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# North Transmission Line Intertie, Segment 1
# Beaverton Creek Crossing – Beaverton, Oregon
# Arborist Report and Tree Plan Two
# March 15, 2024

MHA22045

## Purpose

This Arborist Report describes the tree plan for Segment 1 of the North Transmission Line Intertie project at the Beaverton Creek Crossing site in Beaverton, Oregon, and is provided pursuant to the City of Beaverton Development Code (BDC), Chapters 40.90 and 60.60. This report describes the existing trees located on and adjacent to the project site, as well as the proposed tree removal, preservation, protection and mitigation. This report is based on observations made by International Society of Arboriculture (ISA) Board Certified Master Arborist (PN-6145B) and Qualified Tree Risk Assessor Morgan Holen during site visits conducted on August 2, 2023 and March 7, 2024, and subsequent coordination with the design team.

## Scope of Work and Limitations

Morgan Holen & Associates, LLC was contracted by RH2 Engineering, Inc. on behalf of the City of Beaverton to collect tree inventory data and prepare an arborist report for the project.

An existing conditions plan illustrating the location of existing trees by survey point number was provided to us prior to conducting the fieldwork. Visual Tree Assessment (VTA) was performed on individual trees located on and directly adjacent to the project site as identified by RH2 Engineering. VTA is the standard process whereby the inspector visually assesses the tree from a distance and up close looking for defect symptoms and evaluating overall condition and vitality of individual trees. Trees were evaluated in terms of general condition and suitability for preservation with the proposed construction. This tree inventory does not constitute a Tree Risk Assessment.

Following our fieldwork, I discussed recommendations for tree removal and protection with the design team and coordinated with RH2 Engineering to develop the tree plan drawing included in the applicant's submittal package.

The client may choose to accept or disregard the recommendations contained herein or seek additional advice. Neither this author nor Morgan Holen & Associates, LLC, have assumed any responsibility for liability associated with the trees on or adjacent to this site.

## General Site Description

The project proposes to construct Segment 1 of a 6.4-mile-long water transmission pipeline. RH2 Engineering identified the need for a Tree Plan Two application for a portion of the proposed pipeline, where construction crosses Beaverton Creek. Existing trees are located on the west boundary of Tualatin Hills Nature Park, east of SW 170$^{th}$ Avenue, north and south of the Beaverton Creek crossing (Tax Lot 1S1080000504). Trees located within the SW 170$^{th}$ Avenue right-of-way are within Washington County jurisdiction (not regulated by the City of Beaverton), but trees located on the park property are within City of Beaverton jurisdiction and regulated by BCD Chapters 40.90 and 60.60. The privately-owned park property is mapped as Significant Grove G38 and also includes Significant Natural Resource Areas (SNRA).

The removal of one or more non-exempt surveyed trees within the Significant Grove or SNRA requires Tree Plan Two approval for up to and including 75% of the total diameter of non-exempt surveyed trees on the private property, not including trees in the adjacent county right-of-way (BDC 40.90.15.2(a)(3)). Mitigation for tree removal is only required if greater than 50% of the total diameter of non-exempt surveyed trees is proposed for removal (BDC 60.60.25).

In all, 45 individual trees were assessed including 11 trees in Washington County right-of-way and 34 trees located within the mapped Significant Grove/SNRA on the park property. Of the 34 Significant Grove/SNRA trees, four are exempt from Tree Plan Two requirements including two dead trees (#4289 and #4291) and two nuisance species tree (#4278 and #4292). The other 30 Significant Grove/SNRA trees are non-exempt surveyed trees totaling 496.4 diameter inches.

All 11 street trees and 13 Significant Grove/SNRA trees are proposed for removal for site access and construction. The 13 Significant Grove/SNRA trees proposed for removal, include three of the four exempt trees (#4289, #4291 and #4292). The City may require that large woody debris from removal of the two dead trees be left on-site; if so, it should be placed in direct contact with the forest floor to promote decay. The other 10 Significant Grove/SNRA trees proposed for removal are non-exempt surveyed trees totaling 127.4 diameter inches.

The total diameter of non-exempt surveyed trees proposed for removal within the Significant Grove/SNRA is 26% (127.4/496.4=.257), which is within the Tree Plan Two threshold and no mitigation for tree removal is required since less than 50% of the total diameter is proposed for removal. Table 1 provides a summary of the tree mitigation analysis showing the calculations required by BDC 60.60.25.

**Table 1. Beaverton Creek Crossing – Tree Mitigation Table**

| | |
|---|---|
| **DBH of Non-Exempt Surveyed Trees** | **496.4** |
| Deciduous | 306.8 |
| Coniferous | 189.6 |
| **DBH Proposed for Removal (MAXIMUM removal allowed is 75% Surveyed Tree DBH)** | **127.4** |
| Mitigation Threshold (50% Surveyed Tree DBH) | 248.2 |
| **DBH to be Mitigated (75% DBH Removal- 50% DBH Threshold = 25% Surveyed DBH)** | **0** |
| On Site Mitigation (50% of the DBH to be mitigated) | N/A |
| Off Site OR Partial Off Site Mitigation (100% of the DBH to be mitigated) | N/A |

The other 21 Significant Grove/SNRA trees are proposed to be retained and are unaffected by exposure from the planned removal of adjacent trees. Tree protection measures are required in accordance with BDC 60.60.20. We coordinated with RH2 to develop the proposed tree protection plan which provides tree protection fencing at the City's standard root protection zone, 5-feet beyond the dripline of retained trees, where feasible. Minor encroachments within the City's standard root protection zone are proposed for the following trees:

- Protection fencing is proposed at the dripline of trees #3637 and #4464, at a minimum, due to limited and confined space for site access, staging, and construction within the easement; no encroachment beneath the driplines is proposed.
- At trees #4315 and #4316, tree protection fencing will be installed along the edge of an existing gravel road used for maintenance access, which requires some encroachment beneath the driplines to the south, but no new construction is proposed in this area.

- At tree #4326, a reduction is needed to maintain access to an existing USGS water quality monitoring station and to allow site access and construction of a receiving pit for horizontal directional drilling to install the pipe beneath Beaverton Creek. Tree #4326 has an asymmetrical crown that is very one-sided to the north, opposite the work zone towards the creek. Protection fencing is proposed a minimum of 12-feet to the south (~14-feet adjacent to the work zone and ~12-feet adjacent to the water quality monitoring station), which is an encroachment of up to 6-feet beneath the dripline (based on the crown radius measured to the north) that is limited to one quadrant of the total critical root zone of tree #4326.
- Adjacent to tree #4456, and other Oregon ashes (*Fraxinus latifolia*) in this dense cluster, the protection fencing is reduced in the south quadrant for a proposed construction entrance and material storage and staging area. Protection fencing is proposed no closer than 10-feet to tree #4456 and closer to the driplines of other trees in this group. Existing soils will be protected by placing permeable geotextile fabric on the ground surface and topping the fabric with a minimum of 12-inches of rock. Access, storage and staging will be limited to the rocked area. Following construction, the rock and fabric will be removed to restore native grade.

**Tree Protection Standards**

Trees planned for retention will need special consideration to assure their protection during construction. The following tree protection notes should be included on Construction Documents:

1. **Tree Root Protection Zone.** The Root Protection Zone (RPZ) is defined as 5-feet beyond the dripline of protected trees regardless of the location of tree protection fencing. Protected tree driplines and 5-foot offsets are shown to scale on tree plan drawings.

2. **Temporary Tree Protection Fencing.** Trees to be retained shall be protected by installation of tree protection fencing at the RPZ, or as otherwise depicted on approved site plan drawings. Fencing shall be installed prior to construction activity, including tree removal and demolition of existing infrastructure. The fence shall be a four foot (4') tall orange plastic or snow fence, secured to six foot (6') tall metal posts, driven two feet (2') into the ground. Heavy 12-gauge wire shall be strung between each post and attached to the top and midpoint of each post. Colored tree flagging indicating that this area is a tree protection zone is to be placed every five (5) linear feet on the fence to alert construction crews of the sensitive nature of the area. Fencing shall be maintained and remain in place until physical development is complete. Fencing shall not be opened, adjusted or removed without prior coordination with the Project Arborist.

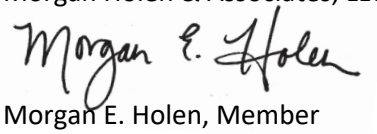
3. **Prohibited Activities.** Without authorization from the Project Arborist, none of the following shall occur beneath the dripline of any protected tree unless otherwise shown on the approved tree plan:
    a. Grade change or cut and fill;
    b. New impervious surfaces;
    c. Utility or drainage field placement;
    d. Placing solvents or irrigated landscaping;
    e. Staging or storage of materials and equipment; or
    f. Vehicle maneuvering.

    The Contractor shall be responsible for contacting the Project Arborist in a timely manner prior to working beneath protected tree driplines. Root protection zones may be entered for tasks like surveying, measuring, and sampling. Fences must be closed upon completion of these tasks.

4. **Erosion Control.** Silt fencing required to be installed within the RPZ shall not be trenched in per manufacturer specifications to avoid root damage. Instead, roll the base of the silt fence around a straw wattle and stake the wattle securely into the ground, or use compost socks or other similar materials that do not require trenching.
5. **Tree Removal.** Trees to be removed shall be clearly identified with tree-marking paint or other methods approved in advanced by the Project Arborist. Tree removal shall be performed by a Qualified Tree Service. Directionally fell trees or surgically remove trees where needed to avoid damage to protected trees. Where trees are approved for removal within a tree protection zone, protection fencing may be temporarily opened for trees to be felled. No heavy machinery is allowed inside of tree protection zones, but a machine may operate outside of the protection zone to reach in and drag felled trees away. Close the protection fencing once tree removal is complete.
6. **Stump Removal.** Stumps of trees planned for removal that are located within the RPZ of retained trees should remain in the ground where feasible. Otherwise, stumps may be removed by stump grinding to just below the ground surface or extracted from the ground under the on-site supervision of the Project Arborist. Stumps of deciduous trees to remain in the ground may be treated with an herbicide to inhibit sprouting; follow manufacturer's specifications.
7. **Crown Pruning.** Pruning may be needed to provide overhead clearance to avoid crown damage during construction and to remove dead and defective branches for safety. Crown pruning shall be performed by a Qualified Tree Service using ISA Best Management Practices for Pruning and ANSI A300 Standards.
8. **Root Pruning.** If roots of protected trees are encountered where work is proposed outside of tree protection zones, the Contractor may prune roots smaller than 2-inches in diameter as digging progresses. Root pruning shall be performed with pruning shears or a sharp saw. Prune roots perpendicular to the natural growth direction with bark firmly attached. Roots measuring 2-inches and larger in diameter should be exposed for the Project Arborist to assess prior to root pruning. The arborist should direct and document pruning of roots 2-inches and larger.

Please contact us if you have questions or need any additional information. Thank you for choosing Morgan Holen & Associates, LLC, to provide consulting arborist services for the North Transmission Line Intertie project in Beaverton.

Thank you,
Morgan Holen & Associates, LLC



Morgan E. Holen, Member
ISA Board Certified Master Arborist, PN-6145B
ISA Tree Risk Assessment Qualified
Forest Biologist

Enclosures: MHA22045 NTLI Beaverton – Tree Data 08-02-2023 Rev. 03-07-2024

**SEGMENT 1 - PROPERTY 2 - BEAVERTON CREEK CROSSING**

| No. | Sheet | Location[1] | Type | Common Name | Species Name | DBH[2] | C-Rad[3] | Cond[4] | Class[5] | Comments | Exempt[6] | Reason[7] | Treatment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3623 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 22 | 18 | F | ROW | Column of advanced trunk decay | Yes | WA Co. | Remove |
| 3624 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 14 | 17 | F | ROW | | Yes | WA Co. | Remove |
| 3626 | Prop-2 | ROW | Dec | Scouler's willow | *Salix scouleriana* | 10 | 10 | F | ROW | Codominant stems 2x7, trunk decay | Yes | WA Co. | Remove |
| 3627 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 36 | 20 | F | ROW | Multiple stems, ivy, dead and broken branches | Yes | WA Co. | Remove |
| 3629 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 22 | 17 | F | 3,4 | Codominant stems, extensive ivy | - | - | Remove |
| 3630 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 14 | 15 | F | 3,4 | Extensive ivy | - | - | Remove |
| 3631 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 8 | 10 | F | 3,4 | Extensive ivy | - | - | Remove |
| 3632 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 10 | 12 | F | 3,4 | Extensive ivy | - | - | Remove |
| 3637 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 14 | 10 | P | 3,4 | Severe decline, mostly dead | - | - | Retain |
| 3640 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 10 | 11 | F | ROW | | Yes | WA Co. | Remove |
| 3642 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 14 | 15 | F | 3,4 | Codominant stems 8,12 | - | - | Remove |
| 3651 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 24 | 16 | F | ROW | Codominant stems 14,20; 20" stem is a decaying snag | Yes | WA Co. | Remove |
| 4268 | Prop-2 | ROW | Dec | red alder | *Alnus rubra* | 8 | 8 | F | ROW | | Yes | WA Co. | Remove |
| 4278 | Prop-2 | THPRD | Dec | sweet cherry | *Prunus avium* | 9 | 0 | D | 3,4 | Dead | Yes | Nuisance | Retain |
| 4281 | Prop-2 | THPRD | Con | Douglas-fir | *Pseudotsuga menziesii* | 34 | 27 | G | 3,4 | Dominant tree | - | - | Retain |
| 4282 | Prop-2 | THPRD | Con | western redcedar | *Thuja plicata* | 45 | 18 | F | 3,4 | Codominant stems 2x20,2x25 | - | - | Retain |
| 4284 | Prop-2 | THPRD | Con | ponderosa pine | *Pinus ponderosa* | 29 | 17 | G | 3,4 | Dominant tree | - | - | Retain |
| 4285 | Prop-2 | THPRD | Con | Douglas-fir | *Pseudotsuga menziesii* | 26 | 14 | G | 3,4 | Dominant tree | - | - | Retain |
| 4286 | Prop-2 | THPRD | Dec | cascara | *Rhamnus purshiana* | 9 | 10 | F | 3,4 | | - | - | Retain |
| 4288 | Prop-2 | THPRD | Dec | bigleaf maple | *Acer macrophyllum* | 8 | 10 | F | 3,4 | | - | - | Retain |
| 4289 | Prop-2 | THPRD | Dec | red alder | *Alnus rubra* | 13 | 0 | D | 3,4 | Dead | Yes | Dead | Remove |
| 4291 | Prop-2 | THPRD | Dec | bigleaf maple | *Acer macrophyllum* | 11 | 0 | D | 3,4 | Dead | Yes | Dead | Remove |
| 4292 | Prop-2 | THPRD | Dec | European white birch | *Betula pendula* | 18 | 25 | F | 3,4 | Invasive species | Yes | Nuisance | Remove |
| 4315 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 11 | 12 | G | 3,4 | Lower trunk damage | - | - | Retain |
| 4316 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 8 | 9 | F | 3,4 | Lower trunk decay | - | - | Retain |
| 4317 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 23 | 16 | P | 3,4 | Dieback, low vigor | - | - | Retain |
| 4320 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 32 | 23 | P | 3,4 | Codominant stems 20,25,dieback, history of large branch failure, crown decay | - | - | Retain |
| 4322 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 16 | 16 | G | 3,4 | | - | - | Remove |
| 4323 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 7 | 8 | F | 3,4 | | - | - | Remove |
| 4324 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 11 | 16 | G | 3,4 | | - | - | Remove |
| 4326 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 7 | 18 | F | 3,4 | One-sided with lean north, lower trunk damage | - | - | Retain |
| 4327 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 11 | 18 | F | 3,4 | Advanced decay in lower trunk | - | - | Remove |

| No. | Sheet | Location[1] | Type | Common Name | Species Name | DBH[2] | C-Rad[3] | Cond[4] | Class[5] | Comments | Exempt[6] | Reason[7] | Treatment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4451 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 20 | 22 | F | ROW | Column of trunk decay with hollow in plane of lean to street | Yes | WA Co. | Remove |
| 4453 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 11 | 19 | F | 3,4 | Codominant stems 5,10, one-sided to west | - | - | Retain |
| 4454 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 7 | 20 | F | 3,4 | One-sided to west | - | - | Retain |
| 4455 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 7 | 25 | P | 3,4 | One-sided with lean south, 13' to low-lying limbs | - | - | Retain |
| 4456 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 14 | 22 | G | 3,4 | Dominant tree in dense group | - | - | Retain |
| 4457 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 16 | 18 | G | 3,4 | Dominant tree in dense group, unusual rooting | - | - | Retain |
| 4460 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 15 | 20 | G | 3,4 | Codominant leaders, ivy | - | - | Retain |
| 4461 | Prop-2 | THPRD | Dec | Oregon ash | *Fraxinus latifolia* | 11 | 18 | F | 3,4 | Codominant stems 5,10 | - | - | Retain |
| 4464 | Prop-2 | THPRD | Con | western redcedar | *Thuja plicata* | 41 | 20 | F | 3,4 | Codominant stems 22, 35, lower trunk decay, very extensive ivy, multiple leaders, one with top dieback | - | - | Retain |
| 6010 | Prop-2 | THPRD | Con | Douglas-fir | *Pseudotsuga menziesii* | 14 | 10 | F | 3,4 | High live crown, trunk intertwined with birch | - | - | Remove |
| 6011 | Prop-2 | ROW | Dec | black hawthorn | *Crataegus douglasii* | 7 | 8 | F | ROW | Crown dieback | Yes | WA Co. | Remove |
| 6012 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 9 | 19 | F | ROW | | Yes | WA Co. | Remove |
| 6013 | Prop-2 | ROW | Dec | Oregon ash | *Fraxinus latifolia* | 7 | 12 | F | ROW | | Yes | WA Co. | Remove |

[1]**Location** identifies whether trees are located within Washington County Right-of-Way (ROW) or on Tualatin Hills Park & Recreation District Property (THPRD).

[2]**DBH** is tree diameter measured at breast height, 4.5-feet above the ground level (in inches); when one or more codominant stems are present, DBH of each stem is recorded in the 'Comments' column with individual stem diameters separated by a comma or described as quantity x size, and the square root of the sum of the squares is used to derive a statistically valid single diameter for the purposes of analyzing mitigation for Significant Grove/SNRA tree removal. Example: A tree with two 10" DBH stems equates to =sqrt((10x10)+(10x10))=14. Note that DBH was visually estimated and not physically measured for trees where assessment was limited by access constraints.

[3]**C-Rad** is the average crown radius measured (in feet) or estimated visually where access was limited.

[4]**Cond** is an arborist assigned rating to generally describe the condition of individual trees as follows- **D**ead; **P**oor; **F**air; or, **G**ood.

[5]**Class** identifies trees per Section 60.60.10, as either: **1**-Significant Individual Trees; **2**-Historic Tree; **3**-Trees within SNRA; **4**-Trees within Significant Groves; **5**-Landscape Trees; **6**-Community Trees; or **7**-Mitigation Trees. **ROW** identifies street trees regulated by the Beaverton Municipal Code and **N/A** identifies trees located on private property smaller than the 10-inch diameter threshold for Community Trees or outside City of Beaverton jurisdiction.

[6]**Exempt** identifies trees that are exempt from Tree Plan requirements per Chapter 90 and Section 40.90.10.

[7]**Reason** provides the reason trees are exempt, including: size (trees smaller than 10 inches DBH, except for western hemlock (*Tsuga heterophylla* ), mountain hemlock (*Tsuga mertensiana* ), Pacific madrone (*Arbutus menziesii* ), and bigleaf maple (*Acer macrophyllum* ) trees smaller than 6-inches DBH per Chapter 90 definition of 'Surveyed Trees'; hazardous, dead, or diseased condition identified as such by a certified arborist; nuisance for trees listed as nuisance species in BDC 40.90.10 or in the City of Portland's Nuisance Plant List or in Clean Water Services' Design and Construction Standards; Street for trees located in public rights-of-way; or, WA Co. for trees outside City of Beaverton jurisdiction.