Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Wetland Edge
(previous delineation)
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

Figure 5-5

Wetlands R-GCA, R-GCB, R-GCF Gun Club Creek

933

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Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation

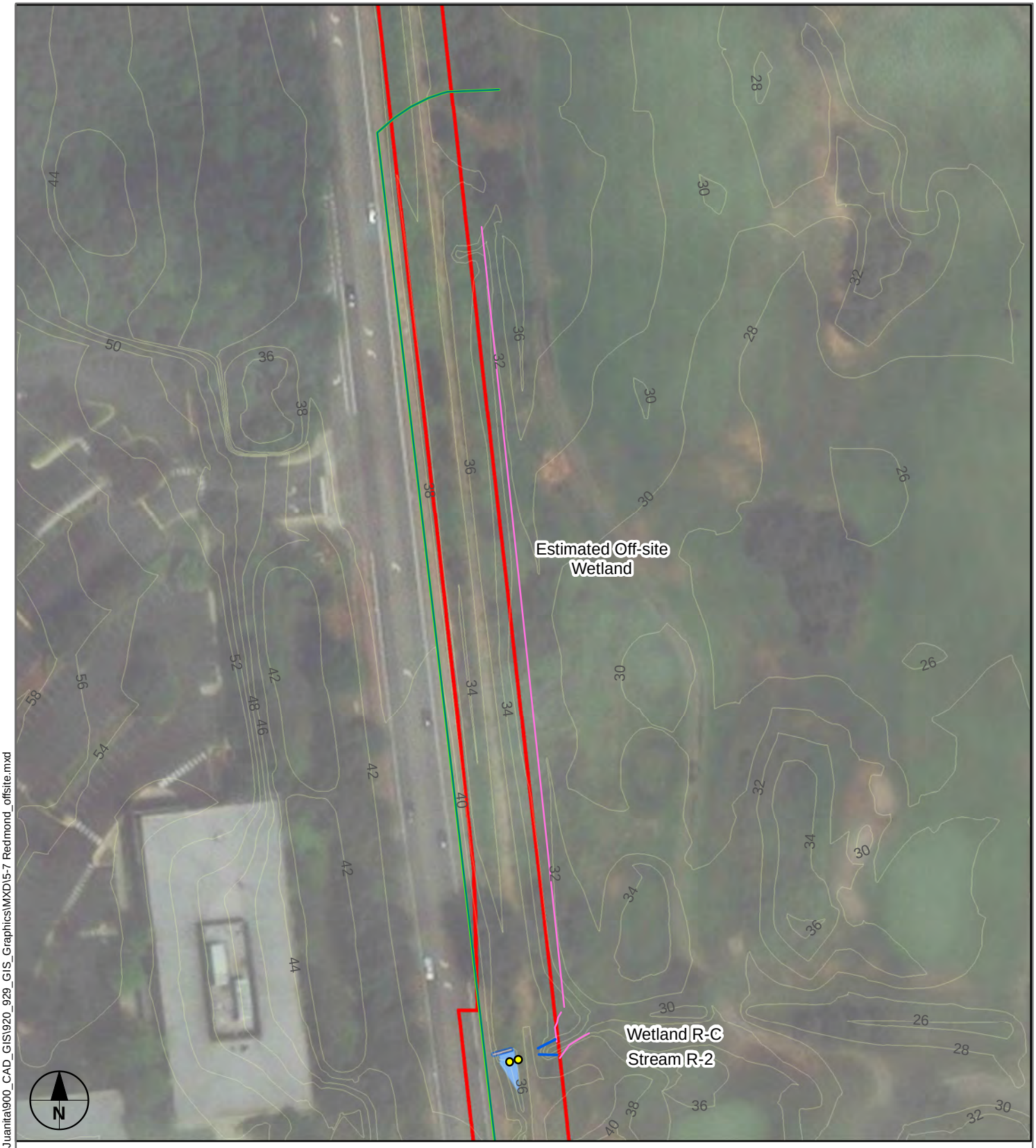
Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 5-6
Wetland R-C and Stream R-2

J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\5-5 Redmond_R-C-R-2.mxd



Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer
Estimated Wetland Edge

Figure 5-7
Estimated Off-site Wetland

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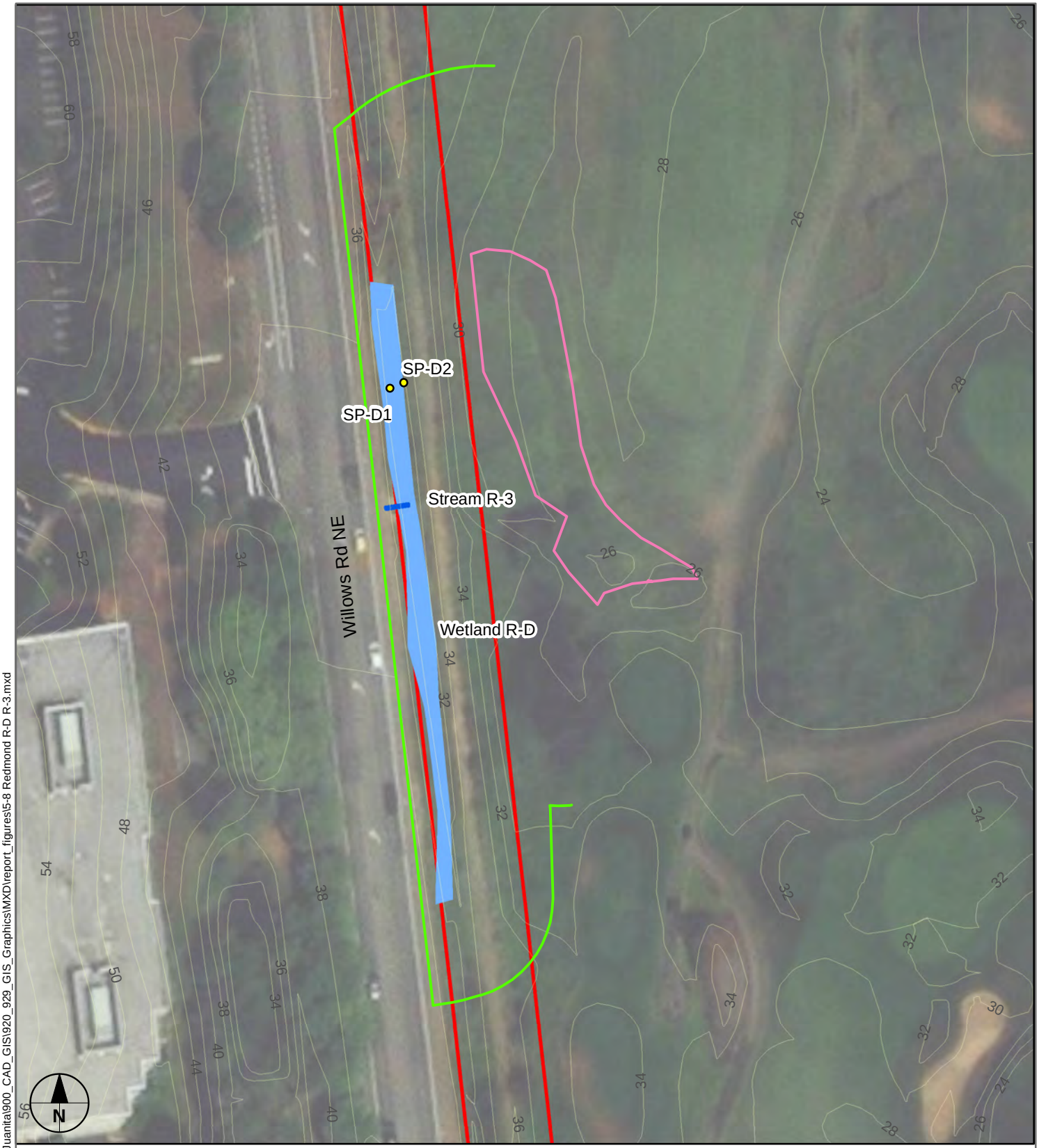


Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

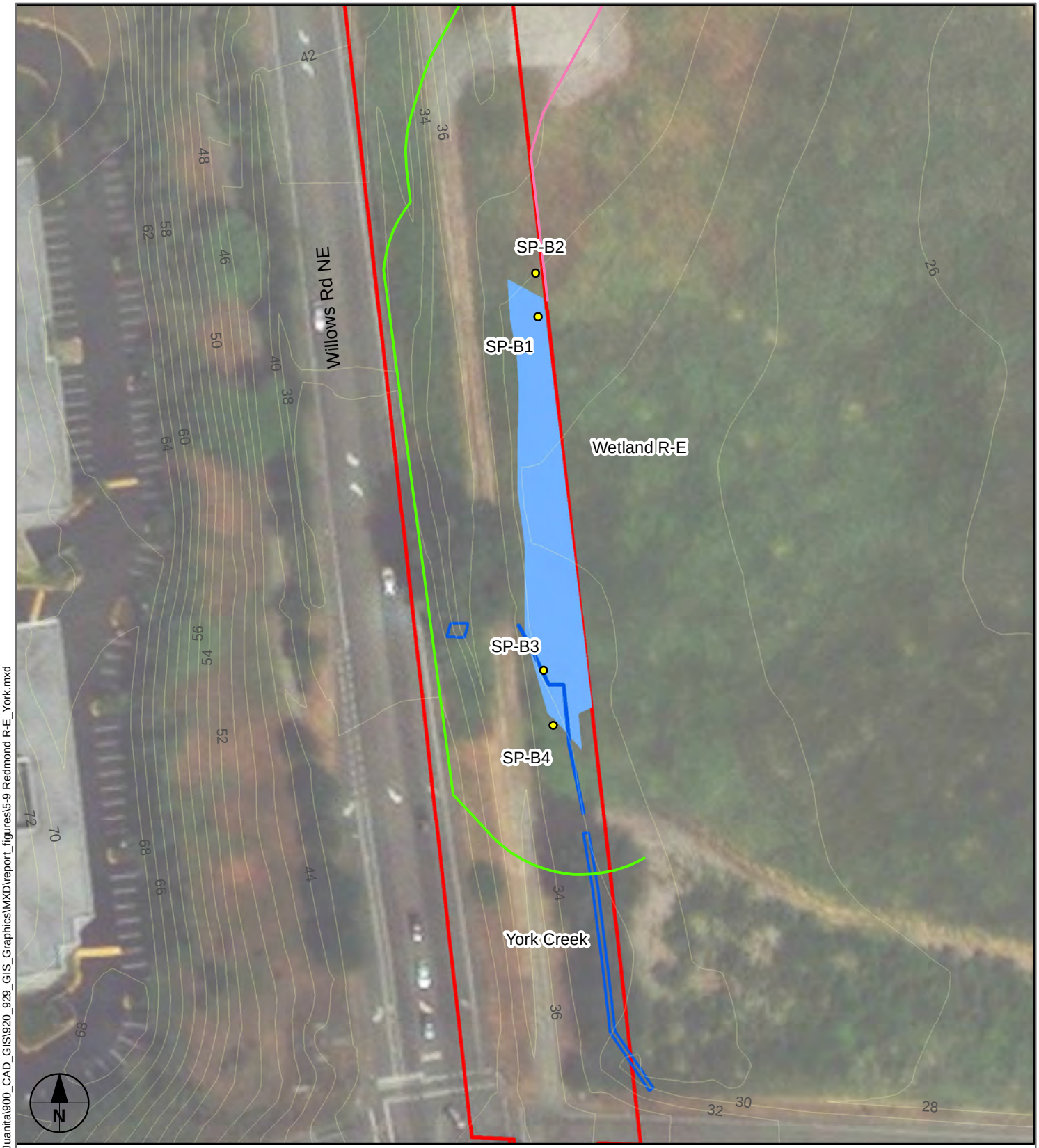
0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Delineated Wetland
Wetland/Stream Buffer (includes off-site wetland buffer)
Estimated Wetland Edge

Figure 5-8
Wetland R-D and Stream R-3

936

J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\5-8 Redmond R-D R-3.mxd



Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Wetland
Delineated Stream
Wetland/Stream Buffer
Estimated Wetland Edge

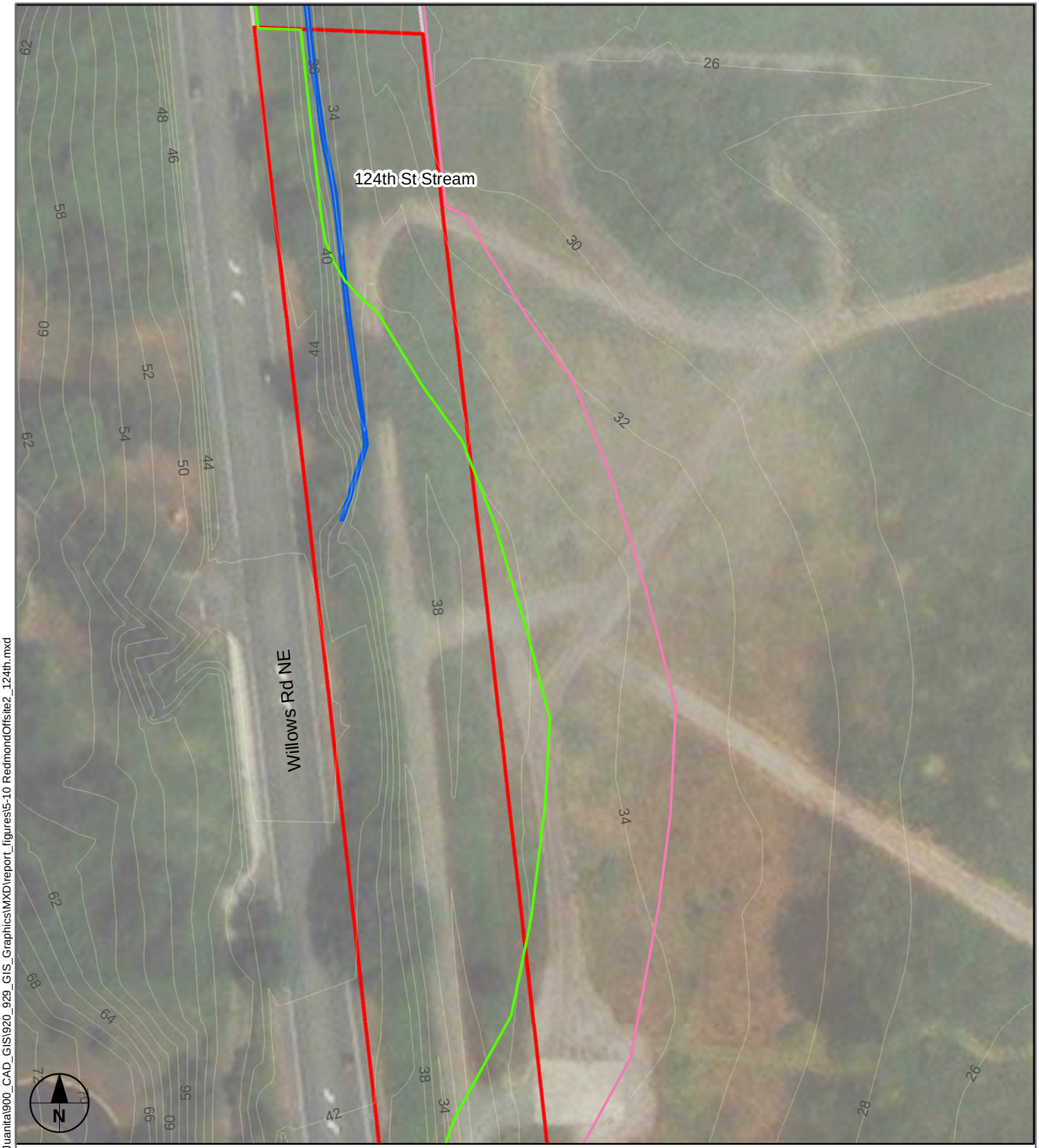
0 50 100 200 Feet

Figure 5-9

Wetland R-E and York Creek

J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\5-9 Redmond R-E_York.mxd

AECOM



Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

0 50 100 200 Feet

Study Area
2-foot Contours
Delineated Stream
Wetland/Stream Buffer
Estimated Wetland Edge

Figure 5-10
124th St Stream and Estimated Off-Site Wetland (Wetland R-E)

938

J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\5-10 RedmondOffsite2_124th.mxd

6.0 Results of Field Evaluations – King County

6.1 Overview

Figure 6-1 shows an overview of the wetlands and streams that were delineated within the portions of the project study area under the jurisdiction of King County. Figures 6-2 and 6-3 show detailed information pertaining to site wetlands, including wetland and stream locations, topographic contours, and regulatory buffers. Two wetlands and two streams have been mapped within the study area. Two sample plots were investigated during the initial field study to characterize the upland and wetland conditions within the study area, with an additional two sample plots investigated during the verification/redelineation. Appendix E provides a summary of information for each sample plot, which includes documented findings pertaining to vegetation, soils, and hydrology. The locations of sample plots are shown on Figures 6-2 and 6-3. Additional information can be found on the field data forms in Appendix B, and on the wetland rating forms in Appendix C.

6.2 Wetlands

6.2.1 Wetland KC-A

Wetland KC-A is a large PEM wetland located in the diked 100-year floodplain of the Sammamish River. It crosses jurisdictional lines, and is the same wetland as Wetland R-E (Section 5.2.5). Only a small portion of the wetland occurs within the study area (Figure 6-2). The estimated mapping of the full wetland is shown on the rating form figures in Appendix C. Wetland KC-A has a depressional HGM class. Site topography is generally flat with minor depressions. Elevations range from approximately 30 feet in the wetland interior and southern boundary to 40 feet. Based on the rating form, which was completed without full access to the wetland, Wetland KC-A is a Category II wetland (scoring 55 points on the 2004 rating form). It generally provides high levels of water quality and hydrologic functions and low levels of habitat functions.

Vegetation. The dominant vegetation is herbaceous, with portions of the wetland being actively used for hay or other seasonal crops. Reed canarygrass is dominant in areas not currently under cultivation. This invasive grass forms thick stands with dense root mats that effectively limit reproduction and growth of native species. Within the portion of the wetland in the study area, reed canarygrass was the dominant species, with low amounts of other weedy species, such as Himalayan blackberry and giant horsetail.

Soils. Soils observed within the study corridor are deep, fine-textured, and have a thick dark surface horizon. At wetland Sample Plot SP-A1, soils observed were silty clay loams with redoximorphic concentrations present within the lower part of the dark (10YR 3/1) A horizon. The soils meet the Redox Dark Surface (F6) hydric soil indicator. The dominant soil map unit for the larger wetland is Tukwila muck. Organic soils in the interior of the wetland in the adjacent Redmond area were confirmed by a previous delineation (The Watershed Company 2009).

Hydrology. The primary sources of hydrology are precipitation and high groundwater across the site. There is also surface and subsurface flow that enters the wetland along its west side. Stream KC-1 flows into the wetland through a culvert under the railroad bed (Figure 6-2). 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. Isolated ponding was observed during the June 28, 2016 field visit. Additional ponding was observed during the May 6, 2015 visit. At Wetland Sample Plot SP-A1, no surface water was observed, but the soil in the log hole was saturated at the surface. The Saturation (A3) wetland hydrology indicator was met.

6.2.2 Wetland KC-B

Wetland KC-B is a small PEM wetland located within the swale between Willows Road and the railroad embankment. The entire wetland is within the study area (Figure 6-2). Wetland KC-B has a depressional HGM class. Based on the 2004 rating form, Wetland KC-B is a Category III wetland (scoring 43 points). It generally provides high levels of water quality functions, moderate hydrologic functions, and low levels of habitat functions.

Vegetation. The dominant vegetation is reed canarygrass, with lesser amounts of red alder, Himalayan blackberry, field horsetail (*Equisetum arvense*), and common lady fern (*Athyrium filix-femina*).

Soils. Soils observed within the wetland have a very dark brown (10YR 2/2) silt loam surface (0 to 5 inches) with a large amount of organic matter. Below this is a very dark greenish gray (10Y 3/1) loamy sand with common redox concentrations. The soils meet the Loamy Mucky Mineral (F1) indicator in the surface layer, and the Sandy Redox (S5) indicator in the subsurface layer.

Hydrology. 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. Ponding was observed in the wetland interior during the June 2019 field visit. High flows discharge into a drainage ditch that appears to flow south at very low gradient.

6.3 Streams

6.3.1 Stream KC-1

Stream KC-1 (Figure 6-2) is an intermittent stream associated with Wetland KC-A that extends beyond the study area boundary. The portion within the study area is 408 square feet/34 linear feet). 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. The OHWM was determined by observations of bed and bank. However, given the narrow width of the stream, its center line was mapped using the GPS rather than its banks. This tributary receives stormwater runoff from Willows Road and agricultural fields.

Stream Assessment. This segment of Stream KC-1 in the study area is adjacent to an old railroad corridor, agricultural fields, and a goat farm. It has a low gradient with low flow, and the stream 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.

Riparian Corridor Characterization. The riparian corridor is fragmented and truncated by agricultural fields. Riparian vegetation consists of reed canarygrass and Himalayan blackberry thickets. Wildlife species found in the riparian corridor are primarily birds, although two deer were observed in the right-of-way.

Existing Stream Value for Fisheries Habitat. There is no documentation of salmon in this segment of stream, and salmonid access to this area is blocked by multiple fish barriers. In addition, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. It also does not provide habitat for resident fish species, and there is no evidence of resident fish occurring in the stream channel. However, as it likely connects outside of the study area to a stream channel that has been mapped by SalmonScape as having modeled presence of salmonids (see Section 4.2.4). Therefore, the recommended classification for this stream segment is Type N.

6.3.2 124th Street Stream

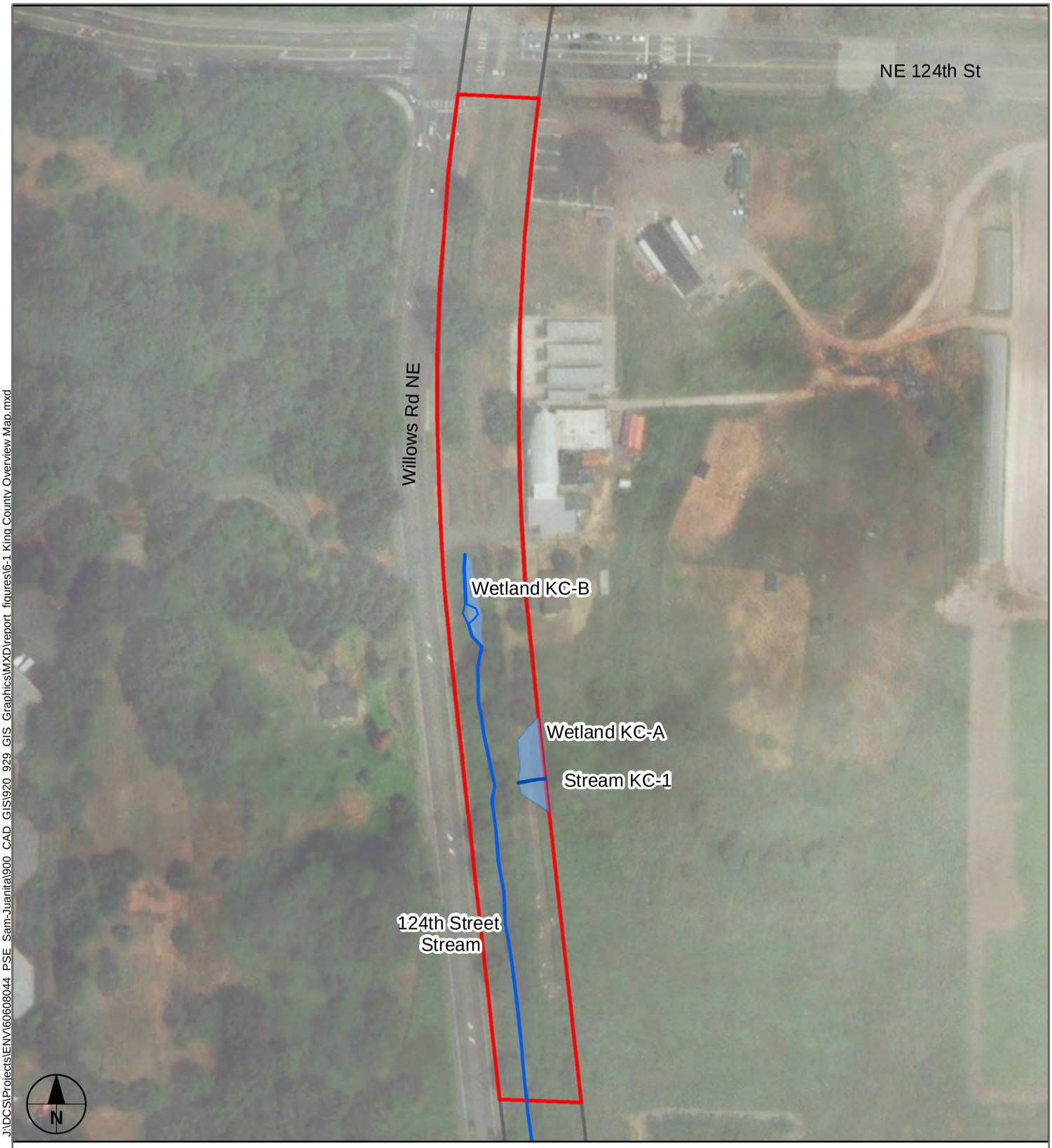
124th Street Stream is likely an intermittent stream that runs adjacent to Willows Road NE, occurring in both Redmond and unincorporated King County. The portion in King County (Figures 6-2 and 6-3) totals 1,588

square feet. This stream was not mapped during the initial survey because it does not have a defined channel, no water was present during site visits, and the area was overgrown with blackberry. However, during a site visit in April 2019 with the City of Redmond, water was present in the stream and there was evidence that vegetation maintenance had occurred.

Stream Assessment. The segment of 124th Street 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 April 2019 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 Corridor Characterization. Riparian vegetation is primarily Himalayan blackberry, with some reed canarygrass and Japanese knotweed (*Polygonum cuspidatum*) also present. When not actively controlled, this aggressively weedy vegetation grows up over the stream, forming a dense thicket. 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 the area could include small mammals and deer, as well as a variety of birds.

Existing Stream Value for Fisheries Habitat. SalmonScape shows a stream in this location, but there is no documentation of salmon in this segment. Within the study area, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. Therefore, our recommended classification is Type F.



J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\6-1 King County Overview Map.mxd

0 50 100 200 Feet

Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

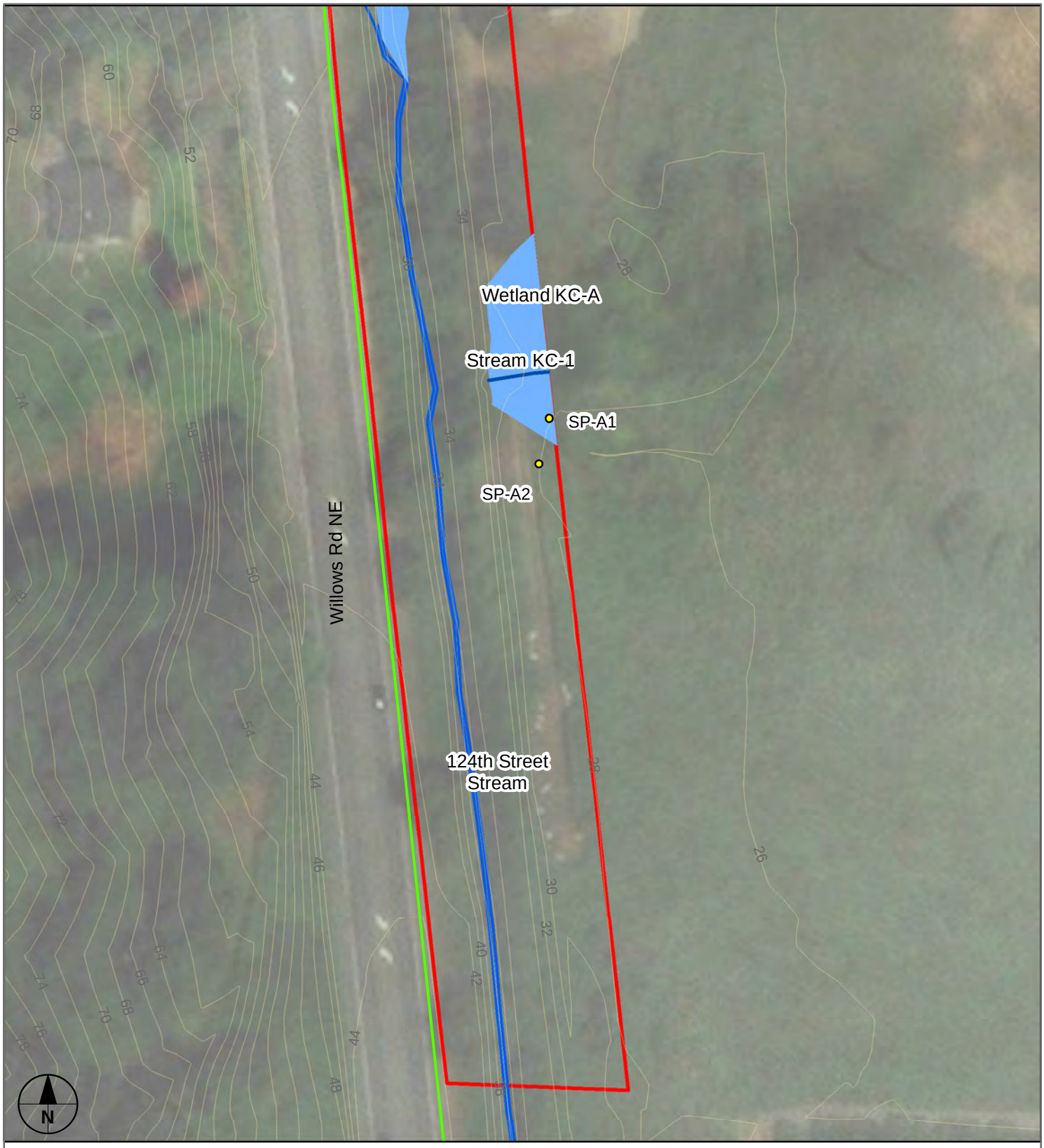
Study Area (King County)

Delineated Wetland

Delineated Stream

Figure 6-1

King County
Overview of Delineated Wetlands and Streams



Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

Study Area (King County)
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100
Feet

Figure 6-2
Wetland KC-A
Stream KC-1
124th Street Stream

943

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Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

Study Area (King County)
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 6-3

Wetland KC-B and 124th Street Stream

944

J:\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\6-3 KCB_124th.mxd

7.0 Results of Field Evaluations – City of Kirkland

7.1 Overview

Figures 7-1 through 7-3 show an overview of the wetlands and streams that were delineated along the portions of the study area under the jurisdiction of Kirkland. Figures 7-4 through 7-12 show detailed information pertaining to site wetlands and streams. A total of 32 sample plots were investigated during the initial field study to characterize the upland and wetland conditions within the study area, with an additional 19 sample plots investigated during the verification/redelineation. Appendix E provides a summary of information for each sample plot, which includes documented findings pertaining to vegetation, soils, and hydrology. The locations of sample plots are shown on Figures 7-4 through 7-12. Additional information can be found on the field data forms in Appendix B and on the wetland rating forms in Appendix C.

As a result of wetland delineations conducted during April 2014, April and June 2016, October and November 2017, and June and July 2019, 15 wetlands have been mapped within the study area (Figures 7-4 through 7-12). Numerous linear wetlands are associated with drainage ditches and other manmade features on both sides of the embankment associated with the former railroad. They are located in topographic depressions and receive runoff from nearby developed areas. Many are connected via culverts under roads, or by drainage ditches that do not also support wetlands. Additionally, the study area includes portions of three large wetlands that contain multiple wetland classes, including open water, and have a high level of structural diversity. Only a portion of these wetlands (K-J, K-L, and K-HF) were accessible to biologists during site visits. Six streams were also mapped within the study area (Figures 7-4, 7-5, 7-7, 7-10, and 7-11), all of which were associated with mapped wetlands.

Wetlands and streams that were delineated during field surveys are discussed in more detail in the sections that follow.

7.1.1 Wetland K-AA and Stream K-1

Wetland K-AA is a small (0.002 acre) PEM wetland located in a ditch between Willows Road NE and a railroad embankment (Figure 7-4). The entire wetland occurs within the study area. Wetland K-AA has a depressional HGM class. Based on the rating form, Wetland K-AA is a Category III wetland (scoring 16 points). It provides moderate levels of water quality and hydrologic functions, and low levels of habitat functions. It is associated with Stream K-1, an intermittent stream that enters the study area through a culvert underneath Willows Road NE, and flows through a second culvert underneath the railroad embankment to the east side of the study area.

Vegetation. The dominant wetland vegetation is reed canarygrass, with lesser amounts of water-starwort (*Callitriche* sp.). There was approximately 40 percent bare ground at the time of inspection (April 15, 2016).

Soils. The soils at the wetland sample plots (SP 500 and SP 501) are silt loams and silty clay loams. They have a dark surface (10YR 3/1) over a subsurface layer with a depleted matrix (hydric soil indicator F3).

Hydrology. The primary source of hydrology is surface runoff from the adjacent slopes. The wetland is located in a swale that traps stormwater from Willows Road NE, and water is impounded by the railroad fill. The wetland discharges to seasonal Stream K-1. During the April 2016 site visit, the water table was within 12 inches of the surface (wetland hydrology indicator A2). The dominant hydroperiods are occasionally flooded (<0.5 feet deep) and saturated.

The OHWM of Stream K-1 (386 square feet within the study area) was determined by observations of bed and bank (Figure 7-4). The stream receives stormwater runoff from Willows Road NE and an adjacent

nursery to the west. The channel is primarily linear and has a width of 1.5 feet. The stream has a variety of grades, with both high and low flow areas. The stream bed substrate is silt/sediment. The stream is in poor condition. It has been impaired by the surrounding development and provides low habitat quality and diversity. Based on field observations, the segment of the stream within the study area lacks the aquatic habitat complexity to support fish. No evidence of fish was observed during the site visits. At least two culverts upstream of the Sammamish River block fish access to this stream segment.

The riparian corridor is fragmented and truncated by adjacent business and associated parking areas. Riparian vegetation consists of scattered patches of Himalayan blackberry with some black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) trees. The riparian area is narrow, at about 25 feet wide. Wildlife species found in the riparian corridor are primarily birds.

The various background data sources provide different information about streams in this portion of the study area. Kirkland GIS data does not have any streams mapped in the vicinity. King County has a stream mapped along the railroad embankment further to the north (Stream K-2 in this report; see Section 7.1.2). SalmonScape, however, shows an intermittent stream running along the east edge of the railroad embankment for the full length of the study area, then turning and flowing east along NE 124th Street to the Sammamish River. As discussed in Section 7.1.2, this stream is mapped by SalmonScape as having documented presence of salmon. Observations made in the field more closely corroborate the King County mapping (although this small stream channel is not mapped at all), as there is no stream channel south of Stream K-1. Based on the available information, there does not appear to be a surface water connection, even through culverts, to other stream channels that might support salmonids or other fish. Given this information and the poor-quality habitat provided by the stream channel, our recommended classification for this stream segment is Type Ns – seasonal non-fish bearing.

7.1.2 Wetland K-BB and Stream K-2

Wetland K-BB is a linear PEM/PSS/PFO wetland located in a ditch between the former railroad embankment and an industrial site (Figure 7-5). Only the southern extent of the wetland occurs within the study area. Wetland K-BB has a depressional HGM class. Based on the rating form, it is a Category II wetland (scoring 20 points). It provides moderate levels of water quality, hydrologic, and habitat functions.

Stream K-2 partially runs within Wetland K-BB, but continues for about 150 feet beyond the south wetland boundary before petering out. The line shown in Figure 7-5 represents just the west OHWM of this stream, as it is partially outside of the study area boundary. Based on field observations, the location of this stream matches King County GIS mapping, which shows the stream ending at approximately the same location. According to the county's mapping, the stream originates east of 141st Avenue NE, probably via a culvert under the road.

Vegetation. The herbaceous layer is dominated by reed canarygrass. The forested layer is dominated by red alder and black cottonwood. The scrub-shrub layer is dominated by willows (*Salix* spp.) and Himalayan blackberry.

Soils. The soils at the wetland sample plot (SP503) are silt loams with a dark surface (10YR 4/1) with redoximorphic concentrations. The soils meet hydric soil indicator Redox Dark Surface (F6).

Hydrology. The primary source of hydrology is surface runoff from the surrounding slopes and shallow groundwater. The wetland discharges to Stream K-2. Standing water was observed in some locations in the wetland during the April 2016 site visit. Depth of inundation is estimated at 2 to 3 feet. In other locations, the water table was 7 inches below the ground surface. The dominant hydroperiods are permanently inundated, seasonally inundated, and saturated.

Stream K-2 receives stormwater runoff from 141st Avenue NE and an adjacent nursery. It has a mostly linear channel with a width of 1.5 feet. The stream grade is relatively flat, paralleling the railroad

embankment. The stream bed substrate is silt/sediment. The stream is in poor condition. It has been impaired by the surrounding development and provides low habitat quality and diversity.

The riparian corridor is fragmented and truncated by adjacent business and associated parking areas. Riparian vegetation consists of scattered patches of blackberry with some black cottonwood trees. The riparian area is narrow, at about 25 feet wide. Wildlife species found in the riparian corridor are primarily birds.

Based on field observations, the segment of the stream within the study area lacks the aquatic habitat complexity to support fish. No evidence of fish was observed during site visits. However, WDFW indicates that there is documented salmonid presence in a stream in the same location. The WDFW mapping is at least partially incorrect, as the stream does not extend south to NE 124th Street, and does not curve to the east along the road. King County mapping, which appears to be the most accurate in regard to this stream, indicates a surface water connection to a series of apparently man-made channels that eventually flow to the Sammamish River. Despite observations within the study area that Stream K-2 lacks suitable habitat for fish, it is connected to streams that do provide habitat for salmonids, and there is evidence to suggest that salmonids have been observed in this stream in the past. Therefore, our recommended classification for this stream segment is Type F – fish bearing.

7.1.3 Wetland K-A

Wetland K-A is a very small (0.01-acre) PEM depressional wetland located on the west side of the railroad embankment (Figure 7-6). Steep slopes occur on both the east and west sides of the wetland, and it is fed by precipitation and stormwater runoff from the surrounding developed areas. A culvert at its eastern edge provides a hydrologic outlet. Based on the rating form, Wetland K-A is a Category III wetland (scoring 16 points). It provides moderate levels of water quality and hydrologic functions, and low levels of habitat functions. It has a single wetland class and low plant and structural diversity. The area does provide some habitat features: while no raptor nests were observed during the site visit, it is likely that one is present in the nearby forested areas. The wetland has a narrow vegetated upland buffer almost all the way around that is connected to habitat areas to the north.

Vegetation. Wetland K-A is surrounded by red alders in the adjacent upland areas, but there are no trees rooted within the wetland. Dominant species within the wetland are reed canarygrass and field horsetail (*Equisetum arvense*), with some Himalayan blackberry and field bindweed (*Convolvulus arvensis*) also present.

Soils. Soils at Sample Point SP-1 consisted of clay loams, with low chroma soils (10YR 4/1) and redox concentrations starting at a depth of 7 inches. This soil meets the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. At the time of the site visit, surface water was not observed, but soils were saturated to the surface and the water table was encountered at a depth of 5 inches. Therefore, both the High Water Table (A2) and Saturation (A3) primary indicators of wetland hydrology were met.

7.1.4 Wetland K-B and Stream K-7

Wetland K-B is a vegetated ditch on the south side of the railroad embankment, just east of 135th Avenue NE (Figure 7-7). It is a linear PEM depressional wetland, 0.07 acre in size, that receives surface water runoff from adjacent upslope development. Based on the rating form, Wetland K-B is a Category IV wetland (scoring 15 points). It 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 (154-square foot), 1- to 2-foot-wide, unnamed tributary that receives water from Wetland K-B (Figure 7-7). The perennial 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 maple 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 by WDFW or Kirkland, and the stream is not connected to fish bearing waters. Therefore, our proposed classification for this stream is a Type Np water

Vegetation. The dominant plant species in this wetland are reed canarygrass and cattail (*Typha* sp.), with a variety of other herbaceous species, including field horsetail, St. John's wort (*Hypericum perforatum*), duckweed, smartweed (*Polygonum* sp.), common velvetgrass, bentgrass (*Agrostis* sp.), and small-fruited bulrush (*Scirpus microcarpus*).

Soils. The wetland is underlain by railroad rock embankment, primarily cobble more than 4 inches in diameter. For this reason, a soil pit could not be dug to describe soils. A thin layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. During field visits, areas of standing/ponded water were observed, but there was no active flow of water within the ditch. At Sample Plot SP-KB1, 4 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.1.5 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 Avenue NE (Figure 7-7). It is located across the trail from Wetland K-B, on the north side. It is a linear PEM depressional wetland, 0.08 acre in size, 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. Based on the rating form, Wetland K-C is a Category III wetland (scoring 16 points). It 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 Wetland K-A and habitat areas further to the north.

Vegetation. Reed canarygrass is prevalent in this wetland, but it also has a large component of smartweed, softstem bulrush (*Schoenoplectus tabernaemontani*), cattail, and common rush. 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. Some Himalayan blackberry is also present within the wetland. A population of the aquatic plant duckweed was observed in an area of standing water.

Soils. Similar to Wetland K-B, wetland K-C is underlain by rock from the railroad embankment, primarily cobble more than 4 inches or more in diameter. For this reason, a soil pit could not be dug to describe soils. A layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff from adjacent steep slopes. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. Standing water was observed within the ditch during the site visit. At wetland Sample Plot SP-KC1, 4 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.1.6 Wetland K-D

Wetland K-D is an approximately 0.7-acre PEM depressional wetland associated with a ditch north of the railroad embankment, west of 135th Avenue NE (Figure 7-8). 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 to Wetland DD via a short culvert through a berm utility box area, with flow eventually draining via a culvert under 132nd Place NE to Wetland K-G to the west (Figure 7-9). A 1- to 2-foot-wide drainage ditch conveys water the entire length of the wetland. The ditch has variable hydrology, with segments that were dry, ponded, and free flowing during the June 2019 site visit. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. Dominant plant species in this wetland are reed canarygrass and cattail, with scattered rose spirea, 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 and red alder trees are scattered throughout the wetland, but a forested class is not present.

Soils. During the initial delineation, observed soils at wetland Sample Plot SP-3, observed soils were silt loams with a low chroma (10YR 2/1) down to a depth of 11 inches, with redox concentrations between 7 and 11 inches. Below 11 inches, a high water table prevented further documentation of soils. This soil meets the Redox Dark Surface (F6) hydric soil indicator. During the verification/redelineation, soils at this location were similar. At a second wetland sample plot (KD-1), rock fill was observed from 0 to 2 inches, with a mix of black (10YR 2/1) gravelly loam (30 percent) and rock fill (70 percent), and 2 percent redox concentrations from 2 to 8 inches. Biologists could not dig deeper than 8 inches because of inundation and fill. This soil meets the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. During site visits, standing water was observed within the wetland. At Sample Plot SP-3 during the initial delineation, 6 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3). Similar conditions were observed at this sample plot and at new Sample Plot KD-1 during the verification/redelineation, but with 3 inches and 0.5 inch of standing water, respectively.

7.1.7 Wetland K-DD

Wetland K-DD is small (less than 0.1-acre) PEM depressional wetland which is hydrologically connected to Wetland K-D (Figure 7-8). A berm with a utility box separates the wetlands. Wetland DD drains via a culvert under 132nd Place NE to Wetland K-G to the west. At the time of the field visit in June 2019, a moderate amount of water flow was passing through the wetland via two culverts: one culvert conveying water from Wetland K-D and the other culvert conveying water from stormwater runoff from commercial developments south of the wetland. Because Wetland K-DD is hydrologically connected to Wetland K-D, the wetlands were rated together, and were both determined to be Category III wetlands.

Vegetation. The dominant plant species in this wetland is reed canarygrass, with lesser amounts of field horsetail, bird's-foot trefoil (*Lotus corniculatus*), and Himalayan blackberry also present. The vegetation in the wetland is disturbed and periodically mowed.

Soils. At wetland Sample Plot K-DD1, observed soils down to a depth of 20 inches were silt loams with a low chroma (10YR 2/1 and 10YR 4/1) and redox concentrations between 6 and 20 inches. This soil meets the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. At Sample Plot KDD-1, the water table was observed at a depth of 9 inches, and soils were saturated at a depth of 4 inches. Therefore, this wetland meets wetland hydrology indicators High Water Table (A2), and Saturation (A3).

7.1.8 Wetland K-E

Wetland K-E is a linear, 0.05-acre PEM depressional wetland located south of the trail from Wetland K-D. 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. Based on the rating form, it is a Category IV wetland (scoring 15 points). It 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.

Vegetation. The dominant vegetation in this wetland is reed canarygrass and cattail, with lesser amounts of other herbaceous species such as softstem bulrush, smartweed, St John's wort, bird's-foot trefoil, and bentgrass.

Soils. The wetland is underlain by rock from the railroad embankment, primarily cobble more than 4 inches in diameter. For this reason, a soil pit could not be dug to describe soils. A thin layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. During site visits, areas of standing/ponded water were observed, but there was no active flow of water within the ditch. At wetland Sample Plot SP-KE1, 2 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.1.9 Wetland K-F

Wetland K-F is a linear, 0.4-acre PEM/PFO depressional wetland located south of the trail, just east of 132nd Place NE (Figure 7-9). It receives stormwater runoff from adjacent developed areas, and functions as a ditch, similar to other wetlands in the area. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. The dominant tree species are black cottonwood and Pacific willow. The dominant herbaceous species are reed canarygrass and common rush. Other plant species observed include rose spirea, bird's-foot trefoil, Himalayan blackberry, redosier dogwood, Sitka willow, and field horsetail.

Soils. During the initial delineation, at wetland Sample Plot SP-5 biologists were only able to dig down to a depth of 8 inches, because rock fill from the railroad berm impeded further excavation with a shovel. From 2 to 8 inches, soils were dark gray (7.5YR 4/1) gravelly silt loams, with prevalent redox concentrations, and noticeable depletions. Soils meet the hydric soil indicator Depleted Matrix (F3). During the verification/redelineation at wetland Sample Plot SP-KF2, dark grayish brown (10YR 4/2) silty clay loams with redox concentrations were observed to a depth of 12 inches. Soils meet the hydric soil indicator Redox Dark Surface (F6).

Hydrology. During the initial site visit, ponding water to a depth of 1 inch was observed at Sample Plot SP-5. The water table was at the ground surface, and the soil was saturated to the surface. Therefore, this sample plot meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3). At new Sample Plot SP-KF2, no saturated soils or water table were encountered within the top 12 inches. However, the primary indicators Sediment Deposits (B2), Surface Soil Cracks (B6), and Sparsely Vegetated Concave Surface (B8) were observed.

7.1.10 Wetland K-G

Wetland K-G is located on the north side of the trail, across from Wetland K-F, between 132nd Place NE and 128th Lane NE (Figure 7-9). It is a linear, PEM, depressional wetland, 0.2 acre in size, located in a ditch that receives stormwater water runoff from upslope adjacent developed areas and conveys it west toward 128th Lane NE, where a culvert runs under the road to Wetland K-J and Stream K-3 (see Section 7.1.11; Figure 7-10). A 1- to 2-foot drainage ditch conveys water the entire length of the wetland. Substrate in the ditch is primarily silt and sediment. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. The dominant vegetation in this wetland consists of reed canarygrass and cattail, with patches of common rush and a few scattered rose spirea shrubs. The wetland is bounded along its north edge by Himalayan blackberry.

Soils. During the initial wetland delineation, at wetland Sample Plot SP-7, soils to a depth of 20 inches were very dark grayish brown (10YR 3/2, 2.5Y 4/2) silt loams. From 0 to 8 inches, redox concentrations were visible in the profile. From 8 inches to 20 inches, redox concentrations were prevalent in a depleted matrix (10YR 5/1). Soils met the hydric soil indicator Depleted Matrix (F3). At wetland Sample Plot SP-6 (not pictured on Figure 7-9), rocks impeded evaluation of soil characteristics. At wetland Sample Plot SP-KG2, inundation and a riprap swale bottom impeded evaluation of soil characteristics. During the verification/redelineation, soils at Sample Plot SP-7 were similar to those observed in 2014, meeting the same hydric soil indicator. At new Sample Plot SP-KG2, organic matter was observed in the top 1 inch, and from 1 to 6 inches in depth, very dark brown (10YR 2/2) silt loams were observed. Biologists were unable to dig below 6 inches because of rock fill. Hydric soils were assumed based on the presence of obligate wetland plants and wetland hydrology.

Hydrology. During field surveys, 14 inches of water were in the ditch in April 2014, 5 inches of water were in the ditch during November 2017, and 1 inch of water was in the ditch in June 2019. Additionally, soils at all wetland sample plots were saturated to the surface, and the water table was at the ground surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.1.11 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 (Figure 7-9). It is a 0.03-acre PEM/PFO depressional wetland south of the trail. It appears to collect water during the wet season, and has no surface water inlets or outlets. Based on the rating form, it is a Category III wetland (scoring 18 points). It 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.

Vegetation. 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 (cottonwoods and Pacific willows) between 20 and 50 feet tall and an herbaceous understory. Other common herbaceous species within the wetland include bird's-foot trefoil and common rush.

Soils. The wetland is surrounded by fill to the west and southwest, and a restrictive layer of rocks impeded digging beyond 5 inches at wetland Sample Plot SP-8 during the initial delineation, and below 6 inches during the verification/redelineation. During both sampling events, a depleted matrix (hydric soil indicator F3) was observed in the upper portion of the soil profile. Soils were silt loams with a light brownish gray (10YR 6/2) matrix and brownish yellow (10YR 6/8) redox concentrations.

Hydrology. Standing water and saturated soils were observed at the time of the 2014 site visit. At wetland Sample Plot SP-8, 1 inch of standing water was measured. The water table was at the surface, and soils were saturated to the surface. Therefore, primary wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3) were documented. During the verification/redelineation, no standing water, saturated soils, or water table were observed at this sample plot. However, primary indicators Surface Soil Cracks (B6) and Sparsely Vegetated Concave Surface (B8) were observed.

7.1.12 Wetland K-J and Stream K-3

Wetland K-J is a large PEM/PSS/PFO/POW wetland that is associated with Totem Lake (Figure 7-10). According to Kirkland GIS mapping, this wetland is 20.3 acres in size and extends well outside of the study area. Biologists were unable to access the entire wetland, so field observations may not be reflective of the wetland as a whole. The rating form figures in Appendix C show an estimate of the full wetland area. Based on the rating form, wetland K-J is a Category I wetland (scoring 24 points). It 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). Just west of 128th Lane NE, the wetland is a narrow, vegetated ditch with some overhanging trees. The water in this ditch flows southwest, then becomes a meandering stream 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 trail between this wetland and Wetland K-K to the south. Numerous birds were observed in this wetland during field visits, including willow flycatcher (*Empidonax traillii*), Oregon junco (*Junco hyemalis*), and American crow (*Corvus brachyrhyncos*).

Stream K-3 is an unnamed tributary to Totem Lake and mapped by Kirkland as non-salmon bearing. SalmonScape shows an intermittent stream in the same general location as Stream K-3. However, it does not extend up to the north as the Kirkland map indicates. Figure 7-10 shows the center line of this stream, which has a variable width of up to 24 inches within the study area. No salmon presence is documented in this stream by WDFW or Kirkland. However, during a field visit on August 21, 2015, about ten 3-inch long juvenile fish where observed in the stream channel. The fish were difficult to identify to species but were in the minnow family (Cyprinidae). Therefore, our proposed classification for this stream is a Type F water.

Vegetation. 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 railroad bed and adjacent upland development to the north. The dominant species are reed canarygrass and field horsetail, with common rush, slough sedge, and scattered rose spirea and Himalayan blackberry also present. 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. Within the PFO portions, common tree/tall shrub species are red alder, cottonwood, Pacific willow, and red elderberry (*Sambucus racemosa*). In the PSS portions of the wetland, common shrub species include redosier dogwood, Pacific and Scouler's willow, salmonberry, red alder, and rose spirea. Himalayan and cutleaf blackberry (*Rubus laciniatus*) are also present. Field horsetail is the dominant herbaceous species. Areas of emergent vegetation are interspersed with the shrubs. Within PEM areas, the dominant vegetation consists of cattails, Himalayan blackberry, field horsetail, scattered Pacific and other willows, reed canarygrass, and smartweed.

Soils: During the initial delineation, at wetland Sample Plot SP-9 soils to a depth of 18 inches were black (2.5Y 3/1). No redox was observed. Soils in this sample plot meet the hydric soil indicator Depleted Matrix (F3). At wetland Sample Plot SP-KJ1, soils from 0 to 12 inches were dark greenish gray, gleyed silt loams. Because of inundation at the time of the site visit, the soil log hole could not be dug deeper. Soils in this sample plot met the hydric soil indicator Loamy Gleyed Matrix (F2). During the verification/redelineation, soils at Sample Plot SP-9 were a bit different and, based on the presence of rocks at a depth of 10 inches, the soil log hole was probably dug in a slightly different location. Soils to a depth of 10 inches were very dark

gray (10YR 3/1) silt loams with 5 percent redox concentrations. Soils met the hydric soil indicator Redox Dark Surface (F6).

Hydrology: During the initial delineation, soil at Sample Plot SP-9 was saturated starting at a depth of 5 inches, and the water table was also high. At wetland Sample Plot SP-KJ1, 1 inch of surface water was present, and soils were saturated to the surface. Therefore, the wetland hydrology indicators Surface Water (A1), High Water Table (A2) and Saturation (A3) were being met. At other locations within the wetland, large areas of deep standing water were also observed. During the verification/redelineation, no surface water or water table was observed at Sample Plot SP-9, but saturated soil was observed at a depth of 5 inches. Therefore, the wetland hydrology indicator of Saturation (A3) was being met.

7.1.13 Wetland K-K and Stream K-6

Wetland K-K is an approximately 1.5-acre, PFO depressional wetland located on the south side of the railroad embankment, across from Wetland K-J (Figure 7-10). A culvert running beneath the trail provides a hydrologic connection between the two wetlands. The boundary of Wetland K-K was mapped in 2017 and then extended in 2019 based on observations made during the verification/redelineation effort. Based on the rating form, Wetland K-K is a Category III wetland (scoring 16 points). It 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 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.

The City of Kirkland maps a small channel in Wetland K-K that runs parallel and adjacent to the trail, and branches off to the south. WDFW also maps a stream in this location, with no documented salmon presence. During the initial field surveys to map the channel, biologists noted standing water with no evidence of bed or bank, and no flow. Therefore, there was no apparent stream in this location. During the verification/redelineation, Stream K-6 was mapped. This stream is a 1- to 2-foot-wide tributary 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, confined by adjacent commercial developments, and loses an active channel signature within Wetland K-K. Based on Kirkland mapping, no salmon are present. Neither SalmonScape nor PHS databases indicate salmon presence in the stream. Because of the stagnant flow, turbidity, sediment, and subsequent low oxygen, it is unlikely to support fish, and is therefore a Type Np water.

Vegetation. The dominant tree species in this wetland are red alder, Pacific and other willows, and black cottonwood. The most prevalent species in the shrub layer is Himalayan blackberry. Common herbaceous layer species include field horsetail and fireweed (*Chamaenerion angustifolium*).

Soils. During the initial delineation, at wetland sample plot (SP-KK1) a restrictive layer of rocks impeded digging beyond 12 inches. In the upper 6 inches of the soil profile, soils were a mix of very dark gray (10YR 3/1) sandy clay loams and fill material. Dark yellowish brown (10YR 4/6) redox concentrations were present (2 percent). From 6 to 12 inches, soils were very dark grey (G1 3/N) sandy clay loams, with 30 percent of this layer consisting of 1-inch angular rock (fill material). Based on the soils within the upper 12 inches of the soil profile, the sample plot met the Redox Dark Surface indicator (F6). During the verification/redelineation, soils at Sample Plot SP-KK1 were similar to those observed in 2017, with the same hydric soil indicator. At new wetland Sample Plot SP-KK4, black (10YR 2/1) silt loams with 2 percent redox concentrations were observed to a depth of 12 inches. Inundation prevented digging below 12 inches. The soil met the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. Standing water and saturated soils were observed during both site visits. At wetland Sample Plot SP-KK1, 6 inches of standing water were measured in October 2017 and 0.5 inch was measured in June 2019. Soils were saturated to the surface during both sampling events. At Sample Plot SP-KK4 in June 2019, 0.5 inch of standing water was measured with soils saturated to the surface. Therefore, primary wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3) were documented.

7.1.14 Wetland K-L and Stream K-5

Wetland K-L is a large depressional/riverine wetland with multiple Cowardin classes that is associated with Stream K-5 (Figure 7-11). According to Kirkland GIS, the full wetland is 21.8 acres and includes a large open water component. The wetland rating form figures in Appendix C show the estimated full extent of this wetland. During field surveys, biologists only had access to the westernmost portion of the wetland, within the survey corridor. PEM and PFO wetland classes were observed in this area (see Appendix C). The PSE project corridor is primarily associated with the PEM component, but the forested edge was visible to the east. Based on the rating form (which was completed without full access to the wetland) Wetland K-L is classified as a Category II wetland (scoring 20 points). It provides moderate levels of water quality, hydrologic, and habitat functions. A variety of birds were observed using the wetland within or near the project corridor, 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 mapped by Kirkland and is part a of larger stream-wetland complex. The unnamed tributary drains into Juanita Creek about 0.6 mile downstream of the project corridor. No salmon presence is documented in this stream by WDFW or Kirkland. The general direction of flow in Stream K-5 is east to west, and three segments of the stream are present within the survey corridor (Figure 7-11). The east-west segment is the mainstem channel, which turns south in the project corridor. The other two segments are back channels that flood during high flows but also receive runoff from the north. Because the stream is perennial and there are no fish present, our recommended classification is Type Np – Perennial, non-fish bearing.

Vegetation. In the PEM component, reed canarygrass is the dominant species. Some cattail is also present, with scattered purple loosestrife (*Lythrum salicaria*) plants observed. Outside the study area, a PFO component was observed that predominantly includes alders and willows. A small shrub component was also observed, with Himalayan blackberry, rose spirea, and salmonberry prevalent in this layer.

Soils. During the initial delineation, at the wetland sample plot near the south end of Wetland K-L (T1-SP2), the top 5 inches of the soil profile were very dark gray (7.5YR 3/1) clay loams, over dark gray (10YR 4/1) sandy clay loams to a depth of 14 inches. The Depleted Below Dark Surface (A11) hydric soil indicator was observed. At the wetland sample plot near the north end of the wetland (T2-SP2), the top 12 inches were very dark gray silt loams, over very dark grayish brown (2.5Y 3/2) silt loams to a depth of 12 inches. The Thick Dark Surface (A12) hydric soil indicator was observed at this sample plot. During the verification/redelineation, at the wetland sample plot near the south end of the wetland (KL-SP3), the top 6 inches of the soil profile were very dark grayish brown (10YR 3/2) loams. From 6 to 10 inches, soils were brown sandy loams with 3 percent redox concentrations, and from 10 to 16 inches, soils were dark grayish brown (10YR 4/2) loams with 8 percent redox concentrations. The Depleted Matrix (F3) hydric soil indicator was observed at this sample plot. At the wetland sample plot near the north end of the wetland (KL-SP2), the top 8 inches of the soil profile were very dark grayish brown (10YR 3/2) loam. From 8 to 16 inches, soils were very dark grayish brown (10YR 3/2) clay loams with 5 percent redox concentrations and 3 percent depletions. The Redox Dark Surface (F6) hydric soil indicator was observed at this sample plot.

Hydrology. During the initial delineation the water table was present starting at a depth of 13 to 14 inches. Soil saturation was observed at the surface at wetland sample plot T2-SP2 and at a depth of 2 inches at the wetland sample plot T1-SP2. The primary wetland hydrology indicator Saturation (A3) was observed at both sample plots. During the verification/redelineation, surface water (indicator A1) was present in the north part

of the wetland. No primary wetland hydrology indicators were observed near the south wetland boundary, but two secondary indicators—Geomorphic Position (D2) and FAC-Neutral test (D5)—were observed.

7.1.15 Wetland K-HF (Heronfield Wetlands)

Wetland K-HF is a large depressional wetland with multiple Cowardin classes. Only the northwest edge of the wetland is within the study area. The total wetland is estimated at approximately 20 acres in size. The onsite portion is 0.6 acre. The wetland rating form figures in Appendix C show the estimated full extent of this wetland. During field surveys, biologists only had access to the extreme northwest portion of the wetland. A PFO wetland class was observed in this area (see Appendix C). PSS and PEM classes are present outside of the study corridor. Based on the rating form (which was completed without full access to the wetland) Wetland K-HF is classified as a Category II wetland (scoring 22 points). It provides high levels of water quality and hydrologic functions, and moderate habitat functions.

Vegetation. 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 common lady fern are common in the herbaceous stratum.

Soils. Soils in the wetland were composed of very dark grayish brown (10YR 3/2) peat over very dark brown (10YR 2/2) muck. Organic soils extend 20 inches or more deep (indicator A1-Histosol).

Hydrology. During the June 2019 inspection of Wetland K-HF, a water table was observed at 5 inches below the soil surface (indicator A2). Other wetland hydrology indicators observed include sparsely vegetated concave surface (B8) and water-stained leaves (B9).

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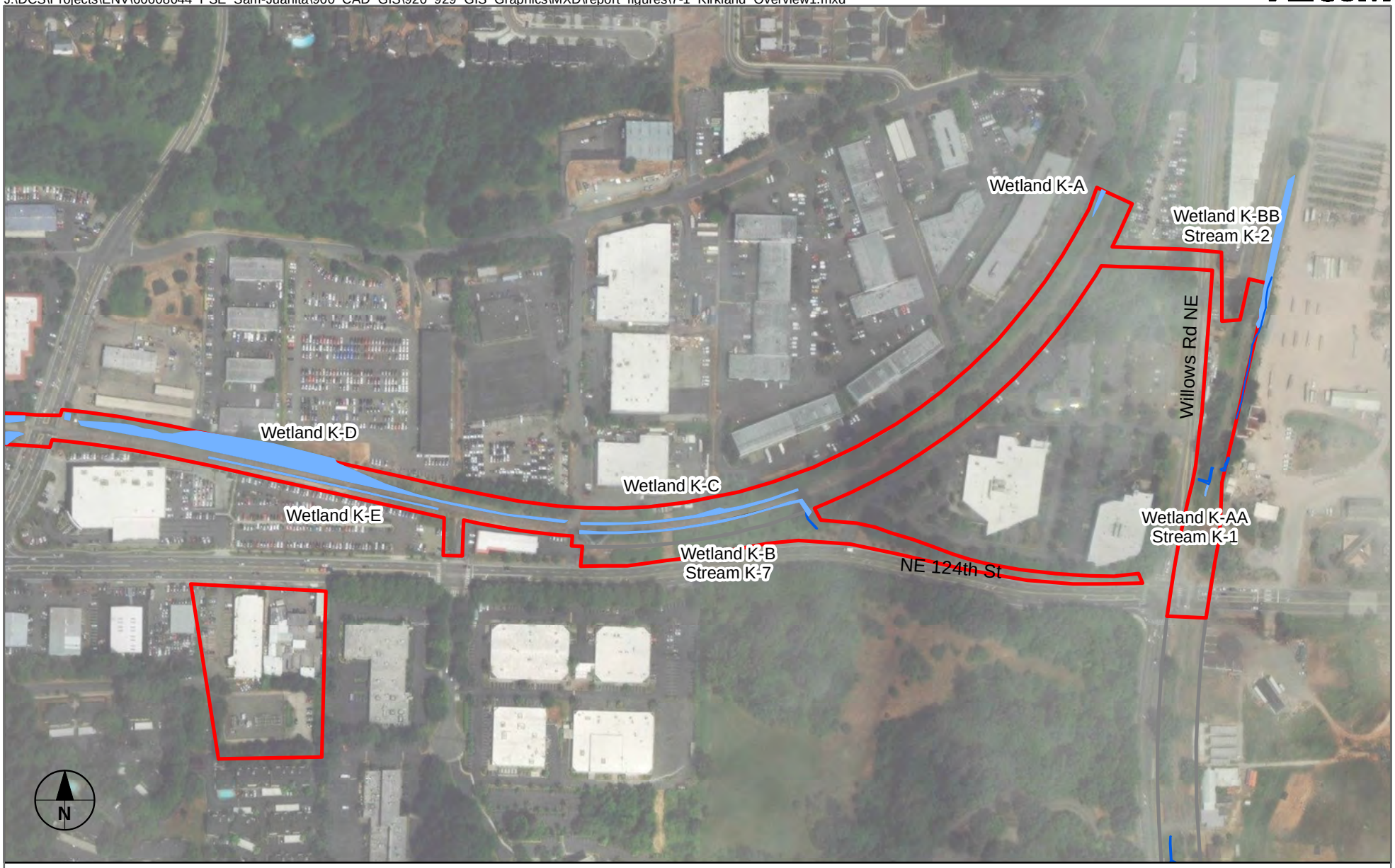

0 125 250 500 Feet

Study Area

Delineated Wetlands

Delineated Streams

Figure 7-1

City of Kirkland
Overview of Delineated Wetlands and Streams
1 of 3

956

Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation
Kirkland, Washington
Project No.: 60608044

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AECOM

0 125 250 500
Feet

Study Area

Delineated Wetlands

Delineated Streams

Puget Sound Energy
Samamish-Juanita Transmission Line
Wetland Delineation
Kirkland, Washington
Project No.: 60608044

Figure 7-2

City of Kirkland
Overview of Delineated Wetlands and Streams
2 of 3

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Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

0 125 250 500
Feet

Study Area

Delineated Wetlands

Delineated Streams

Figure 7-3

City of Kirkland
Overview of Delineated
Wetlands and Streams
3 of 3

Puget Sound Energy
Samamish-Juanita Transmission Line Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 7-4
Wetland K-AA and Stream K-1

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Puget Sound Energy
Samamish-Juanita Transmission Line Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100
Feet

Figure 7-5
Wetland K-BB and Stream K-2

960

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AECOM

Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 7-6

Wetland K-A

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Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Wetland
Delineated Stream
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 7-7

Wetlands K-B and K-C and Stream K-7

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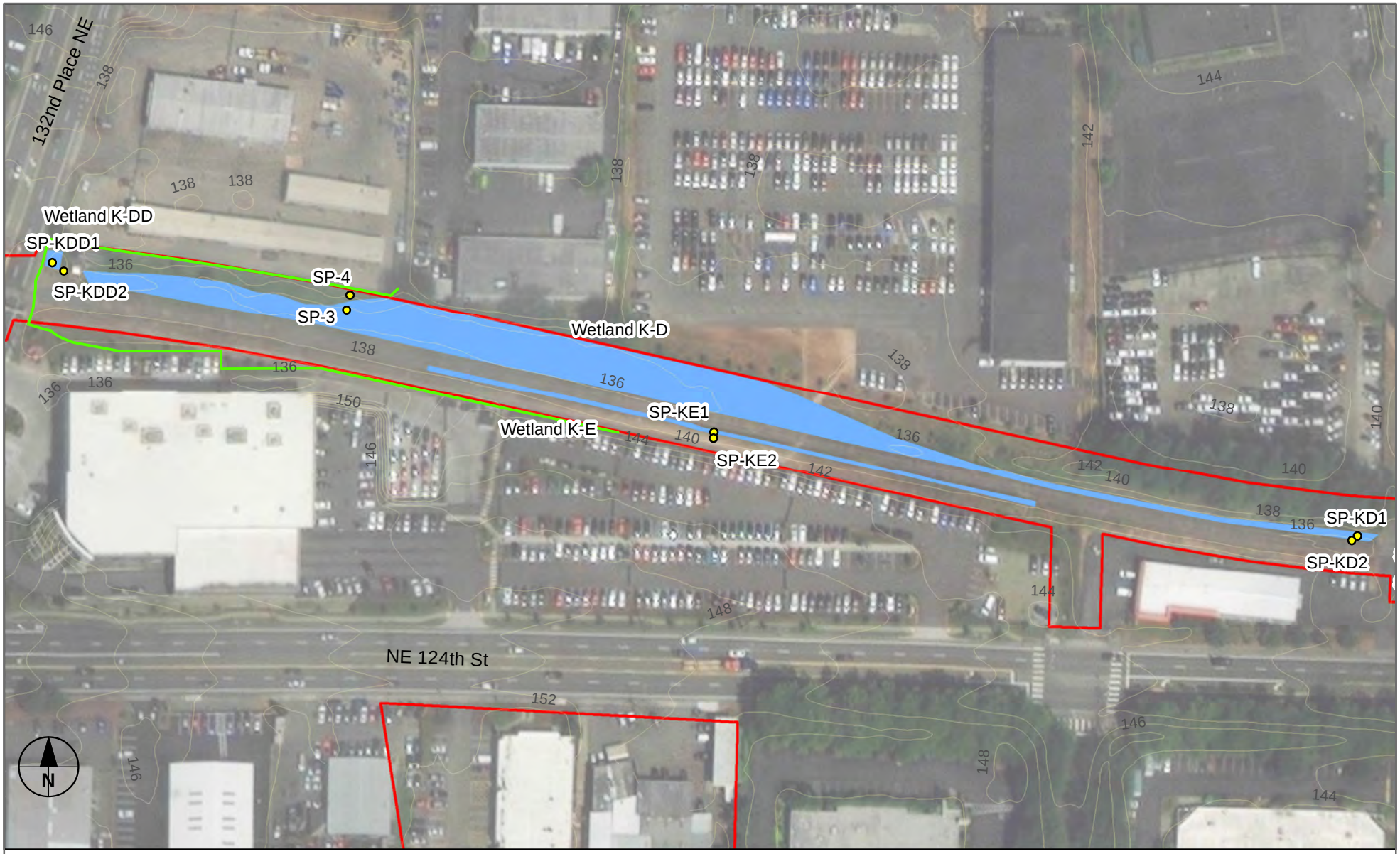
AECOM



Puget Sound Energy
Samamish-Juanita Transmission Line Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
Delineated Wetland
2-foot Contours
Wetland/Stream Buffer

0 50 100 200 Feet

Figure 7-8

Wetlands K-D, K-DD, and K-E

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AECOM

Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
Delineated Wetland
2-foot Contours
Wetland/Stream Buffer

0 50 100 200 Feet

Figure 7-9

Wetlands K-F, K-G, and K-H

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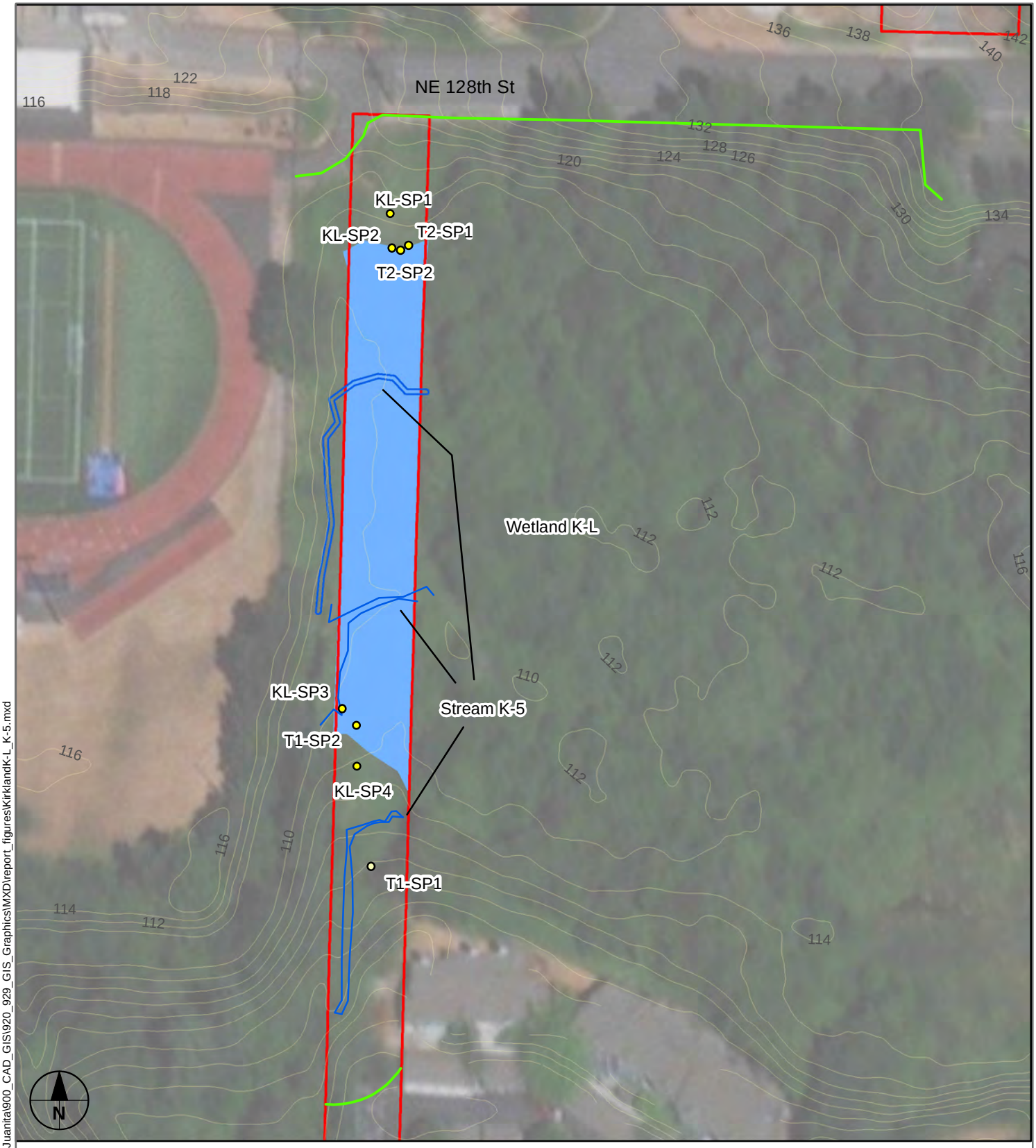
Puget Sound Energy
Samamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
Delineated Stream
2-foot Contours
Delineated Wetland
Wetland/Stream Buffer

0 50 100 200
Feet

Figure 7-10
Wetlands K-J and K-K Streams K-3 and K-6



Puget Sound Energy
Samamish-Juanita Transmission Line Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 50 100 200 Feet

Figure 7-11
Wetland K-L and Stream K-5

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Puget Sound Energy
Samamish-Juanita Transmission Line Wetland Delineation

Kirkland, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 50 100 200
Feet

Figure 7-12

Wetland K-HF (Heronfield Wetlands)

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8.0 Wetland and Stream Buffers

Required wetland and stream buffers are determined by jurisdiction, in accordance with applicable local regulations, as discussed in the sections that follow.

8.1 Wetland and Stream Buffers – City of Redmond

8.1.1 Wetland Buffers

Based on information provided in RZC 21.64.030, wetland buffers are determined using information pertaining to the wetland rating and the level of impact of the land use, as shown in Table 8.1.

Table 8.1. City of Redmond Wetland Buffer Requirements

Wetland Category and Characteristics	Buffer Width (by Impact of Land Use[1])	Other Measures Recommended for Protection
Category I		
Forested	To be based on score for habitat functions or water quality functions	If high score for habitat, need to maintain connections to other habitat areas. Restore degraded parts of buffer.
High level of function for habitat (score for habitat 8 to 9 points)	Low: 150 feet Moderate: 225 feet High: 300 feet	Maintain connections to other habitat areas. Restore degraded parts of buffer.
Moderate level of function for habitat (score for habitat 5 to 7 points)	Low: 75 feet Moderate: 110 feet High: 150 feet	None
High level of function for water quality improvement (8 to 9 points) and low for habitat (less than 5 points)	Low: 50 feet Moderate: 75 feet High: 100 feet	No additional surface discharges of untreated runoff.
Not meeting above criteria	Low: 50 feet Moderate: 75 feet High: 100 feet	None
Category II		
High level of function for habitat (8 to 9 points)	Low: 150 feet Moderate: 225 feet High: 300 feet	Maintain connections to other habitat areas.
Moderate level of function for habitat (5 to 7 points)	Low: 75 feet Moderate: 110 feet High: 150 feet	None
High level of function for water quality improvement (8 to 9 points) and low for habitat (less than 5 points)	Low: 50 feet Moderate: 75 feet High: 100 feet	No additional surface discharges of untreated runoff.
Not meeting above characteristics	Low: 50 feet Moderate: 75 feet High: 100 feet	None

Table 8-1 (continued). City of Redmond Wetland Buffer Requirements

Wetland Category and Characteristics	Buffer Width (by Impact of Land Use[1])	Other Measures Recommended for Protection
Category III		
Moderate level of function for habitat (5 to 7 points). If wetland scores 8 to 9 habitat points, use Category II buffers identified above	Low: 75 feet Moderate: 110 feet High: 150 feet	None
Habitat score 3 to 4 points	Low: 40 feet Moderate: 60 feet High: 80 feet	None
Category IV		
Score for all three basic functions less than 16 points	Low: 25 feet Moderate: 40 feet High: 50 feet	None
[1] High impact = commercial, industrial, institutional, retail sales, high-intensity recreation (golf courses, ball fields), and residential uses with a density of more than one dwelling unit per acre. Medium impact = residential uses with a density of one unit per acre or less, moderate-intensity open space (parks) and paved trails. Low impact = low-intensity open space, such as passive recreation and natural resources preservation, and unpaved trails. Source: RZC 21.64.030.B		

The Department of Planning and Community Development may extend buffer widths on a case-by-case basis as necessary to protect wetland functions and values based on site-specific characteristics. The Department may also allow standard buffer widths to be reduced on a case-by-case basis when it is determined that a smaller area is adequate to protect wetland functions and values based on site-specific characteristics.

8.1.2 Stream Buffers

Based on information provided in RZC 21.64.020, stream buffers are determined based on the classification of the riparian stream corridor, as shown in Table 8.2.

Table 8.2. City of Redmond Stream Buffer Requirements

Riparian Stream Corridor Classification	Stream Buffer Width
Class I	
Sammamish River north of PSE powerline crossing	150-foot inner buffer + 50-foot outer buffer
Sammamish River south of PSE powerline crossing	150 feet
Bear Creek west of Avondale Road	150 feet
Bear Creek east of Avondale Road	150-foot inner buffer + 50-foot outer buffer
Evans Creek	150-foot inner buffer + 50-foot outer buffer
Class II	
Class II	100 feet + 50-foot outer buffer
Class III	
Class III	100 feet
Class IV	
Perennial	36 feet
Intermittent	25 feet
Source: RZC 21.64.020.B	

The Department of Planning and Community Development may increase stream buffer width if it is determined that the recommended width is insufficient to prevent habitat degradation and to protect the structure and function of the habitat area; to extend the buffer to the outer edge of the frequently flooded area; or to make it equal to a landslide hazard area or erosion hazard area buffer.

8.1.3 Buffers of Wetlands and Streams in the Study Area

Transmission line corridors are not specifically called out in the RZC. Based on conversations with the City, Ecology land use designations for utility corridors should be used in this instance to determine the level of impact. These designations are as follows (Washington Department of Ecology 2014):

- Moderate Impact – Utility corridor right-of-way shared by several utilities and including access/maintenance road
- Low Impact – Utility corridor without a maintenance road and little or no vegetation management.

For the purposes of this report, a moderate impact is assumed. Table 8.3 and Table 8.4 summarize the standard required buffer distances for the wetlands and streams mapped in the study corridor within Redmond, based on their classification. Figures 5-3 through 5-10 show portions of wetland/stream buffers within the study area, in the vicinity of proposed project impacts. Buffers were truncated at roads and other paved areas. 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.

Estimated buffers off off-site wetlands are based on boundaries determined by best professional judgment have been included. Additionally, the buffer of Wetland R-E is based on the estimated full size of the wetland, as shown on the figures in Appendix C.

Table 8.3. Standard Regulatory Buffers for Study Area Wetlands – City of Redmond

Name	Category	Habitat Score	Water Quality Score	Standard Buffer Width (Moderate Impact)
Wetland R-A	II	6	8	110 feet
Wetland R-B	II	6	7	110 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
Wetland R-GCA[1]	III	4	6	60 feet
Wetland R-GCB[1]	III	4	6	60 feet
Wetland R-GCF[1]	IV	4	6	40 feet
[1]Information on the rating, habitat score, and water quality score for Wetlands R-GCA, R-GCB, and R-GCF comes from Parametrix 2018.				

Table 8.4. Standard Regulatory Buffers for Study Area Streams – City of Redmond

Name	Category	Standard Buffer
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 Street Stream	Class III	100 feet

8.2 Wetland and Stream Buffers – King County

8.2.1 Wetland Buffers

Based on information provided in the KCC, wetland buffers are determined using information pertaining to the wetland rating, the level of impact of the land use, and whether the property is located within the UGA. The King County portion of the study area is located just inside the 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 8.5).

Table 8.5. King County Wetland Buffer Requirements Within the Urban Growth Area

Wetland Category and Characteristics	Buffer
Category I	
Natural Heritage Wetlands	215 feet
Bog	215 feet
Estuarine	175 feet
Coastal Lagoon	175 feet
Habitat score from 31 to 36 points	225 feet
Habitat score from 20 to 30 points	150 feet plus 7.5 feet for each habitat score above 20 points
Category I wetlands not meeting any of the criteria above	125 feet
Category II	
Estuarine	135 feet
Habitat score from 31 to 36 points	200 feet
Habitat score from 20 to 30 points	125 feet plus 7.5 feet for each habitat score above 20 points
Category II wetlands not meeting any of the criteria above	100 feet
Category III	
Habitat score from 20 to 28 points	125 feet
Category III wetlands not meeting any of the criteria above	75 feet
Category IV	50 feet
Source: KCC 21A.24.325	

Buffer widths may be modified under certain circumstances, subject to County approval, as stated in KCC 21A.24.325.

8.2.2 Aquatic Area Buffers

Aquatic area buffers for properties inside the UGA are shown in Table 8.6.

Table 8.6. King County Aquatic Area Buffer Requirements Within the Urban Growth Area

Aquatic Area Classification	Aquatic Area Buffer
Type S	115 feet
Type F	115 feet
Type N	65 feet
Type O	25 feet
Source: KCC 21A.24.358	

Buffer widths may be modified under certain circumstances, subject to County approval, as stated in KCC 21A.24.358.

8.2.3 Buffers of Wetlands and Streams in the Study Area

Table 8.7 summarize the standard required buffer distances for the wetlands and streams mapped in the study corridor within unincorporated King County, based on their classification. Figures 6-2 and 6-3 show associated wetland/stream buffers within the study area. The buffer of Wetland KC-A is based on the estimated full size of the wetland, as shown on the figures in Appendix C.

Table 8.7. Standard Regulatory Buffers for Study Area Wetlands and Streams – King County

Name	Category	Standard Buffer
Wetland KC-A	Category II	100 feet
Wetland KC-B	Category III	75 feet
Stream KC-1	Type N	65 feet
124th Street Stream	Type F	115 feet

Wetland and stream buffers were truncated at paved areas. KCC 21A.24.325 and 21A.24.358 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)).

8.3 Wetland and Stream Buffers – City of Kirkland

8.3.1 Wetland Buffers

In accordance with the KZC, wetland buffers are determined using information pertaining to the wetland category and habitat scores on the associated rating form, as shown in Table 8.8.

Table 8.8. City of Kirkland Standard Wetland Buffers

Wetland Category	Buffer Width Based on Habitat Points			
	3-4 Points	5 Points	6-7 Points	8-9 Points
Category I: bogs and high conservation areas	190 feet	190 feet	190 feet	225 feet
Category I: Others	75 feet	105 feet	165 feet	225 feet
Category II	75 feet	105 feet	165 feet	225 feet
Category III	60 feet	105 feet	165 feet	225 feet
Category IV	40 feet	40 feet	40 feet	40 feet
Source: KZC Table 90.55.1.				

Buffer averaging is permitted if appropriate criteria are met. An increased buffer may be required if the wetland or its buffer contains or is adjacent to a severe erosion hazard area, habitat of certain species, or a frequently flooded area.

8.3.2 Stream Buffers

Based on information provided in the RZC, stream buffers are determined based on the classification of the riparian stream corridor, as shown in Table 8.9.

Table 8.9. City of Kirkland Standard Stream Buffer Widths

Stream Type	Stream Buffer Width
F (Fish bearing)	100 feet
Np (Perennial non-fish bearing)	50 feet
Ns (Season non-fish bearing)	50 feet
Source: KZC Table 90.65.1.	

Buffer averaging is permitted if appropriate criteria are met. An increased buffer may be required if the stream or its buffer contains or is adjacent to a severe erosion hazard area, habitat of certain species, or a frequently flooded area.

8.3.3 Buffers of Wetlands and Streams in the Study Area

Based on the information in the KZC, Table 8.10 and Table 8.11 summarize the standard required buffer distances for wetlands and streams mapped in the study corridor within Kirkland, based on their classification. Figures 7-4 through 7-12 show wetland/stream buffers within the study area. Where wetlands extend beyond the study area boundary, buffers are based on the estimated full size of the wetlands, as shown on the figures in Appendix C.

Table 8.10. Standard Regulatory Buffers for Study Area Wetlands – City of Kirkland

Name	Category	Habitat Score	Standard Buffer Width
Wetland K-AA	III	4	60 feet
Wetland K-BB	II	6	165 feet
Wetland K-A	III	3	60 feet
Wetland K-B	IV	3	40 feet
Wetland K-C	III	3	60 feet
Wetland K-D	III	3	60 feet
Wetland K-DD	III	3	60 feet
Wetland K-E	IV	3	40 feet
Wetland K-F	III	3	60 feet
Wetland K-G	III	3	60 feet
Wetland K-H	III	3	60 feet
Wetland K-J	I	6	165 feet
Wetland K-K	III	3	60 feet
Wetland K-L	II	6	165 feet
Wetland K-HF	II	5	105 feet

Table 8.11. Standard Regulatory Buffers for Study Area Streams – City of Kirkland

Name	Type	Standard Buffer
Stream K-1	Type Ns	50 feet
Stream K-2	Type F	100 feet
Stream K-3	Type F	100 feet
Stream K-5	Type Np	50 feet
Stream K-6	Type Np	50 feet
Stream K-7	Type Np	50 feet

Wetland and stream buffers were truncated at paved areas to more accurately reflect the current site conditions.

KZC 90.120 allows an interrupted buffer waiver if the following criteria are met:

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.

9.0 Summary

AECOM identified and evaluated 22 wetlands and 13 streams within the study area. These included 5 wetlands and 5 streams in Redmond, 2 wetlands and 2 streams in unincorporated King County, and 15 wetlands and 6 streams in Kirkland. Table 9.1 provides a summary of pertinent information for each wetland delineated, and Table 9.3 provides a summary of pertinent information for each stream segment mapped. For completeness, Table 9.1 also includes information about three wetlands within the study area that were delineated for a different project.

Table 9.1. Summary of Wetlands in the Study Area

Wetland	Area	HGM Class	Cowardin Class	Functional Rating			
				Category	Water Quality Score	Hydrologic Score	Habitat Score
City of Redmond							
R-A	13,068 ft^2 (0.30 ac)	Riverine	PEM/PSS/PFO	II	8	7	6
R-B	3,848 ft^2 (0.80 ac)	Depressional	PEM/PSS	II	7	7	6
R-C	305 ft^2 (0.01 ac)	Depressional	PEM	III	7	6	3
R-D	4,210 ft^2 (0.10 ac)	Depressional	PEM	III	7	6	3
R-E[1]	9,975 ft^2 (0.23 ac)	Depressional	PEM	II	8	8	4
R-GCA[2]	2,831 ft^2 0.07 ac	Riverine	PEM/RAB	III	6	7	4
R-GCB[2]	4,617 ft^2 (0.11 ac)	Riverine	PEM/RAB	III	6	7	4
R-GCF[2]	1,6112 ft^2 (0.04 ac)	Slope	PSS/PFO	IV	6	5	4
King County[3]`							
KC-A[3]	8,799 ft^2 (0.20 ac)	Depressional	PEM	II	22	20	13
KC-B[3]	1,029 ft^2 (0.02 ac)	Depressional	PEM	III	22	14	7
City of Kirkland							
K-AA	91.9 ft^2 (0.002 ac)	Depressional	PEM	III	6	6	4
K-BB[1]	871 ft^2 (0.02 ac)	Depressional	PEM/PSS/PFO	II	7	7	6
K-A	476 ft^2 (0.01 ac)	Depressional	PEM	III	7	6	3
K-B	3,047 ft^2 (0.07 ac)	Depressional	PEM	IV	6	6	3
K-C	3,634 ft^2 (0.08 ac)	Depressional	PEM	III	7	6	3

Table 9.2 (Continued). Summary of Wetlands in the Study Area

Wetland	Area	HGM Class	Cowardin Class	Functional Rating			
				Category	Water Quality Score	Hydrologic Score	Habitat Score
K-D[1]	28,254 ft^2 (0.65 ac)	Depressional	PEM	III	7	7	3
K-DD	225 ft^2 (0.01 ac)	Depressional	PEM	III	7	7	3
K-E	1,992 ft^2 (0.05 ac)	Depressional	PEM	IV	6	6	3
K-F[1]	19,251 ft^2 (0.44 ac)	Depressional	PEM/PFO	III	7	7	3
K-G	10,119 ft^2 (0.23 ac)	Depressional	PEM	III	7	7	3
K-H[4]	1,486 ft^2 (0.03 ac)	Depressional	PEM/PFO	III	8	7	3
K-J[1]	49,807 ft^2 (1.14 ac)	Depressional	PEM/PSS/ PFO/POW	I	9	9	6
K-K[1]	16,563 ft^2 (0.38 ac)	Depressional	PFO	III	6	7	3
K-L[1]	15,130 ft^2 (0.35 ac)	Depressional +Riverine	PEM/PSS/ PFO/POW	II	7	7	6
K-HF[1]	25,937 ft^2 (0.60 ac)	Depressional	PEM/PSS/ PFO	II	8	8	5

[1] These wetlands extend beyond the study area boundary. Only the acreage within the study area is given.
[2] Wetlands R-GCA, R-GCB, R-GCF were delineated in 2017 by Parametrix (2018). Information has been included for completeness but has not been verified.
[3] Note that based on the requirements in KCC 21A.24.318, the 2004 wetland rating form was used to rate the King County wetlands.
[4] Wetland K-H is outside the study area boundary, but was mapped and surveyed.
HGM = hydrogeomorphic, PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested, RAB = riparian aquatic bottom, and POW = palustrine open water.

Table 9.3. Summary of Streams Within the Study Corridor

Stream Name	Associated Wetland	Area/Length Within Study Area	Classification
City of Redmond			
Gun Club Creek	Wetlands R-A, R-GCA, R-GCB	74,357 square feet	Class III
Stream R-2	Wetland R-C	137 square feet	Class III
Stream R-3	Wetland R-D	21 square feet	Class III
York Creek	Wetland R-E	579 square feet	Class III
124th Street Stream	none	602 square feet	Class III
King County			
Stream KC-1	Wetland KC-A	408 square feet	Type N
124th Street Stream	none	1,588 square feet	Type F
City of Kirkland			
Stream K-1	Wetland K-AA	386 square feet	Type Ns

Table 9-3 (Continued). Summary of Streams Within the Study Corridor

Stream Name	Associated Wetland	Area/Length Within Study Area	Classification
Stream K-2	Wetland K-BB	219 feet (edge of corridor)	Type F
Stream K-3	Wetland K-J	5,784 square feet	Type F
Stream K-5	Wetland K-L	1,188 square feet	Type Np
Stream K-6	Wetland K-K	1,455 square feet	Type Np
Stream K-7	Wetland K-B	154 square feet	Type Np

Based on wetland ratings and habitat scores, and stream ratings, appropriate buffers for these sensitive areas have been determined. Mapped locations of wetlands, streams, and wetland/stream buffers have been provided to PSE for use in planning and permitting the Sammamish-Juanita transmission line project.

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Appendix A

Photographic Logs

Redmond

Photographic Log

King County

Photographic Log

Kirkland

Photographic Log

Appendix B

Field Data Forms

Redmond

Field Data Forms

King County

Field Data Forms

Kirkland

Field Data Forms

Appendix C

Wetland Rating Forms

Redmond

Wetland Rating Forms

King County

Wetland Rating Forms

Kirkland

Wetland Rating Forms

Appendix D

Soil Resource Reports

Redmond

Soil Resource Report

King County

Soil Resource Report

Kirkland

Soil Resource Report

Appendix E

Summary of Wetland Parameters at Sample Plot

Table E-1. Summary of Wetland Parameters at Sample Plots

Sample Plot	% Dominants Hydrophytic	Hydric Soil Indicator(s)	Hydrology Indicator(s)	Water Table/Saturation Depth (inches)	Wetland Determination
City of Redmond					
T1-SP1	75	n/a	n/a	n/a	Upland (near R-A)
T1-SP2	60	A10	A2, A3	0/0	Wetland (R-A)
T1-SP3	50[1]	n/a	n/a	n/a	Upland (near R-A)
T2-SP1	50	n/a	n/a	n/a	Upland (near R-A)
T2-SP2	85	A10	A3	16/0	Wetland (R-A)
T2-SP3	40	n/a	n/a	n/a	Upland (near R-A)
T3-SP1	33	n/a	n/a	n/a	Upland (near R-B)
T3-SP2	100	A4	A1	0/0	Wetland (R-B)
T3-SP3	100	A11	A3	16/12	Wetland edge (R-B)
T3-SP4	75	A11	n/a	n/a	Upland (near R-B)
SP-1	75	n/a	n/a	n/a	Upland (near R-B)
SP-2	100	F3	B4, B9	n/a	Wetland (R-B)
SP-3	100	F3	B4, B8	n/a	Wetland (R-B)
SP-4	100	n/a	n/a	n/a	Upland (near R-B)
SP-B1	100	Other (Problematic)	D2, D5	n/a	Wetland (R-E)
SP-B2	100	n/a	n/a	n/a	Upland (near R-E)
SP-B3	100	A12	A3	n/a/0-14	Wetland (R-E)
SP-B4	100	n/a	n/a	n/a	Upland (near R-E)
SP-D1	100	F6	C2, D2, D5	23/20	Wetland (R-D)
SP-D2	100	n/a	n/a	n/a	Upland (near R-D)
SP-F1	100	A2, A4	A2, A3	0/0	Wetland (R-C)
SP-F2	100	n/a	n/a	n/a	Upland (near R-C)
SP-US	100	n/a	n/a	n/a	Upland (between R-C and R-D)
King County					
SP-A1	100	F6	A3	n/a/10	Wetland (KC-A)
SP-A2	100	n/a	n/a	n/a	Upland (near KC-A)
SP-1	100	F1	A2, A3	9/7	Wetland (KC-B)
SP-2	75	n/a	n/a	n/a	Upland (near KC-B)
SP-Ditch	100	n/a	A1, A2	0/0	Upland (ditch S. of 124th St.)
City of Kirkland					
SP500	100	F3	A2, A3	2/6	Wetland (K-AA)
SP501	100	F3	A3	13/12	Wetland (K-AA)
SP502	100	F6	n/a	n/a	Upland (near K-AA)
SP503	100	F6	A2, A3	7/4	Wetland (K-BB)
SP504	100	F6	n/a	n/a	Upland (near K-BB)
SP1	100	F3	A1, A2, D2	5/0	Wetland (K-A)
SP2	100	n/a	n/a	n/a	Upland (near K-A)
SP-KB1	100	Other (Problematic)	A1, A2, A3	0/0	Wetland (K-B)
SP-KB2	50	n/a	n/a	n/a	Upland (near K-B)
SP-KC1	100	Other (Problematic)	A1, A2, A3	0/0	Wetland (K-C)
SP-KC2	100	n/a	n/a	n/a	Upland (near K-C)

Table E-1 (continued). Summary of Wetland Parameters at Sample Plots

Sample Plot	% Dominants Hydrophytic	Hydric Soil Indicator(s)	Hydrology Indicator(s)	Water Table/Saturation Depth (inches)	Wetland Determination
SP3 (2014)	67	F3	A1, A2, A3, D2	0/0	Wetland (K-D)
SP4 (2014)	66	n/a	n/a	n/a	Upland (near K-D)
SP-3 (2019)	100	F6	A1, A2, A3	0/0	Wetland K-D
SP-4 (2019)	67	n/a	n/a	n/a	Upland (near K-D)
SP-KD1	100	F6	A1, A2, A3	0/0	Wetland (K-D)
SP-KD2	0	n/a	n/a	n/a	Upland (near K-D)
SP-KDD1	100	F6	A2, A3	9/4	Wetland (K-DD)
SP-KDD2	25	n/a	n/a	n/a	Upland (near K-DD)
SP-KE1	100	Other (Problematic)	A1, A2, A3	0/0	Wetland (K-E)
SP-KE2	100	n/a	n/a	n/a	Upland (near K-E)
SP5	100	F3	A1, A2, A3, B2, B4, B9. B10, D2	0/0	Wetland (K-F)
SP-KF1 (2016)	75	n/a	n/a	n/a	Upland (between K-F and K-H)
SP-KF1 (2019)	50	n/a	n/a	n/a	Upland (between K-F and K-H)
SP-KF2	83	F6	B2, B6, B8, B9, D5	n/a	Wetland (K-F)
SP6[1]	100	Other (Problematic)	A1, A2, A3, B2, B10, D2	0/0	Wetland (K-G)
SP7 (2014)	67	F3	A1, A2, A3, D2	0/0	Wetland (K-G)
SP-KG1 (2017)	100	n/a	n/a	n/a	Upland (near K-G)
SP-KG2 (2017)	100	Other (Problematic)	A1, A2, A3	0/0	Wetland (K-G)
SP-7 (2019)	80	F3	A1, A2, A3	0/0	Wetland (K-G)
SP-KG1 (2019)	100	n/a	n/a	n/a	Upland (near K-G)
SP-KG2 (2019)	100	Other (Problematic)	A1, A2, A3, D5	0/0	Wetland (K-G)
SP8 (2014)	100	F3	A1, A2, A3, B9, D5	0/0	Wetland (K-H)
SP-8 (2019)	80	F6, F7	B6, B8	n/a	Wetland (K-H)
SP9 (2014)	100	F3	A1, A2, A3	0/0.5	Wetland (K-J)
SP-KJ1 (2017)	83	F2	A1, A2, A3	0/0	Wetland (K-J)
SP-9 (2019)	83	F6	A3	n/a/5	Wetland (K-J)
SP-KJ2	100	n/a	n/a	n/a	Upland (near K-J)

Table E-1 (continued). Summary of Wetland Parameters at Sample Plots

Sample Plot	% Dominants Hydrophytic	Hydric Soil Indicator(s)	Hydrology Indicator(s)	Water Table/Saturation Depth (inches)	Wetland Determination
SP-KK1 (2017)	100	F6	A1, A2, A3	0/0	Wetland (K-K)
SP10 (2014)	67	n/a	n/a	n/a	Upland (near K-K)
SP-KK1 (2019)	100	F6	A1, A2, A3	0/0	Wetland (K-K)
SP-KK2	100	n/a	n/a	n/a	Upland (near K-K)
SP-KK3	100	n/a	A2, A3	7/4	Upland (near K-K – wetland edge)
SP-KK4	100	F6	A1. A2. A3	0/0	Wetland (K-K)
SP-10 (2019)	63	n/a	n/a	n/a	Upland (near K-K)
SP11	60	n/a	n/a	n/a	Upland (near K-J)
SP12	75	n/a	n/a	n/a	Upland plot (not near a wetland)
T1-SP1	75	n/a	n/a	n/a	Upland (near K-L)
T1-SP2	50[1]	A11	A3	13/2	Wetland (K-L)
T2-SP1	50[1]	n/a	n/a	n/a	Upland (near K-L)
T2-SP2	100	A12	A3	14/0	Wetland (K-L)
KL-SP1	100	n/a	n/a	15/13	Upland (near K-L)
KL-SP2	100	F8	A1	0/0	Wetland (K-L)
KL-SP3	100	F3	D2, D5	n/a	Wetland (K-L)
KL-SP4	100	n/a	n/a	n/a	Upland (near K-L)
HF-SP1	100	n/a	n/a	n/a	Upland (near K-HF)
HF-SP2	100	A1	A2, A3, B8	5/2	Heronfield wetland (K-HF)

[1]Based on prevalence index, hydrophytic vegetation is present in these sample plots.
[2]The location of this data point was not recorded by the GPS, and could not be displayed on maps.
Hydric soil indicators: A2 = Histic Epipedon; A4 = Hydrogen Sulfide; A11 = Depleted Below Dark Surface; A12 = Thick Dark Surface; F1 = Loamy mucky mineral; F2 = Loamy Gleyed Matrix; F3 = Depleted Matrix; F6 = Redox Dark Surface; F7 = Depleted Dark Surface;
Hydrology indicators: A1 = Surface Water; A2 = High Water Table; A3 = Saturation; B2 = Sediment Deposits; B4 = Algal Mat or Crust; B6 = Surface Soil Cracks; B8 = Sparsely Vegetated Concave Surface; B9 = Water-Stained Leaves; B10 = Drainage Patterns; C2 = Dry-Season Water Table; D2 = Geomorphic Position; D5 = FAC-Neutral Test.

Appendix F

Wetland Functional Assessment (Redmond Wetlands)

This appendix provides an assessment of the functions provided by the wetlands in the study area under the jurisdiction of Redmond. This assessment follows the requirements of the RZC, and has been completed based on information provided in the *Washington State Wetland Rating System for Western Washington* (Washington Department of Ecology 2014).

Functions can be divided into the following categories: water quality functions, hydrologic functions, and habitat functions. Water quality functions predominantly refer to the wetland's ability to reduce sediment, chemical nutrients, and toxic pollutants; reduce groundwater and surface water pollution; and provide shading to maintain desirable water temperatures. Hydrology functions include the wetland's ability to moderate runoff volume and flow rates to reduce flooding and erosion. Habitat functions refer to the wetland's ability to provide wildlife, plant, and fisheries habitat.

F.1 Wetland R-A

Table F-1 provides a summary of the water quality, hydrologic, and habitat functions provided by Wetland R-A. It was assessed as a riverine wetland.

Table F-1. Functions Assessment of Wetland R-A

Category/Function	Level of Function
Water Quality	
Site potential to improve water quality	Moderate
Landscape potential to support the water quality function of the site	High
Value to society of water quality functions	High
Hydrologic	
Site potential to reduce flooding and erosion	Moderate
Landscape potential to support the hydrologic functions of the site	High
Value to society of hydrologic functions	Moderate
Habitat	
Site potential to provide habitat	Moderate
Landscape potential to support the habitat functions of the site	Moderate
Value to society of habitat	Moderate

F.1.1 Assessment of Water Quality Functions

Wetland R-A generally provides a high level of water quality functions. It has a moderate potential to improve water quality, primarily because of the prevalence of woody vegetation. Trees and shrubs are present over most of the wetland and can help trap or filter out pollutants. Depressions that can trap sediments and associated pollutants are present, but do not cover a majority of the wetland area.

The landscape in which Wetland R-A occurs has a high potential to support the water quality functions of the site. The wetland is located within an incorporated city, and its contributing basin also includes an incorporated area. Additionally, parking lots and other paved areas occur within 150 feet of the wetland that are potential sources of stormwater runoff. No other potential sources of pollutants into the wetland were identified.

Wetland R-A is located along a stream that is on the 303(d) list[1] (Gun Club Tributary). Additionally, it occurs in the Cedar-Sammamish Basin, which has multiple aquatic resources on the 303(d) list and for which a TMDL[2] for temperature and dissolved oxygen has been set. Therefore, water quality improvement afforded by the wetland is highly valuable to society.

F.1.2 Assessment of Hydrologic Functions

Wetland R-A generally provides a moderate level of hydrologic functions. It has a moderate potential to reduce flooding and erosion. Given the narrow width of the wetland relative to the width of the stream channel, the volume of storage available within the wetland is small. However the dense trees and shrubs within the wetland likely serve to slow water velocities during floods and reduce maximum flows.

The landscape in which Wetland R-A occurs has a high potential to support the hydrologic functions of the site. There is no evidence that the portion of Gun Club Tributary that runs through Wetland R-A is downcut. The upgradient watershed includes developed areas within the Redmond and associated impervious surfaces, which makes the wetland of high value from a flood attenuation perspective.

The greater Cedar-Sammamish basin has flooding problems, and locations downstream have been identified by the City as chronic flooding areas (Otak Inc. 2009). However, Wetland R-A is relatively small and has not been identified specifically as important for flood storage or flood conveyance. The value that it provides in terms of flood and flow rate reduction is moderate.

F.1.3 Assessment of Habitat Functions

Wetland R-A provides a moderate level of habitat functions. It has high structural complexity, with four plant community structures (emergent, scrub-shrub, and a multi-layered forest canopy). Species richness is high, three hydroperiods are present (occasionally flooded, saturated only, and seasonally flowing stream in/adjacent to the wetland), and there is high interspersion of habitats. However, only one special habitat feature is present (overhanging plants). Based on these attributes, the wetland has a moderate potential to provide habitat for numerous species.

The landscape has a moderate potential to support the habitat functions of the site. Within 1 kilometer of the wetland, 27 percent of the area abutting the wetland unit is accessible habitat, and 35 percent of the total land area is undisturbed habitat. However, high intensity land uses are prevalent within 1 kilometer of the wetland, accounting for more than 50 percent of the land area.

The value to society of the habitat provided by the wetland is moderate. The site is not documented as providing habitat for species valued in federal, state, or local laws, regulations or policies. However, two priority habitats occur within 330 feet: instream habitat and riparian habitat.

F.2 Wetland R-B

Table F-2 provides a summary of the water quality, hydrologic, and habitat functions provided by Wetland R-B. It was assessed as a depressional wetland.

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[1] 303(d) refers to a section of the federal Clean Water Act. The 303(d) list is comprised of waters in the polluted water category, for which beneficial uses—such as drinking, recreation, aquatic habitat, and industrial use—are impaired by pollution. Various stretches of the Sammamish River and its tributaries are on the 303(d) list, including the Gun Club tributary within the study site.

[2] The TMDL is the maximum amount of pollution a water body can receive without violating water quality standards.

Table F-2. Functional Assessment of Wetland R-B

Category/Function	Level of Function
Water Quality	
Site potential to improve water quality	Moderate
Landscape potential to support the water quality function of the site	Moderate
Value to society of water quality functions	High
Hydrologic	
Site potential to reduce flooding and erosion	High
Landscape potential to support the hydrologic functions of the site	Moderate
Value to society of hydrologic functions	Moderate
Habitat	
Site potential to provide habitat	Moderate
Landscape potential to support the habitat functions of the site	Moderate
Value to society of habitat	Moderate

F.2.1 Assessment of Water Quality Functions

Wetland R-B generally provides a moderate level of water quality functions. The site has a moderate potential to improve water quality. It is a large man-made depression that was apparently created to retain surface water and stormwater flows from upslope developed areas. It does not have clay or true organic soils, but it does have persistent, ungrazed plants over greater than half of its area that can trap small amounts of sediments and pollutants.

The landscape within which Wetland R-B is located has a moderate potential for supporting water quality functions. The wetland receives stormwater discharges from nearby parking lots and other developed areas that generate pollutants. However there are no septic systems or other sources of pollutants nearby that might be released into the wetland.

Wetland R-B does not discharge to other aquatic habitats in the vicinity. However, it does occur in the Cedar-Sammamish Basin, which has multiple aquatic resources on the 303(d) list and for which a TMDL for temperature and dissolved oxygen has been set. Therefore, water quality improvement afforded by the wetland is highly valuable to society.

F.2.1 Assessment of Hydrologic Functions

Wetland R-B generally provides a moderate level of hydrologic functions. Given that there are no outflows from this wetland, it has a relatively large depth of storage during wet periods, and it is large in relation to the size of contributing basin, it has the potential to reduce flooding and stream erosion. While the wetland does receive stormwater discharges, and more than 10 percent of the area within 150 feet of the wetland has the potential to generate excess runoff, much of the contributing basin does not support intensive land uses. Therefore, it has a moderate potential for providing hydrologic functions from a landscape perspective, as there are documented surface flooding problems within the Sammamish River valley. Wetland R-B was apparently created to retain stormwater, but it has not been called out specifically in a regional flood control plan.

F.2.2 Assessment of Habitat Functions

Wetland R-B generally provides a moderate level of habitat functions. It has relatively high variability hydroperiods, but few plant structures and low interspersion of habitats, and moderate species richness.

The wetland contains two special habitat features: thin-stemmed persistent plants for egg laying by amphibians, and low cover of invasive plants.

The landscape has a moderate potential to support the habitat functions of the site. Within 1 kilometer of the wetland, 24 percent of the area abutting the wetland unit is accessible habitat, and 35 percent of the total land area is undisturbed habitat. However, high intensity land uses are prevalent within 1 kilometer of the wetland, accounting for more than 50 percent of the land area.

The value to society of the habitat provided by the wetland is moderate. The site is not documented as providing habitat for species valued in federal, state, or local laws, regulations or policies. However, the wetland is located with 330 feet of two WDFW priority habitats: riparian and instream areas.

F.3 Wetland R-C and R-D

Wetlands R-C and R-D were rating using a single rating form, as they are both small depressional PEM wetlands located in ditches between Willows Road NE and the embankment associated with a former railroad. Table F-3 provides a summary of the water quality, hydrologic, and habitat functions provided by these wetlands. Both were assessed as depressional wetlands.

Table F-3. Functional Assessment of Wetlands R-C and R-D

Category/Function	Level of Function
Water Quality	
Site potential to improve water quality	Moderate
Landscape potential to support the water quality function of the site	Moderate
Value to society of water quality functions	High
Hydrologic	
Site potential to reduce flooding and erosion	Moderate
Landscape potential to support the hydrologic functions of the site	Moderate
Value to society of hydrologic functions	Moderate
Habitat	
Site potential to provide habitat	Low
Landscape potential to support the habitat functions of the site	Low
Value to society of habitat	Low

F.3.1 Assessment of Water Quality Functions

Wetlands R-C and R-D generally provide a moderate level of water quality functions. The sites have a moderate potential to improve water quality. Both wetlands either have a ditch or a culvert that allows water to leave slowly, allowing for some retention of sediments/pollutants. Neither wetland occurs in an area that is mapped as organic or clay soil by the NRCS, and no clay/organic soil was observed at the wetland sample plots for these wetlands. However, the vegetation within the wetlands can help trap or filter out sediments and pollutants, as more than 95 percent of the wetland area is covered by dense, uncut herbaceous plants. Additionally, in both wetlands the area that is seasonally ponded covers more than half the wetland, potentially allowing nitrogen transformation and removal.

The landscape within which Wetlands R-C and R-D are located has a moderate potential for supporting water quality functions. Both wetlands receive stormwater discharges from adjacent Willows Road NE, which is a source of pollutants. No septic systems or other sources of pollutants have been identified.

Both wetlands are within 1 mile of the Sammamish River, which is on the 303(d) list. Additionally, the wetlands occur in the Cedar-Sammamish Basin, which has multiple aquatic resources on the 303(d) list and for which a multi-parameter TMDL has been set (temperature and dissolved oxygen). Therefore

they are highly valuable to society in terms of the water quality improvement that they can potentially provide.

F.3.2 Assessment of Hydrologic Functions

Wetlands R-C and R-D generally provide a moderate level of hydrologic functions. The narrow/constricted outlets from these wetlands allow them some ability to reduce flooding, and their locations in manmade ditches intended to reduce flooding gives them a relatively large depth of storage. However, the wetlands are small, and the amount of storage that they offer is minimal when the area of the upstream basin is considered. Both wetlands receive stormwater discharges and occur in locations where roughly half the area within 150 feet of the wetland are in land uses that generate excessive runoff. The wetlands are located in an area that is prone to flooding, but are small in size and are located north of the railroad berm. They provide hydrologic functions that are of moderate value to society.

F.3.3 Assessment of Habitat Functions

Wetlands R-C and R-D generally provide low levels of habitat functions. With only one Cowardin class, no interspersion of habitats, one hydroperiod, low plant species richness, and no special habitat features, the wetlands have very little potential to provide habitat. And while 25 percent of the land area within 1 km of the wetlands is undisturbed habitat, there is no undisturbed habitat directly abutting either wetland. Additionally, high intensity land uses are prevalent within 1 kilometer of the wetlands. Therefore the landscape has a low potential to support the habitat functions of the site. The habitat provided by the wetlands is of low value to society. The wetland sites are not documented as providing habitat for species valued in federal, state, or local laws, regulations or policies, and are not within 300 feet of any WDFW Priority Habitats.

F.4 Wetland R-E

Table F-4 provides a summary of the water quality, hydrologic, and habitat functions provided by Wetland R-E. It was assessed as a depressional wetland. Biologists did not have access to the larger wetland, and consulted a previous delineation report for the site (The Watershed Company 2009) for additional information. Best professional judgment was used, as needed to complete the rating form.

Table F-2. Functional Assessment of Wetland R-E

Category/Function	Level of Function
Water Quality	
Site potential to improve water quality	Moderate
Landscape potential to support the water quality function of the site	High
Value to society of water quality functions	High
Hydrologic	
Site potential to reduce flooding and erosion	Moderate
Landscape potential to support the hydrologic functions of the site	High
Value to society of hydrologic functions	High
Habitat	
Site potential to provide habitat	Low
Landscape potential to support the habitat functions of the site	Low
Value to society of habitat	Moderate

F.4.1 Assessment of Water Quality Functions

Wetland R-E generally provides a high level of water quality functions. The site has a moderate potential to improve water quality by trapping sediments and pollutants, as it has true organic soils, some persistent, ungrazed plants, and a large surface area that is seasonally ponded.

The landscape within which Wetland R-E is located has a high potential for supporting water quality functions. The wetland receives stormwater discharges from nearby developed areas that generate pollutants. Additionally, it includes agricultural land uses, which are a source of additional pollutants.

Wetland R-E discharges to the Sammamish River, which is on the 303(d) list. Additionally, it is in the Cedar-Sammamish Basin, which has multiple aquatic resources on the 303(d) list and for which a multi-parameter TMDL has been set (temperature and dissolved oxygen). Therefore, water quality improvement afforded by the wetland is highly valuable to society.

F.4.2 Assessment of Hydrologic Functions

Wetland R-E generally provides a high level of hydrologic functions. It has a moderate depth of storage to retain water during wet periods, and is large relative to the size of the upstream basin. The wetland receives stormwater discharges from Willows Road NE and nearby development, and a large portion of the area within 150 feet of the wetland is in land uses that generate excess runoff. Additionally, more than 25 percent of the contributing basin of the wetland is covered with intensive human land uses. Therefore, the wetland is located in an area with increased runoff, and the landscape potential to support hydrologic functions of the site is high. A portion of the wetland is also located in an area that has been mapped as an area of chronic flooding in the City of Redmond Final Comprehensive Flood Hazard Management Plan. The hydrologic functions offered by the wetland are therefore highly valuable to society, as flooding down-gradient would increase within the storage offered by this large wetland.

F.4.3 Assessment of Habitat Functions

Wetland R-E generally provides low levels of habitat functions. The wetland has a single Cowardin class (emergent), no interspersion of habitats, and moderate plant species richness. However, it has a four different hydroperiods. Therefore, its potential to provide habitat for a variety of species is moderate. There is limited undisturbed habitat within 1 km of the wetland, and there is no undisturbed habitat directly abutting the wetland. Therefore, the landscape has a low potential to support the habitat functions of the site. The habitat provided by the wetlands is of moderate value to society, as there are two WDFW Priority Habitats within 300 feet: riparian areas and instream habitat.

THE WATERSHED COMPANY
SCIENCE & DESIGN

September 4, 2020

Jennifer Anderer
City of Kirkland Planning Department
123 5th Avenue
Kirkland, WA 98033

Re: Kirkland PSE Transmission Line

The Watershed Company Reference Number: 170622.93

Dear Jennifer:

This letter represents our peer review for the proposed Puget Sound Energy (PSE) Sammamish-Juanita transmission line construction project. The proposed transmission line will cross multiple jurisdictions, including the Cities of Kirkland and Redmond as well as unincorporated King County. This peer review assesses proposed critical area impacts and mitigation within the City of Kirkland. Impacts and mitigation outside of Kirkland were not reviewed. The following documents were reviewed:

- *Puget Sound Energy Sammamish-Juanita Transmission Line Critical Areas Impact Assessment Final* (AECOM. February 2020) (Impact Assessment)
- *Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report Revised Final* (AECOM. February 2020) (Delineation Report)
- *Puget Sound Energy Sammamish-Juanita Transmission Line Wetland Mitigation Bank Use Plan* (AECOM. February 2020) (Bank Use Plan)
- *PSE Transmission Line, Confirmation of Wetland and Stream Boundaries – Peer Review Letter* (The Watershed Company. January 28, 2020) (Delineation Peer Review)

Project Summary

PSE is proposing to construct five miles of new 115 kV transmission line between Redmond and Kirkland. Within the City of Kirkland, project construction will result in the permanent loss of

55 square feet of wetland; 60 square feet of buffer; 7,015 square feet of temporary wetland impacts; and 4,500 square feet of temporary buffer impacts in areas dominated primarily by reed canarygrass. Additional impacts include the conversion of forested buffer areas to scrub-shrub or emergent areas, which is necessary to allow for the power lines to operate without the risk of taller trees contacting the lines. The total area of buffer conversion was calculated to be 11,900 square feet. All permanent wetland and buffer impacts will be mitigated through the purchase of mitigation bank credits from the Keller Farm Wetland Mitigation Bank. Temporary impacts will be restored on-site. Additionally, PSE proposes to mitigate the impacts of converting forested areas to shrub/emergent areas by purchasing mitigation bank credits at a reduced ratio of one-half the standard requirements for loss of buffer.

Peer Review Findings

We agree with the mitigation approach proposed for permanent wetland/buffer impacts as well as the proposed mitigation for conversion of forested buffer. Interagency guidance recommends mitigating forested conversion impacts at one-half the standard ratios (*Wetland Mitigation in Washington Part 1 – Agency Policies and Guidance* (Washington Department of Ecology, U.S. Army Corps of Engineers Seattle Branch, Environmental Protection Agency Region 10. March 2006). The proposed mitigation bank credits are correctly calculated for the permanent impacts and vegetation conversion impacts as identified in the Impact Assessment and Bank Use Plan. However, the temporary impact areas will likely need to be reassessed.

The Delineation Peer Review identified two classification errors. The Delineation Peer Review recommended that Wetland K-J should be classified as a Category II wetland, rather than a Category I wetland. It was also recommended that Stream K-6 be classified as a Type F stream, rather than a Type Np; the classification of Stream K-6 as Type F is based on size, gradient, connectivity to other documented fish-bearing waters, and the Type F inventory status per Washington Department of Natural Resources FPAMT website. Neither of these revisions was incorporated into the permitting documents. Reclassifying Wetland K-J as a Category II wetland, as has been previously accepted by the City, will not affect the buffer width but may result in less required compensatory mitigation for the proposed five square feet of wetland fill. The reclassification of Stream K-6 would increase the buffer from 50 feet to 100 feet. Several transmission line poles would be located within the 100-foot buffer that are not currently addressed as buffer impacts. We recommend PSE reassess the proposed buffer impacts based on these changes and adjust the proposed mitigation credits and impact restoration areas accordingly.

Recommendations

1. Reclassify Wetland K-J as a Category II wetland, and reassess the required compensatory mitigation for five square feet of wetland fill.

2. Reclassify Stream K-6 as Type F, and revise the buffer width to 100 feet.

3. Reassess any permanent buffer loss, temporary buffer impacts, and forested buffer conversion associated with the larger Stream K-6 buffer. Revise the proposed restoration and compensatory mitigation associated with the larger buffer.

Please contact us with any additional questions or concerns.

Sincerely,

Ryan Kahlo, PWS
Senior Ecologist

ATTACHEMENT 9
ZON20-00104

AECOM Environment

Submitted to:
Puget Sound Energy
Bellevue, Washington

Submitted by:
AECOM
Seattle, WA
60608044
February 2021

Puget Sound Energy Sammamish-Juanita Transmission Line Project Wetland and Stream Delineation Report

Revised Final (February 2021)

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Environment

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Revised Final (February 2021)

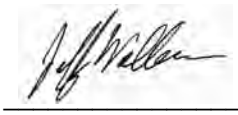
Prepared By:

Kim Anderson, PWS

Paul Hamidi, PWS, CPSS

Glen Mejia, Fisheries/Wildlife Biologist

Reviewed By:



Jeff Walker, PWS

Executive Summary

AECOM conducted wetland and stream delineations for Puget Sound Energy along the planned route of the approximately 5-mile Sammamish-Juanita 115-kilovolt transmission line corridor, located in the Cities of Redmond and Kirkland and in unincorporated King County, Washington. The primary goal of the study was to provide information about wetlands and streams, and their buffers, that might be affected by activities associated with the planned transmission line construction project. The objectives of the study were to identify, map, categorize, and rate wetlands and streams within the study area. Initial field surveys were conducted in April, May, and June 2014; May and June 2015; April and June 2016, and October and November 2017, with an additional site visit to rate wetlands and take representative photographs in August 2016. Follow-up field surveys to verify and update previously mapped wetland boundaries and to delineate wetlands and streams in previously unsurveyed portions of a revised study area occurred in April, June, and July 2019. Note that wetlands and streams south of Sammamish Substation were previously delineated and are described in the *Sammamish Substation Wetland Delineation and Stream Reconnaissance Report* (AECOM 2016).

During field surveys, a total of 18 wetlands and 10 streams were delineated. A total of 70 sample plots were investigated to characterize the upland and wetland conditions within the study area. Table ES-1 provides a summary of the wetlands that were delineated during field surveys, and Table ES-2 summarizes the streams that were encountered. For completeness, Table ES-1 also includes information about two wetlands within the study area that were delineated as part of a different project.

Table ES-1. Summary of Wetlands Delineated

Wetland	Area	HGM Class	Cowardin Class	Functional Rating			
				Category	Water Quality Score	Hydrologic Score	Habitat Score
City of Redmond							
R-A	13,248 ft^2 (0.30 ac)	Riverine	PEM/PSS/PFO	II	8	7	6
R-C	305 ft^2 (0.01 ac)	Depressional	PEM	III	7	6	3
R-D	4,210 ft^2 (0.10 ac)	Depressional	PEM	III	7	6	3
R-E[1]	9,975 ft^2 (0.23 ac)	Depressional	PEM	II	8	8	4
R-GCA[2]	2,831 ft^2 0.07 ac	Riverine	PEM/RAB	III	6	7	4
R-GCB[2]	4,617 ft^2 (0.11 ac)	Riverine	PEM/RAB	III	6	7	4
King County[3]`							
KC-A[3]	8,799 ft^2 (0.20 ac)	Depressional	PEM	II	22	20	13
KC-B[3]	1,029 ft^2 (0.02 ac)	Depressional	PEM	III	22	14	7
City of Kirkland							
K-B[4]	3,047 ft^2 (0.07 ac)	Depressional	PEM	IV	6	6	3
K-C[4]	3,634 ft^2 (0.08 ac)	Depressional	PEM	III	7	6	3
K-D[5]	28,254 ft^2 (0.65 ac)	Depressional	PEM	III	7	7	3

Table ES-1 (continued). Summary of Wetlands Delineated

Wetland	Area	HGM Class	Cowardin Class	Functional Rating			
				Category	Water Quality Score	Hydrologic Score	Habitat Score
K-DD	225 ft^2 (0.01 ac)	Depressional	PEM	III	7	7	3
K-E	1,992 ft^2 (0.05 ac)	Depressional	PEM	IV	6	6	3
K-F[1]	19,251 ft^2 (0.44 ac)	Depressional	PEM/PFO	III	7	7	3
K-G	10,119 ft^2 (0.23 ac)	Depressional	PEM	III	7	7	3
K-H[4]	1,486 ft^2 (0.03 ac)	Depressional	PEM/PFO	III	8	7	3
K-J[1]	49,807 ft^2 (1.14 ac)	Depressional	PEM/PSS/ PFO/POW	II	9	9	6
K-K[1]	16,563 ft^2 (0.38 ac)	Depressional	PFO	III	6	7	3
K-L[1]	15,130 ft^2 (0.35 ac)	Depressional +Riverine	PEM/PSS/ PFO/POW	II	7	7	6
K-HF[1]	25,937 ft^2 (0.60 ac)	Depressional	PEM/PSS/ PFO	II	9	8	5

[1] Wetland extends beyond the study area boundary. The total acreage within the study area is given.
[2] Wetlands R-GCA and R-GCB were delineated in 2017 by Parametrix (2018). Information has been included for completeness but has not been verified.
[3] Note that based on the requirements in KCC 21A.24.318, the 2004 wetland rating form was used to rate the unincorporated King County wetlands.
[4] Wetland is outside the current project study area boundary, but was mapped during earlier surveys of a larger area.
[5] Wetland extends beyond the current study area boundary but was delineated in full. Total wetland acreage is given.
HGM = hydrogeomorphic, PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested, RAB = riverine aquatic bed, and POW = palustrine open water.

Table ES-2. Summary of Streams Delineated

Stream Name/ID	Associated Wetland	Area Within Study Area	Classification
City of Redmond			
Gun Club Creek	R-A, R-GCA, R-GCB	74,357 square feet	Class III
Stream R-2	R-C	137 square feet	Class III
Stream R-3	R-D	21 square feet	Class III
York Creek	R-E	579 square feet	Class III
124th Street Stream	none	602 square feet	Class III
Unincorporated King County			
Stream KC-1	KC-A	408 square feet	Type N
124th Street Stream	none	1,588 square feet	Type F
City of Kirkland			
Stream K-3	K-J	5,784 square feet	Type F
Stream K-5	K-L	1,188 square feet	Type F
Stream K-6	K-K	1,455 square feet	Type F
Stream K-7[1]	K-B	154 square feet	Type Np

[1]Area given extends beyond the study area.

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1.0 Site General Information

Name of Proposal: PSE Sammamish-Juanita Transmission Line

Name of Applicant: Puget Sound Energy (PSE)

Name of Organization and Individuals Preparing this Report: AECOM

Delineators: Kim Anderson, PWS; JD Brooks; Michelle Brownell, WPIT; Paul Hamidi, PWS; Linda Howard; Glen Mejia; and Tina Mirabile, PWS

Report Prepared by: Kim Anderson, PWS; Paul Hamidi, PWS; and Glen Mejia (Fish and Wildlife Biologist)

Report Reviewed by: Jeff Walker, PWS

Date Prepared: December 2019

Location of Proposed Activity: The study area (Figure 1-1) includes an approximately 5-mile linear corridor within which the proposed transmission line will be located. The study area reflects areas that were surveyed for wetlands within the City of Redmond, unincorporated King County, and the City of Kirkland, Washington. The study area begins at the Sammamish Substation (9221 Willows Road NE; King County Tax Parcel Number 0325059002). It runs from the substation northeast to Willows Road (through Parcel 0325059258) and turns north along a former BNSF railroad route owned by the City of Redmond, parallel to Willows Road (Parcels 0325059019, 3426059023, 2726059140, and 2726059145). At NE 124th Street, the corridor turns to the northwest and crosses both Willows Road NE and NE 124th Street and runs roughly west on the north side of 124th Street (Parcel 2726059024). The route turns south and crosses NE 124th toward the Totem Substation (13211 NE 123rd Street), making a loop through Parcels 2726059041, 2726059084, 2726059012, and 2726059087 before heading back north across NE 124th Street and through Parcel 2726059074 to a second former BNSF rail corridor owned by King County. The study area follows the Cross Kirkland Connector (CKC) trail corridor in a generally southwest direction (Parcels 2726059019, 2826059202, and 2826059027). Just before I-405, it turns to the west and crosses the highway, into Parcel 2826059115. The transmission line route then heads northwest on the east side of 120th Avenue NE, crossing over to the west side of the street just before NE 124th Street. It cuts across Parcel 2926059030 and then runs west on the north side of NE 124th Street. The route turns north into Parcel 3754550000 and to the east of Juanita High School property through the Juanita Country Club Condominium property, turns east and runs along the south side of NE 128th Street, and then turns north through Parcel 2926059007 to the Juanita Substation. A small segment of the route heads south across NE 124th Street into Parcel 2926059021.

Portions of the route that were not surveyed for wetlands or streams include sections along NE 124th Street and NE 128th Street in which the project will occur within the street right-of-way either in pavement or in the street landscaping strip where critical areas are not present. Additionally, biologists were not permitted to enter Parcels 2726059041, 276059012, and 2726059067 (the loop south of NE 124th Street) or Parcel 2726059106.

The study area is located in Township 25 North, Range 5 East, Section 3; and Township 26 North, Range 5 East, Sections 27-29, and 34.

Site Description: The study area is approximately 48.5 acres in size, and consists of both developed and undeveloped lands in a predominantly urban setting.

Adjacent Land Uses: Transportation right-of-way, commercial, industrial, residential, agriculture, open space

USGS/NWI topographic map: Kirkland, WA USGS 7.5-minute quadrangle

Landform: Various

Elevation: Ranges from 40 to 180 feet above mean sea level

Water Resource Inventory Area (WRIA): Lake Washington/Cedar/Sammamish (WRIA 8)

Watershed: Sammamish River, Lake Washington/Cedar River

NRCS soil series: Kitsap Silt Loam (36 percent of study area), Indianola Loamy Sand (33 percent), Alderwood Gravelly Sandy Loam (11 percent), Everett Very Gravelly Sandy Loam (7 percent), Tukwila Muck (6 percent), Earlmont Silt Loam (5 percent), Seattle Muck (3 percent)

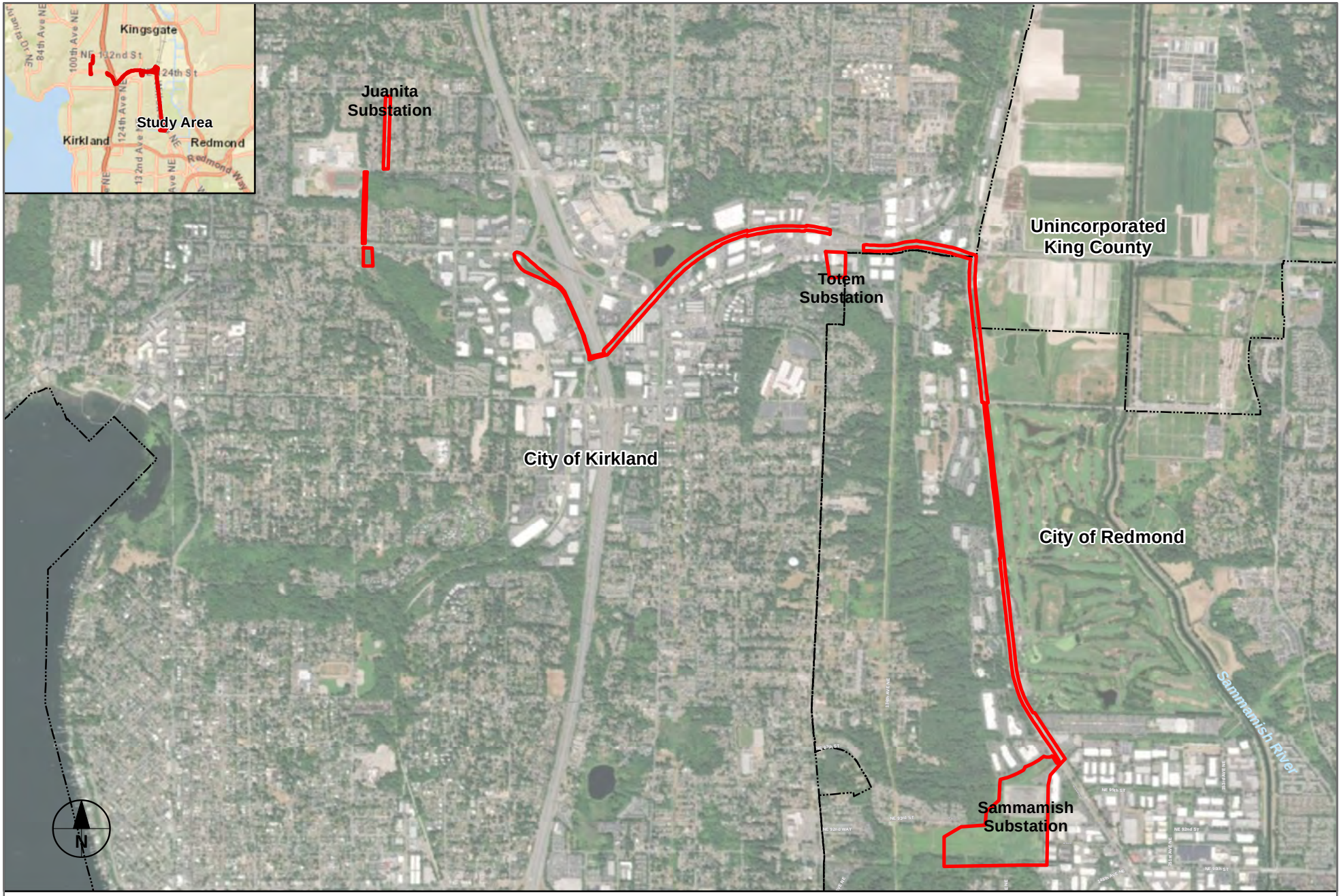
Cowardin classes: Palustrine emergent (PEM); Palustrine scrub-shrub (PSS), Palustrine forested (PFO), Palustrine Open Water (POW). (Note: POW Cowardin class occurs outside the study area boundary).

Delineated Wetland Area: 212,831 square feet (4.9 acres)

Delineated Waters Area: 86,273 square feet (2.0 acres)

Reporting Accuracy: Site wetland boundaries and the ordinary high water mark (OHWM) of streams were delineated and mapped using a Global Positioning System (GPS) unit, with a follow-up survey by David Evans and Associates (DEA) in most cases. Where higher accuracy survey data is available, it is used. Where survey data is unavailable, GPS data is used. Information about wetlands outside of the study area and areas inaccessible to biologists, was determined based on best professional judgment, hand drawn on aerial photos, and digitized into Geographic Information System (GIS). Existing sources of information were also used, as identified within the report.

AECOM



Puget Sound Energy
Sammamish-Juanita Transmission Line Wetland Delineation
Project No.: 60608044

0 0.25 0.5 1 Miles

Study Area

Jurisdictional Boundary

Figure 1-1

Vicinity Map

2.0 Background and Regulatory Framework

2.1 Introduction

This report presents the results of wetland and stream delineations conducted by AECOM for PSE for the proposed Sammamish-Juanita transmission line project, located in the City of Redmond, the City of Kirkland, and unincorporated King County, Washington. Initial field studies to delineate wetland boundaries were conducted during April, May, and June 2014; June 2015; April and June 2016; and October and November 2017. Following a delay of more than a year during which the planned transmission line route changed, follow-up field studies were conducted in April, June, and July 2019 to verify/update delineations more than 5 years old and survey previously undelineated portions of the new transmission line route, and in October 2019 to map ditches in the study area. This report provides information on wetlands and streams that occur within the study area (as modified in 2019) and that could potentially be affected by the proposed project. Some of these features fall outside or extend beyond the study area because the study area has been changed to reflect a change in the proposed transmission line route.

Because the study area spans multiple jurisdictions (Figure 1-1), information presented in this report is separated out by jurisdiction, with separate headings or subheadings for City of Redmond, City of Kirkland, and unincorporated King County, as appropriate.

2.2 Project Background and Study Objectives

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. 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. 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 the 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 1.5-mile construction and maintenance gravel access road. PSE will replace existing culverts under the existing rail ballast as part of the ballast widening for the access road construction.

The objectives of this study were to identify, map, categorize, and rate wetlands and streams within the study area, and to determine their appropriate regulatory buffers. Additionally, information on ditches and stormwater features that do not classify as streams or wetlands by the pertinent local jurisdiction have been included for informational purposes. The information provided in this report will be used to identify and avoid wetlands and streams that could be affected by future project activities. An assessment of project-specific impacts to wetlands/streams and their buffers will be provided in a separate report.

2.3 Study Area Description

The study area is the approximately 5-mile linear corridor that follows the route of the proposed transmission line, as well as some adjacent areas. The study area predominantly consists of developed areas. Nearly the entire corridor has been altered by development, and invasive and other weedy species are prevalent. Surface water flows have also been highly altered, and are directed by a series of culverts and drainage ditches and other stormwater improvements.

2.3.1 Study Area – City of Redmond

Within the City of Redmond, the study area is 19.4 acres (Figure 2-1). From the Sammamish Substation the study area crosses over predominantly developed areas north of the substation and across Willows Road NE, to an old railroad bed on the east side of Willows Road NE. It continues roughly north along the railroad bed to the City limits at Parcel 2726059127. In this stretch, the study area includes the railroad bed and narrow bands of undeveloped but heavily altered land that parallels the rail ballast. The dominant vegetation is reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry (*Rubus armeniacus*), and other weedy species, with some trees also present along the ballast. Adjacent land uses include commercial/industrial development, transportation, parks, and open space. In the southern end of the study area, the rail ballast along Willows Road NE has been converted to the paved Redmond Central Connector (RCC) II Trail, which ends at NE 100th Court.

2.3.2 Study Area – Unincorporated King County

Within unincorporated King County, the study area is 2.9 acres (Figure 2-2). The small portion of the study area that runs through unincorporated King County is primarily located on the former rail corridor parcel owned by the City of Redmond, just inside the Urban Growth Area (UGA) boundary. The unincorporated King County study area is bounded on the north by NE 124th Street. The adjacent property to the east (Parcel 2726059145) is identified as an Agricultural Production District by King County. The study area includes the railroad ballast and tracks, and narrow bands of predominantly undeveloped but heavily altered land. The study area includes portions of buildings and other development associated with the agricultural property. The dominant vegetation in the study area is reed canarygrass and other herbaceous weedy species. Adjacent land use to the west is transportation (Willows Road NE).

2.3.3 Study Area – City of Kirkland

Within the City of Kirkland, the study area is 31.3 acres (Figure 2-3). It includes mostly developed land in an urban setting, with some undeveloped lands included or adjacent. In the developed areas, weedy species and planted trees are prevalent. Undeveloped lands partially within the study area include the Totem Lake wetlands, the Heronfield wetlands, and a large wetland area east of Juanita High School. Adjacent land uses include agriculture east of the study area and north of NE 124 Street, commercial/industrial development on the north side of NE 124th Street and on both sides of the CKC trail and near I-405, residential development west of I-405, and park/open space associated with Totem Lake and the Heronfield wetlands. The former rail corridor has been converted into the CKC trail. The trail corridor west of 132nd Avenue NE/Slater Road has been improved with a gravel trail. The former rail corridor east of 132nd Avenue NE/Slater Road is owned by King County and still includes the rails from the previous railroad use.

2.4 Regulatory Information and Definitions – City of Redmond

Regulations pertaining to Critical Areas under the jurisdiction of the City of Redmond can be found in the Redmond Zoning Code (RZC; Title 21 of the Redmond Municipal Code). Critical Areas Regulations are found in Section 21.64 of the RZC. Guidance on critical areas reporting is found in Appendix 1 (Critical Areas Reporting Requirements).

2.4.1 Wetlands

The RZC defines wetlands as follows, which is based on the U.S. Army Corps of Engineers (USACE) definition:

> Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales,

> canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990 that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands. (RZC 21.78)

According to RZC 21.64.030, wetlands must be rated and regulated according to the categories defined by the Washington State Department of Ecology (Ecology) *Wetland Rating System for Western Washington* (rating form; Washington Department of Ecology 2014). This system scores wetlands on the basis of their sensitivity to disturbance, the functions they provide, and whether they can be replaced. The four categories of wetlands are briefly described below:

Category I Wetlands that represent a unique or rare wetland type, are more sensitive to disturbance than most wetlands, are relatively undisturbed, and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions. They include: 1) wetlands identified by scientists at the Washington Natural Heritage Program as high quality, relatively undisturbed wetlands, or wetlands that support state-listed threatened or endangered plants; 2) bogs; 3) mature and old-growth forested wetlands over 1 acre in size; or 4) wetlands that provide a very high level of functions, as evidenced by a score of 23 points or more on the rating form.

Category II Wetlands that provide high levels of some functions which are difficult to replace. They include wetlands scoring 20 to 22 point on the rating form that do not meet the criteria of Category I.

Category III Wetlands that provide a moderate level of functions. They are typically more disturbed and have less diversity or are more isolated from other natural resources in the landscape. They include wetlands scoring 16 to 19 points on the rating form that do not meet the criteria of Category I.

Category IV Wetlands that provide the lowest levels of functions. These wetlands score less than 16 points on the rating form.

2.4.2 Streams

Streams are defined as areas where surface waters produce a channel or bed, which need not contain water year-round. They do not include artificially created irrigation ditches, canals, storm or surface water runoff devices, other entirely artificial watercourses unless they are used by salmonids or created for the purposes of stream mitigation (RZC 21.78).

Riparian stream corridors are a subset of Fish and Wildlife Habitat Conservation Areas regulated under RZC 21.64.020. They include streams and adjacent riparian habitat (stream buffers). Riparian stream corridors contain elements of both aquatic and terrestrial ecosystems that mutually influence each other.

According to RZC 21.64.020, riparian stream corridors are categorized as follows:

Class I – Streams identified as “shorelines of the state” under the City of Redmond Shoreline Master Program.

Class II – Natural streams that are not Class I and are either perennial or intermittent and have salmonid fish use or the potential for salmonid fish use.

Class III – Natural streams that are not Class I or Class II and are either perennial or intermittent and have one of the following characteristics:

- Non-salmonid fish use or the potential for non-salmonid fish use;

- Headwater streams with a surface water connection to salmon-bearing or potentially salmon-bearing streams (Class I or II).

Class IV – Natural streams that are not Class I, Class II, or Class III. They are either perennial or intermittent, do not have fish or the potential for fish, and are non-headwater streams.

Intentionally Created – Manmade streams that do not include streams created as mitigation. Intentionally created streams are created through purposeful human action, such as irrigation and drainage ditches, grass-lined swales, and canals.

2.5 Regulatory Framework and Definitions – King County

In unincorporated King County, regulations pertaining to wetlands and streams are found in King County Code (KCC) Chapter 21A.24, Critical Areas.

2.5.1 Wetlands

The KCC definition of a wetland is based on the USACE definition, and is similar to the definition for the other jurisdictions covered by this report (see Section 2.4.1).

KCC 21A.24.318 classifies wetlands based on the 2004 version of the *Washington State Wetland Rating System for Western Washington* (Washington Department of Ecology 2004). The 2004 rating form has the same four categories of wetlands as those discussed in Section 2.4.1, but the point system is different:

Category I – Greater than 70 points

Category II – 51 to 69 points

Category III – 30 to 50 points

Category IV – less than 30 points.

2.5.2 Streams

King County regulates streams as aquatic areas, which include all non-wetland water features.

The KCC defines a stream as “an aquatic area where surface water produces a channel, not including a wholly artificial channel, unless it is: A) used by salmonids; or B) used to convey a stream that occurred naturally before construction of the artificial channel.”

According to KCC 21A.24.355, aquatic areas are categorized into the following types:

Type S – all aquatic areas inventoried as “shorelines of the state” under King County’s Shoreline Master Program.

Type F – all segments of aquatic areas that are not Type S waters and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 feet of the entire tributary if the tributary is highly significant for protection of downstream water quality.

Type N – all segments of aquatic areas that are not Type S or F waters and that are physically connected to Type S or F waters by an above-ground channel system, pipe or culvert, stream, or wetland.

Type O – all segments of aquatic areas that are not Type S, F, or N waters and that are not physically connected to Type S, F, or N waters by an aboveground channel system, pipe or culvert, stream, or wetland.

2.6 Regulatory Framework and Definitions – City of Kirkland

Within the City of Kirkland, regulations pertaining to wetlands and streams are found in Chapter 90 of the Kirkland Zoning Code (KZC).

2.6.1 Wetlands

The KZC defines wetlands based on the USACE definition (see Section 2.4.1).

The City of Kirkland requires wetlands to be classified and rated in accordance with the 2014 *Washington State Wetland Rating System for Western Washington*. See Section 2.4.1 for a discussion of the four categories of wetlands under this rating system.

2.6.2 Streams

KZC Chapter 5.895 defines streams as "areas where surface waters produce a defined channel or bed that demonstrates clear evidence of the passage of water, including but not limited to bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed need not contain water year-round, provided there is evidence of at least intermittent flow during years of normal rainfall. Streams do not include irrigation ditches, canals, storm or surface water runoff devices, or other entirely artificial watercourses, unless they are used by salmonids or convey a naturally occurring stream that has been diverted into the artificial channel, or are created for the purposes of stream mitigation."

According to KZC Chapter 5.898, streams are classified according to WAC 222-16-030, as amended:

Type F – Fish bearing. Segments of natural waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water and which contain fish habitat pursuant to WAC 22-16-030, as amended.

Type Np – Perennial non-fish bearing. All segments of natural waters within the bankfull width of defined channels that are perennial non-fish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow pursuant to WAC 222-16-030, as amended.

Type Ns – Seasonal non-fish bearing. All segments of natural waters within the bankfull width of the defined channels that are not Type F or Np waters. These are seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream that is a Type Np water. Ns waters must be physically connected by an above-ground channel system to Type F or Np waters pursuant to WAC 222-16-030, as amended.

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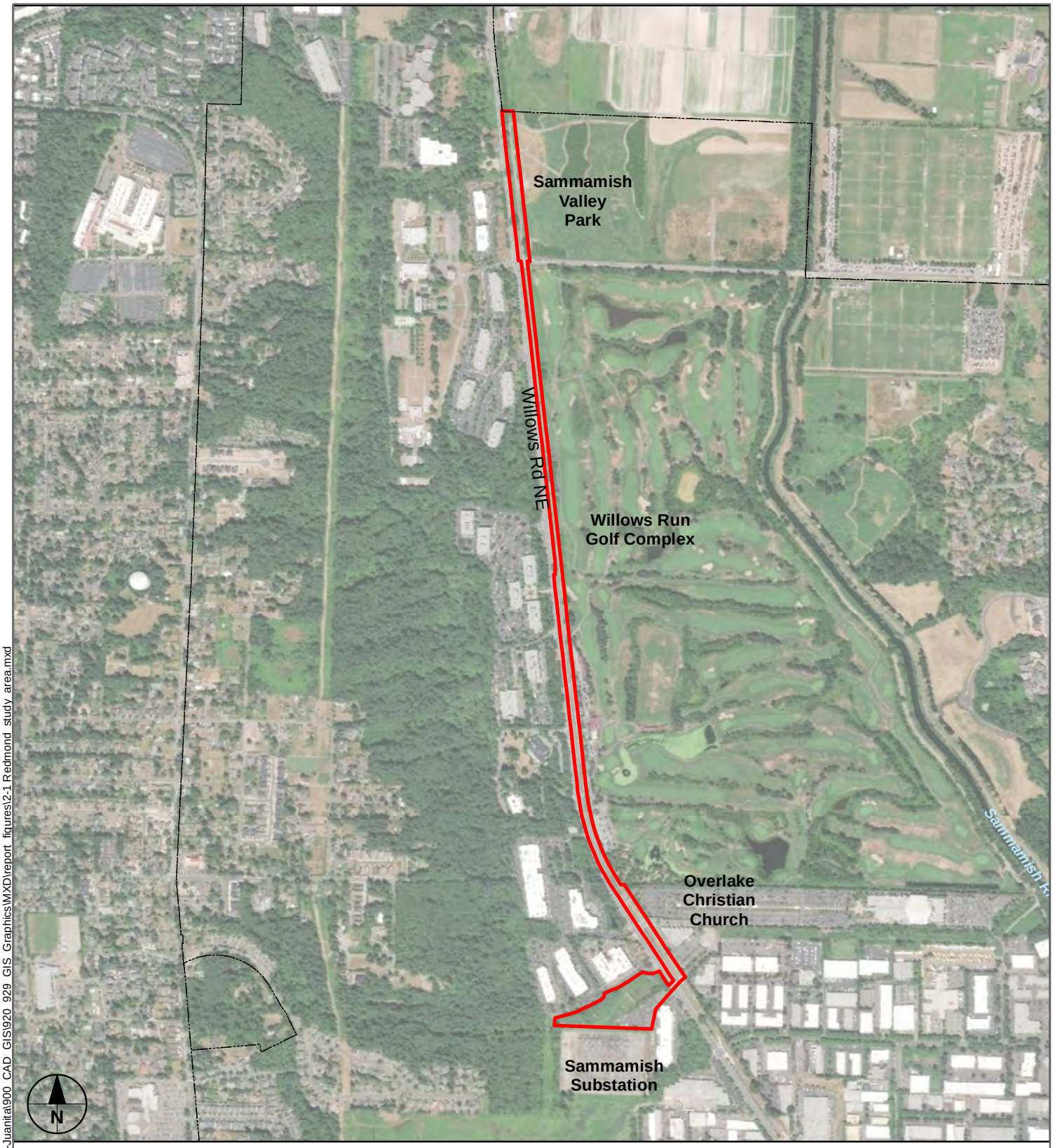

Puget Sound Energy
Sammamish-Juanita Transmission Line Wetland Delineation
Redmond, Washington
Project No.: 60608044

Study Area (Redmond)

Jurisdictional Boundary

0 500 1,000 2,000 Feet

Figure 2-1
City of Redmond Study Area

1028

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AECOM

Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation
King County, Washington
Project No.: 60608044

Study Area (King County)
Jurisdictional Boundary
Urban Growth Area

0 100 200 400
Feet

Figure 2-2
Unincorporated King County Study Area

1029

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AECOM

Puget Sound Energy
Sammamish-Juanita Transmission Line Wetland Delineation
Kirkland, Washington
Project No.: 60608044

0 500 1,000 2,000 Feet

Study Area (Kirkland)

Jurisdictional Boundary

Figure 2-3
City of Kirkland Study Area

3.0 Methods

3.1 Background Review

AECOM conducted a review of background materials to obtain information about mapped and potential wetland and stream locations in the study area. These materials included the following:

- Digital aerial photos and topographic maps of the study area.
- King County GIS data, showing mapped wetlands, streams, and other critical areas, downloaded from the King County GIS Open Data (https://gis-kingcounty.opendata.arcgis.com/).
- The City of Kirkland Sensitive Areas map (http://www.kirklandwa.gov/Assets/IT/GIS/Sensitive+Areas+Map.pdf?_sm_au_=iVVP5FRLs5DqSHHS) and GIS data of Sensitive Areas obtained from the City at http://inter.kirklandwa.gov/gisdata/AllData/.
- City of Redmond GIS data and maps, available on-line at https://www.redmond.gov/416/Maps-GIS, and GIS data on wetlands obtained directly from the City of Redmond in August 2019.
- National Wetlands Inventory (NWI) GIS data (U.S. Fish and Wildlife Service 1977 to present).
- Custom Soil Resource Report for King County Area, Washington, generated from the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey (http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm; Appendix D).
- Washington Department of Fish and Wildlife (WDFW) data on Priority Habitats and Species (PHS) (WDFW 2019a), available on-line at http://apps.wdfw.wa.gov/phsontheweb/.
- Data on fish occurrence obtained on-line from WDFW SalmonScape (WDFW 2019b) (http://apps.wdfw.wa.gov/salmonscape/).
- Digital data on rare plant species element occurrences from the Washington Natural Heritage Program (Washington Natural Heritage Program 2019).
- Willows Road Culvert Replacement Critical Areas Report (Parametrix 2018).
- Sammamish Valley Park Wetland Delineation Report (The Watershed Company 2009).

3.2 Wetland Delineation

The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010) was the primary reference manual for delineations conducted within the study area. This manual is a supplement to the *1987 Corps of Engineers Delineation Manual* (USACE 1987).

For all jurisdictions, the field survey methodology is broken into two sections: one describing the initial wetland delineation and mapping through 2017, and one describing new surveys and wetland verification/redelineation surveys following changes in the proposed transmission line route and changes in

site conditions. Photographs documenting wetland characteristics at the time of field surveys are included in Appendix A of this report. Complete field data forms can be found in Appendix B.

3.2.1 Field Evaluation – City of Redmond

Table 3.1 summarizes field surveys for wetlands within the City of Redmond. The wetlands listed in the table are described in detail in Section 4.1.1. Data sheet numbers are given in parentheses, with additional information for sample plots provided in Appendix B and Appendix E.

Table 3-1. City of Redmond Wetland Survey Dates

Wetland	Initial Survey Date	Verification/Redelineation Date
R-A	6/4/14 (T1-SP1 to T2-SP3)	n/a – no longer in project area
R-C	6/29/16 (SP-F1, SP-F2)	n/a
R-D	6/29/16 (SP-D1, SP-D2)	n/a
R-E	6/28/16 (SP-B1 to SP-B4)	n/a
R-GCA[1]	n/a	n/a
R-GCB[1]	n/a	n/a
[1] AECOM did not delineate the boundary of this wetland. Information was obtained from Parametrix 2018.		

3.2.1.1 Initial Wetland Delineation

The initial wetland delineation surveys occurred on May 19 and June 4, 2014, and June 28 and 29, 2016. Surveys were conducted to identify, delineate, categorize, and map wetlands in the study area. Additional information to support the information presented in this report was obtained during a May 6, 2015 reconnaissance of wetlands along the former rail corridor east of Willows Road NE, and during an April 15, 2016 site visit to obtain supporting photographs and other information, and to determine boundaries of Cowardin classes (Cowardin et al. 1979).

Where feasible, biologists followed the instructions for a routine determination, as described in the *Corps Manual* (USACE 1987). In the study area located north of the Sammamish Substation, a baseline was established along the road parallel to the Gun Club Creek stream channel and perpendicular to the hydrologic gradient. Two transects were run to the northwest, across the stream channel, located to capture the range of apparent plant community types in the study area. No soil log holes were located in the upland triangle bounded by the paved walkway, the path, and the parking lot of the adjacent property. This area is a planted upland mitigation site with black sheeting in place to control weeds, and would be altered by digging holes.

Within the portion of the study area along Willows Road NE, wetlands were delineated following an initial reconnaissance to determine probable locations. During the reconnaissance, numerous soil probes were located on each side of the railroad bed to obtain information about soils and hydrology, and likely wetland locations were mapped. During the follow-up delineation biologists revisited the likely wetland locations and formally delineated the boundaries, filling out data forms for wetland and upland plots.

Wetland boundaries, as well as sample plots where data was collected, were flagged and numbered, and mapped with a Trimble Geo Explorer handheld GPS unit. Wetland flagging was professionally surveyed by DEA. In instances where survey data is incomplete or unavailable, GPS data obtained by the delineators has been used to as a backup.

Biologists also mapped the demarcation between wetland Cowardin classes in the field. This task was completed by hand drawing the observed boundary lines on high resolution aerial photos in the field and then digitizing these lines in GIS.

For areas where biologists did not have access to adjacent properties and it appeared that a wetland was likely to be present close enough to the project corridor for potential buffer impacts, biologists used aerial photographs, field observations of vegetation and standing water, and soil surveys to come up with "best professional judgment" offsite wetland boundaries, which were then digitized into GIS.

3.2.1.2 Wetland Verification/Redelineation

Wetland verification/redelineations occurred on June 4, 2019. Field surveys focused on wetlands for which initial delineations occurred more than five years earlier, and in portions of the study area where site conditions have changed since the initial delineation. The wetland identified as R-A during an initial delineation in 2014 was not verified since the proposed project no longer has the potential to impact this wetland or its buffer. For the portion of the study area along Willows Road NE, updates were not needed based on the initial wetland delineation date (2016). However, there is evidence that conditions in 2019 were much wetter than those during the initial delineations, likely as a result of a ditch-cleaning project that occurred in 2017 (described in Parametrix 2018). Therefore, biologists reinvestigated the full study area to confirm that no additional wetlands were present and that mapped boundaries were correct. Wetlands associated with Gun Club Creek were not delineated, as these wetlands were mapped as part of a separate project in 2017 by the City of Redmond. Offsite wetlands with buffers extending into the study area were also reevaluated during the June 4, 2019 field survey. The boundary of the offsite wetland east of Wetland R-D was slightly modified based on observations of vegetation and review of high-resolution aerial photography.

3.2.2 Field Evaluation – Unincorporated King County

Table 3.2 summarizes field surveys for wetlands within unincorporated King County. Data sheet numbers are given in parentheses, with additional information for the referenced sample plots provided in Appendix B and Appendix E.

Table 3-2. King County Wetland Survey Dates

Wetland	Initial Survey Date	Verification/Redelineation Date
KC-A	6/28/16 (SP-A1 to SP-A2)	n/a
KC-B	6/4/19 (SP-1 to SP-2)	n/a

3.2.2.1 Initial Wetland Delineation

Field surveys of the unincorporated King County portion of the study area were conducted on April 15, 2016. Additional data to support the information presented in this report was obtained during a May 6, 2015 reconnaissance of wetlands along the former rail corridor east of Willows Road NE. Wetland delineations followed the protocols and technical information provided in the *1987 Corps Manual* and the *2010 Regional Supplement*. Wetland boundaries and sample plots where data was collected were flagged and numbered with a Trimble Geo Explorer handheld GPS. Follow-up professional surveys were done by DEA.

Because of the lack of rights to access properties outside of the study area, delineations along Willows Road NE did not extend beyond the study area boundary. However, biologists investigated surrounding areas from within the corridor and used best professional judgment to determine whether wetlands were likely to be present in these areas. If biologists determined that an off-site wetland was likely to be present close enough to the project corridor for potential buffer impacts, they used aerial photographs, field observations of vegetation and standing water, and soil surveys to come up with approximate wetland boundaries, which were then digitized into GIS

3.2.2.2 Wetland Verification/Redelineation

Because, the initial wetland delineation in unincorporated King County occurred in 2016, no update to the delineation was needed. However, given the apparent changes in site conditions since 2016, biologists walked the study corridor again on June 4, 2019 to confirm the findings of the previous delineation, focusing on areas with vegetation or hydrology that could indicate the presence of a wetland. One additional wetland was delineated, and other non-wetland areas were documented with sample plots.

3.2.3 Field Evaluation – City of Kirkland

Table 3.3 summarizes field surveys for wetlands within the City of Kirkland. Data sheet numbers are given in parentheses, with additional information for sample plots provided in Appendix B and Appendix E. Additional surveys occurred in areas that are no longer part of the proposed project area. The study area shown in the figures in this report reflects the current planned transmission line route, and does not include additional areas that are no longer pertinent to the project.

Table 3-3. City of Kirkland Wetland Survey Dates

Wetland	Initial Survey Date	Verification/Redelineation Date
K-B	10/22/17 (SP-KB1, SP-KB2)	7/1/19 (SE boundary confirmed)
K-C	10/22/17 (SP-KC1, SP-KC2)	n/a
K-D	4/16/14 (SP3, SP4)	6/4/19 (SP-KD1, SP-KD2, SP-3, SP-4)
K-DD	6/4/19 (SP-KDD1, SP-KDD2)	n/a
K-E	10/22/17 (SP-KE1, SP-KE2)	n/a
K-F	4/17/14 (SP5); 10/22/17 (SP-KF1)	6/4/19 (SP-KF1 to SP-KF2)
K-G	4/17/14 (SP6, SP7); 11/6/17 (SP-KG1, SP-KG2)	6/4/19 (SP-KG1 to SP-KG2)
K-H	4/17/14 (SP8)	6/4/19 (SP-8)
K-J	4/17/14 (SP9); 10/24/17 (SP-KJ1)	6/4/19 (SP-KJ2)
K-K	4/17/14 (SP10); 10/24/17 (SP-KK1)	6/4/19 (SP-KK1 to SP-KK4, SP-10)
K-L	6/6/14 (T1-SP1, T1-SP2, T2-SP1, T2SP2)	6/20/19 (KL-SP1 to KL-SP4)
K-HF	6/20/19 (SP-1 to SP-2)	n/a

3.2.3.1 Initial Wetland Delineation

Field surveys of the City of Kirkland portion of the study area were conducted on April 14 through 18, 2014, June 6, 2014, June 18, 2015, August 21, 2015, April 15, 2016, October 20, 22, and 24, 2017, and November 6, 2017. Surveys were conducted to identify, delineate, categorize, and map wetlands and streams in the study area. The study area does not include sections of the proposed transmission line corridor along NE 124th Street and NE 128th Street; see Figure 2-3. In these areas the project will occur within the street right-of-way either in pavement or in the street landscaping strip, or on a paved, developed private parcel (2726059074), and PSE determined that a wetland/stream survey was not necessary.

Because of the linear nature of the study area, wetlands were generally delineated along a single transect line. However, in many situations, a second transect line was necessary in order to document wetlands on both sides of a central upland area (such as the railroad corridor). Much of the study area has been altered by development. Many of the wetlands are located in man-made features, such as ditches. In some cases, digging holes to document the soil was problematic because of the rock fill present along the former rail ballast. Therefore, biologists used site topography to assist with wetland delineations, as appropriate.

Wetland and stream boundaries, as well as sample plots where data was collected, were flagged and numbered, and mapped with a Trimble Geo Explorer handheld GPS unit. Flagged wetland boundaries were then professionally surveyed by DEA. The figures presented in this report utilize the professionally surveyed

data provided by DEA. Biologists also mapped the demarcation between wetland Cowardin classes, where applicable and appropriate.

3.2.3.2 Wetland Verification/Redelineation

Biologists revisited the City of Kirkland study area in June and July 2019 and verified the boundaries of wetlands mapped in 2014. Because the planned transmission line route has changed since 2017, wetlands that no longer have the potential to be impacted by the proposed project were not verified (Wetlands K-AA, K-BB, and K-A). However, new sections of the route were surveyed for wetlands. These include the west edge of the Heronfield Wetlands and the Totem Substation parcel. Additionally, information about a stream on a privately owned parcel (2726059106) was estimated from an adjacent property.

3.3 Wetland Rating

Wetlands encountered and mapped during field surveys were mapped using the *Washington State Wetland Rating System for Wetland Washington*. For wetlands in the City of Redmond and City of Kirkland, the 2014 update to the rating system (Washington Department of Ecology 2014) was used, and for wetlands in areas under the jurisdiction of King County, the 2004 version of the rating system (Washington Department of Ecology 2004) was used, in accordance with the KCC. Biologists completed as much of the rating forms as possible in the field, with sections requiring desktop review completed at a later date using GIS and other tools to obtain additional information. The completed rating forms were used to determine a category for each wetland. In the case of large wetlands where biologists were only able to access a small portion in the field, rating forms were completed using all available information and best professional judgment.

Site visits to rate the City of Redmond wetlands occurred on April 15, June 28, and June 29, 2016. Site visits to rate the unincorporated King County wetlands occurred on April 15 and June 28, 2016, and June 4, 2019. Site visits to rate the City of Kirkland wetlands occurred on July 25, 2016 and June 20, 2019. The completed wetland rating forms are provided in Appendix C.

3.4 Stream Survey and Rating

In all jurisdictions, stream boundaries were delineated using physical characteristics to determine the OHWM, based on guidance from Ecology (Anderson et al. 2016) and USACE (2005). Project site stream boundaries and associated OHWMs were determined in the field using observations of matted, bent, or absent vegetation; scour marks; presence of bed and bank; and changes in the plant community.

The OHWMs of streams encountered during field surveys were flagged and numbered, and mapped with the Trimble GPS unit. Following field surveys, the streams were professionally surveyed by DEA.

Streams were initially mapped at the same time as wetland boundaries. During verification/redelineation surveys in 2019, biologists confirmed the mapped locations of streams, adjusting the boundaries as needed. In the City of Redmond, biologists met with Tom Hardy, the City's stream and habitat planner, to obtain additional information about some streams that were initially determined to be non-fish bearing drainage ditches based on the lack of a defined channel and the lack of water during site visits. Following the April 8, 2019 site visit, AECOM mapped additional streams based on direction from the City. These streams were mapped using GPS but not flagged for follow-up survey. Table 3.4 summarizes field mapping of streams within the study area.

In all jurisdictions, mapped streams were categorized in accordance with the jurisdiction-specific rating instructions presented earlier in this section.

Table 3-4. Stream Survey Dates

Stream	Initial Survey Date	Verification/Redelineation Date
City of Redmond		
Gun Club Creek	4/15/16	4/8/19 (portion along Willows Creek)
Stream R-2	6/29/16	4/8/19 (extended)
Stream R-3	4/8/19	n/a
York Creek	4/8/19	n/a
124th Street Stream	4/8/19	n/a
Unincorporated King County		
Stream KC-1	6/28/16	6/4/19
124th Street Stream	4/8/19	n/a
City of Kirkland		
Stream K-3	10/20/17	6/20/19
Stream K-5	6/6/14	6/20/19
Stream K-6	6/4/19	n/a
Stream K-7	7/1/19	n/a

3.5 Ditch Mapping

In all jurisdictions, numerous man-made drainage ditches were encountered within the study area, often located on both sides of the railroad ballast. In accordance with the regulatory guidance from all three of the applicable jurisdictions, these artificial watercourses were not considered to meet the definition of streams unless they were used by salmonids or conveyed a naturally occurring stream that was diverted into the artificial channel. Artificial watercourses without salmonid use or stream diversion were mapped as ditches for informative purposes.

In the City of Redmond and unincorporated King County, AECOM initially obtained information about manmade ditches in the field on June 4 and 5, 2019. Ditches were mapped in areas within the study area where streams were not observed but where there was evidence of water conveyance (e.g., scour, sediment deposits) in manmade features. Culverts at each ditch endpoint were mapped using GPS, and the ditch line was generated by connecting these endpoints. Following the initial field mapping, AECOM identified additional mapped ditches in the City of Redmond's GIS data and made a follow-up site visit on October 24, 2019 to investigate these areas and ground truth the ditch locations. Actual locations were noted on field maps and then digitized into GIS for mapping purposes.

4.0 Results of Background Review

4.1 City of Redmond

4.1.1 Wetlands

As discussed in Section 3.1, background data reviewed to determine existing mapping of wetlands within the study corridor includes NWI data and maps/GIS data obtained from the City of Redmond website.

According to the City's mapping and GIS data (Figure 4-1), wetlands cross the project corridor at four locations, and the area adjacent to the rail corridor to the east contains a mixture of wetlands and uplands.

Figure 4-1 shows the NWI data for the site. No wetlands are mapped within the study area. However, a large PEM wetland is depicted just east of the study area for most of its length along Willows Road NE.

4.1.2 Streams

The City of Redmond has mapped several locations where streams occur within the study area (Figure 4-1). Gun Club Creek, mapped as a Class III stream, is shown running north of the Sammamish Substation, under Willows Road NE, and for a short distance parallel to and along the east side of Willows Road NE. Adjacent to the golf course property, two unnamed Class III streams are mapped running east-west within the study area, with short segments on both sides of the rail ballast, and continuing into the golf course property for a short distance before ending. Just north of NE 116th Street, a Class III stream (York Creek) is mapped running along the east edge of the study area, with a small segment of the stream running east-west under the ballast. At the north end of the City of Redmond portion of the study area, another Class III stream (124th Street Stream) is mapped running north-south on the west side of the ballast. WDFW SalmonScape shows Gun Club Creek as a perennial stream within the study area, as well as five intermittent/ephemeral streams that flow east-west across the study area, all of which have a surface water connection to the Sammamish River. Only one of these five streams corresponds with a stream shown on the City of Redmond GIS mapping.

4.1.3 Soils

The NRCS has mapped six soil map units within the City of Redmond study area (see Appendix D; USDA NRCS 2019a). Indianola loamy sands (0 to 15 percent slopes) make up the majority (72.4 percent) of the City of Redmond study area. They are mapped north of the substation, adjacent to the golf course property, and adjacent to a portion of Sammamish Valley Park. These soils occur on sandy glacial outwash moraines, and are somewhat excessively drained with no flooding or ponding. Included within this map unit are 8 percent Alderwood soils, 5 percent Everett soils, and 2 percent Norma soils (in depressions and drainageways).

Alderwood gravelly sandy loams (8 to 15 percent slopes and 15 to 30 percent slopes) are mapped over 16.7 percent of the City of Redmond study area, at the northwest corner of the Sammamish Substation and at various locations along the rail corridor in the vicinity of NE 116th Street. These soils occur on moraines and till plains, and have formed over basal till with some volcanic ash. They are moderately well drained, and have a low frequency of flooding and ponding. Alderwood gravelly sandy loams are generally considered upland soils, but where they occur in topographic depressions, they may have a component of hydric soils. Included with this map unit are 5 percent Indianola soils, 5 percent Everett soils, 3 percent Shalcar soils and 2 percent Norma soils. The Shalcar and Norma series occur in depressions and are considered hydric soils.

Earlmont silt loams are mapped over 10.2 percent of the City of Redmond study area. They are mapped near the south end of the study area on the east side of Willows Road NE. These soils occur in floodplains on diatomaceous earth. They are somewhat poorly drained and occasionally flooded, and are considered hydric soils. Included in this map unit are 10 percent Snohomish variant soils, 1 percent Seattle soils, 1 percent Tukwila soils, and 1 percent Sultan soils. All of these inclusions, with the exception of the Sultan series, are hydric soils that occur in depressions.

A very small percentage (0.7 percent) of the City of Redmond study area, at its northern end, is mapped as Tukwila muck. These soils occur on floodplains and have formed over herbaceous organic material. They are very poorly drained, and ponding is frequent. They are considered hydric soils, and have minor components of three other hydric soil series: Seattle, Bellingham, and Norma.

4.1.4 Priority Habitats and Species

According to WDFW's PHS database (WDFW 2019a), no priority species occur within the portion of the study corridor under City of Redmond jurisdiction, although a Coho salmon breeding area is mapped in adjacent Willows Creek, which is shown with a hydrologic connection to Gun Club Creek. The only priority habitat mapped in the vicinity of the study corridor is a freshwater emergent wetland just east of the study area.

According to WDFW SalmonScape, modeled fish presence has been mapped in one stream in the City of Redmond study area (WDFW 2019b). However, this stream, which is shown as an intermittent stream spanning both sides of Willows Road NE, is not shown east of Willows Road NE on the City of Redmond stream map. Fall Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisuch*), winter steelhead (*O. mykiss*), and sockeye salmon (*O. nerka*) have all been modeled as occurring in this section of stream, based on its location in relation to known species presence and stream gradient. The modeling does not factor in habitat quality, flow, or any other natural or human-caused condition that would otherwise prevent habitat use.

According to the City of Redmond's Fish and Wildlife Habitat Conservation Areas map (City of Redmond 2005), The area along Gun Club Creek west of Willows Road NE has been designated as a Native Growth Protection Easement. Additionally, the study area abuts a Transfer Development Rights Easements (Sammamish Valley Park and six parcels that make up Willows Run Golf Course) east of the rail corridor parcels. Native Growth Protection Easements and Transfer of Development Rights Easements are classified as Core Preservation Areas under the Fish and Wildlife Habitat Conservation Area regulations in RZC 21.64.020. These areas are already protected through other regulatory mechanisms.

There are no rare plant species or rare/high quality ecological communities mapped within the City of Redmond study area by the Washington Natural Heritage Program (2019).

4.2 Unincorporated King County

4.2.1 Wetlands

Based on data shown in King County iMap and GIS data layers, no wetlands have been mapped in the study area within unincorporated King County.

4.2.2 Streams

King County GIS data layers show the presence of three connected stream channels within the study area in unincorporated King County (Figure 4-2). One runs north-south on the east side of the railroad bed and appears to receive water from the west side of Willows Road NE. A second stream flows east from this channel and into the adjacent agricultural property. It is shown as curving up to the north in the direction of NE 124th Street, where it meets up with a third channel that is mapped as a straight east-west channel south of NE 124th Street, and ends just inside the study area. In iMap this stream is shown as running north-south for about 200 feet within the northern portion of the study area before heading east and back up to NE 124th

Street. WDFW SalmonScape (WDFW 2017b) has different mapping of streams within the unincorporated King County portion of the study area. Only one intermittent/perennial stream is shown in the study area vicinity. However, it is shown crossing the study area to the south, in the area under City of Redmond jurisdiction (see Section 4.1.2), and then flowing north into the agricultural property. It is mapped as coming within 30 feet of the unincorporated King County study area boundary.

4.2.3 Soils

The NRCS has mapped two soil map units within the unincorporated King County portion of the study area (see Appendix D; USDA NRCS 2019b). Tukwila muck is mapped over 93 percent of the area, with just a small section in the northern end mapped as Earlmont silt loams. Tukwila muck soils occur on floodplains and have formed over herbaceous organic material. They are very poorly drained, and ponding is frequent. They are considered hydric soils, and have minor components of three other hydric soil series: Seattle, Bellingham, and Norma. Earlmont silt loam soils occur in floodplains on diatomaceous earth. They are somewhat poorly drained and occasionally flooded, and are considered hydric soils. Included in this map unit are 10 percent Snohomish variant soils, 1 percent Seattle soils, 1 percent Tukwila soils, and 1 percent Sultan soils.

4.2.4 Priority Habitats and Species

According to WDFW's PHS database, no priority habitats occur in or near the portion of the study corridor under King County jurisdiction (WDFW 2019a). The closest salmon-bearing streams are shown within the agricultural property approximately 950 feet to the east of the study area, and north of NE 124th Street, in the City of Kirkland.

WDFW SalmonScape (WDFW 2019b) does not show mapped salmonid fish distribution within the unincorporated King County portion of the study area. The stream mapped just east of the study area indicates modeled presence of fall Chinook and coho salmon, winter steelhead trout, and sockeye salmon. The nearest section of stream mapped with modeled presence of salmonids is approximately 70 feet from the study area boundary.

There are no rare plant species or rare/high quality ecological communities mapped within the unincorporated King County portion of the study area by the Washington Natural Heritage Program (2019).

4.3 City of Kirkland

4.3.1 Wetlands

As discussed in Section 3.1, background data reviewed to determine existing mapping of wetlands within the study corridor includes the City of Kirkland sensitive areas map/GIS data and NWI data.

City of Kirkland GIS mapping shows a large wetland that stretches roughly east-west between Juanita High School and I-405 (Figure 4-3). Another large wetland (the Heronfield wetlands) is mapped south of 124th Street, the northwest tip of which intersects the study area. Another large wetland is mapped at Totem Lake Park, which intersects the study area between 124th Avenue NE and 128th Lane NE. Numerous smaller wetlands are mapped on both sides of the CKC trail and King County ERC corridor at various locations within the study area.

NWI data shows PFO and PSS wetlands that roughly correlate to the City of Kirkland-mapped Juanita Creek wetland, and a complex of wetland types in the vicinity of Totem Lake and at the Heronfield wetlands, with a coverage similar to the City of Kirkland GIS mapping. The wetland on the opposite side of the trail from the Totem Lake wetlands is mapped adjacent to the City of Kirkland-mapped wetland. The smaller wetlands mapped by the City of Kirkland on both sides of the trail and railroad bed do not show up on NWI maps for the area.

4.3.2 Streams

City of Kirkland sensitive areas GIS data shows three mapped stream channels associated with the study area (Figure 4-3). Two streams are unnamed tributaries that drain into the Totem Lake wetland complex. A third stream is an unnamed tributary that runs east-west through the project corridor in the vicinity of Juanita High School and drains into Juanita Creek about 0.6 mile downstream of the study area. This stream connects to a fourth stream, which runs north-south along the edge/just outside of the study area along portions of 109th Court NE and 108th Court NE, crossing NE 124th Street. SalmonScape (WDFW 2019b) has a different mapping of streams, showing longer intermittent water courses in the study area. At the east end of the City of Kirkland study area, an intermittent stream runs along the east side of the rail corridor east of Willows Road NE, curving to the east on the north side of NE 124th Street, and eventually flowing into the Sammamish River. Several additional intermittent surface water connections to the Sammamish River are also shown. A second intermittent stream is shown connecting to the first channel and running roughly east-west through the study area. This channel is mapped crossing over to the north side of the CKC trail, and connecting with the Totem Lake wetlands. A third intermittent stream channel crosses the study area in the vicinity of Juanita High School, connecting the large wetland complex in this area with Juanita Creek east of the study area. A fourth intermittent stream channel connects to this channel, running north-south with a slightly different mapping than the City of Kirkland's, and connecting to Heronfield wetlands.

4.3.3 Soils

The NRCS has mapped six soil map units within the City of Kirkland study area (see Appendix D; USDA NRCS 2019c). Kitsap silt loam, 2 to 8 percent slopes, makes up 66.5 percent of the study area. This map unit occurs on terraces, and has a parent material of lacustrine deposits. These soils are moderately well drained upland soils, with no flooding or ponding. Minor components include 10 percent Alderwood soils, and 1 percent each of Bellingham, Tukwila, and Seattle soil series. The latter three soils occur in depressions and are considered hydric soils.

Everett very gravelly sandy loams, 8 to 15 percent slopes, occur over 13.2 percent of the study area, at the northwest end near the Juanita Substation and Juanita High School. They are upland soils that occur on kames, eskers, and moraines, are somewhat excessively drained, and have no ponding or flooding. Minor components include 10 percent each of the Alderwood and Indianola soil series, both of which are upland soils.

Alderwood gravelly sandy loams (8 to 15 percent slopes and 15 to 30 percent slopes) are mapped over 7.5 percent of the City of Kirkland study area. These soils occur on moraines and till plains, and have formed over basal till with some volcanic ash. They are moderately well drained, and have a low frequency of flooding and ponding. Alderwood gravelly sandy loams are generally considered upland soils, but where they occur in topographic depressions, they may have a component of hydric soils. Included with this map unit are 5 percent Indianola soils, 5 percent Everett soils, 3 percent Shalcar soils and 2 percent Norma soils. The Shalcar and Norma series occur in depressions and are considered hydric soils.

Indianola loamy sands (5 to 15 percent slopes) make up 6.8 percent of the City of Kirkland study area. They occur on sandy glacial outwash moraines, and are somewhat excessively drained with no flooding or ponding. Included within this map unit are 8 percent Alderwood soils, 5 percent Everett soils, and 2 percent Norma soils (in depressions and drainageways).

Seattle muck soils occur over 5.2 percent of the study area, and are mapped in the vicinity of Totem Lake and the Heronfield wetlands. They are hydric soils that occur in depressions and form over organic parent material. They are very poorly drained, and have frequent ponding.

Earlmont silt loam soils occur over a very small portion of the study area (0.9 percent), at its eastern corner, near the boundary with unincorporated King County. These soils occur on floodplains and have a parent material of diatomaceous earth. They are somewhat poorly drained and occasionally flooded, and are

considered hydric soils. Included in this map unit are 10 percent Snohomish variant soils, 1 percent Seattle soils, 1 percent Tukwila soils, and 1 percent Sultan soils. All of these inclusions, with the exception of the Sultan series, are hydric soils that occur in depressions.

4.3.4 Priority Habitats and Species

According to WDFW's PHS database, three priority habitats/species occur within the City of Kirkland portion of the study corridor. These include two large wetland areas between Juanita High School and I-405 (called the Lake Washington Wetlands by PHS), the Heronfield wetlands (also called Lake Washington Wetlands by PHS), and the wetlands associated with Totem Lake, all of which include small portions of the study area. The PHS data does not show any salmon-bearing streams within the study area vicinity.

According to WDFW SalmonScape, there is one mapped salmon-bearing stream within the project area vicinity in the City of Kirkland. This intermittent stream has been mapped at the east end of the City of Kirkland portion of the study area, running roughly north-south adjacent to the former railroad on its east side. This stream channel curves to the east along the north side of NE 124th Street and meets up with the Sammamish River. SalmonScape indicates documented presence of winter steelhead and sockeye salmon. No other streams within the City of Kirkland portion of the study area have been mapped as salmon-bearing.

There are no rare plant species or rare/high quality ecological communities mapped within the City of Kirkland study area by the Washington Natural Heritage Program (2019).

4.4 Climatic Conditions

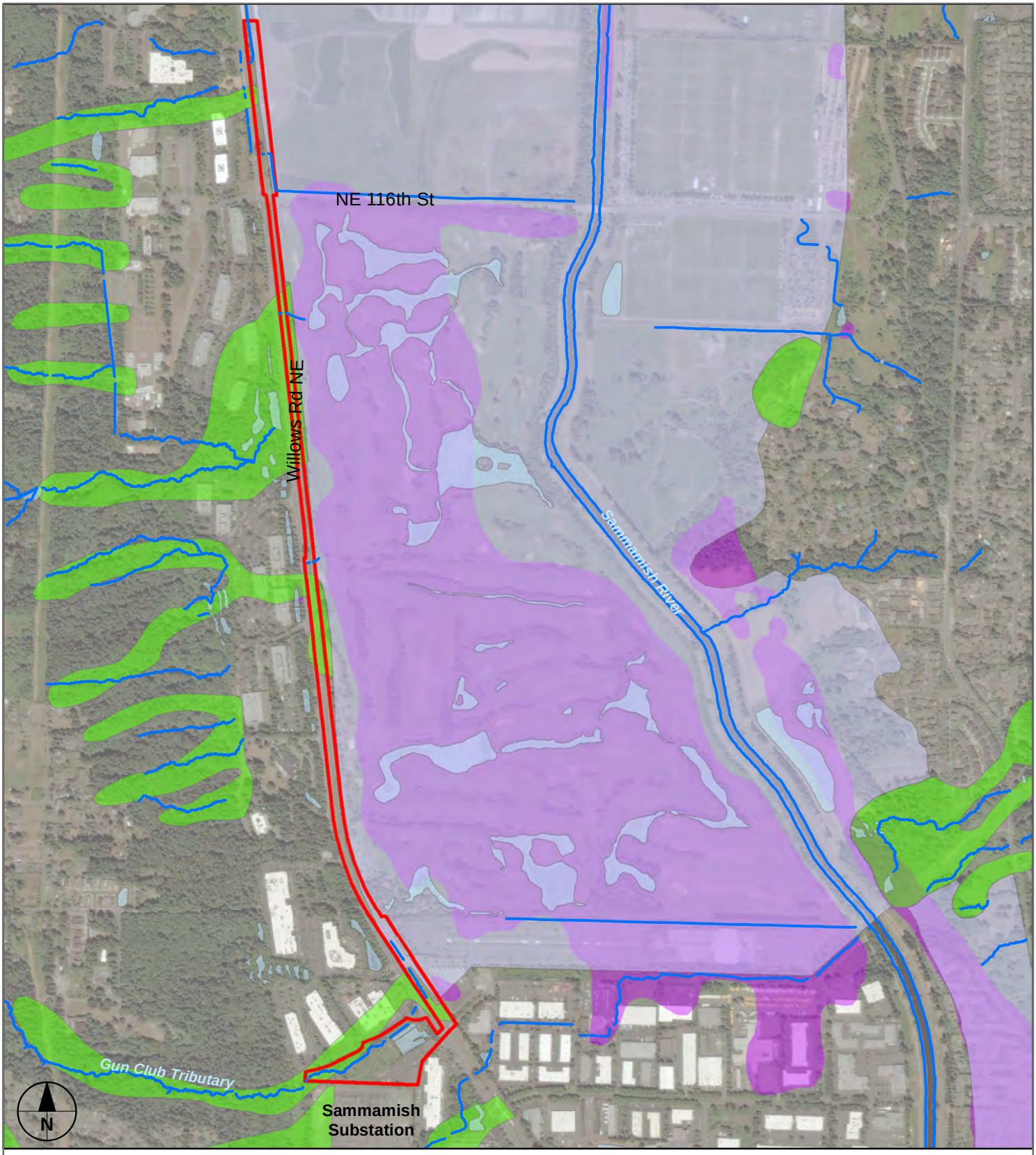
The average air temperature for the region during the dates when wetland and stream delineations were conducted ranged from 41 to 66 °F, with daytime highs ranging from 46 to 78 °F (Table 4.1; Weather Underground 2017a). Wetland delineations were predominantly conducted during the growing season.

Table 4-1. Climatic Conditions for Wetland and Stream Delineation Dates

Date	Average Temp	Daytime High	Precipitation Amount
April 14, 2014	56	70	0.00
April 16, 2014	52	55	0.41
April 17, 2014	52	57	0.70
April 18, 2014	52	60	0.00
May 19, 2014	62	71	0.00
June 4, 2014	60	68	0.00
June 6, 2014	65	78	0.00
April 15, 2016	54	60	0.00
June 28, 2016	66	79	0.00
June 29, 2016	65	73	0.00
October 20, 2017	48	54	0.11
October 22, 2017	55	61	0.06
October 24, 2017	56	66	0.00
November 6, 2017	41	46	0.00
April 8, 2019	54	62	0.00
June 4, 2019	62	73	0.00
June 20, 2019	70	60	0.41
July 1, 2019	81	70	0.00

Source: Weather Underground 2019a
Note: Table includes only the subset of field survey dates during which delineations were conducted.

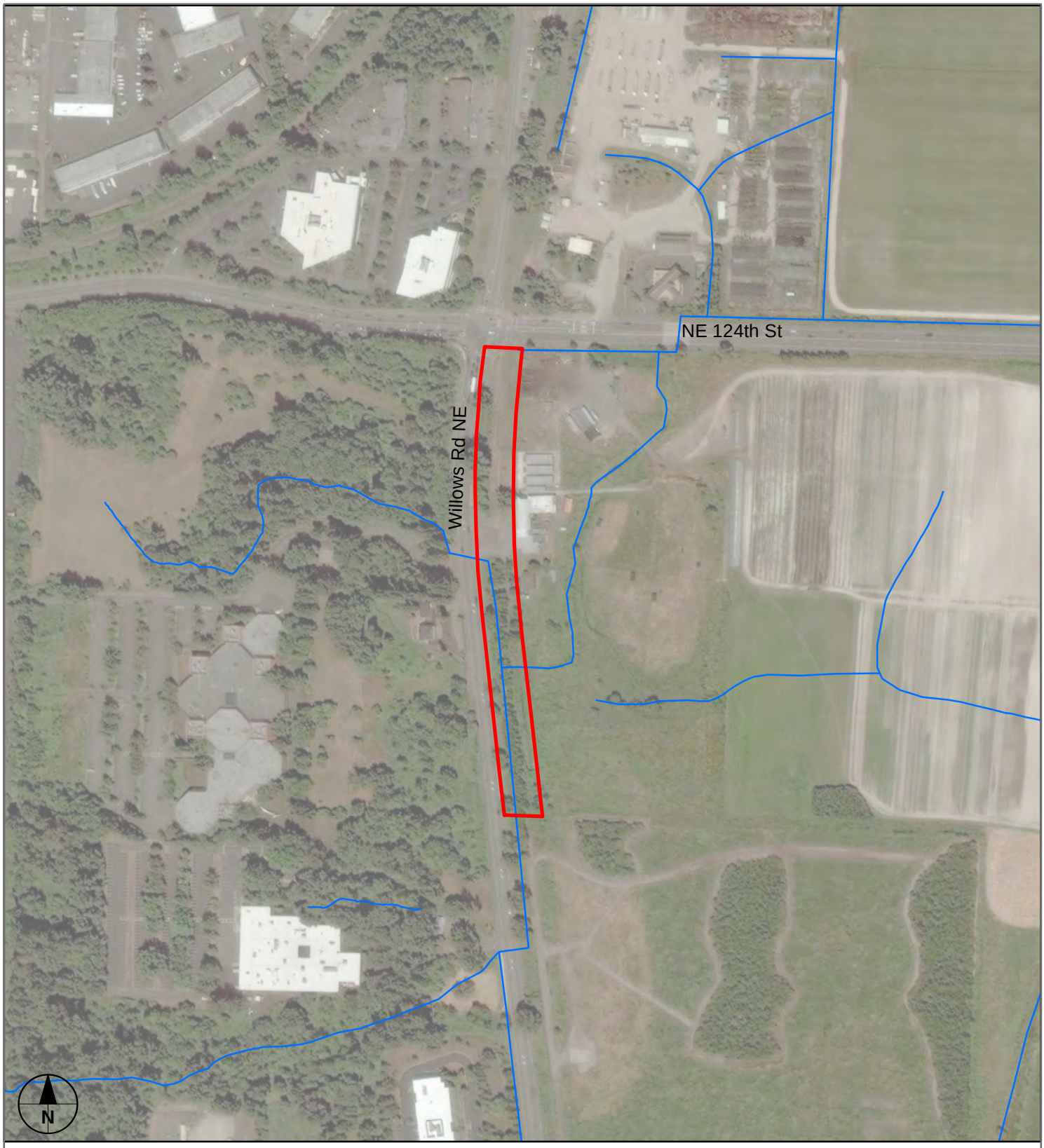
Precipitation was recorded on five delineation dates: 0.41 inches on April 16, 2014, 0.70 inches on April 17, 2014, 0.11 inches on October 20, 2017, 0.06 inches on October 22, 2017, and 0.41 inches on July 1, 2019 (Weather Underground 2019a). Based on historical weather data, regional precipitation recorded during April 2014, June 2016, and October 2017 was 0.2 to 1.61 inches greater than average, depending on the month. Regional precipitation recorded during June 2019, May 2014, and April 2016 was 0.67 to 1.38 inches lower than average, depending on the month (Weather Underground 2019b). Therefore, wetland delineations were spread out over a range of conditions with respect to precipitation.



Puget Sound Energy
Sammamish-Juanita Transmission Line
Wetland Delineation
Redmond, Washington
Project No.: 60608044

Figure 4-1

City of Redmond
Wetland and Stream Mapping



Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

Study Area (King County)

County-mapped Streams

0 100 200 400
Feet

Figure 4-2

King County
Wetland and Stream Mapping

1044

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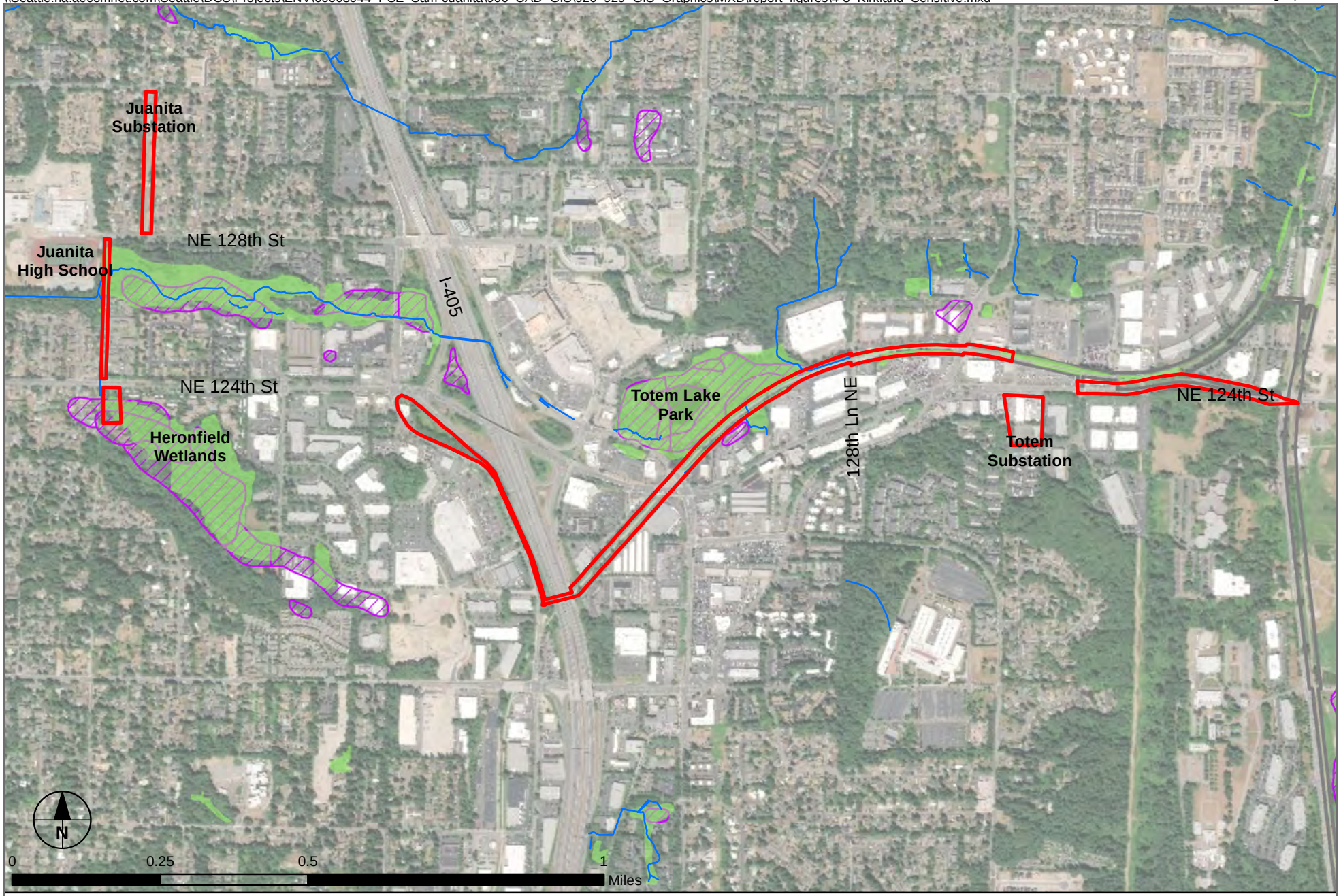


Puget Sound Energy
Sammamish-Juanita Transmission Line
Wetland Delineation
Kirkland, Washington
Project No.: 60608044

Study Area (Kirkland)
City-mapped Streams
City-mapped Wetlands
NWI Wetlands

Figure 4-3
City of Kirkland
Wetland and Stream Mapping

5.0 Results of Field Evaluations – City of Redmond

5.1 Overview

Figures 5-1 and 5-2 provide an overview of the wetlands and streams that were delineated within the portions of the project study that are under the City of Redmond's jurisdiction. Figures 5-3 through 5-9 show detailed information pertaining to site wetlands, including wetland and stream locations, topographic contours, and regulatory buffers. Cowardin classes for these wetlands are shown on maps accompanying the rating forms in Appendix C. A total of 15 sample plots were investigated during the initial field study to characterize the upland and wetland conditions within the study area, with an additional 6 sample plots investigated during the verification/redelineation. Appendix E provides a summary of information for each sample plot, which includes documented findings pertaining to vegetation, soils, and hydrology. The locations of sample plots are shown on Figures 5-3 through 5-9. Additional information can be found on the field data forms in Appendix B and on the wetland rating forms in Appendix C. A functional assessment of the wetlands is provided in Appendix F.

As a result of field evaluations conducted during May and June 2014, June 2016, and June 2019, four wetlands have been mapped within the City of Redmond portions of the project study area: Wetlands R-A and R-C through R-E. Additionally, five streams have been mapped. Wetlands and streams are discussed further in Sections 5.2.1 through 5.3.5.

Three wetlands associated with Gun Club Creek were delineated by Parametrix in November 2017. These wetlands are included in maps and summary tables in this report as Wetlands K-GCA and K-GCB. Detailed descriptions of these wetlands and associated data can be found in the Willows Road Culvert Replacement Critical Areas Report (Parametrix 2018).

5.2 Wetlands

5.2.1 Wetland R-A

Wetland R-A is a linear PEM/PSS/PFO riverine wetland located along the Gun Club Creek (Section 5.3.1; Figure 5-3). 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. Based on the rating form, Wetland R-A is a Category II wetland (scoring 21 points). It generally provides high levels of water quality functions and moderate levels of hydrologic and habitat functions. A more detailed discussion of wetland functions can be found in Appendix F.

Vegetation. The vegetation in wetland R-A consists primarily of trees and tall shrubs, with some small PEM areas. Trees overhang the stream channel along much of the wetland's length. The dominant tree species are red alder (*Alnus rubra*) and Pacific willow (*Salix lucida* ssp. *lasiandra*). Trees and shrubs in the understory include Sitka willow (*S. sitchensis*), Pacific ninebark (*Physocarpus capitatus*), salmonberry (*Rubus spectabilis*), and redosier dogwood (*Cornus sericea*), with some Himalayan blackberry. In PSS areas, the same shrub species are prevalent, with rose (*Rosa* sp.) also present in some areas. Along the southern edge of the wetland, shrubs are dense and nearly impenetrable in places. Common herbaceous species in the wetland include slough sedge (*Carex obnupta*), reed canarygrass (except in the most shaded areas), American skunk cabbage (*Lysichiton americanus*), and American speedwell (*Veronica americana*). In wetter areas, common duckweed (*Lemna minor*), water parsley (*Oenanthe sarmentosa*), and watercress (*Nasturtium officinale*) were observed. In open emergent areas, reed canarygrass is the dominant species. Himalayan blackberry is found in scattered areas throughout the wetland.

Soils. At both wetland sample plots for this wetland (T1-SP2 and T2-SP2), soils did not meet any of the normal indicators for hydric soils. However, based on the smooth, greasy feel of the soils, the problematic hydric soil indicator 2cm Muck (A10) was selected. These sample plots were located waterward of the OHWM.

Hydrology. The predominant hydroperiod in this wetland is saturated, with a few areas that are occasionally flooded. At wetland Sample Plots T1-SP2 and T2-SP2, soil was saturated to the surface and the water table was observed within 16 inches. Therefore, the wetland hydrology indicator Saturation (A3) is present at both locations.

5.2.2 Wetland R-C

Wetland R-C is a very small PEM wetland located in a ditch between Willows Road NE and the former railroad embankment (Figure 5-5). The entire wetland occurs within the study area. Wetland R-C has a depressional hydrogeomorphic (HGM) class. Based on the rating form, Wetland R-C is a Category III wetland (scoring 16 points). It provides moderate levels of water quality and hydrologic functions and low levels of habitat functions. A more detailed discussion of wetland functions can be found in Appendix F. There is evidence that this wetland receives regular vegetation maintenance, given its location adjacent to Willows Road NE.

Vegetation. The dominant vegetation is reed canarygrass, with lesser amounts of giant horsetail (*Equisetum telmateia*), climbing nightshade (*Solanum dulcamara*), and stinging nettle (*Urtica dioica*).

Soils. Soils observed in the wetland (Sample Plot SP-F1) had a layer of sandy sediment approximately 8 inches deep over black (10YR 2/1) organic muck. It met hydric soil indicators Histic Epipedon (A2) and Hydrogen Sulfide (A4).

Hydrology. 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 former railroad embankment and enters a seasonal stream. The water table was at the surface at the time of the site visit on June 29, 2016. Ponding was observed on May 6, 2015. The dominant hydroperiod is seasonally flooded. Primary wetland hydrology indicators High Water Table (A2) and Saturation (A3) were observed.

5.2.3 Wetland R-D

Wetland R-D is a small linear PEM wetland located in a ditch between Willows Road NE and the former railroad embankment (Figure 5-7). The entire wetland occurs in the study area. Wetland R-D has a depressional HGM class. Based on the rating form, Wetland R-D is a Category III wetland (scoring 16 points). It provides moderate levels of water quality and hydrologic functions and low levels of habitat functions. A more detailed discussion of wetland functions can be found in Appendix F. There is evidence that this area undergoes regular mowing as part of vegetation maintenance for the road right-of-way.

Vegetation. The dominant vegetation is reed canarygrass, with lesser amounts of giant horsetail, Canada thistle (*Cirsium arvense*), Himalayan blackberry, and stinging nettle.

Soils. Soils observed in the wetland (Sample Plot SP-D1) had a dark (10YR 3/1) silt loam surface layer with redoximorphic concentrations. The subsurface was also silt loam (10YR 3/2) with redox concentrations and layers of diatomaceous earth. The soils met the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. 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 former railroad embankment. A water table was present at 23 inches at the time of the site visit on June 29, 2016. Ponding was observed on May 6, 2015. The dominant hydroperiod is seasonally flooded. Primary wetland hydrology indicators High Water Table (A2) and Saturation (A3) were observed.

5.2.4 Wetland R-E

Wetland R-E is a large PEM wetland located mostly within the diked 100-year floodplain of the Sammamish River; however, project activities will not occur within the floodplain. Only a small portion of the wetland (0.23 acre) occurs within the study area (Figure 5-8). Wetland R-E has a depressional HGM class. Site topography is generally flat with minor depressions. Elevations range from approximately 30 feet in the wetland interior and southern boundary to 40 feet. Based on the rating form, which was completed without full access to the wetland, Wetland R-E is a Category II wetland (scoring 20 points). It generally provides high levels of water quality and hydrologic functions and low levels of functions. A more detailed discussion of wetland functions can be found in Appendix F. This wetland extends to the north into the area under King County's jurisdiction, where it is called Wetland KC-A (see Section 6.2.1).

Vegetation. The dominant vegetation is herbaceous, with portions of the wetland being actively used for hay or other seasonal crops. Reed canarygrass is dominant in areas not currently under cultivation. This invasive grass forms thick stands with dense root mats that effectively limit reproduction and growth of native species. Within the study area, other herbaceous species present in smaller amounts include meadow foxtail (*Alopecurus pratensis*), common velvetgrass (*Holcus lanatus*), quackgrass (*Elymus repens*), bluegrass (*Poa* sp.), and giant horsetail.

Soils. Soils observed within the study area are deep, fine-textured, and have a thick dark surface horizon. The predominant textures are silty clay loam and silt loam. Redoximorphic concentrations are present below or within the lower part of the dark (10YR 3/1) A horizon. The southwest portion of the wetland has sandier textures with depth. The dominant soil map unit for the wetland is Tukwila muck. Organic soils in the interior of the wetland were confirmed by a previous delineation (The Watershed Company 2009). Within one of the wetland sample plots within the study area (SP-B3), the Thick Dark Surface (A12) hydric soil indicator was observed. In the other wetland sample plot (SP-B1), problematic hydric soils were observed, with the thick dark surface masking redox concentrations.

Hydrology. The primary sources of hydrology are precipitation and high groundwater across the site. There is also surface and subsurface flow that enters the wetland along its west side. Further to the north in the unincorporated King County portion of the wetland, Stream KC-1 (see Section 6.3.1 and Figure 6-1) flows into the wetland through a culvert under the 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. Isolated ponding was observed during the June 28, 2016 field visit. Additional ponding was observed during the May 6, 2015 visit.

5.2.5 Offsite Wetlands

Two offsite wetlands (Wetlands ROS-A and ROS-B) located just outside the study area boundary (on the Willows Run Golf Course property) were identified based on observations about hydrology and vegetation made from within the study area, aerial photos, and City mapping of wetlands. The estimated boundaries of these wetlands are shown on Figures 5-5 through 5-7. Portions of Wetland R-E outside the study area were also estimated (Figures 5-8 and 5-9). Offsite wetland boundaries were not confirmed with sample plots, as biologists did not have access to the adjacent properties. The City of Redmond had a consultant delineate the portion of Wetland R-E on the Sammamish Valley Park property in 2009, however that delineation is more than 5 years old and could not be used to substantiate the wetland boundaries outside the study area (The Watershed Company 2009).

5.3 Streams

5.3.1 Gun Club Creek

Gun Club Creek is a perennially flowing tributary to the Sammamish River that is associated with the riverine wetlands R-A, R-GCA, and R-GCB (Figures 5-3 and 5-4). The stream extends beyond the study

area boundary, with the segment to the west described in the *Puget Sound Energy Sammamish Substation Wetland Delineation and Stream Reconnaissance Report* (AECOM 2016). The portion within the study area totals 74,357 square feet. The OHWM was determined by observations of bed and bank. This stream receives stormwater runoff from adjacent developed areas.

Stream Assessment. The segment of Gun Club Creek 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. In portions of the tributary, a plastic liner placed below stream material was observed. The stream channel is primarily linear with some meanders. This segment of the stream has a low gradient with low flow. The stream channel width is 3 to 4 feet. The stream bed substrate is a mix of silt/sediment and cobble. Up to 10 inches of sediment has accumulated in the culvert that carries the stream underneath a paved walking trail that crosses over the stream to an adjacent parking lot.

Gun Club Creek flows through a culvert under Willows Road NE into a linear ditch between the road and the RCC II trail and 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), flowing water in a defined channel was observed. During the 2019 surveys, the stream channel ranged from 2 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 street with a culvert allowing water flow. In both sections, the substrate is silt/mud.

Riparian Corridor Characterization. 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, predominantly red alder, Pacific willow, Sitka willow, Pacific ninebark, salmonberry, redosier dogwood, and Himalayan blackberry. Riparian areas also include 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.

Existing Stream Value for Fisheries Habitat. There is no documentation of salmon in the segments of Gun Club Creek 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 2019b) will replace the existing culvert under Willows Road NE with a fish-passable box culvert.

Gun Club Creek has been impaired by the surrounding development and has low habitat quality and diversity. It is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. While the segment on the west side of Willows Road NE has some riparian cover, the segment east of Willows Road NE lacks this cover, which may affect water temperature and dissolved oxygen content. According to WDFW SalmonScape (WDFW 2019b) and PHS data (WDFW 2019a), the portion of the stream within the study area does not support salmon species. No fish were observed during field investigations; however, this stream likely supports non-salmonid fish. Therefore, our recommended classification for this stream segment is Class III, which matches the rating shown on the City of Redmond's GIS mapping.

5.3.2 Stream R-2

Stream R-2 (Figure 5-5) is an intermittent stream that extends beyond the study area boundary. The portion within the study area is 137 square feet. The OHWM was determined by observations of bed and bank. This tributary receives stormwater runoff from Willows Road NE and the Willows Run Golf Course property. WDFW SalmonScape shows this stream flowing into ponds and other stream channels on the golf course property, before eventually draining into the Sammamish River.

Stream Assessment. The segment of Stream R-2 within the project corridor is adjacent to Willows Road NE and the Willows Run Golf Course. This segment of the stream has a low gradient with low flow. East of the rail ballast, the active stream channel is 12 inches wide and has steep vertical banks. The stream bed substrate is primarily silt/sediment. West of the ballast, there is no defined channel and the stream has a vegetated bottom (reed canarygrass). The stream appears to lack the aquatic habitat complexity necessary to support fish, including salmon species.

Riparian Corridor Characterization. The riparian corridor is fragmented and truncated by the landscaping on the golf course. Riparian vegetation consists of reed canarygrass and Himalayan blackberry thickets. Wildlife species found in the riparian corridor are primarily common birds.

Existing Stream Value for Fisheries Habitat. There is no documentation of salmon in this segment of the intermittent stream that has been mapped by SalmonScape. However, modeled presence for fall Chinook, coho, and sockeye salmon, and winter steelhead is mapped in this stream just east of the study area boundary. Within the study area, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. It also does not provide good habitat for resident fish species, and there is no evidence of resident fish occurring in the stream channel. Our recommended classification for this stream segment is Class III, because it is a headwater stream with likely a surface water connection to a potentially salmon-bearing stream. This matches the City of Redmond's classification as shown on the Stream Classifications map dated 3/12/2016.

5.3.3 Stream R-3

Stream R-3 (Figure 5-7) is a very small intermittent stream located between two culverts and associated with Wetland R- D. The portion within the study area totals 21 square feet. This stream was not mapped during the initial survey because it does not have a defined channel. However, 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 (based on City GIS data and personal communication with Tom Hardy).

Stream Assessment. The segment of Stream R-3 within the study is located between Willows Road NE and the old railroad embankment. This segment of the stream has a low gradient with low flow, with 4 inches of water observed during the April 2019 site visit. The stream is approximately 18 inches wide, with a vegetated bottom (reed canarygrass). The apparent channel was identified by bent down reed canarygrass. The stream appears to lack the aquatic habitat complexity necessary to support fish, including salmon species.

Riparian Corridor Characterization. Within the study area, there is no defined riparian corridor. Vegetation within and adjacent to the stream consists of predominantly reed canarygrass.

Existing Stream Value for Fisheries Habitat. SalmonScape shows a stream in this location, but there is no documentation of salmon in this segment. Within the study area, the stream is relatively small, lacks riparian cover and woody material, and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. Fish habitat condition of the stream is low and there is no evidence of resident fish occurring in the stream channel. Based on information from the City of Redmond (GIS data and personal communication with Tom Hardy), this stream is considered a Class III stream because of connections to salmon-bearing stream segments outside the study area.

5.3.4 York Creek

York Creek is a perennial stream that runs within the study area from NE 116th Street and along the east side of the rail ballast, adjacent to Sammamish Valley Park, into Wetland R-E (Figure 5-8). The stream crosses beneath the rail ballast via a culvert, with a small stretch of stream between this culvert and a culvert leading underneath Willows Road NE. SalmonScape and City of Redmond stream mapping show this stream running east along the north side of NE 116th Street almost to the Sammamish River. The

portion within the study area totals 579 square feet. This stream receives stormwater runoff from Willows Road NE. York Creek was not mapped during the initial survey because it does not have a defined channel. However, based on its connection to surface waters outside the study area, the City of Redmond considers it to be a Class III stream (based on GIS data and personal communication with Tom Hardy).

Stream Assessment. The water observed in the stream segment adjacent to Willows Road NE was stagnant during the site visit in April 2019. Water appeared to be impounded in this area likely due to a culvert under the rail ballast that was filled with sediment. There was no defined channel, and the stream segment was functioning more like a topographic depression that holds water than a channel with flowing water. The area of impounded water was 8 feet wide, with a water depth of 1 foot, and a silt bottom. The segment on the east side of the ballast also had very low flow and no defined channel, with water moving through the vegetation. The channel bottom is vegetated (inundated and bent down reed canarygrass), and during the site visit water was trapped in small depressions rather than being conveyed as streamflow. The stream width north of an access road heading east off the railroad ballast, approximately 170 feet north of NE 116th Street, is 10 inches wide, increasing to approximately 3 feet south of the access road. Both segments of the stream within the study area currently appear to lack the aquatic habitat complexity necessary to support fish, including salmon species.

Riparian Corridor Characterization. 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 the access road, is surrounded by reed canarygrass that apparently receives regularly maintenance (mowing). South of the access road, 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.

Existing Stream Value for Fisheries Habitat. According to SalmonScape, there is no documentation of salmon in this segment of York Creek. Within the study area, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. It also does not provide good habitat for resident fish species, and there is no evidence of resident fish occurring in the stream channel. Based on information from the City of Redmond (GIS data and personal communication with Tom Hardy), this stream is considered a Class III stream because of connections to salmon-bearing stream segments outside the study area.

5.3.5 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. The portion in the City of Redmond totals 602 square feet (Figure 5-9). This stream was not mapped during the initial survey because it does not have a defined channel, no water was present during site visits, and the area was overgrown with blackberry. However, based on its connection to surface waters outside the study area, the City of Redmond considers it to be a Class III stream (based on GIS data and personal communication with Tom Hardy). During the site visit in April 2019, water was present in the stream and there was evidence that vegetation maintenance had occurred.

Stream Assessment. The segment of 124th Street Stream in the City of Redmond runs along the base of a slope leading down from the road shoulder and flows 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 April 2019 site visit. The stream is approximately 2 feet wide, with no defined channel and a silt bottom. Fish habitat condition of the stream is low and 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.

Riparian Corridor Characterization. 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 Willows 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.

Existing Stream Value for Fisheries Habitat. SalmonScape shows a stream in this location, but there is no documentation of salmon in this segment. Within the study area, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. Based on information from the City of Redmond (GIS data and personal communication with Tom Hardy), this stream is considered a Class III stream because of connections to salmon-bearing stream segments outside the study area.

5.4 Ditches

5.4.1 Ditch R-1

Ditch R-1 runs along the east side of Willows Road NE, on the west side of the rail ballast (Figures 5-1 and 5-2). This ditch is mapped by the City of Redmond as extending from the south end of the study area, passing through Wetlands R-GCB and R-GCA, to Wetland R-C/Stream R-2. The ditch through Wetlands R-GCB and R-GCA is considered a relocated channel of Gun Club Creek and is mapped as such for this report. The ditch consists of several segments. The southernmost segment flows north into Wetland R-GCB. A second segment flows south into a culvert that discharges to Gun Club Creek, north of Wetland R-GCA. A third segment also flows south into a culvert that discharges to a bioswale on Willows Run Golf Course. A fourth segment flows north into Stream R-2. The second, third, and fourth segments are separated from each other by uplands. The ditch is also broken for brief stretches where it is piped through culverts underneath roads and driveways.

During the early June 2019 site visit, portions of this ditch showed evidence of water conveyance and were mapped in the field. The ditch was visited again in late October 2019 after sustained rainfall and was found to be dry outside of the wetland and stream segments. Flow through the non-wetland and non-stream segments of the ditch is considered to be ephemeral based on the vegetated bed, lack of scour or gravel sorting, and lack of an OHWM. The ditch drains Willows Road and associated uplands, and is not a relocated tributary or excavated in a tributary (except for the segment coincident with Gun Club Creek).

5.4.2 Ditch R-2

Ditch R-2 runs east-west through the study area, beneath the rail ballast, in the vicinity of an offsite wetland (ROS-A) on the Willows Run Golf Complex property (Figure 5-2). City of Redmond GIS maps show two culverts in this location (one beneath Willows Road NE and one beneath the rail ballast), but no ditch has been mapped. During a site visit in August 2019, there was some water flowing through the culverts and the ditch, which was likely coming from a stormwater detention pond on the west side of Willows Road NE. The ditch is manmade through uplands. Flow from the ditch enters another water conveyance feature just east of the study area that runs south and discharges to Stream R-2. The offsite ditch is not mapped by the City of Redmond.

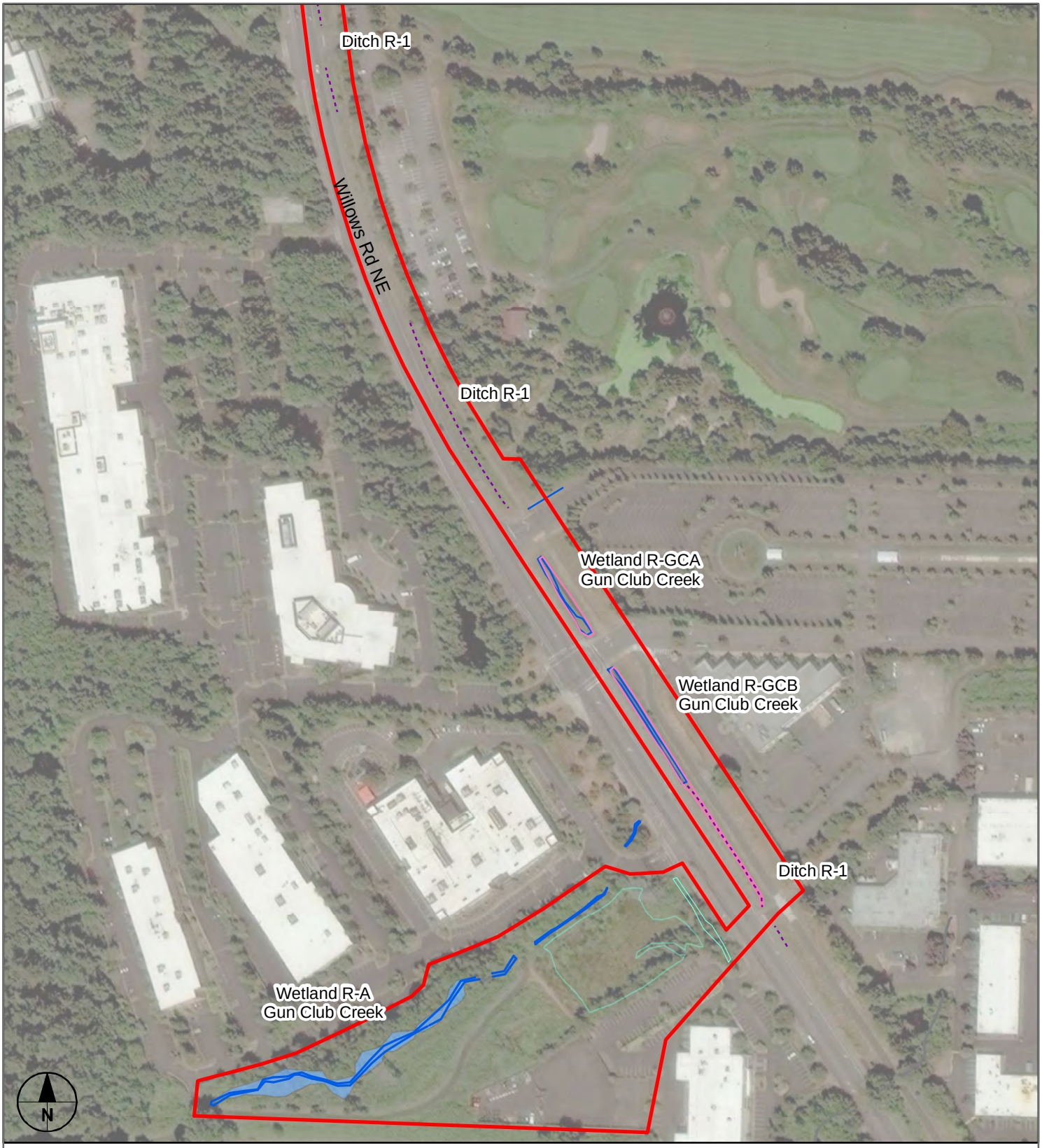
5.4.3 Ditch R-3

Ditch R-3 occurs on the west side of the rail ballast, north of NE 116th Street (Figure 5-2). The ditch receives runoff from the rail ballast and Willows Road NE, and conveys flow north into York Creek. Flow is ephemeral based on the lack of scour or an OHWM. There was no flow during the June and October 2019 site visits.

5.5 Stormwater Features

Two stormwater features were mapped as potential wetlands during delineations by AECOM and Parametrix, but do not meet the definition of wetland provided in RZC 21.78 (see Section 2.4.1). One is a large (0.8-acre) stormwater detention pond located north of the Sammamish Substation, west of Willows Road NE (Figure 5-1). The feature is bounded by rock walls on its north and east sides, and berms made from fill on its south and west sides. There is no apparent outlet from this wetland, which appears to have been designed to retain water from upslope developed areas. Based on as-built plans from 1995 (see Appendix E in Parametrix 2018), the detention pond was constructed as part of the Willows Commerce Park Project. Because the feature is an artificial wetland intentionally created from a non-wetland site for stormwater control, it is not regulated as a wetland by the City of Redmond (RZC 21.78; see Section 2.4.1).

A biofiltration swale, also constructed in 1995, is located adjacent to the stormwater detention pond (Figure 5-1). Based on information provide in Parametrix (2018), this swale receives runoff from the adjacent slope to the west and Willows Road NE to the east, and drains to a culvert at its north end, which empties into Wetland R-GCB/Gun Club Creek. Because the feature is an artificial wetland intentionally created from a non-wetland site for biofiltration, it is not regulated as a wetland by the City of Redmond, based on RZC 21.78.



0 125 250 500 Feet

Study Area
Delineated Wetlands
Delineated Streams
Ditches
Stormwater Features
Wetland Edge (previous delineation)

Puget Sound Energy
Sammamish-Juanita Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

Figure 5-1

City of Redmond
Overview of Delineated Wetlands and Streams
Figure 1 of 2

1054

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Puget Sound Energy
Sammamish-Juanita Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

Figure 5-2

City of Redmond
Overview of Delineated Wetlands and Streams
Figure 2 of 2

1055

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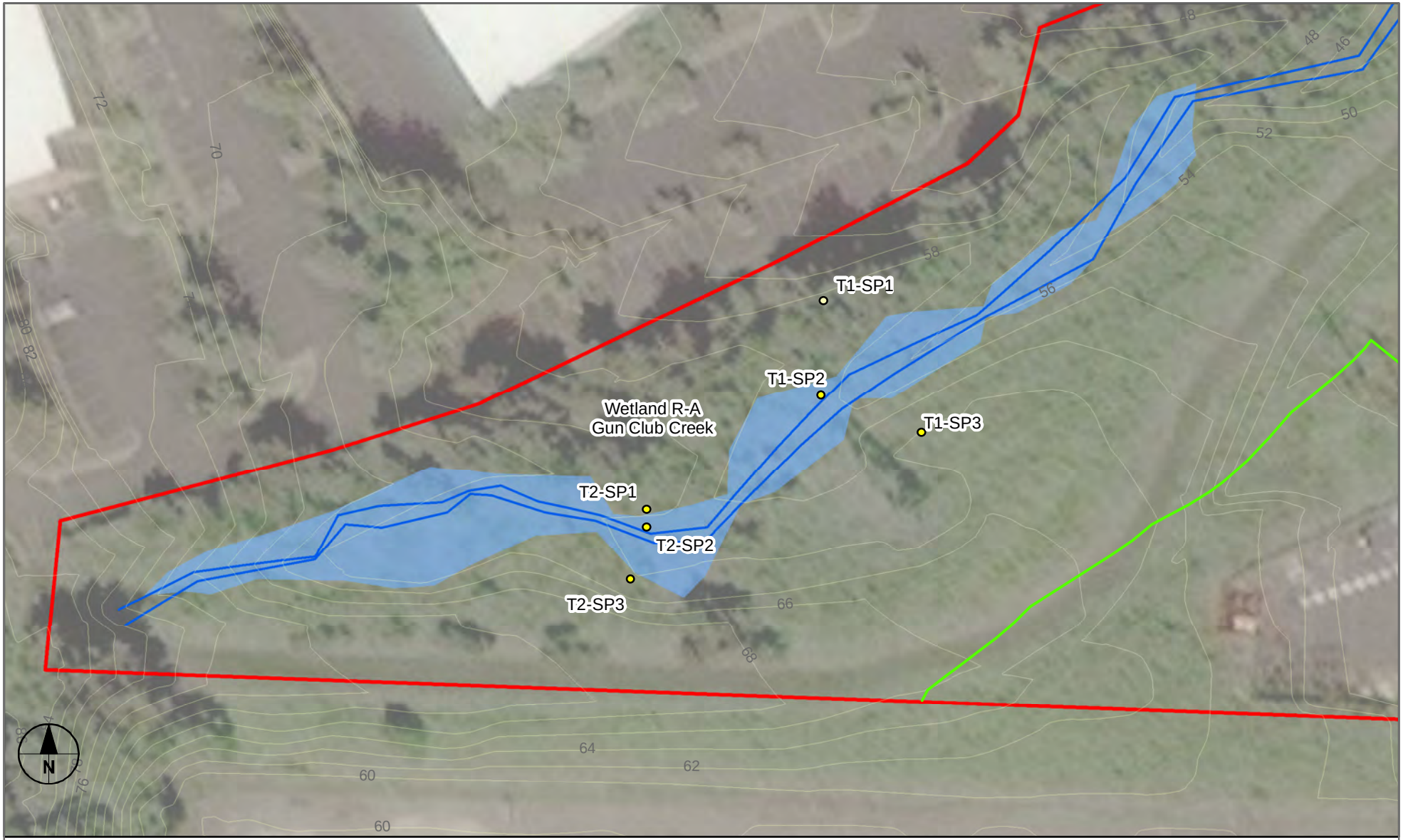


Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

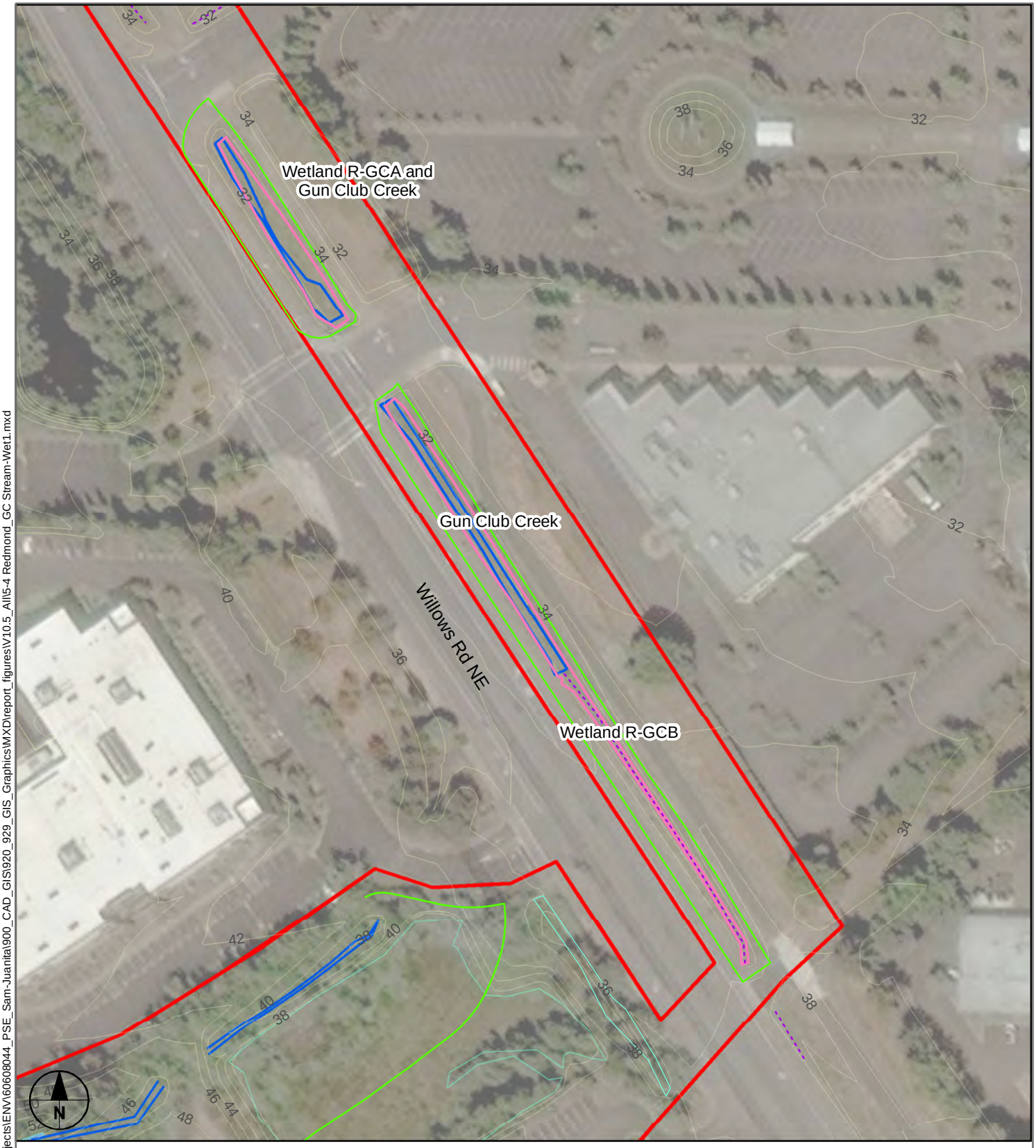
Redmond, Washington
Project No.: 60608044

Study Area
Sample Plot
Delineated Stream
2-foot Contours
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 5-3
Wetland R-A and Gun Club Creek

1056



Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Wetland Edge
(previous delineation)
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer
Stormwater Feature

Figure 5-4

Wetlands R-GCA, R-GCB, Gun Club Creek

1057

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Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

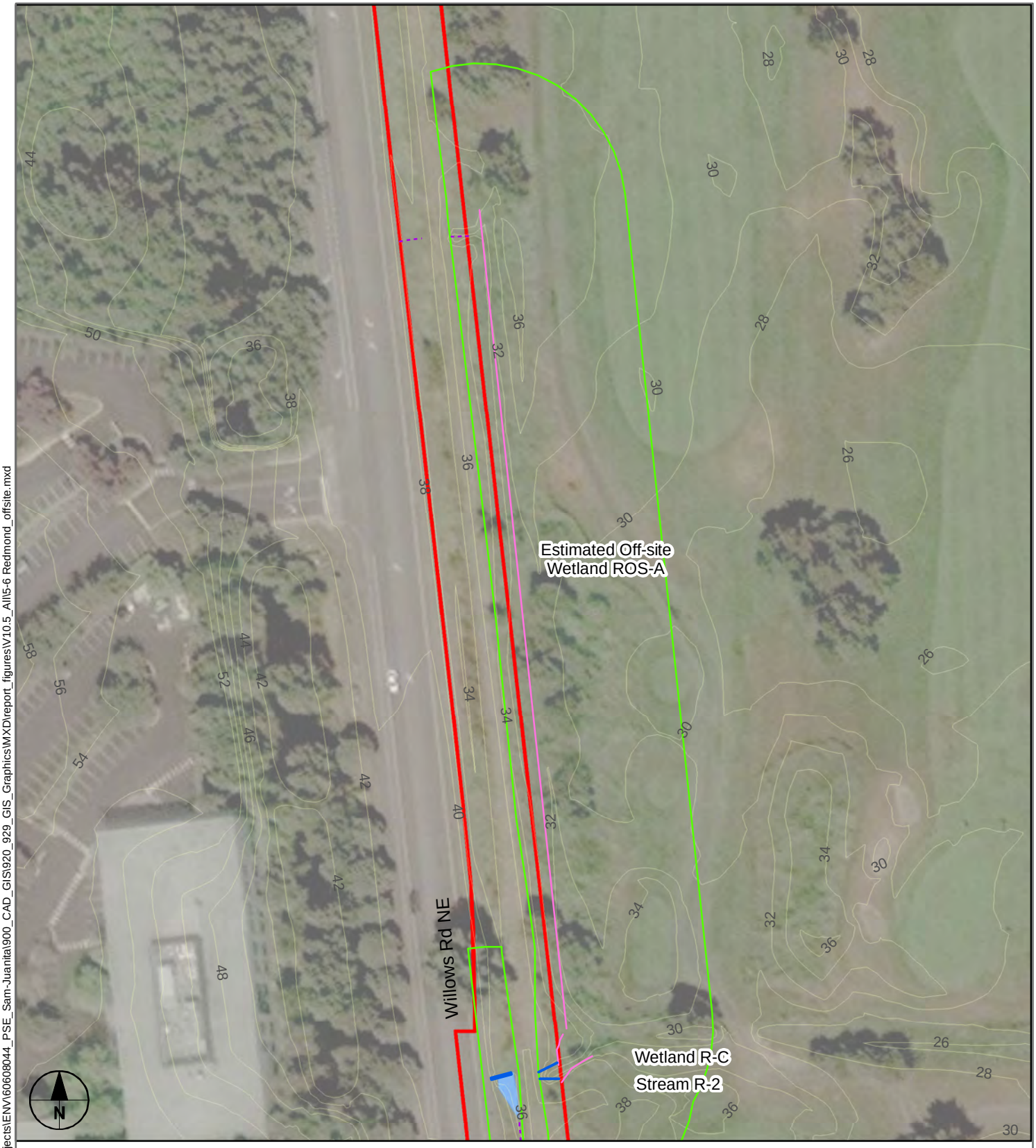
Study Area
Sample Plot
2-foot Contours
Ditch
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer
Estimated Wetland Edge

0 25 50 100 Feet

Figure 5-5
Wetland R-C and Stream R-2

1058

\\Seattle.na.aecomnet.com\Seattle\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\V10.5_All5-5 Redmond_R-C-R-2_REV.mxd



Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Kirkland, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer
Estimated Wetland Edge

Figure 5-6
Estimated Off-site Wetland ROS-A

1059

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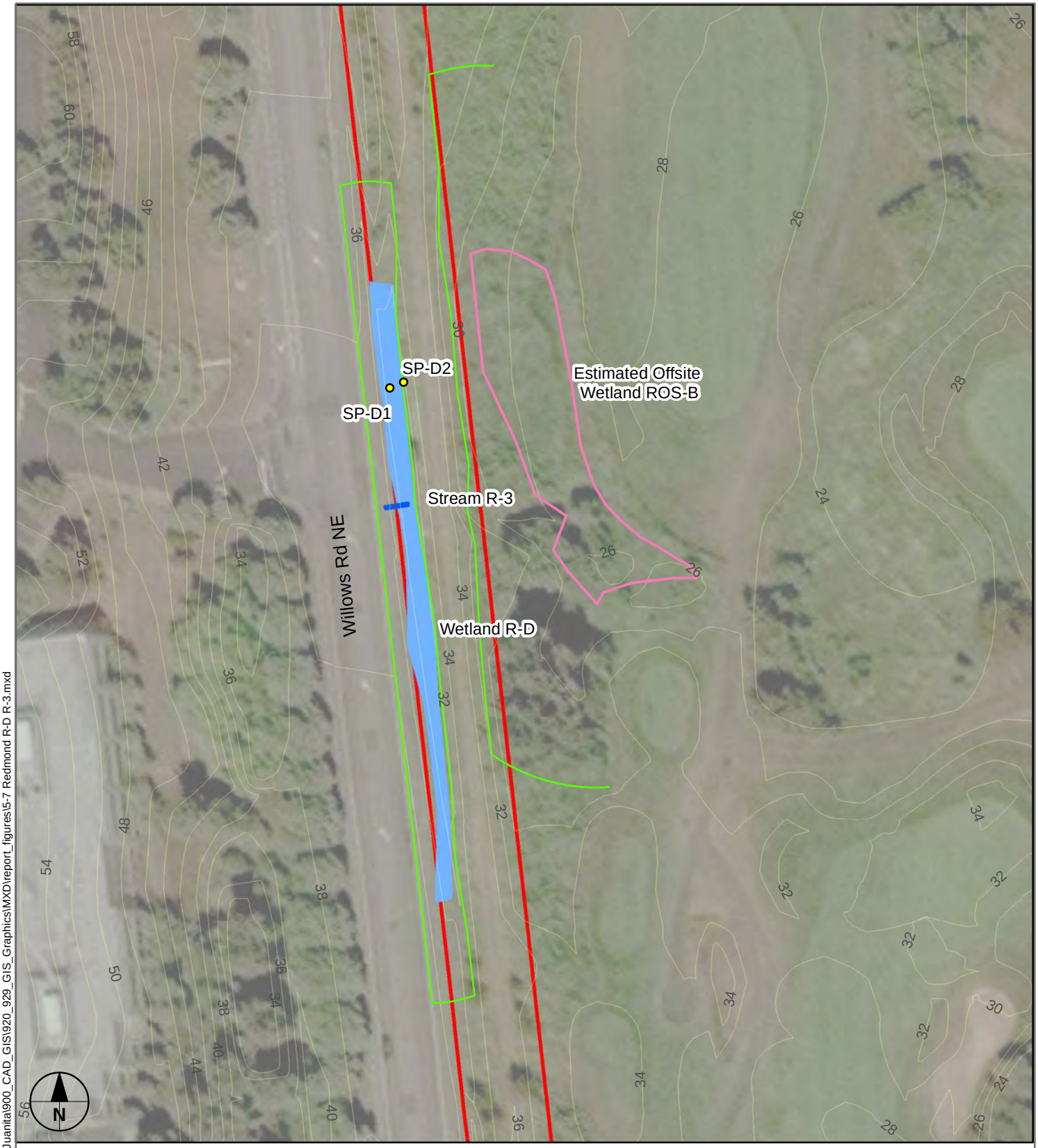

Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
Sample Plot
2-foot Contours
Delineated Wetland
Wetland/Stream Buffer (includes off-site wetland buffer)
Estimated Wetland Edge

Figure 5-7

Wetland R-D and Stream R-3

1060

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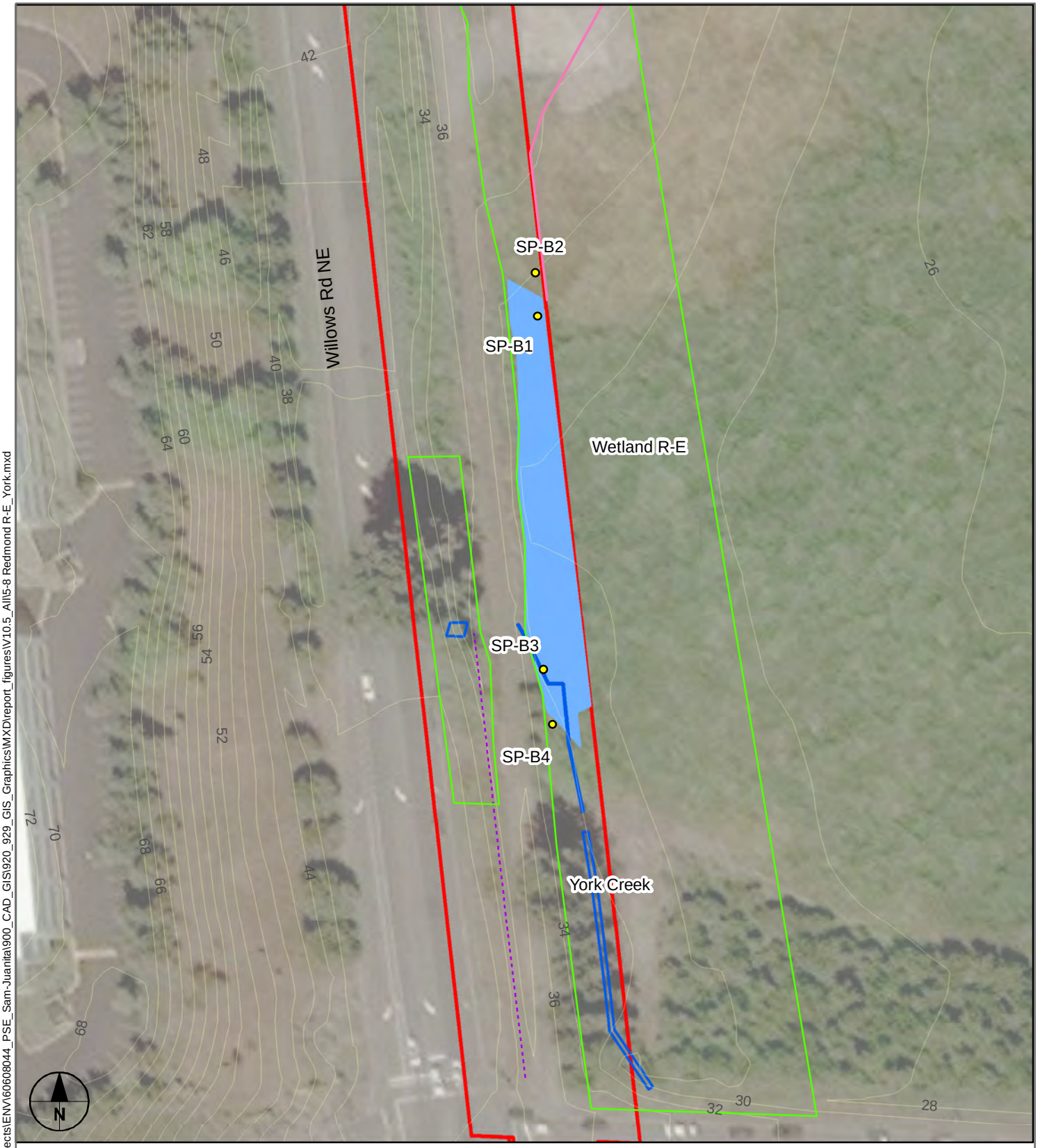


Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

Study Area
Sample Plot
2-foot Contours
Ditch

Delineated Wetland
Delineated Stream
Wetland/Stream Buffer
Estimated Wetland Edge

0 50 100 200
Feet

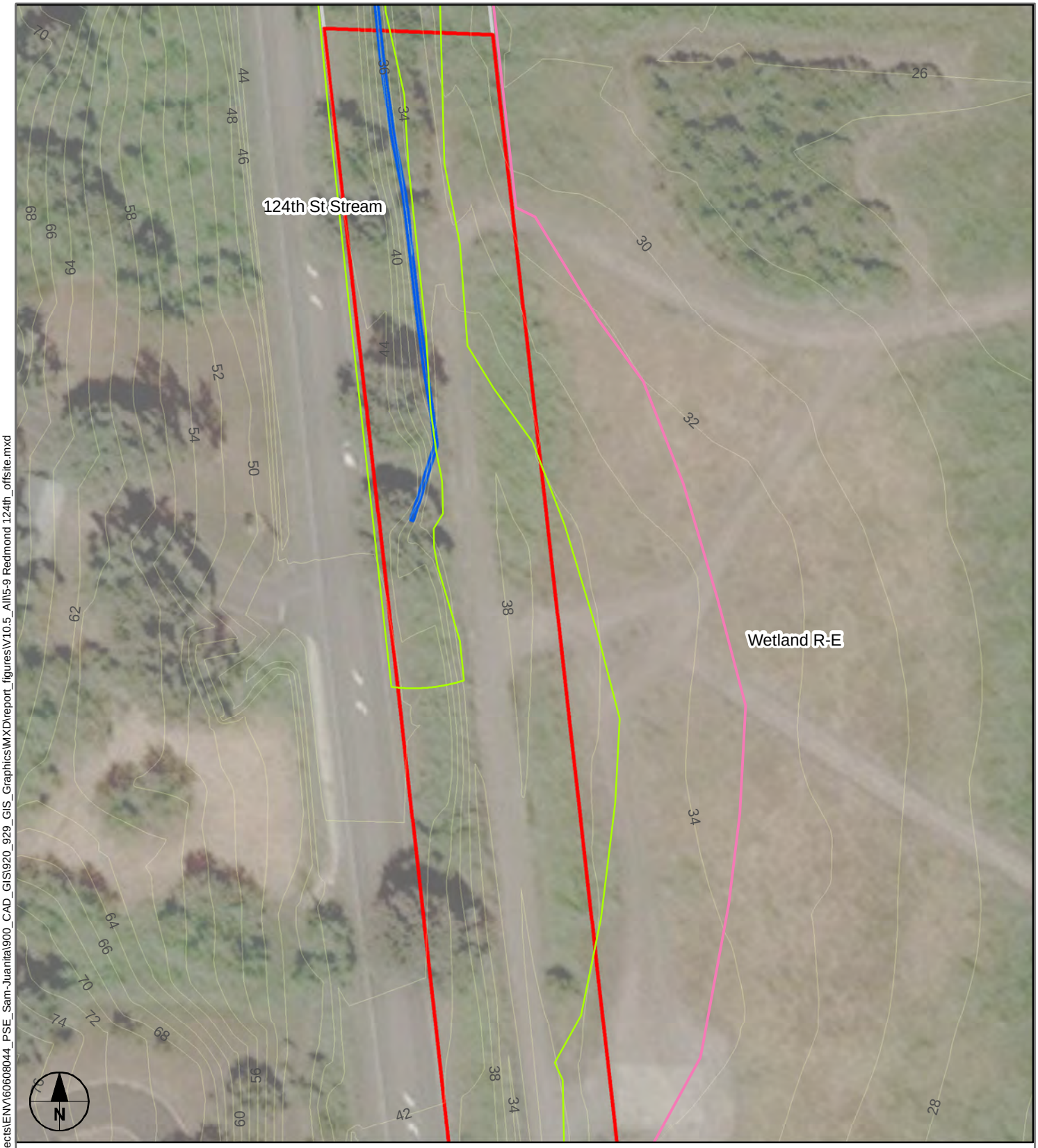
Figure 5-8

Wetland R-E and York Creek

1061

\\Seattle.na.aecomnet.com\Seattle\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\V10.5_All\5-8 Redmond R-E_York.mxd

AECOM



Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

Redmond, Washington
Project No.: 60608044

Study Area
2-foot Contours
Delineated Stream
Wetland/Stream Buffer
Estimated Wetland Edge

0 50 100 200
Feet

Figure 5-9

124th St Stream and Estimated Off-site Wetland (Wetland R-E)

1062

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6.0 Results of Field Evaluations – Unincorporated King County

6.1 Overview

Figure 6-1 shows an overview of the wetlands and streams that were delineated within the portions of the project study area under the jurisdiction of King County. Figures 6-2 and 6-3 show detailed information pertaining to site wetlands, including wetland and stream locations, topographic contours, and regulatory buffers. Two wetlands and two streams have been mapped within the study area. Two sample plots were investigated during the initial field study to characterize the upland and wetland conditions within the study area, with an additional two sample plots investigated during the verification/redelineation in June 2019. Appendix E provides a summary of information for each sample plot, which includes documented findings pertaining to vegetation, soils, and hydrology. The locations of sample plots are shown on Figures 6-2 and 6-3. Additional information can be found on the field data forms in Appendix B, and on the wetland rating forms in Appendix C.

6.2 Wetlands

6.2.1 Wetland KC-A

Wetland KC-A is a large PEM wetland located mostly within the diked 100-year floodplain of the Sammamish River; however, project activities will not occur within the floodplain. It crosses jurisdictional lines, and is the same wetland as Wetland R-E (Section 5.2.5). Only a small portion of the wetland occurs within the study area (Figure 6-2). The estimated mapping of the full wetland is shown on the rating form figures in Appendix C. Wetland KC-A has a depressional HGM class. Site topography is generally flat with minor depressions. Elevations range from approximately 30 feet in the wetland interior and southern boundary to 40 feet. Based on the rating form, which was completed without full access to the wetland, Wetland KC-A is a Category II wetland (scoring 55 points on the 2004 rating form). It generally provides high levels of water quality and hydrologic functions and low levels of habitat functions.

Vegetation. The dominant vegetation is herbaceous, with portions of the wetland being actively used for hay or other seasonal crops. Reed canarygrass is dominant in areas not currently under cultivation. This invasive grass forms thick stands with dense root mats that effectively limit reproduction and growth of native species. Within the portion of the wetland in the study area, reed canarygrass was the dominant species, with low amounts of other weedy species, such as Himalayan blackberry and giant horsetail.

Soils. Soils observed within the study corridor are deep, fine-textured, and have a thick dark surface horizon. At wetland Sample Plot SP-A1, soils observed were silty clay loams with redoximorphic concentrations present within the lower part of the dark (10YR 3/1) A horizon. The soils meet the Redox Dark Surface (F6) hydric soil indicator. The dominant soil map unit for the larger wetland is Tukwila muck. Organic soils in the interior of the wetland in the adjacent City of Redmond area were confirmed by a previous delineation (The Watershed Company 2009).

Hydrology. The primary sources of hydrology are precipitation and high groundwater across the site. There is also surface and subsurface flow that enters the wetland along its west side. Stream KC-1 flows into the wetland through a culvert under the railroad bed (Figure 6-3). 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. Isolated ponding was observed during the June 28, 2016 field visit. Additional ponding was observed during the May 6, 2015 visit. At Wetland Sample Plot SP-A1, no surface water was observed, but the soil in the log hole was saturated at the surface. The Saturation (A3) wetland hydrology indicator was met.

6.2.2 Wetland KC-B

Wetland KC-B is a small PEM wetland located within the swale between Willows Road NE and the railroad embankment. The entire wetland is within the study area (Figure 6-2). Wetland KC-B has a depressional HGM class. Based on the 2004 rating form, Wetland KC-B is a Category III wetland (scoring 43 points). It generally provides high levels of water quality functions, moderate hydrologic functions, and low levels of habitat functions.

Vegetation. The dominant vegetation is reed canarygrass, with lesser amounts of red alder, Himalayan blackberry, field horsetail (*Equisetum arvense*), and common lady fern (*Athyrium filix-femina*).

Soils. Soils observed within the wetland have a very dark brown (10YR 2/2) silt loam surface (0 to 5 inches) with a large amount of organic matter. Below this is a very dark greenish gray (10Y 3/1) loamy sand with common redox concentrations. The soils meet the Loamy Mucky Mineral (F1) indicator in the surface layer, and the Sandy Redox (S5) indicator in the subsurface layer.

Hydrology. 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. Ponding was observed in the wetland interior during the June 2019 field visit. High flows discharge into a drainage ditch that appears to flow south at very low gradient.

6.3 Streams

6.3.1 Stream KC-1

Stream KC-1 (Figure 6-2) is an intermittent stream associated with Wetland KC-A that extends beyond the study area boundary. The portion within the study area is 408 square feet/34 linear feet). 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. The OHWM was determined by observations of bed and bank. However, given the narrow width of the stream, its center line was mapped using the GPS rather than its banks. This tributary receives stormwater runoff from Willows Road and agricultural fields.

Stream Assessment. This segment of Stream KC-1 in the study area is adjacent to an old railroad corridor, agricultural fields, and a goat farm. It has a low gradient with low flow, and the stream 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.

Riparian Corridor Characterization. The riparian corridor is fragmented and truncated by agricultural fields. Riparian vegetation consists of reed canarygrass and Himalayan blackberry thickets. Wildlife species found in the riparian corridor are primarily birds, although two deer were observed in the right-of-way during the delineation survey.

Existing Stream Value for Fisheries Habitat. There is no documentation of salmon in this segment of stream, and salmonid access to this area is blocked by multiple fish barriers. In addition, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. It also does not provide habitat for resident fish species, and there is no evidence of resident fish occurring in the stream channel. However, as it likely connects outside of the study area to a stream channel that has been mapped by SalmonScape as having modeled presence of salmonids (see Section 4.2.4). Therefore, the recommended classification for this stream segment is Type N.

6.3.2 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. The portion in unincorporated King County (Figures 6-2 and 6-3) totals 1,588 square feet. This stream was not mapped during the initial survey because it does not have a defined channel, no water was present during site visits, and the area was overgrown with blackberry. However, during a site visit in April 2019 with the City of Redmond, water was present in the stream and there was evidence that vegetation maintenance had occurred.

Stream Assessment. The segment of 124th Street 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 April 2019 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 Corridor Characterization. Riparian vegetation is primarily Himalayan blackberry, with some reed canarygrass and Japanese knotweed (*Polygonum cuspidatum*) also present. When not actively controlled, this aggressively weedy vegetation grows up over the stream, forming a dense thicket. 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 the area could include small mammals and deer, as well as a variety of birds.

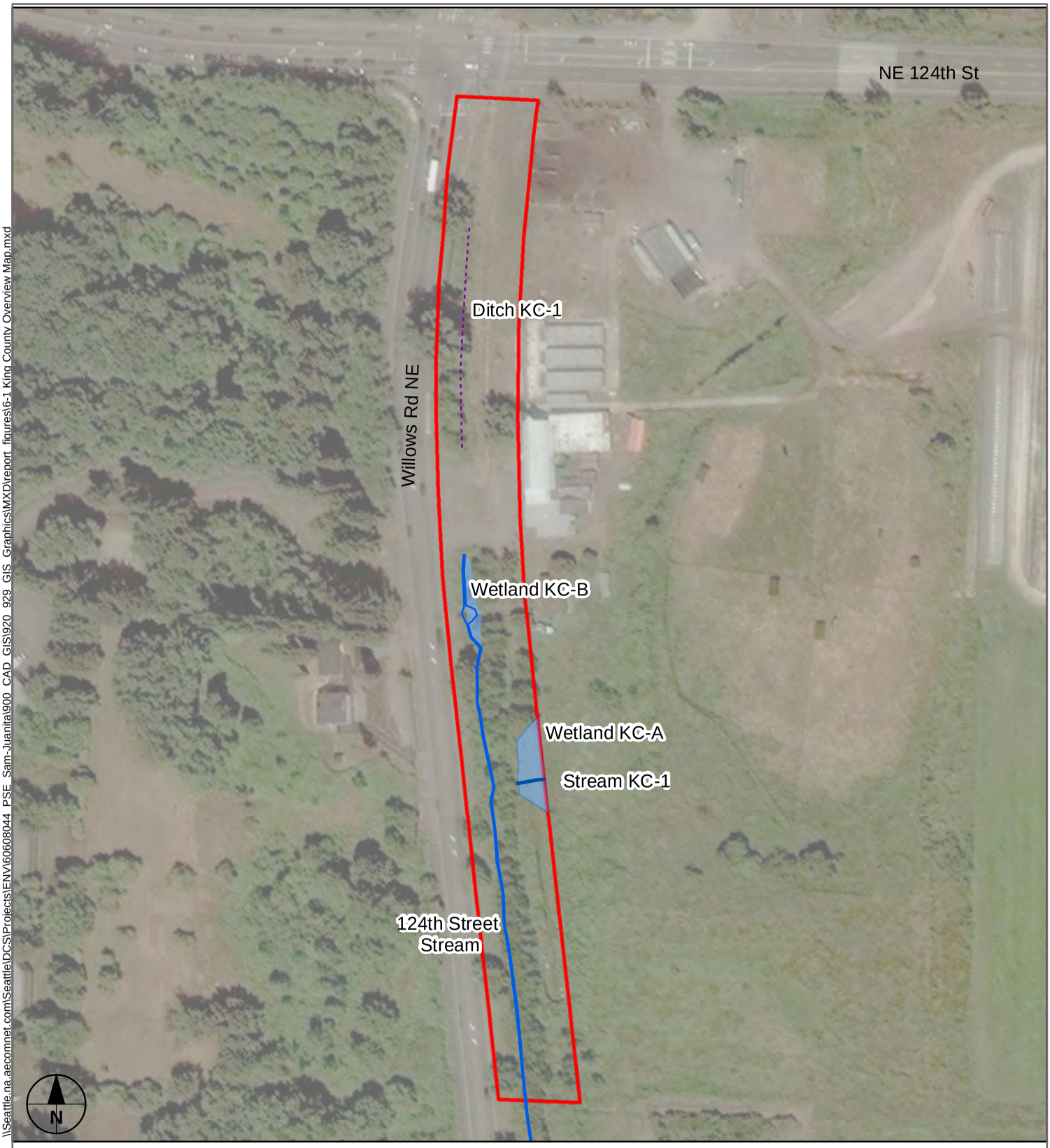
Existing Stream Value for Fisheries Habitat. SalmonScape shows a stream in this location, but there is no documentation of salmon in this segment. Within the study area, the stream is relatively small and does not provide the deep pools, stream complexity, and off-channel habitat required by salmonids. Therefore, our recommended classification is Type F.

6.4 Ditches

Information on ditches is provided for informational purposes. The one ditch mapped in unincorporated King County, Ditch KC-1, is not considered a Critical Area based on the definitions in KCC 21A.06.072.

Ditch KC-1 runs along the east side of Willows Road NE, on the west side of the railroad ballast (Figure 6-1). This ditch has not been mapped by King County or the City of Redmond but was observed in the field. This ditch receives runoff from Willows Road NE, the railroad ballast, and associated uplands, and is not known to receive discharge from a natural stream. The ditch had flow approximately 2 inches deep during the early June and late October 2019 field visits. Water flows north into a pipe culvert that discharges into Stream KC-1 several hundred feet to the east.

Flow is characterized as intermittent based on the lack of scour or gravel sorting, and the lack of an OHWM. The ditch substrate is sand and gravel fill material, largely vegetated with reed canarygrass. The ditch is not a relocated tributary or excavated in a tributary.



\\Seattle.na.aecomnet.com\Seattle\DCS\Projects\ENV\60608044_PSE_Sam-Juanita\900_CAD_GIS\920_929_GIS_Graphics\MXD\report_figures\6-1 King County Overview Map.mxd

0 50 100 200 Feet

Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

Study Area (King County)
Delineated Wetland
Delineated Stream
Ditch

Figure 6-1

King County
Overview of Delineated Wetlands and Streams

Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

0 25 50 100
Feet

Study Area
2-foot Contours
Sample Plot
Estimated Wetland Edge
Delineated Wetland
Wetland/Stream Buffer
Delineated Stream

Figure 6-2
Wetland KC-A, Stream KC-1, and 124th Street Stream

1067

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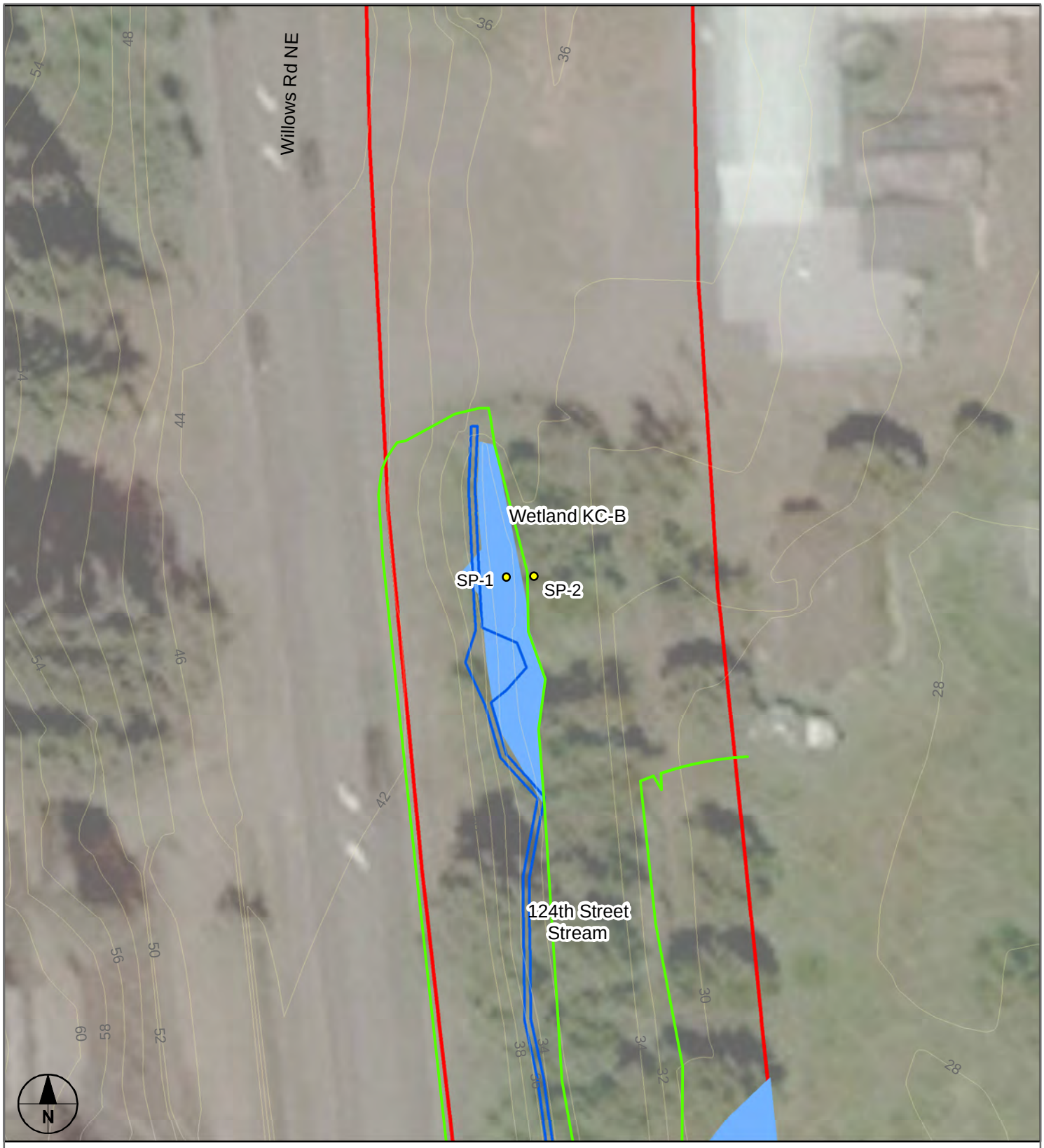

Puget Sound Energy
Sammamish-Juanita
Transmission Line
Wetland Delineation

King County, Washington
Project No.: 60608044

Study Area (King County)
Sample Plot
2-foot Contours
Delineated Stream
Delineated Wetland
Wetland/Stream Buffer

0 25 50 100 Feet

Figure 6-3

Wetland KC-B and 124th Street Stream

1068

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7.0 Results of Field Evaluations – City of Kirkland

7.1 Overview

Figures 7-1 through 7-3 show an overview of the wetlands and streams that were delineated along the portions of the study area under the jurisdiction of the City of Kirkland. Figures 7-4 through 7-9 show more detailed information pertaining to site wetlands and streams. A total of 32 sample plots were investigated during the initial field study to characterize the upland and wetland conditions within the study area, with additional sample plots investigated (and some reinvestigated) during the verification/redelineation during June and July 2019. Appendix E provides a summary of information for each sample plot, which includes documented findings pertaining to vegetation, soils, and hydrology. The locations of sample plots are shown on Figures 7-4 through 7-9. Additional information can be found on the field data forms in Appendix B and on the wetland rating forms in Appendix C.

As a result of wetland delineations conducted during April 2014, April and June 2016, October and November 2017, and June and July 2019, 12 wetlands have been mapped within the study area (Figures 7-4 through 7-9). Numerous linear wetlands are associated with drainage ditches and other manmade features on both sides of the embankment associated with the former railroad. They are located in topographic depressions and receive runoff from nearby developed areas. Many are connected via culverts under roads, or by drainage ditches that do not also support wetlands. Additionally, the study area includes portions of three large wetlands that contain multiple wetland classes, including open water, and have a high level of structural diversity. Only a portion of these wetlands (K-J, K-L, and K-HF) were accessible to biologists during site visits. Four streams were also mapped within the study area (Figures 7-4, 7-7, and 7-8), all of which were associated with mapped wetlands.

7.2 Wetlands and Streams

7.2.1 Wetland K-B and Stream K-7

Wetland K-B is a vegetated ditch on the south side of the railroad embankment, just east of 135th Avenue NE (Figure 7-4). It is a linear PEM depressional wetland, 0.07 acre in size, that receives surface water runoff from adjacent upslope development. Based on the rating form, Wetland K-B is a Category IV wetland (scoring 15 points). It 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 (154-square foot), 1- to 2-foot-wide, unnamed tributary that receives water from Wetland K-B (Figure 7-4). The perennial 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 maple 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 by WDFW or the City of Kirkland, and the stream is not connected to fish bearing waters. Therefore, our proposed classification for this stream is a Type Np water.

Vegetation. The dominant plant species in this wetland are reed canarygrass and cattail (*Typha* sp.), with a variety of other herbaceous species, including field horsetail, St. John's wort (*Hypericum perforatum*), duckweed, smartweed (*Polygonum* sp.), common velvetgrass, bentgrass (*Agrostis* sp.), and small-fruited bulrush (*Scirpus microcarpus*).

Soils. The wetland is underlain by railroad rock embankment, primarily cobble more than 4 inches in diameter. For this reason, a soil pit could not be dug to describe soils. A thin layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. During field visits, areas of standing/ponded water were observed, but there was no active flow of water within the ditch. At Sample Plot SP-KB1, 4 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.2.2 Wetland K-C

Like Wetland K-B described in the previous section, Wetland K-C is a vegetated ditch (see Section 7.3.2) adjacent to the railroad embankment, just east of 135th Avenue NE (Figure 7-4). It is located across the rail ballast from Wetland K-B, on the north side. It is a linear PEM depressional wetland, 0.08 acre in size, 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. Based on the rating form, Wetland K-C is a Category III wetland (scoring 16 points). It 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 Wetland K-A and habitat areas further to the north.

Vegetation. Reed canarygrass is prevalent in this wetland, but it also has a large component of smartweed, softstem bulrush (*Schoenoplectus tabernaemontani*), cattail, and common rush. 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. Some Himalayan blackberry is also present within the wetland. A population of the aquatic plant duckweed was observed in an area of standing water.

Soils. Similar to Wetland K-B, wetland K-C is underlain by rock from the railroad embankment, primarily cobble more than 4 inches or more in diameter. For this reason, a soil pit could not be dug to describe soils. A layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff from adjacent steep slopes. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. Standing water was observed within the ditch during the site visit. At wetland Sample Plot SP-KC1, 4 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.2.3 Wetland K-D

Wetland K-D is an approximately 0.7-acre PEM depressional wetland associated with a ditch north of the railroad embankment, west of 135th Avenue NE (Figure 7-5). This wetland is widest at its central portion, and extends beyond the study area to the east. It receives runoff from upland areas to the north and south, and is connected to Wetland K-DD via a short culvert through a berm utility box area, with flow eventually draining via a culvert under 132nd Place NE to Wetland K-G to the west (Figure 7-6). A 1- to 2-foot-wide drainage ditch conveys water the entire length of the wetland. The ditch has variable hydrology, with segments that were dry, ponded, and free flowing during the June 2019 site visit. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. Dominant plant species in this wetland are reed canarygrass and cattail, with scattered rose spirea, 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 and red alder trees are scattered throughout the wetland, but a forested class is not present.

Soils. During the initial delineation, observed soils at wetland Sample Plot SP-3, observed soils were silt loams with a low chroma (10YR 2/1) down to a depth of 11 inches, with redox concentrations between 7 and 11 inches. Below 11 inches, a high water table prevented further documentation of soils. This soil meets the Redox Dark Surface (F6) hydric soil indicator. During the verification/redelineation, soils at this location were similar. At a second wetland sample plot (KD-1), rock fill was observed from 0 to 2 inches, with a mix of black (10YR 2/1) gravelly loam (30 percent) and rock fill (70 percent), and 2 percent redox concentrations from 2 to 8 inches. Biologists could not dig deeper than 8 inches because of inundation and fill. This soil meets the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. During site visits, standing water was observed within the wetland. At Sample Plot SP-3 during the initial delineation, 6 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3). Similar conditions were observed at this sample plot and at new Sample Plot SP-KD1 during the verification/redelineation, but with 3 inches and 0.5 inch of standing water, respectively.

7.2.4 Wetland K-DD

Wetland K-DD is small (less than 0.1-acre) PEM depressional wetland which is hydrologically connected to Wetland K-D (Figure 7-5). A berm with a utility box separates the wetlands. Wetland K-DD drains via a culvert under 132nd Place NE to Wetland K-G to the west. At the time of the field visit in June 2019, a moderate amount of water flow was passing through the wetland via two culverts: one culvert conveying water from Wetland K-D and the other culvert conveying water from stormwater runoff from commercial developments south of the wetland. Because Wetland K-DD is hydrologically connected to Wetland K-D, the wetlands were rated together, and were both determined to be Category III wetlands.

Vegetation. The dominant plant species in this wetland is reed canarygrass, with lesser amounts of field horsetail, bird's-foot trefoil (*Lotus corniculatus*), and Himalayan blackberry also present. The vegetation in the wetland is disturbed and periodically mowed.

Soils. At wetland Sample Plot SP-KDD1, observed soils down to a depth of 20 inches were silt loams with a low chroma (10YR 2/1 and 10YR 4/1) and redox concentrations between 6 and 20 inches. This soil meets the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. At Sample Plot SP-KDD1, the water table was observed at a depth of 9 inches, and soils were saturated at a depth of 4 inches. Therefore, this wetland meets wetland hydrology indicators High Water Table (A2), and Saturation (A3).

7.2.5 Wetland K-E

Wetland K-E is a linear, 0.05-acre PEM depressional wetland located south of the rail ballast from Wetland K-D (Figure 7-5). 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. Based on the rating form, it is a Category IV wetland (scoring 15 points). It 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.

Vegetation. The dominant vegetation in this wetland is reed canarygrass and cattail, with lesser amounts of other herbaceous species such as softstem bulrush, smartweed, St John's wort, bird's-foot trefoil, and bentgrass.

Soils. The wetland is underlain by rock from the railroad embankment, primarily cobble more than 4 inches in diameter. For this reason, a soil pit could not be dug to describe soils. A thin layer of silt/sediment covers the rock that has likely been deposited by stormwater runoff. Because of the altered conditions in this wetland, hydric soils were assumed based on standing/ponded water, landform, and vegetation.

Hydrology. During site visits, areas of standing/ponded water were observed, but there was no active flow of water within the ditch. At wetland Sample Plot SP-KE1, 2 inches of standing water were present, and soils were saturated to the surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.2.6 Wetland K-F

Wetland K-F is a linear, 0.4-acre PEM/PFO depressional wetland located south of the CKC trail, just east of 132nd Place NE (Figure 7-6). It receives stormwater runoff from adjacent developed areas, and functions as a ditch (see Section 7.3.5), similar to other wetlands in the area. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. The dominant tree species are black cottonwood and Pacific willow. The dominant herbaceous species are reed canarygrass and common rush. Other plant species observed include rose spirea, bird's-foot trefoil, Himalayan blackberry, redosier dogwood, Sitka willow, and field horsetail.

Soils. During the initial delineation, at wetland Sample Plot SP-5 biologists were only able to dig down to a depth of 8 inches, because rock fill from the railroad berm impeded further excavation with a shovel. From 2 to 8 inches, soils were dark gray (7.5YR 4/1) gravelly silt loams, with prevalent redox concentrations, and noticeable depletions. Soils meet the hydric soil indicator Depleted Matrix (F3). During the verification/redelineation at wetland Sample Plot SP-KF2, dark grayish brown (10YR 4/2) silty clay loams with redox concentrations were observed to a depth of 12 inches. Soils meet the hydric soil indicator Redox Dark Surface (F6).

Hydrology. During the initial site visit, ponding water to a depth of 1 inch was observed at Sample Plot SP-5. The water table was at the ground surface, and the soil was saturated to the surface. Therefore, this sample plot meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3). At new Sample Plot SP-KF2, no saturated soils or water table were encountered within the top 12 inches. However, the primary indicators Sediment Deposits (B2), Surface Soil Cracks (B6), and Sparsely Vegetated Concave Surface (B8) were observed.

7.2.7 Wetland K-G

Wetland K-G is located on the north side of the CKC trail, across from Wetland K-F, between 132nd Place NE and 128th Lane NE (Figure 7-6). It is a linear, PEM, depressional wetland, 0.2 acre in size, located in a ditch (see Section 7.3.4) that receives stormwater water runoff from upslope adjacent developed areas and conveys it west toward 128th Lane NE, where a culvert runs under the road to Wetland K-J and Stream K-3 (see Section 7.2.9; Figure 7-7). A 1- to 2-foot drainage ditch conveys water the entire length of the wetland. Substrate in the ditch is primarily silt and sediment. Based on the rating form, it is a Category III wetland (scoring 17 points). It 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.

Vegetation. The dominant vegetation in this wetland consists of reed canarygrass and cattail, with patches of common rush and a few scattered rose spirea shrubs. The wetland is bounded along its north edge by Himalayan blackberry.

Soils. During the initial wetland delineation, at wetland Sample Plot SP-7, soils to a depth of 20 inches were very dark grayish brown (10YR 3/2, 2.5Y 4/2) silt loams. From 0 to 8 inches, redox concentrations were visible in the profile. From 8 inches to 20 inches, redox concentrations were prevalent in a depleted matrix (10YR 5/1). Soils met the hydric soil indicator Depleted Matrix (F3). At wetland Sample Plot SP-6 (not pictured on Figure 7-6), rocks impeded evaluation of soil characteristics. At wetland Sample Plot SP-KG2, inundation and a riprap swale bottom impeded evaluation of soil characteristics. During the verification/redelineation, soils at Sample Plot SP-7 were similar to those observed in 2014, meeting the same hydric soil indicator. At new Sample Plot SP-KG2, organic matter was observed in the top 1 inch, and from 1 to 6 inches in depth, very dark brown (10YR 2/2) silt loams were observed. Biologists were unable to dig below 6 inches because of rock fill. Hydric soils were assumed based on the presence of obligate wetland plants and wetland hydrology.

Hydrology. During field surveys, 14 inches of water were in the ditch in April 2014, 5 inches of water were in the ditch during November 2017, and 1 inch of water was in the ditch in June 2019. Additionally, soils at all wetland sample plots were saturated to the surface, and the water table was at the ground surface. Therefore, this wetland meets wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3).

7.2.8 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 (Figure 7-6). It is a 0.03-acre PEM/PFO depressional wetland south of the CKC gravel trail. It appears to collect water during the wet season, and has no surface water inlets or outlets. Based on the rating form, it is a Category III wetland (scoring 18 points). It 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.

Vegetation. 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 (cottonwoods and Pacific willows) between 20 and 50 feet tall and an herbaceous understory. Other common herbaceous species within the wetland include bird's-foot trefoil and common rush.

Soils. The wetland is surrounded by fill to the west and southwest, and a restrictive layer of rocks impeded digging beyond 5 inches at wetland Sample Plot SP-8 during the initial delineation, and below 6 inches during the verification/redelineation. During both sampling events, a depleted matrix (hydric soil indicator F3) was observed in the upper portion of the soil profile. Soils were silt loams with a light brownish gray (10YR 6/2) matrix and brownish yellow (10YR 6/8) redox concentrations.

Hydrology. Standing water and saturated soils were observed at the time of the 2014 site visit. At wetland Sample Plot SP-8, 1 inch of standing water was measured. The water table was at the surface, and soils were saturated to the surface. Therefore, primary wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3) were documented. During the verification/redelineation, no standing water, saturated soils, or water table were observed at this sample plot. However, primary indicators Surface Soil Cracks (B6) and Sparsely Vegetated Concave Surface (B8) were observed.

7.2.9 Wetland K-J and Stream K-3

Wetland K-J is a large PEM/PSS/PFO/POW wetland that is associated with Totem Lake (Figure 7-7). According to City of Kirkland GIS mapping, this wetland is 20.3 acres in size and extends well outside of the study area. Biologists were unable to access the entire wetland, so field observations may not be reflective of the wetland as a whole. The rating form figures in Appendix C show an estimate of the full wetland area. Based on a rating form completed by AECOM with access to only a small portion of the wetland, Wetland K-

J scored 24 points and was initially documented as a Category I wetland. However, a memorandum from The Watershed Company (2020) provided information about a subsequent rating of the wetland based on field assessment of the entire wetland, which documented a slightly lower habitat score. Based on this information, the rating of Wetland K-J has been revised to Category II. 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). Just west of 128th Lane NE, the wetland is a narrow, vegetated ditch with some overhanging trees. The water in this ditch flows southwest, then becomes a meandering stream 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 CKC gravel trail between this wetland and Wetland K-K to the south. Numerous birds were observed in this wetland during field visits, including willow flycatcher (*Empidonax traillii*), Oregon junco (*Junco hyemalis*), and American crow (*Corvus brachyrhyncos*).

Stream K-3 is an unnamed tributary to Totem Lake and mapped by the City of Kirkland as non-salmon bearing. SalmonScape shows an intermittent stream in the same general location as Stream K-3. However, it does not extend up to the north as the City of Kirkland map indicates. Figure 7-7 shows the center line of this stream, which has a variable width of up to 24 inches within the study area. No salmon presence is documented in this stream by WDFW or the City of Kirkland. However, during a field visit on August 21, 2015, about ten 3-inch long juvenile fish where observed in the stream channel. The fish were difficult to identify to species but were in the minnow family (Cyprinidae). Therefore, our proposed classification for this stream is a Type F water.

Vegetation. 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 railroad bed and adjacent upland development to the north. The dominant species are reed canarygrass and field horsetail, with common rush, slough sedge, and scattered rose spirea and Himalayan blackberry also present. 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. Within the PFO portions, common tree/tall shrub species are red alder, cottonwood, Pacific willow, and red elderberry (*Sambucus racemosa*). In the PSS portions of the wetland, common shrub species include redosier dogwood, Pacific and Scouler's willow, salmonberry, red alder, and rose spirea. Himalayan and cutleaf blackberry (*Rubus laciniatus*) are also present. Field horsetail is the dominant herbaceous species. Areas of emergent vegetation are interspersed with the shrubs. Within PEM areas, the dominant vegetation consists of cattails, Himalayan blackberry, field horsetail, scattered Pacific and other willows, reed canarygrass, and smartweed.

Soils: During the initial delineation, at wetland Sample Plot SP-9 soils to a depth of 18 inches were black (2.5Y 3/1). No redox was observed. Soils in this sample plot meet the hydric soil indicator Depleted Matrix (F3). At wetland Sample Plot SP-KJ1, soils from 0 to 12 inches were dark greenish gray, gleyed silt loams. Because of inundation at the time of the site visit, the soil log hole could not be dug deeper. Soils in this sample plot met the hydric soil indicator Loamy Gleyed Matrix (F2). During the verification/redelineation, soils at Sample Plot SP-9 were a bit different and, based on the presence of rocks at a depth of 10 inches, the soil log hole was probably dug in a slightly different location. Soils to a depth of 10 inches were very dark gray (10YR 3/1) silt loams with 5 percent redox concentrations. Soils met the hydric soil indicator Redox Dark Surface (F6).

Hydrology: During the initial delineation, soil at Sample Plot SP-9 was saturated starting at a depth of 5 inches, and the water table was also high. At wetland Sample Plot SP-KJ1, 1 inch of surface water was present, and soils were saturated to the surface. Therefore, the wetland hydrology indicators Surface Water (A1), High Water Table (A2) and Saturation (A3) were being met. At other locations within the wetland, large areas of deep standing water were also observed. During the verification/redelineation, no surface water or

water table was observed at Sample Plot SP-9, but saturated soil was observed at a depth of 5 inches. Therefore, the wetland hydrology indicator of Saturation (A3) was being met.

7.2.10 Wetland K-K and Stream K-6

Wetland K-K is an approximately 1.5-acre, PFO depressional wetland located on the south side of the railroad embankment, across from Wetland K-J (Figure 7-7). A culvert running beneath the CKC trail provides a hydrologic connection between the two wetlands. The boundary of Wetland K-K was mapped in 2017 and then extended in 2019 based on observations made during the verification/redelineation effort. Based on the rating form, Wetland K-K is a Category III wetland (scoring 16 points). It 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 provides habitat for numerous species. A variety of birds were observed in this wetland during field visits, including cedar waxwing, willow flycatcher, chickadee, winter wren, rufous hummingbird, and downy woodpecker.

The City of Kirkland maps a small channel in Wetland K-K that runs parallel and adjacent to the CKC trail, and branches off to the south. WDFW also maps a stream in this location, with no documented salmon presence. During the initial field surveys to map the channel, biologists noted standing water with no evidence of bed or bank, and no flow. Therefore, there was no apparent stream in this location. During the verification/redelineation, Stream K-6 was mapped. This stream is a 1- to 2-foot-wide tributary 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, confined by adjacent commercial developments, and loses an active channel signature within Wetland K-K. Based on City of Kirkland GIS mapping, WDFW SalmonScape, and the PHS database, there are no salmon in Stream K-6. Because of the 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, and is therefore classified as a Type F water.

Vegetation. The dominant tree species in this wetland are red alder, Pacific and other willows, and black cottonwood. The most prevalent species in the shrub layer is Himalayan blackberry. Common herbaceous layer species include field horsetail and fireweed (*Chamaenerion angustifolium*).

Soils. During the initial delineation, at wetland sample plot (SP-KK1) a restrictive layer of rocks impeded digging beyond 12 inches. In the upper 6 inches of the soil profile, soils were a mix of very dark gray (10YR 3/1) sandy clay loams and fill material. Dark yellowish brown (10YR 4/6) redox concentrations were present (2 percent). From 6 to 12 inches, soils were very dark grey (G1 3/N) sandy clay loams, with 30 percent of this layer consisting of 1-inch angular rock (fill material). Based on the soils within the upper 12 inches of the soil profile, the sample plot met the Redox Dark Surface indicator (F6). During the verification/redelineation, soils at Sample Plot SP-KK1 were similar to those observed in 2017, with the same hydric soil indicator. At new wetland Sample Plot SP-KK4, black (10YR 2/1) silt loams with 2 percent redox concentrations were observed to a depth of 12 inches. Inundation prevented digging below 12 inches. The soil met the Redox Dark Surface (F6) hydric soil indicator.

Hydrology. Standing water and saturated soils were observed during both site visits. At wetland Sample Plot SP-KK1, 6 inches of standing water were measured in October 2017 and 0.5 inch was measured in June 2019. Soils were saturated to the surface during both sampling events. At Sample Plot SP-KK4 in June 2019, 0.5 inch of standing water was measured with soils saturated to the surface. Therefore, primary wetland hydrology indicators Surface Water (A1), High Water Table (A2), and Saturation (A3) were documented.

7.2.11 Wetland K-L and Stream K-5

Wetland K-L is a large depressional/riverine wetland with multiple Cowardin classes that is associated with Stream K-5 (Figure 7-8). According to City of Kirkland GIS, the full wetland is 21.8 acres and includes a large open water component. The wetland rating form figures in Appendix C show the estimated full extent of this wetland. During field surveys, biologists only had access to the westernmost portion of the wetland, within the study area. PEM and PFO wetland classes were observed in this area (see Appendix C). The PSE project corridor is primarily associated with the PEM component, but the forested edge was visible to the east. Based on the rating form (which was completed without full access to the wetland) Wetland K-L is classified as a Category II wetland (scoring 20 points). It provides moderate levels of water quality, hydrologic, and habitat functions. A variety of birds were observed using the wetland within or near the project corridor, 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 part a of larger stream-wetland complex mapped by the City of Kirkland. In the study area, stream K-5 consists of three separate channels (Figure 7-8) that generally flow from east to west. The three delineated stream channels (all referenced as Stream K-5 in this report) are presumed to be secondary channels that converge offsite to form an unnamed intermittent tributary of Juanita Creek. The main channel was observed flowing south just outside the west edge of the study area. The width of the main channel varies from approximately 5 to 10 feet (at ordinary high water) and the substrate is mainly sand and fine gravel. Two of the secondary channels occur in Wetland K-L, in dense reed canarygrass. They are approximately 3 feet wide with silt substrate. The southernmost secondary channel was mapped south of the wetland, but is believed to connect with the wetland and other secondary channels east of the study area. No salmon presence is documented by WDFW SalmonScape or City of Kirkland GIS in the delineated stream segments within the study area or in the larger stream channel to the west. Segments of the stream within the study area are deeply incised, lack riparian cover and woody material, and do not provide the stream complexity required by salmonids. Fish habitat condition of the stream channels is low, with observed low to stagnant flow, high turbidity, substrate dominated by excess sediment, and absence of habitat structure such as riffles and pools. High temperatures, low oxygen, and limited aquatic insects/macroalgae production make these stream segments unlikely to support fish. However, fish have been documented in the main stream channel west of the study area. Therefore, Stream K-5 is a Type F water.

Vegetation. In the PEM component, reed canarygrass is the dominant species. Some cattail is also present, with scattered purple loosestrife (*Lythrum salicaria*) plants observed. Outside the study area, a PFO component was observed that predominantly includes alders and willows. A small shrub component was also observed, with Himalayan blackberry, rose spirea, and salmonberry prevalent in this layer.

Soils. During the initial delineation, at the wetland sample plot near the south end of Wetland K-L (T1-SP2), the top 5 inches of the soil profile were very dark gray (7.5YR 3/1) clay loams, over dark gray (10YR 4/1) sandy clay loams to a depth of 14 inches. The Depleted Below Dark Surface (A11) hydric soil indicator was observed. At the wetland sample plot near the north end of the wetland (T2-SP2), the top 12 inches were very dark gray silt loams, over very dark grayish brown (2.5Y 3/2) silt loams to a depth of 12 inches. The Thick Dark Surface (A12) hydric soil indicator was observed at this sample plot. During the verification/redelineation, at the wetland sample plot near the south end of the wetland (KL-SP3), the top 6 inches of the soil profile were very dark grayish brown (10YR 3/2) loams. From 6 to 10 inches, soils were brown sandy loams with 3 percent redox concentrations, and from 10 to 16 inches, soils were dark grayish brown (10YR 4/2) loams with 8 percent redox concentrations. The Depleted Matrix (F3) hydric soil indicator

was observed at this sample plot. At the wetland sample plot near the north end of the wetland (KL-SP2), the top 8 inches of the soil profile were very dark grayish brown (10YR 3/2) loam. From 8 to 16 inches, soils were very dark grayish brown (10YR 3/2) clay loams with 5 percent redox concentrations and 3 percent depletions. The Redox Dark Surface (F6) hydric soil indicator was observed at this sample plot.

Hydrology. During the initial delineation the water table was present starting at a depth of 13 to 14 inches. Soil saturation was observed at the surface at wetland sample plot T2-SP2 and at a depth of 2 inches at the wetland sample plot T1-SP2. The primary wetland hydrology indicator Saturation (A3) was observed at both sample plots. During the verification/redelineation, surface water (indicator A1) was present in the north part of the wetland. No primary wetland hydrology indicators were observed near the south wetland boundary, but two secondary indicators—Geomorphic Position (D2) and FAC-Neutral test (D5)—were observed.

7.2.12 Wetland K-HF (Heronfield Wetlands)

Wetland K-HF is a large depressional wetland with multiple Cowardin classes. Only the northwest edge of the wetland is within the study area (Figure 7-9). PSE's existing transmission line corridor where poles and conductor will be replaced runs through a paved area east of the wetland. The total wetland is estimated at approximately 20 acres in size. The onsite portion is 0.6 acre. The wetland rating form figures in Appendix C show the estimated full extent of this wetland. During field surveys, biologists only had access to the extreme northwest portion of the wetland. A PFO wetland class was observed in this area (see Appendix C). PSS and PEM classes are present outside of the study corridor. Based on the rating form (which was completed without full access to the wetland) Wetland K-HF is classified as a Category II wetland (scoring 22 points). It provides high levels of water quality and hydrologic functions, and moderate habitat functions.
Vegetation. 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 common lady fern are common in the herbaceous stratum.

Soils. Soils in the wetland were composed of very dark grayish brown (10YR 3/2) peat over very dark brown (10YR 2/2) muck. Organic soils extend 20 inches or more deep (indicator A1-Histosol).

Hydrology. During the June 2019 inspection of Wetland K-HF, a water table was observed at 5 inches below the soil surface (indicator A2). Other wetland hydrology indicators observed include sparsely vegetated concave surface (B8) and water-stained leaves (B9).

7.3 Ditches

Information on ditches is provided for informational purposes. Ditches are not considered Critical Areas under the KZC, but may have a hydrologic connection to nearby wetlands and/or streams. Ditches are labeled in Figures 7-1 through 7-3.

7.3.1 Ditch K-1

Ditch K-1 (Figure 7-1) receives runoff from NE 124th Street and adjacent uplands. It flows east a short distance before flow appears to infiltrate into the coarse soil. There is no apparent connection to other waters. Flow is ephemeral based on the small catchment size and lack of scour and an OHWM.

7.3.2 Ditch K-2

Ditch K-2 (Figure 7-1) begins outside of the study area, and roughly east-west runs between the north side of the old railroad embankment and industrial areas. Within and north of the study area, the ditch runs though Wetlands K-C and K-D, ending at 132nd Place NE. The section of the ditch within the study area that could be impacted by project activities is entirely within mapped wetlands K-C, K-D, and K-DD. The ditch lacks a distinct bed and bank within the wetlands. The channel is dominated by reed canarygrass.

7.3.3 Ditch K-3

Ditch K-3 (Figure 7-1) runs approximately the same distance as Ditch K-2, but on the opposite (south) side of the railroad embankment. Most of the ditch occurs within Wetlands K-B and K-E, where the channel is dominated by reed canarygrass and a distinct bed and bank is not visible. Outside of the wetlands, the ditch substrate is gravel fill material with reed canarygrass and dominantly upland vegetation. There was no flow during the late October 2019 site visit. Flow is characterized as ephemeral due to the lack of scour and an OHWM. The ditch is not a relocated tributary or excavated in a tributary.

7.3.4 Ditch K-4

Ditch K-4 runs on the north side of the railroad embankment from 132nd Place NE to 128th Lane NE (Figure 7-2). It occurs entirely within Wetland K-G. More information on this ditch can be found in the discussion of Wetland K-G in Section 7.2.7.

7.3.5 Ditch K-5

Ditch K-5 (Figure 7-2) is mapped on the south side of the railroad embankment, just west of 132nd Place NE, for a distance of approximately 225 feet. It occurs entirely within Wetland K-F. The ditch lacks a distinct bed and bank, or indications of scour. Flow is to the east into a catch basin at 132nd Place NE.

7.3.6 Ditches K-6 and K-7

Ditches K-6 and K-7 occur on opposite sides of the CKC gravel trail, between NE 124th Street and I-405 (and mapped as continuing on underneath I-405 and outside of the study area) (Figure 7-2). The trail and ditches are excavated through uplands in this section, with steep side slopes along the south half of the ditches. Flow is to the northeast. Ditch K-7 flows into a culvert at NE 124th Street. Ditch K-6 appears to lack a connection to a downstream water. The ditches drain developed upland areas and roads. The ditches are not relocated tributaries, and lack an OHWM. Flow is ephemeral to intermittent.

7.3.7 Ditch K-8

Ditch K-8 occurs on the east side of 120th Avenue NW, just north of NE 118th Street (Figure 7-2). The ditch drains the road and associated uplands. Flow is ephemeral based on the small catchment and lack of scour or an OHWM. There is no apparent surface connection to downstream waters.

7.3.8 Ditch K-9

Ditch K-9 occurs between 120th Avenue NE and the I-405 on-ramp (Figure 7-2). The ditch receives runoff from a culvert from the parking lot and developed areas on the west side of 120th Avenue NE. Water flows down the slope and along the on-ramp. Flow is ephemeral. Scour is present on the slope but there is no OHWM. This ditch is not a relocated tributary or excavated in a tributary.

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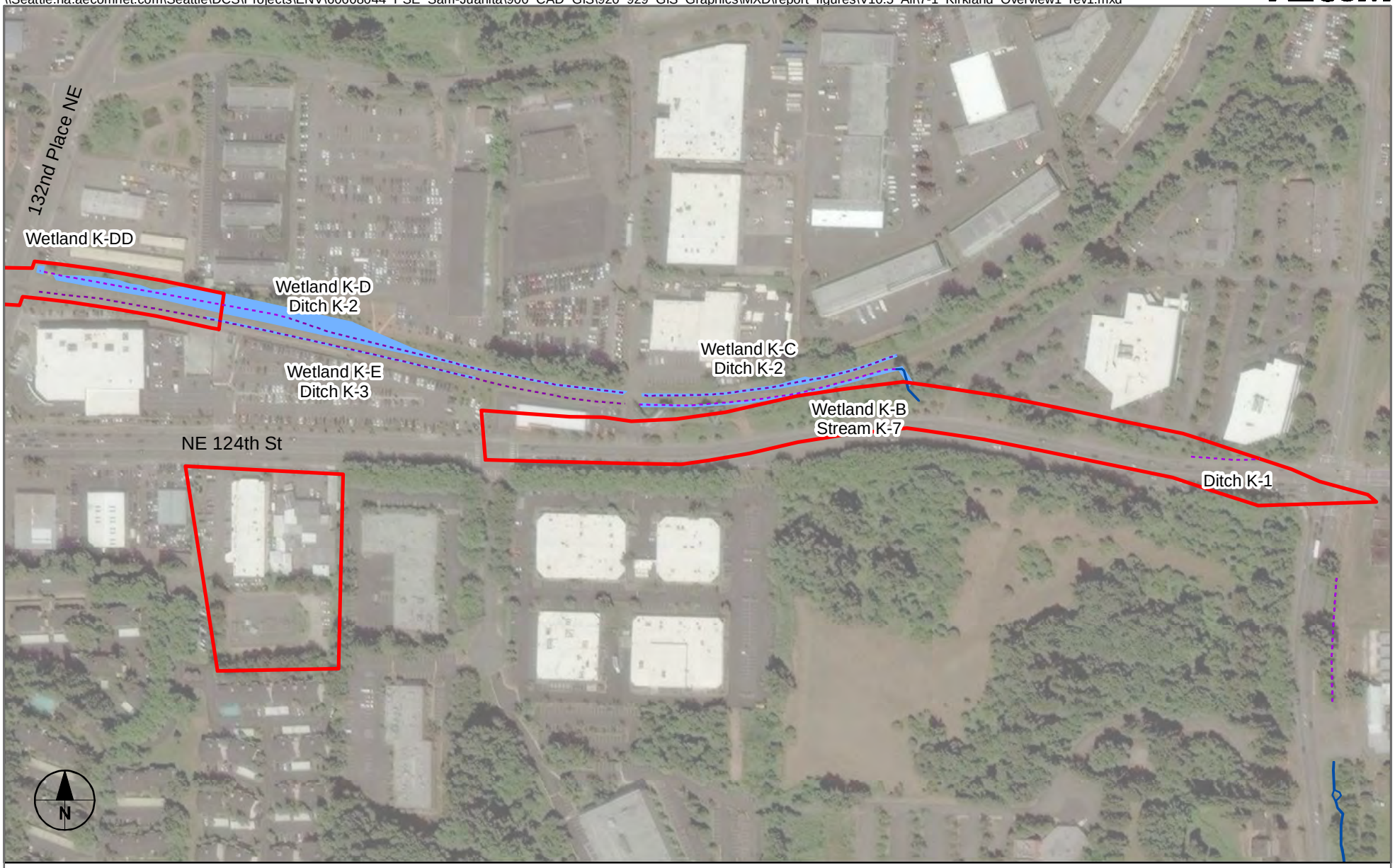

0 125 250 500 Feet

Study Area

Delineated Wetlands

Delineated Streams

Ditches

Puget Sound Energy
Sammamish-Juanita Transmission Line
Wetland Delineation
Kirkland, Washington
Project No.: 60608044

Figure 7-1

City of Kirkland
Overview of Delineated Wetlands and Streams
Figure 1 of 3