

RICHARDS CREEK PARCEL TREE INVENTORY REPORT

Puget Sound Energy – Energize Eastside Project

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TABLE OF CONTENTS

	Page #
1 Executive Summary.....	5
2 Introduction.....	6
2.1 Background.....	6
2.2 Defined Study Area.....	6
3 Site Description	6
4 Photos.....	10
5 Methods	12
5.1 Significant Trees	12
5.2 Non-Significant Trees and Shrubs.....	12
5.3 Authority.....	13
5.4 Vegetation Mapping	13
5.5 Attribute data collection.....	13
5.6 Data Management.....	15
6 Limitations of Study	15
7 Tree Inventory Results	16
8 References	17

LIST OF FIGURES

Figure 1 - An overview map of proposed Oak and Willow routes from the Energize Eastside website. The Oak route is depicted in green while the Willow route variation is shown in orange.7

Figure 2 - Overview of the Richards Creek Parcel vicinity.8

Figure 3 - Richards Creek Parcel study area.9

Figure 4 - Two subject red alder trees in the west half of the Richards Creek Parcel. (Photo taken on July 31, 2015)..... 10

Figure 5 - Forest of bigleaf maple, red alder and vine maple with an understory of Himalayan blackberry. (Photo taken on August 12, 2015) 11

Figure 6 - Looking north at the gravel lot and existing 115kV lines in the Richards Creek Parcel. (Photo taken on August 1, 2015)..... 11

LIST OF TABLES

Table 1 - Attributes recorded for all inventoried vegetation and that are presented in the spreadsheet database..... 14

Acronyms and Abbreviations

APS	APS Survey & Mapping, LLC
BCC	Bellevue City Code
DBH	Diameter at 4.5 feet above the surface of the ground
I-90	Interstate-90
ISA	International Society of Arboriculture
LUC	Land Use Code: Title 20 of the Bellevue City Code
PSE	Puget Sound Energy
ROE	Right of entry
ROW	Right-of-way
SR520	State Route 520
WSDOT	Washington State Department of Transportation
TWC	The Watershed Company

RICHARDS CREEK PARCEL TREE INVENTORY REPORT

PUGET SOUND ENERGY – ENERGIZE EASTSIDE

1 EXECUTIVE SUMMARY

The Watershed Company conducted a field-based tree inventory at the 8.46-acre Richards Creek substation parcel (parcel number 1024059130), located in the City of Bellevue. A total of 522 trees greater than six inches in diameter were tagged and assessed within the study area in both 2015 and 2016. Of those trees 468 meet the City's definition of "significant" (equal to or larger than eight inches in diameter and healthy). Twenty-one large trees, exhibiting a diameter of 30 inches or larger, are included. Many of the assessed trees are located in wetlands or within wetland and stream buffers. This inventory provides baseline information and does not represent the number of trees that could be pruned or removed as a result of the Energize Eastside project.

2 INTRODUCTION

The purpose of this tree inventory is to quantify and characterize all significant trees and tall shrubs with the potential to reach greater than 15 feet in height along the subject corridor consisting of the routes known as “Willow” and “Oak”. This inventory provides baseline information and does not represent the number of trees that could be pruned or removed as a result of the Energize Eastside project. These routes have been identified by Puget Sound Energy (PSE) as part of the Energize Eastside project.

This report summarizes the findings for the 8.46-acre Richards Creek Parcel (parcel number 1024059131), which is situated south of the Lakeside Substation and is in line with the “Willow” and “Oak” Route alignment. Route improvements outside of the existing corridor may be proposed for the parcel. This report is intended to support the design and permitting efforts for improvements to this parcel related to the Energize Eastside project.

2.1 Background

The Energize Eastside project proposes to build a new electric substation and higher capacity transmission lines to serve homes and businesses on the Eastside. Current route options include Oak and Willow routes that will extend from Redmond to Renton (Figure 1). The two proposed routes diverge through the Factoria and Somerset neighborhoods of the City of Bellevue. Each route option includes a set of Segments, as follows. The Oak route comprises Segments A, C, E, G2, I, K2, M, and N. The Willow route comprises Segments A, C, E, J, M, and N.

The Richards Creek Parcel is in-line with routes being considered for the Energize Eastside project. Infrastructure improvements outside of the alignment are also being considered for this parcel. Data from this report is intended to support design and permitting for these proposed improvements.

2.2 Defined Study Area

The study area for this report is the entire 8.46-acre Richards Creek Parcel (Figure 3).

3 SITE DESCRIPTION

The Richards Creek Parcel is situated south of and adjacent to the PSE-owned Lakeside Substation parcel (Figure 3). The existing 115kV line sets run north/south through the center of the parcel and the subject area. Deciduous

forest of red alder and bigleaf maple characterize the west and east edges of the study area outside of the powerline corridor (Figure 4 and Figure 5). An approximately 1.3-acre gravel parking lot and staging area is situated in the center of the lot beneath the powerlines (Figure 6), with an access road connecting it to SE 30th Street to the west.

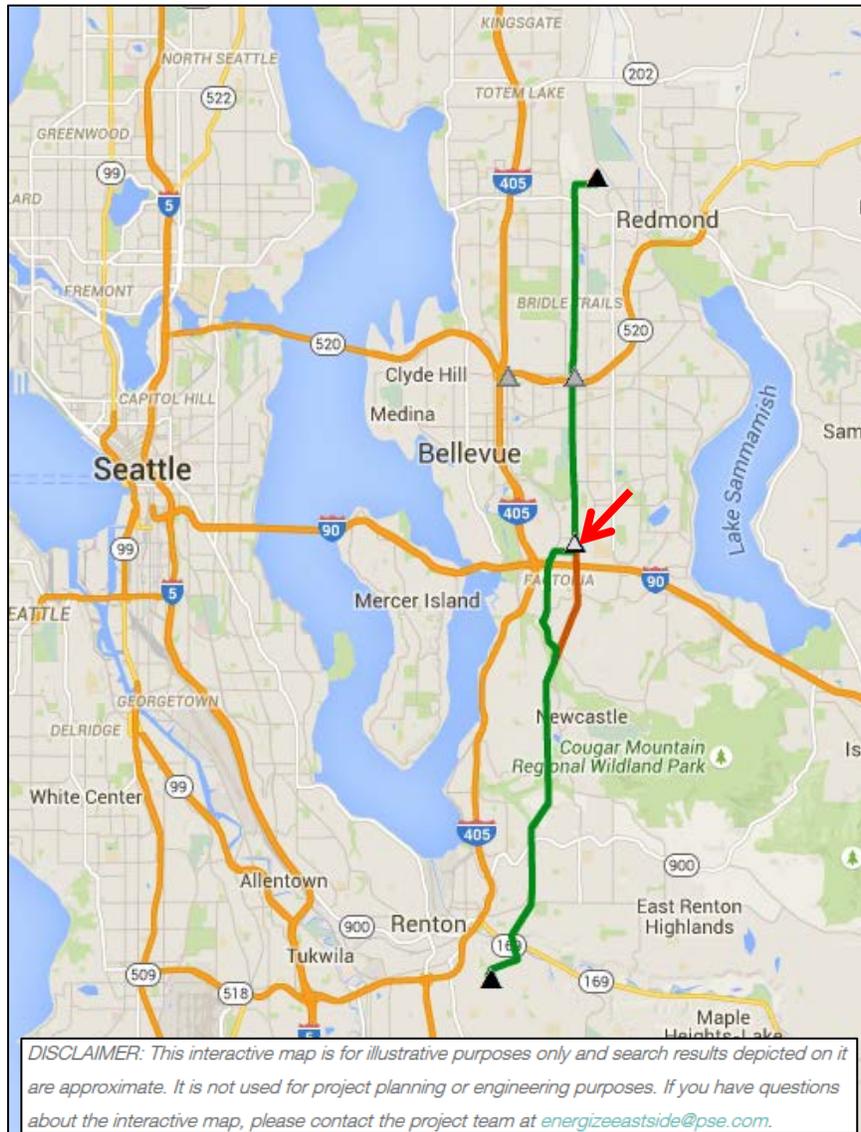


Figure 1 - An overview map of proposed Oak and Willow routes from the Energize Eastside website. The Oak route is depicted in green while the Willow route variation is shown in orange. The location of Richards Creek is indicated with a red arrow.

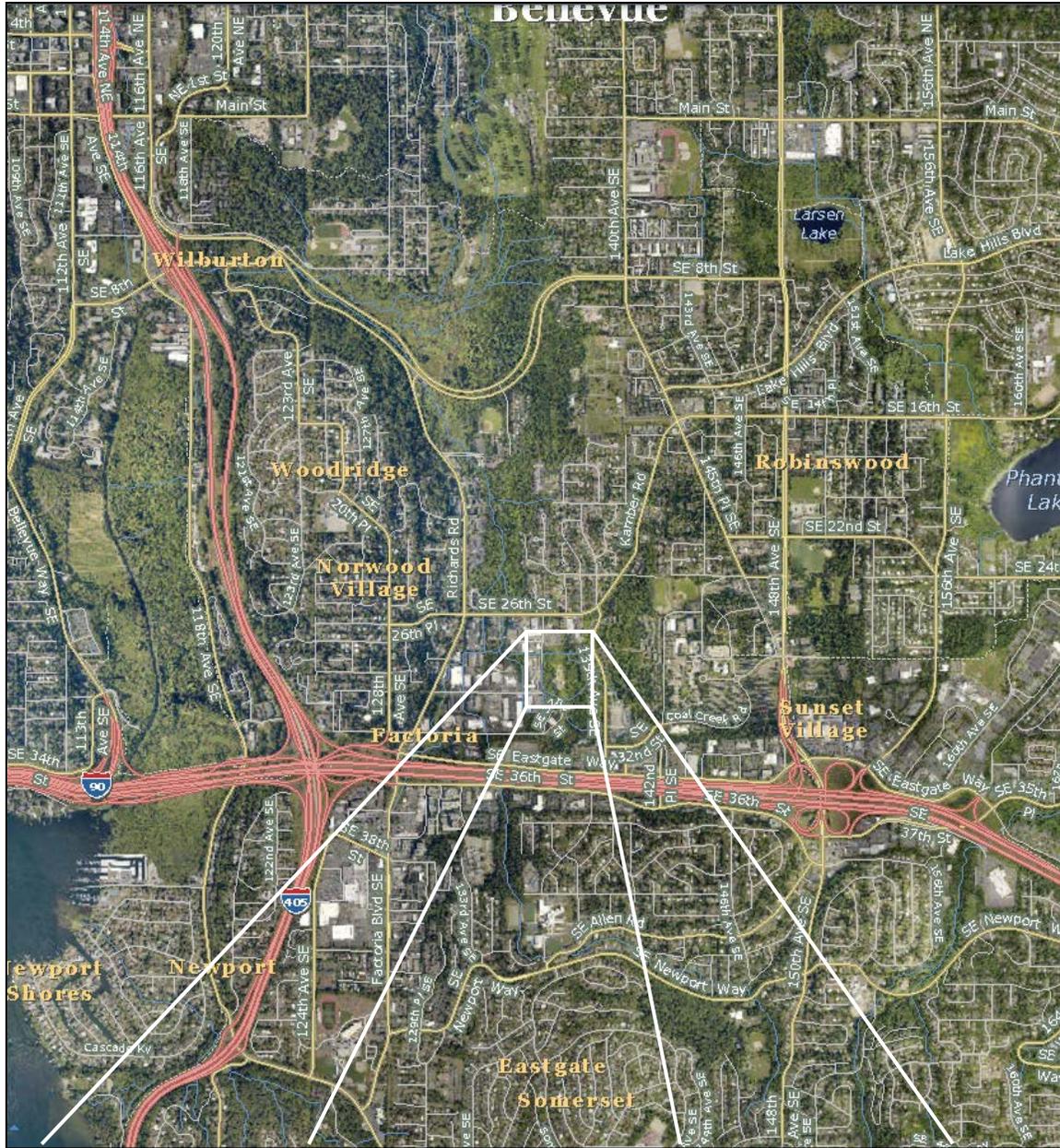


Figure 2 - Overview of the Richards Creek Parcel vicinity.



Figure 3 - Richards Creek Parcel study area.

4 PHOTOS



Figure 4 - Two subject red alder trees in the west half of the Richards Creek Parcel. (Photo taken on July 31, 2015)



Figure 5 - Forest of bigleaf maple, red alder and vine maple with an understory of Himalayan blackberry. (Photo taken on August 12, 2015)



Figure 6 - Looking north at the gravel lot and existing 115kV lines in the Richards Creek Parcel. (Photo taken on August 1, 2015)

5 METHODS

Watershed Company certified arborists conducted a field-based inventory at the Richards Creek Parcel in July and August of 2015 and June of 2016 using the methods detailed below. Proposed methodology for the Energize Eastside project as a whole was developed, written and submitted to PSE in a Technical Memorandum dated March 13, 2015 for review and approved prior to field work. The methodology was developed to comprehensively identify, describe (by collecting attribute data), and mark (i.e., flagging to assist survey in locating subject trees), all vegetation greater than 15 feet tall, or that had the potential to reach a mature height of 15 feet or taller. The following methodology is based on the Energize Eastside methodology, but was adapted, in consultation with PSE, for the specific site conditions at the Richards Creek Parcel.

Most trees with a diameter of six inches or greater had been survey-located and marked with purple paint at the Richards Creek Parcel prior to the tree inventory field work. Surveyed trees had not, however, been physically tagged with a numbered marker by the surveyors. Thus TWC field crews affixed a numbered tag on the trunk of subject trees per Section 5.1.

5.1 Significant Trees

According to LUC 20.50.046, the City of Bellevue defines a significant tree as a healthy evergreen or deciduous tree, eight inches in diameter or greater, measured four feet above existing grade. The Director of the Development Services Department may authorize the exclusion of any tree which for reasons of health, age or site development is not desirable to retain.

For the purposes of the field work, any tree with a diameter of six inches at four feet above the surface of the ground (DBH) was tagged and included in this study. A round one-and-one-quarter-inch-wide, numbered aluminum tag was affixed to the trunk of significant trees using a two-and-one-quarter-inch long aluminum nail. Trees that had been located, numbered and marked by the surveyors were given a unique numbered tag by TWC. Both the surveyor number and TWC number are included in the data table provided with this report.

Aluminum tags are intended to remain on the tree in perpetuity; however, they will eventually be consumed by the expanding radius of the tree trunk.

5.2 Non-Significant Trees and Shrubs

Trees and shrubs smaller than six inches in diameter were not included in the inventory.

5.3 Authority

Online resources were referenced to determine the maximum height of the various species of tree and shrub encountered in the subject area. For landscape trees and shrubs (plants not native to Washington State), the Oregon State University Department of Horticulture online landscape plant database (Oregon State University, 2016) was referenced. Native trees and shrub maximum heights were verified using the University of Washington WTU herbarium website (University of Washington, 2016) and the USDA plant database (United States Department of Agriculture, 2016). These resources were used for verifying both the scientific and common names for the spreadsheet reporting.

5.4 Vegetation Mapping

As stated above, a majority of the trees in the project area had been survey-located and mapped prior to the tree inventory work. However, Watershed Company found and assessed a total of 57 trees larger than six-inches that were not shown on the survey information. TWC field crews hand-sketched the location of the non-surveyed trees and digitized their locations in AutoCAD. The AutoCAD file with the 57 sketched trees will be submitted with this report for use by PSE.

5.5 Attribute data collection

All survey-located trees were given a number by the surveyors and also by The Watershed Company – both are listed in the master tree data table. The Watershed Company number corresponds to the number on the metal tag in the field. The “APS number” listed in the table corresponds to the number associated with the survey data.

The attributes collected during the field survey are described in Table 1, below. The Microsoft Excel spreadsheet data table contains the data collected for each tree and polygon inventoried. General attributes documented for all inventoried vegetation include the date of assessment, unique identification number of tree or polygon, location (parcel number), and name of plant species. Physical attributes include number of stems, stem diameter (DBH), height, canopy radius, condition, and notes. For polygons, approximate number of individual trees or large shrubs within a polygon was recorded instead of stem number, and other physical attributes for vegetation within polygons were recorded as averages.

Diameter of all subject trees was measured at four-and-a-half feet above the surface of the ground at the trunk (DBH) where possible; however, some stems were measured differently due to size or branching structure. Very small trees without a defined stem at four-and-a-half feet above the ground were measured using the caliper-method, where the stem is measured at six inches above the ground. For trees with major branching at or below four-and-a-half feet, the smallest portion of the trunk below major branching was measured.

Table 1 - Attributes recorded for all inventoried vegetation and that are presented in the spreadsheet database.

ATTRIBUTE	DESCRIPTION OF ATTRIBUTE
DATE OF ASSESSMENT	Date that the Watershed Company field crew tagged and assessed the tree or shrub.
ID NUMBER	Unique number assigned to an assessed tree or polygon. This number corresponds to the tag number in the field or the polygon number on the maps.
PARCEL NUMBER	Parcel number(s) in which the subject tree or polygon is located. In some cases, the parcel number corresponds to the closest parcel if the tree is in a City right-of-way.
SCIENTIFIC NAME	Formal scientific name conforming to the International Code of Nomenclature.
COMMON NAME	Name that is based on normal or common language of the Pacific Northwest.
DECIDUOUS/EVERGREEN	Notes whether a tree is considered deciduous or evergreen.
STEMS	Number of trunks or shoots that contribute significantly to the canopy.
DBH	Diameter at Breast Height; or 4.5 feet from the ground surface. See Section 5.5 for variations.
DBH2	DBH of secondary and other minor stems.
HEIGHT	Approximate distance from the ground surface at the trunk to the highest point of the subject tree as visually estimated. Average height for polygons.
CANOPY RADIUS	Measurement from the stem to the average drip line, or end of branches.
CONDITION	Health rating of an assessed tree using a 5-tier system as follows: 1 – Excellent: No apparent problems with the tree. Form is exemplary for the species. 2 – Good: Few minor defects such as crossed branches, minor foliage die-back, and minor trunk damage, or unbalance canopy. 3 – Fair: Several minor problems exist. 4 – Poor: Major defects visible such as significant trunk decay, codominant leaders with included bark, significant canopy die-back, major cracks in a stem or major limbs, and/or other structural problems. Topped trees are generally considered poor. 5 – Dead or dying: Tree is dead or is in a state of significant decline.
NOTES	Additional comments relating to assessment of the tree or polygon unit.
APS NUMBER	The number corresponding to the survey tree point.

Methodology for measuring diameter of trees with major leans, on steep slopes, and with multiple trunks or stems generally followed those outlined in the *Guide for Plant Appraisal* (Gooding, et al., 2000).

5.6 Data Management

Data were recorded in the field using paper field data sheets. Data were entered into a Microsoft Excel spreadsheet in the office and subsequently reviewed, corrected, and organized into a searchable database.

Summary data reported in the *Tree Inventory Results* section below was derived from querying the tree spreadsheet using Excel formulas. The City of Bellevue definition of a significant tree was used to tally data from the inventory. Any tree with a stem diameter of eight inches or greater was considered; however, only trees with a condition of *excellent*, *good*, *fair* and *poor* were tallied as significant in the results below.

6 LIMITATIONS OF STUDY

Some reported parcel numbers in the spreadsheet may not be correct; the survey should be used as the authority. Trees located on the edge of parcel boundaries were assigned a parcel number based on field observations. However, fence lines sometimes do not exactly match parcel lines and the parcel boundary overlay on aerial imagery used in the field was sometimes inaccurate. Determining exact parcel boundary locations in the field was not always possible. The survey should be referenced to determine the exact ownership and location of any particular tree.

Tree size and condition vary with time. The attributes reported here in this report represent a snapshot at the time of the field work and may not necessarily be accurate in the future.

7 TREE INVENTORY RESULTS

A total of 522 trees were tagged and assessed by the Watershed Company in the Richards Creek Parcel study area. Of those, 468 are larger than eight inches in diameter and healthy enough to meet the City of Bellevue's significant tree definition. Twelve big leaf maples, five black cottonwood, two western red cedars, two Douglas-firs and one red alder exhibit a trunk diameter of 30 inches or larger. An additional 30-inch red alder is also located in the study area, but was not considered significant due to its poor health. A 53-inch diameter western red cedar with a dead top is the largest-diameter tree on-site. The canopy is primarily made up of big leaf maple, black cottonwood, red alder, with some western red cedar also present. Pacific willow, English holly, Pacific madrone, apple, bitter cherry, cascara and common hawthorn are also present on-site.

Wetlands and Streams are mapped in the project area and were assessed by TWC in 2015, summarized in the *City of Bellevue Critical Areas Delineation Report: Puget Sound Energy – Energize Eastside Project* (The Watershed Company, 2016). Several of the 522 trees assessed under this inventory are located in wetlands and wetland and stream buffers. Please see the TWC study for more information regarding critical areas.

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