantly developed areas and runs for most of its length along former railroad ballast and street right-of-way. Adjacent land uses include commercial and industrial development, a golf course, transportation (roads), single and multi-family residential development, and park/open space.

Within the City of Kirkland, the study area is 31.3 acres. It includes mostly developed land in an urban setting. In the developed areas, weedy species and ornamental trees are prevalent. Undeveloped lands partially within the study area include the Totem Lake wetlands, Wetland K-L south of Juanita Substation, and the Heronfield wetlands (Wetland K-HF) east of PSE's existing north/south transmission corridor south of NE 124th Street. Adjacent land uses include commercial/industrial development on the north side of NE 124th Street, on both sides of the Cross Kirkland Corridor (CKC) trail, and near I-405; residential development west of I-405; and park/open space associated with Totem Lake and the Heronfield wetlands. Within the City of Kirkland, the transmission line runs along the north side of NE 124th Street in the street right-of-way, loops through Totem Substation south of NE 124th Street, and then heads back north to run along the former rail corridor (parcel 2826059202 owned by King County). Within this section of the transmission line, only one pole is located within a buffer in the NE 124th Street right-of-way, and two poles are located within wetland buffer within the King County owned parcel. The former rail corridor west of 132nd Avenue NE has been converted into the CKC gravel trail and is owned by the City of Kirkland. The transmission line follows the CKC trail corridor to I-405 and then crosses I-405 to the 120th Avenue NE right-of-way. The transmission corridor heads north until 120th Avenue NE intersects with NE 124th Street. The transmission line route then heads west on the north side of NE 124th Street until intersecting with an existing north/south transmission line corridor that connects to Juanita Substation. Pole replacement will occur within the existing corridor. There are no critical areas or buffers west of I-405, except north of NE 124th Street within the existing transmission corridor.

2.2 Wetlands and Streams

During field surveys conducted by AECOM, a total of 12 wetlands and 4 streams were delineated in the City of Kirkland portions of a field survey area that includes the Project study area as well as some adjacent areas. These wetlands and streams are described in detail in the *Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report* (AECOM 2020b). Table 1 lists the square footage/acreage of wetlands and streams delineated within the City of Kirkland field survey area.

Table 1. Field-Identified City of Kirkland Wetlands and Streams and Associated Buffer Areas

Wetland	Delineated Area	Wetland Classification: Rating[2], HGM Class, and Cowardin Class[3]	Associated Stream and Classification[4]	Standard Regulatory Wetland and Aquatic Area Buffers[5]
K-B	3,047 ft^2 (0.07 ac)	Category IV Depressional PEM	Stream K-7 – Type Np	Wetland: 40 feet Stream: 50 feet
K-C	3,634 ft^2 (0.08 ac)	Category III Depressional PEM	NA	60 feet
K-D	28,254 ft^2 (0.65 ac)	Category III Depressional PEM	NA	60 feet
K-DD	225 ft^2 (0.01 ac)	Category III Depressional PEM	NA	60 feet
K-E	1,992 ft^2 (0.05 ac)	Category IV Depressional PEM	NA	40 feet
K-F[1]	19,251 ft^2 (0.44 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-G	10,119 ft^2 (0.23 ac)	Category III Depressional PEM	NA	60 feet
K-H	1,486 ft^2 (0.03 ac)	Category III Depressional PEM/PFO	NA	60 feet
K-J[1]	49,807 ft^2 (1.14 ac)	Category II Depressional PEM/PSS/PFO/POW	Stream K-3 – Type F	Wetland: 165 feet Stream: 100 feet
K-K[1]	16,563 ft^2 (0.38 ac)	Category III Depressional PFO	Stream K-6 – Type F	Wetland: 60 feet Stream: 100 feet
K-L[1]	15,130 ft^2 (0.35 ac)	Category II Depressional + Riverine PEM/PSS/PFO/POW	Stream K-5 – Type F	Wetland: 165 feet Stream: 100 feet
K-HF[1]	25,937 ft^2 (0.60 ac)	Category II Depressional PEM/PSS/PFO	NA	105 feet

HGM = hydrogeomorphic; ft^2 = square feet; ac = acre; NA = not applicable.
[1] Wetland extends beyond the field survey area. The delineated acreage is given here.
[2] HGM classification and Ecology wetland ratings were determined according to Hruby 2014.
[3] Cowardin Classification: PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, PFO=Palustrine Forest, POW=Palustrine Open Water (Cowardin et al. 1979).
[4] Stream classifications are based on WAC 222-16-030, as specified in KZC 90.110.
[5] Sources: KZC 90.55 and KZC 90.65.

2.3 Buffers

Table 1 summarizes the standard regulatory buffer widths for wetlands and streams mapped in the City of Kirkland, based on their classification. Buffer widths and regulations are described in detail in the Impact Assessment Report (AECOM 2020a).

The functional buffers are generally below the standard width and are constrained by roads, sidewalks, railroad ballast and other development. Therefore, they have been reduced to their functional widths to reflect field conditions in order to determine impacts per City of Kirkland code (KZC 90.120.1.d). Buffers are dominated by invasive species including reed canarygrass and non-native blackberries.

3. Mitigation Sequencing

The Project is designed to mitigate impacts to wetlands and buffers by following the standard mitigation sequence as required by the City of Kirkland (KZC 90.145). This sequence is described in detail in the Impact Assessment Report (AECOM 2020a).

3.1 Avoidance

PSE engineers used information from the delineations to adjust pole locations to avoid wetlands, streams, and buffers wherever feasible within the Project corridor. The following avoidance measures were followed:

> Pole locations are adjacent to existing gravel and paved surfaces where equipment can be staged to avoid or minimize impacts to critical areas and buffers. The exception is the replacement of Pole 4/10, which is located within a wetland in an existing transmission line corridor south of Juanita Substation. Temporary matting will be used for access to minimize construction impacts.

The Project design avoids permanent and temporary impacts to most of the wetlands within the study area. The Project construction will utilize existing roads, other paved areas, and the gravel trail and railroad ballast to transport supplies and ground-operated equipment. Location of the poles close to the edge of paved or gravel areas will allow work to occur predominantly on one side of the pole, avoiding the need to enter adjacent wetlands with equipment and associated temporary impacts. In areas where pole installation sites are close to a wetland edge, a high visibility fence will be installed at the wetland boundary to prevent access by equipment. At the site of replacement Pole 4/10, which will be replaced within a wetland in an existing cross-country transmission line corridor, temporary matting will be used to access the construction area and minimize impacts to the critical area.

Temporary equipment staging will be located in upland areas outside of critical areas and buffers, except for a temporary work area around Pole 4/10. Temporary stringing sites will be located on existing paved or gravel surfaces and will not result in new disturbance.

The Project avoids impacts to Wetlands K-C, K-DD, K-E, K-F, and K-H and their associated buffers. Apart from necessary tree removals along the transmission corridor, no permanent or temporary Project-associated disturbances are planned within Wetland K-HF. No poles will be located in streams. Poles that will encroach into wetlands and buffers have been located to minimize the amount of encroachment. Replacement Pole 4/10 in Wetland K-L is the only pole that will be located completely in a wetland, as its location is dictated by the existing transmission line corridor.

3.2 Minimization

To minimize impacts to wetlands and streams, work will be conducted during the dry season, when soils will be at their driest and water levels will be at their lowest. Use of existing paved and gravel surfaces for temporary access routes will minimize temporary impacts to wetlands, streams, and their buffers.

BMPs have been developed that will further minimize indirect impacts to wetlands, waterways and other resources during construction. These BMPs include:

- Demarcating and maintaining construction fencing through stages of construction as appropriate to protect and avoid wetlands and streams.
- Leaving a vegetative buffer zone between wetlands and upland construction areas.
- Installing and maintaining erosion control measures, such as silt fences and straw wattles, to minimize sediment transport into otherwise unaffected wetlands.
- To access Pole 4/10, use of ground equipment with low pressurized rubber tires and placement of mats to cover the ground surface where tracked equipment is used.

In Wetland K-L, timber or fiberglass mats will be laid down temporarily over wetland vegetation (predominantly reed canarygrass) to provide temporary access routes to poles and prevent damage associated with heavy equipment. To cross the stream channel in this location, PSE will also lay temporary fiberglass or timber matting across the stream channel to allow construction equipment to cross and prevent entry into or disturbance of the stream channel.

3.3 Restoration

Temporarily exposed soils resulting from Project activities (primarily construction access) in wetlands or buffers will be re-seeded with a mixed native seed mix and/or covered with mulch to reduce the potential for sediment to enter aquatic resource areas.

3.4 Compensation

The unavoidable removal of 17 trees combined from Wetlands K-D, K-J, and K-K, and 52 trees combined from the buffers of Wetland K-B/Stream K-7, Wetland K-J/Stream K-3 and Wetland K-K/Stream K-6 will be compensated for through a fee in lieu payment to the City of Kirkland. PSE does not own the trail corridor and any mitigation planting would likely be disturbed when the City implements their CKC master plan and widens and paves the interim trail in the foreseeable future. At such time as the improvements occur, the City will plant mitigation trees in appropriate wetland or buffer environments along the corridor. PSE is in the process of developing a payment and implementation agreement with the City of Kirkland Transportation Department.

All remaining unavoidable permanent impacts to wetlands and buffers associated with the Project will be compensated for through purchase of appropriate credits at the Keller Farm Wetland Mitigation Bank (described in Sections 5 and 6).

4. Wetland, Stream and Buffer Impacts

Proposed Project impacts to wetlands, streams and buffers in the City of Kirkland are described fully in the Impact Assessment Report (AECOM 2020a) and summarized below.

4.1 Wetlands

Construction of the Project will result in unavoidable permanent and temporary impacts to Wetlands K-D, K-G, K-J, and K-L from installation of new poles and replacement of Pole 4/10 (Table 2). The permanent wetland impact area will be approximately **55 square feet (0.001 acre).** Impacts in Wetlands K-D, K-G, and K-J will occur at the very edge of the wetlands adjacent to the rail ballast and gravel trail. Impacts in Wetland K-L will occur near the western edge of the large wetland, in a degraded area within an existing transmission line corridor that is dominated by the non-native species reed canarygrass. Pole installation and replacement should have negligible impacts on overall wetland function.

Table 2. Permanent Pole Impacts in City of Kirkland Wetlands

Wetland/ Stream	Pole Number	Hole Diameter (feet)	Portion in Wetland (feet)	Depth of Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
Wetland K-D	2/14	5	2	tbd	10	tbd
Wetland K-D	2/14 stub pole	5	2	tbd	10	tbd
Wetland K-D	2/15	5	1	tbd	5	tbd
Wetland K-G	2/16	5	2.5	tbd	10	tbd
Wetland K-J	2/21	5	1	tbd	5	tbd
Wetland K-L	4/10	4	4	11	15	6
Total					**55**	**tbd**

Tbd = to be determined

Permanent impacts associated with tree removal will occur in Wetlands K-D, K-J, and K-K. A total of 17 trees will be removed. As noted previously, these trees will be compensated for through a fee in lieu agreement with the City of Kirkland who will replant trees in comparable wetland areas upon completion of their CKC master plan trail improvements in the foreseeable future.

Unavoidable temporary impacts will also occur in portions of Wetlands K-D, K-G, K-J, and K-L. The estimated total temporary impact area will be approximately **7,015 square feet (0.16 acre)** for access routes to Pole 4/10 and areas around the poles listed in Table 2. Temporary impacts will be restored on site.

4.2 Buffers

The Project will result in unavoidable permanent and temporary impacts to the regulatory buffers of Wetland K-B/Stream K-7, Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5. Permanent impacts associated with installation of five new poles will occur within buffers, as summarized in Table 3. The total area of permanent impact will be approximately **60 square feet (0.002 acre).** The permanent impacts will occur predominantly in degraded, low functioning buffer strips between the wetland and the railroad ballast and gravel trail.

Table 3. Permanent Pole Impacts in City of Kirkland Stream/Wetland Buffer

Pole Number	Impacted Buffer	Hole Diameter (feet)	Portion in Buffer (feet)	Depth of Pole or Foundation (feet)	Permanent Impact Area (square feet)	Volume of Fill (cubic yards)
2/3	Stream K-7	4	4	10	15	5
2/15	Wetland K-D	5	2	tbd	15	tbd
2/20	Wetland K-J	5	1	tbd	5	tbd
2/21	Wetland K-J	5	1	tbd	5	tbd
3/2	Wetland K-K Stream K-6	5	5	tbd	20	tbd
Total					**60**	**tbd**

Tbd = to be determined

Additional impacts associated with removal of trees will occur in the buffers of Wetland K-J/Stream K-3, Wetland K-K/Stream K-6, Wetland K-HF, and Wetland K-L/Stream K-5. A total of 69 trees have been identified for removal; however, 52 trees will be replanted on site by the City of Kirkland (see Section 3.4). Therefore,17 private property trees (as listed in Table 4) will be mitigated for through purchase of bank credits.

Table 4. Tree Removals from City of Kirkland Wetland and Stream Buffers Requiring Mitigation

Wetland/Stream Buffer	Species	Size (inches dbh)	Number Removed
Wetland K-HF	Red alder	7-17	8
Wetland K-HF	Douglas-fir	14	1
Wetland K-HF	Pine	21	2
Wetland K-L/Stream K-5	Western redcedar	10-12	3
Wetland K-L/Stream K-5	Douglas-fir	12	1
Wetland K-L/Stream K-5	Red alder	8	1
Wetland K-L/Stream K-5	Pine	9	1
Total			**17**

Temporary impacts from access routes and work areas will occur in portions of the buffers of Stream K-7, Wetland K-J, Wetland K-K/Stream K-6, and Wetland K-L/Stream K-5. The estimated total temporary impact area will be approximately **4,500 square feet (0.10 acre)**. Temporary impacts will be restored on site.

The permanent and temporary impacts from the Project within the City of Kirkland are summarized in Table 5.

Table 5. Summary of City of Kirkland Wetland, Stream and Buffer Impacts

		Wetland and Stream Impacts			Buffer Impacts		
Wetland/ Stream	Category/ Type	Permanent Impact Area – Fill (sq ft)	Tree Removals	Temporary Impact Area (sq ft)	Permanent Impact Area (sq ft)	Tree Removals	Temporary Impact Area (sq ft)
K-B/K-7	Category IV/ Type Np	0	0	0	15	1	400
K-D	Category III	25	1	600	15	0	0
K-G	Category III	10	0	600	0	0	0
K-J/K-3	Category II/ Type F	5	9	600	10	27	200
K-K/K-6	Category III/ Type F	0	7	0	20	24	1,850
K-L/K-5	Category II/ Type F	15	0	5,215	0	6	2,050
K-HF	Category II	0	0	0	0	11	0
Total		**55**	**17***	**7,015**	**60**	**69***	**4,500**

* Includes trees (17 in wetlands and 52 in wetland/stream buffers) that will be compensated for through a fee in lieu payment to the City of Kirkland, associated with the master trail plan.

5. Mitigation Bank

5.1 Mitigation Bank Site Overview and History

The Keller Farm Mitigation Bank (KFMB) is located along Bear Creek in the City of Redmond, (Section 6 Township 25N, Range 6E and Section 1, Township 25N, Range 5E) in King County, Washington (**Figure 2**). Credits are expected to be available as soon as January 2020 (Z. Woodward, personal communication, December 13, 2019).

The KFMB site has been used for agriculture, predominantly dairy farming, for the last 120 years (Habitat Bank 2018). The Keller family, the original homesteading family, operated a dairy farm until the 1990's and rented portions of the property for crop production.

The KFMB site is approximately 75 acres and is approved to provide wetland and buffer mitigation credit for both the Lake Sammamish Service Area and the Lake Washington Service Area, both within Water Resource Inventory Area (WRIA) 8. The bank is anticipated to provide 51.1 acres of re-established wetland area, 7.9 acres of rehabilitated wetland area, 4.3 acres of rehabilitated stream channel and associated wetlands and 11.9 acres of enhanced riparian upland forested area. The bank site includes additional areas that will not generate bank credits, including a 20-foot City waterline easement, a 30-foot City pedestrian trail easement and buffers along the bank boundary that are intended to protect the bank project from adjacent land uses.

The site is located 2.1 miles above Bear Creek's confluence with the Sammamish River. Bear Creek runs along the southern and eastern boundary of the bank site. The bank area is located within the 100-year floodplain of Bear Creek. Most of the riparian areas adjacent to Bear Creek lack native tree or shrub cover and are dominated by blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). The bank site is at the confluence of Bear, Evans, and Perrigo Creeks. An additional 5,400 linear feet of ditches is included within the bank property. Restoration actions will add an additional 2,800 feet of stream channel habitat which will have a direct, year-round connection to Bear Creek and be accessible for resident and anadromous fish species.

Nine depressional, seasonally flooded wetlands were delineated on the KFMB site totaling 7.9 acres. All have been heavily disturbed by past logging and agricultural activities. These wetlands are actively farmed. Vegetation consists of non-native pasture grasses, row crops and invasive species. Efforts to control invasive poison hemlock (*Conium maculatum*), blackberry, and reed canarygrass were conducted in summer of 2016. The fields were planted with a mixture of native grasses to provide erosion control and reduce the spread of invasive species. The wetlands are now dominated by tufted hairgrass (*Deschampsia cepitosa*) and water foxtail (*Alopecurus geniculatus*).

Restoration actions intend to address the loss of wetland and aquatic area hydrology and functions related to water quantity, quality and temperature limitations on the bank property. Restoration also intends to improve anadromous fish habitat by creating new stream channels, forested and shrub wetlands and connectivity between Bear Creek, Perrigo Creek, and floodplain wetlands.

5.2 Site Selection Rationale

On-site mitigation for Project impacts within the City of Kirkland is not a feasible option because the Project is being built in a multi-use corridor that contains a public trail, a sewer easement and rights for potential future expansion to include bus rapid transit or light rail. Other significant factors include the fact that PSE is not the property owner and only has rights to operate utility facilities within the corridor under the reciprocal easement agreement with the property owner and other corridor users. However, PSE will be compensating the City of Kirkland for the loss of trees within the corridor so they can be planted on site in a location that does not conflict with the transmission line once the CKC master plan improvements are fully implemented in the foreseeable future. As for impacts in the existing cross-country transmission

corridor due to pole replacement, PSE cannot mitigate in an actively maintained transmission corridor with native tree species that will survive in a wetland setting. In addition, PSE is not the property owner of the corridor and does not have rights to mitigate in the corridor under the transmission line easement rights, and more significantly, the impact areas are small and negligible with little ability for success amongst a larger area of invasive species. The very small scale of Project-related permanent wetland and buffer impacts, 85 square feet and 90 square feet, respectively, are much more efficiently mitigated for by use of a mitigation bank than permittee-responsible mitigation. Bank credits will also be used to mitigate for permanent impacts from tree removal. Because replanting of native tree species cannot occur below the new transmission lines, and because there may be issues with obtaining permission to replant and maintain mitigation long-term through a permanent encumbrance on private property outside of the transmission line corridor, PSE will use bank credits to mitigate for tree removal impacts.

The KFMB site was selected for mitigation in conformance with Kirkland's Zoning Code Chapter 90.145, which lists preferred criteria for mitigation sites when on-site mitigation is not feasible, or the likelihood for success of on-site mitigation is low. Project impacts are nearby and within the same watershed as the mitigation bank site. Bank activities will re-establish and rehabilitate farmed wetlands and enhance buffers which have disturbed vegetation types which are similar to the wetlands and buffers being impacted by the Project. Mitigation at the bank has a much greater likelihood for success and for providing improved functions compared to the impacted wetlands and buffers.

In addition, the Federal Rule on Compensatory Mitigation (33 CFR part 332, July 2012) lists mitigation banks as the preferred option for compensatory mitigation when Project impacts occur within a bank's service area.

5.3 Wetland Functions Provided at the Keller Farm Bank Site

The wetlands on the KFMB site were rated using the Washington Department of Ecology's Washington State Wetland Rating System for Western Washington, Revised (Hruby 2014) by Essency Environmental in 2016.

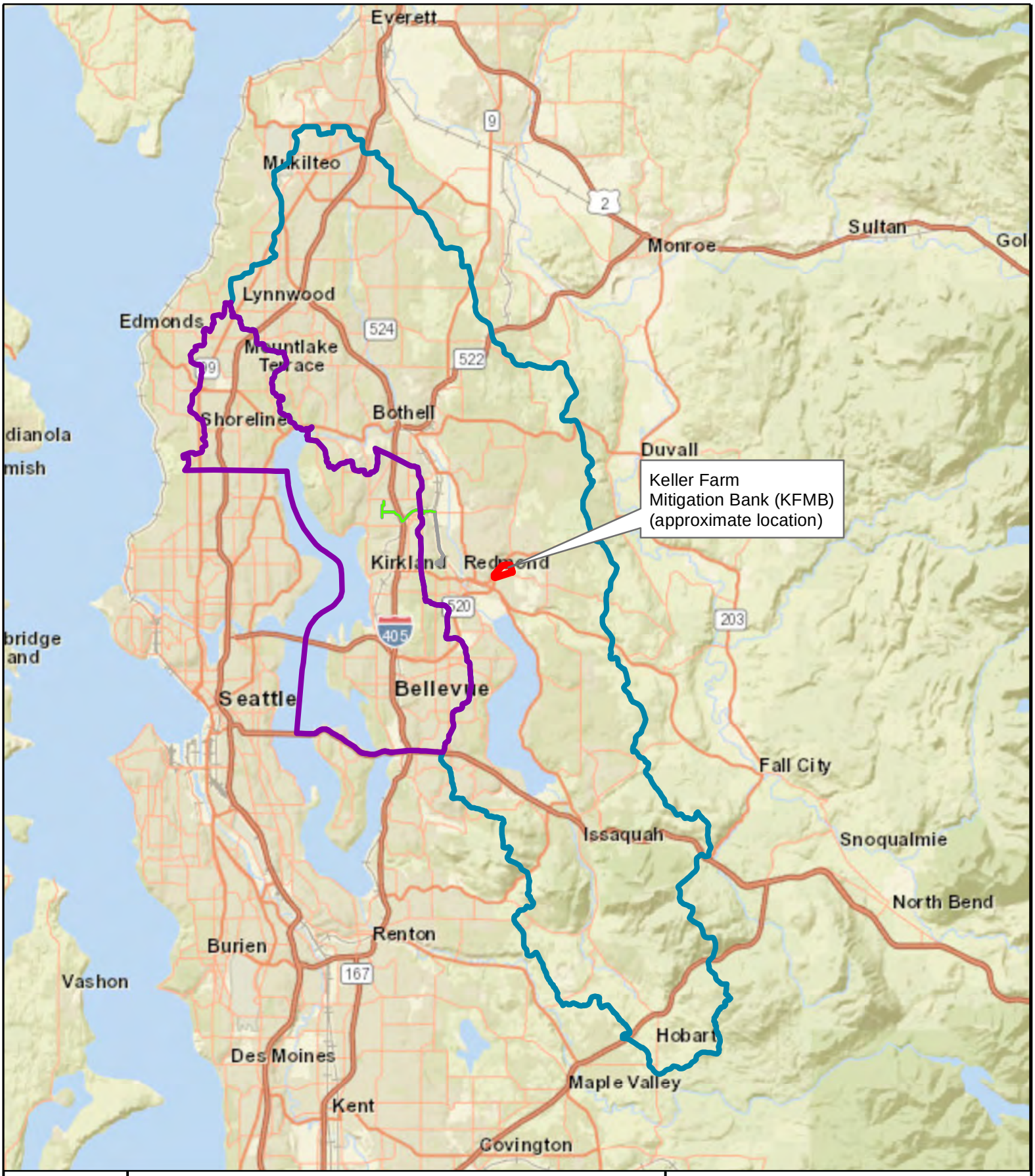
The wetlands on the KFMB site provide a medium level of water quality functions. Lack of surface channel connections and limited ponding restrict the site potential to provide water quality functions. In addition, the filtering capability of vegetation of the wetlands is limited because of a lack of native vegetation and the wetland's current use for agriculture.

The wetlands have medium landscape potential to provide water quality functions because the surrounding agricultural land use generate pollutants. Bear Creek and Perrigo Creek are listed on the Washington 303(d) list.

The wetlands provide a medium level of hydrologic functions. The depressional wetlands have medium potential to reduce flooding and erosion and provide up to 2 feet of storage during flooding events. The wetlands have a high level of hydrologic function that is valuable to society, and capture surface water that reduces downstream flooding.

The wetlands provide a medium level of habitat functions. There is low site potential to provide habitat because the plant communities lack special habitat features, and invasive species are present. The wetlands have been identified as being valuable to society in City of Redmond and regional planning documents.

The general goals of the KFMB are to restore hydrology and connectivity, increase habitat function, and re-establish native wetland and riparian vegetation communities. Restoration will improve water quality through capture and filtration of sediments, heavy metals, and nutrients, and will reduce flood impacts to the immediate area. Fish and wildlife habitat will be improved by restoring habitat connectivity and creating aquatic features including stream channels and wetlands.



N

1:450,000

KFMB Lake Washington Service Area

KFMB Lake Sammamish Service Area

Project Corridor

Kirkland Project Corridor

0 5 10

Miles

Figure 2
Mitigation Bank Location

Sammamish-Juanita
Transmission Line Project
Redmond, Kirkland, and King County, WA

6. Proposed Credit Use

Unavoidable permanent wetland and buffer impacts from the Project not compensated for through permittee-responsible mitigation within the City of Kirkland will be compensated for by the purchase of credits from the Keller Farm Wetland Mitigation Bank. The removal of one 12-inch diameter red alder from a buffer in unincorporated King County will have negligible impacts to critical areas. Therefore, the use of mitigation bank credits will only be required for impacts within the City of Kirkland.

6.1 Wetlands

Mitigation bank credits will be used to compensate for permanent impacts from pole replacement to **55 square feet** of wetland (35 square feet of Category III wetland and 20 square feet of Category II wetland). The Keller Farm Mitigation Banking Instrument suggests mitigation ratios for each wetland category (I through IV) shown in Table 6.

Table 6. Relevant Credit Ratios Recommended in the KFMB Instrument

Category of Impacted Wetland	Credit Recommended per Impact Acre
I	Case-by-Case
II	1.2:1
III	1:1
IV	0.85:1

Based on these recommendations and a maximum impact area of 0.002 acre, **0.002 bank credit** is proposed to compensate for permanent wetland impacts.

6.2 Buffers

Mitigation bank credits will be used to compensate for permanent impacts from installation and replacement of poles within **60 square feet (0.0014 acre)** of buffers.

In addition, bank credits will also be used to compensate for impacts from tree removals within buffers that are necessary to provide adequate clearance for the transmission lines on private property within the City of Kirkland. These 17 tree removals from buffers will be compensated for by purchase of bank credits. The majority of these trees are red alder. Alders can have very sparse canopies in terms of habitat value. Tree diameters at breast height (dbh) range from 7 to 21 inches. There are four native conifers (Douglas-fir and western redcedar) with dbhs of 10 to 14 inches.

To translate tree removal to wetland impact area, a hypothetical average tree canopy spread of 30 feet was used as a surrogate for permanent impact area. This value was based on general field observations as well as crown diameter to stem diameter relationships developed in the forestry literature (Hemery et al. 2005; Pretzsch et al. 2015). Using this value, each tree would have a canopy cover area of approximately 700 square feet. Thus, the 17 trees to be removed translate to approximately **11,900 square feet (0.273 acre)** of impacts. The banking instrument does not specify a credit ratio for tree removal impacts alone in buffers. Since the impacted buffers will remain in native herbaceous and shrub vegetation, a ratio one-half that used for permanent buffer impacts is used for this project.

One bank credit is generated by every 5 acres of wetland or riparian upland buffer that is created at the bank site, which yields a ratio of **0.3:1** for permanent critical area buffer impacts, and **0.15:1** for tree removal impacts. Thus, **0.041 bank credit** will be required for tree removal impacts, and **0.043 bank credit** for the combined buffer mitigation.

Compensation for the combined wetland and buffer impacts will require **0.045 bank credit**.

6.3 Credit Purchase

Bank credits are currently available for purchase. PSE will communicate with the KFMB to hold the appropriate number of credits during the permitting process. Once permits have been issued, and prior to any impacts to wetlands or buffers, PSE will purchase the agreed-upon bank credits. Proof of purchase will then be provided to the City of Kirkland.