ATTACHMENT 21

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

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CRITICAL AREA STUDY

FOR

Ellsworth – 134th Avenue

Wetland Resources, Inc. Project #11122

Prepared By:

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APPENDICES

PROJECT LOCATION AND SITE DESCRIPTION

Wetland Resources, Inc. (WRI) completed a site investigation on October 20, 2011 to evaluate and delineate jurisdictional wetlands and streams on and in the vicinity of King County parcel #0325059100. The subject property is located south of the intersection of 134th Avenue NE and NE 100th Street in the City of Redmond, Washington. The Public Land Survey System (PLSS) locator for the site is Section 03, Township 25N, Range 05E, W.M. The subject property is situated within the Cedar/Sammamish Watershed, or Water Resources Inventory Area (WRIA) 8.

The 1.45-acre subject property is undeveloped and located in a residential setting. The site has a gentle southeast aspect with a shallow ravine along the eastern border. The eastern and southern portions of the site contain forested vegetation, and scattered trees are present in the northwest corner as well. The center portion is dominated by a mix of herbaceous and scrub-shrub vegetation. The subject property is bordered on the north by NE 100th Street. Developed parcels are located to the east, west, and south, along with undeveloped, forested areas.

The October 2011 site inspection resulted in the identification of one stream along/near the eastern property boundary and extending off-site to the southeast. In addition, steep slopes (approx. 40%) are located in the southeast property corner.

PROJECT DESCRIPTION

A sanitary sewer easement and new sanitary sewer line are being proposed for construction on the subject property. The new easement and sewer line will be placed in the southern portion of the property and will be tied into an existing sewer line.

REVIEW OF EXISTING INFORMATION

As part of this project, public resources were reviewed to gather background information on the subject property, the surrounding area, and critical areas in the vicinity. The following information was examined:

- USFWS National Wetlands Inventory: The National Wetland Inventory (NWI) does not indicate any wetland areas on the subject property.
- USDA/NRCS Web Soil Survey: The soil mapped within the project area includes Alderwood gravelly sandy loam, 0 to 6 percent slopes, and Alderwood gravelly sandy loam, 6 to 15 percent slopes. Neither soil is classified as hydric by the Natural Resources Conservation Service (NRCS).
- WDFW SalmonScape Interactive Mapping System: The SalmonScape interactive map illustrates the off-site portion of the stream identified during the October 2011 site investigation. SalmonScape also indicates that fish use (Coho salmon) is present in the easternmost portion of the stream, east of Willows Road NE, approximately two miles away from the subject property.
- StreamNet Interactive Mapper: The StreamNet interactive mapping system illustrates the off-site portion of the identified stream and indicates fish use in the same location as the SalmonScape map.

- WDFW Priority Habitat and Species (PHS) Interactive Map: There are no priority habitats or listed species on the subject property per the PHS Interactive Map. The off-site portion of the identified stream is illustrated, however.
- King County iMap Interactive Mapping Tool: Similar to the other mapping systems, the King County iMap illustrates the off-site portion of the identified stream.
- City of Redmond Maps: The off-site portion of the identified stream is illustrated on the following City of Redmond maps: Critical Areas Map (Map 64.4: Wetlands), Critical Areas Map (Map 64.3: Streams Classification), and Fish and Wildlife Habitat Conservation Areas.

METHODOLOGY

Wetland boundaries were determined using the routine determination approach described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), or Corps Manual, and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountians, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers 2010), or the Regional Supplement. Under the routine methodology, the process for making a wetland determination is based on three steps:

1.) Examination of the site for hydrophytic vegetation (species present and percent cover);

2.) Examination of the site for hydric soils;

3.) Determining the presence of wetland hydrology

The following criteria must be met in order to make a positive wetland determination:

Vegetation Criteria

The Corps Manual and 2010 Regional Supplement define hydrophytic vegetation as "the assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence." Field indicators are used to determine whether the hydrophytic vegetation criteria have been met. Examples of these indicators include, but are not limited to, the rapid test for hydrophytic vegetation, a dominance test result of greater than 50%, and/or a prevalence index score less than or equal to 3.0.

Soils Criteria

The 2010 Regional Supplement (per the National Technical Committee for Hydric Soils) defines hydric soils as soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators are used to determine whether a given soil meets the definition for hydric soils. Indicators are numerous and include, but are not limited to, presence of a histosol or histic epipedon, a sandy gleyed matrix, depleted matrix, and redoximorphic depressions.

Hydrology Criteria

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing

season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively. The strongest indicators include the presence of surface water, a high water table, and soil saturation within at least 12 inches of the soil surface.

BOUNDARY DETERMINATION FINDINGS/RESULTS

No wetlands were identified on or near the subject property during the October 2011 site investigation. However, one stream was identified along and near the eastern property boundary. The ordinary high water mark (OHWM) of the stream was identified using the methodology described in the Washington State Department of Ecology document Determining the Ordinary High Water Mark on Streams in Washington State (Second Review Draft) (Olson and Stockdale 2010). The stream was categorized according to Redmond Zoning Code (RZC) section 21.64.020(A)(2)(d) and was classified according to the U.S. Fish and Wildlife Service (USFWS) Classifications of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979), also known as the Cowardin Classification System.

Stream

The identified stream is a perennial feature that meets the criteria for a Class IV stream per RZC 21.64.020(2)(d). It enters the property in the northeast corner via a culvert under NE 100th Street, crosses the northeast property corner, and then flows off-site to the east. The stream continues flowing south, roughly paralleling the eastern property boundary. Based on the Cowardin Classification System, the stream is a riverine/lower perennial, unconsolidated bottom/mud and cobble-gravel system.

The stream is a tributary to the Sammamish River and does not support fish in the vicinity of the subject property, nor does it have the potential to support fish in that area. A steep gradient (>16 percent) east of the property and a lack of suitable on-site, in stream habitat prevent fish access or use of the stream.

Per RZC section 21.64.020(B)(3), perennial Class IV streams require a 36-foot buffer measured from the OHWM.

Upland/Buffer Areas

Vegetation throughout the upland and buffer areas consists of trees in the northwest corner and along the eastern property boundary. The center of the property is open and appears to be abandoned pasture that is currently dominated by Himalayan blackberry (*Rubus armeniacus*) and creeping buttercup (*Ranunculus repens*). The southern portion of the subject property is forested and part of a large, forested corridor that extends off-site to the south. Typical vegetation in the forested portions of the site is represented by big leaf maple (*Acer macrophyllum*), Indian plum (*Oemleria cerasiformis*), Himalayan blackberry (*Rubus armeniacus*), creeping buttercup (*Ranunculus repens*), and sword fern (*Polystichum munitum*). Vegetation in the abandoned pasture area is comprised of scattered, sapling big-leaf maple, with Himalayan blackberry, creeping buttercup, colonial bentgrass (*Agrostis tenuis*), orchard grass (*Dactylis glomerata*), and small patches of reed canarygrass (*Phalaris arundinacea*). Soils across the site have matrix colors ranging from very dark grayish brown to dark yellowish brown with textures of gravelly sandy loam from 0 to 18 inches below the surface. Soils were moist to dry during our October 2011 site investigation.

FUNCTIONS AND VALUES ASSESSMENT

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretations. This assessment pertains specifically to the on-site stream system, but is typical for assessments of similar systems throughout western Washington.

Streams and their associated floodplains in western Washington perform a variety of ecosystem functions including the movement of water and sediment, storage of flood waters, recharge of groundwater, treatment of pollutants, dynamic stability, and habitat diversity. Assessments of these functions for the project site are provided below.

The on-site stream serves to collect stormwater from the surrounding areas and convey it to downstream systems. The vegetation and micro topography in the adjacent upland buffer serves to filter and trap sediments and pollutants in overbank areas, and to naturally purify in-stream flows. The stream and associated buffer comprise part of a larger, natural area that provides habitat for a wide variety of wildlife species, as well as a protected movement corridor. The dominance of multi-strata, native vegetation in the stream buffer provides shade and allochthonous material to the stream and downstream systems and generally improves the stream's functions and values

Along with the preceding functions and values, stream buffers often provide additional functions in western Washington such as physical protection to the stream, aesthetic value, and recreational opportunities.

PROJECT IMPACT ASSESSMENT

The proposed sanitary sewer project will have no impact to the stream or stream buffer. The proposed work will occur outside (west) of the stream buffer. Work may occur in a portion of the steep slope buffer, however (see attached Critical Areas Map for more details).

USE OF THIS REPORT

This Critical Area Study is supplied to Tom Ellsworth and Jon Nelson/Land Development Advisors, LLC as a means of determining on-site critical area conditions, as required by the City of Redmond. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

This delineation and report conforms to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Jim Rothwell
Senior Ecologist, PWS

REFERENCES

City of Redmond, WA. 2011. Redmond Zoning Code.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. Laroe. 1979. Classification of Wetlands and Deep Water Habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS 79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. Environmental Laboratory, Department of the Army, Corps Waterways Experiment Station, Vicksburg, MS.

KCGIS Center. 2012. King County iMAP: Interactive Mapping Tool. http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx. Accessed September 2013.

Lichvar, R.W. 2013. The National Wetland Plant List: 2013 wetland ratings. Phytoneuron 2013-49: 1–241. Published July 17, 2013. ISSN 2153 733X

Munsell Color. 2012. Munsell Soil Color Book. Munsell Color, Grand Rapids, MI.

StreamNet. 2013. StreamNet Mapper. http://www.streamnet.org/mapping_apps.cfm. Accessed September 2013.

U.S. Army Corps of Engineers (Corps). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). U.S. Army Engineer Research and Development Center Environmental Laboratory. Vicksburg, MS. Publication # ERDC/EL TR-10-3.

U.S. Fish and Wildlife Service. National Wetland Inventory (NWI). Wetlands Mapper. http://www.fws.gov/wetlands/. Accessed September 2013.

USDA-NRCS. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm Accessed September 2013.

Washington State Department of Fish and Wildlife (WDFW). 2013. Priority Habitats and Species: PHS on the Web. http://wdfw.wa.gov/mapping/phs/. Accessed September 2013.

Washington State Department of Fish and Wildlife (WDFW). 2011. SalmonScape. http://wdfw.wa.gov/mapping/salmonscape/index.html. Accessed September 2013.

Appendix A

Field Data Summary Sheet (October 2011)

Field Data Sheet
Ellsworth 134th Ave - WRI # 11122
Investigation Date: 10.20.2011

Pit	Depth	Texture	Color	Moisture	Species	%	Status	Strata
S1	0-18"	Gravelly Sandy Loam	10YR 3/2	moist	*Acer macrophyllum*	80	FacU	tree
Upland					*Oemleria cerasiformis*	30	FacU	Shrub
					Polystichum munitum	20	FacU	Herb
					Tolmiea menziesii	50	Fac	Herb
					Erodium cicutarium	20	FacU	Herb
					Rubus ursinus	10	FacU	Woody Vine
					Urtica dioica	10	Fac+	Herb
Conclusion: Upland - Parameters for hydrophytic vegetation, hydric soils, and wetland hydrology are not met.								
S2	0-18"	Gravelly Sandy Loam	10YR 4/4	dry	*Acer macrophyllum*	80	FacU	Tree
Upland					*Oemleria cerasiformis*	20	FacU	Shrub
					Rubus ameniacus	10	FacU	Shrub
					Ranunculus repens	30	FacW	Herb
					Erodium cicutarium	20	FacU	Herb
					Polystichum munitum	10	FacU	Herb
Conclusion: Upland - Parameters for hydrophytic vegetation, hydric soils, and wetland hydrology are not met.								
S3	0-5"	Silt Loam	10YR 3/2	moist	sapling *Acer macrophyllum*	30	FacU	Tree
Upland	5-18"	Gravelly Sandy Loam	10YR 3/2 (4/4 mixed)	dry	*Rubus ameniacus*	20	FacU	Shrub
					Ranunculus repens	50	FacW	Herb
Area appears recently cleared or abandoned pasture - soils somewhat disturbed					*Agrostis tenuis*	30	Fac	Herb
					Dactylis glomerata	10	FacU	Herb
					Phalaris arundinacea	10	FacW	Herb
Conclusion: Upland - Parameters for hydrophytic vegetation, hydric soils, and wetland hydrology are not met.								
S4	0-18"	Gravelly Sandy Loam	10YR 3/2	dry	*Rubus ameniacus*	60	FacU	Shrub
Upland			10YR 4/4		*Ranunculus repens*	70	FacW	Herb
			mixed		*Phalaris arundinacea*	20	FacW	Herb
			disturbed soils					
Conclusion: Upland - Parameters for hydrophytic vegetation, hydric soils, and wetland hydrology are not met.								

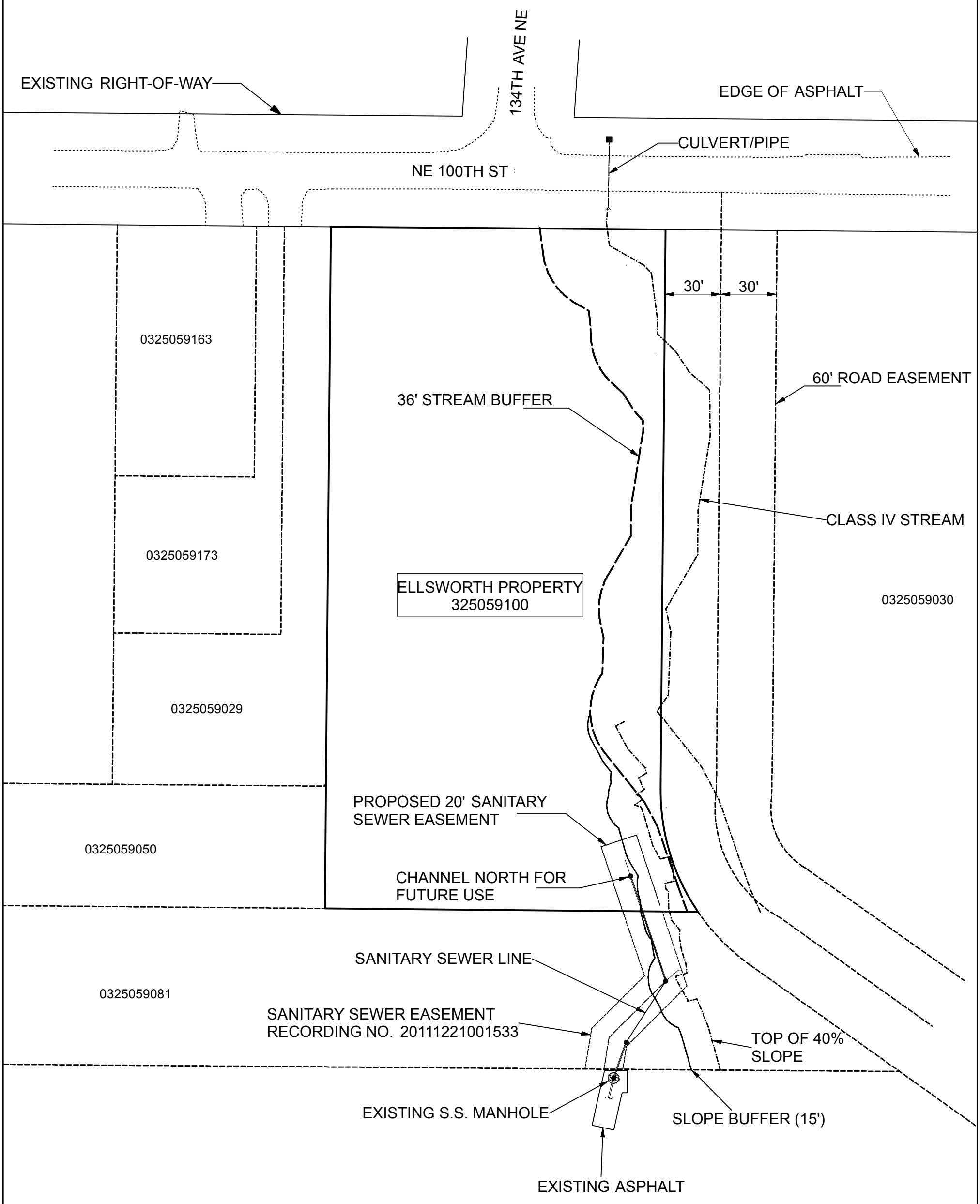
Appendix B

Critical Areas Map

ATTACHMENT 21

CRITICAL AREAS MAP
ELLSWORTH - 134TH AVE.
CITY OF REDMOND, WASHINGTON

PORTION OF SECTION 03, TOWNSHIP 25N, RANGE 05E, W.M.



SCALE: 1" = 50'

0 25 50 75 100

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CRITICAL AREA STUDY MAP
ELLSWORTH - 134TH AVE.
CITY OF REDMOND, WASHINGTON

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Sheet 1/1
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Date: Sept. 24, 2013