

# ARBORIST REPORT

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## Phillips Residence

Prepared for:

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# ARBORIST REPORT

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## PHILLIPS RESIDENCE

### 1 INTRODUCTION

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This report has been prepared as part of a proposal to permit demolition of an existing single-family residence and construction of a new single-family residence for owner Nick Phillips at 2003 82<sup>nd</sup> Avenue SE in the City of Mercer Island (parcel # 5449300080). The approximately 5,553 square-foot proposed structure is to be sited in the southern portion of the parcel within the same general area as the existing residence. Proposed construction of the Phillips Residence will also include construction of an accessory structure approximately 400 square feet in size located in the north portion of the parcel, and an access driveway from 81<sup>st</sup> Avenue SE located partially within an easement off-parcel to the south (parcel # 5449300070 and 5449300075).

The purpose of this report is to provide an inventory summary of regulated trees located on or near the subject property as necessary to permit the construction of the proposed single-family residence, accessory structure, and associated driveway improvements. Elements of proposed improvements that may impact trees include clearing, grubbing, grading, trenching for utilities, and altered environmental factors on-site including wind direction, sun exposure, and altered infiltration of runoff due to changes in impervious surfaces.

This report is based on preliminary site plans provided by the project architect, Baylis Architects (dated February 28, 2019). This report summarizes local regulations related to tree removal, retention, and replacement requirements associated with development proposals. Per Mercer Island's tree code requirements, the proposed improvements result in a full application being required.

A tree inventory was conducted on the property to quantify and characterize all Large (regulated) trees as part of the site plan development. The study area for the tree inventory (Figures 1 and 2) includes the 1.07-acre subject parcel (parcel #5449300080), the driveway easement on portions of parcels # 5449300070 and 5449300075, and the 81<sup>st</sup> Avenue SE right-of-way adjacent to these parcels. Large trees not rooted on the subject parcel, but with driplines extending over the subject property line, were screened to evaluate impacts to their critical root zone on the subject parcel or easement.

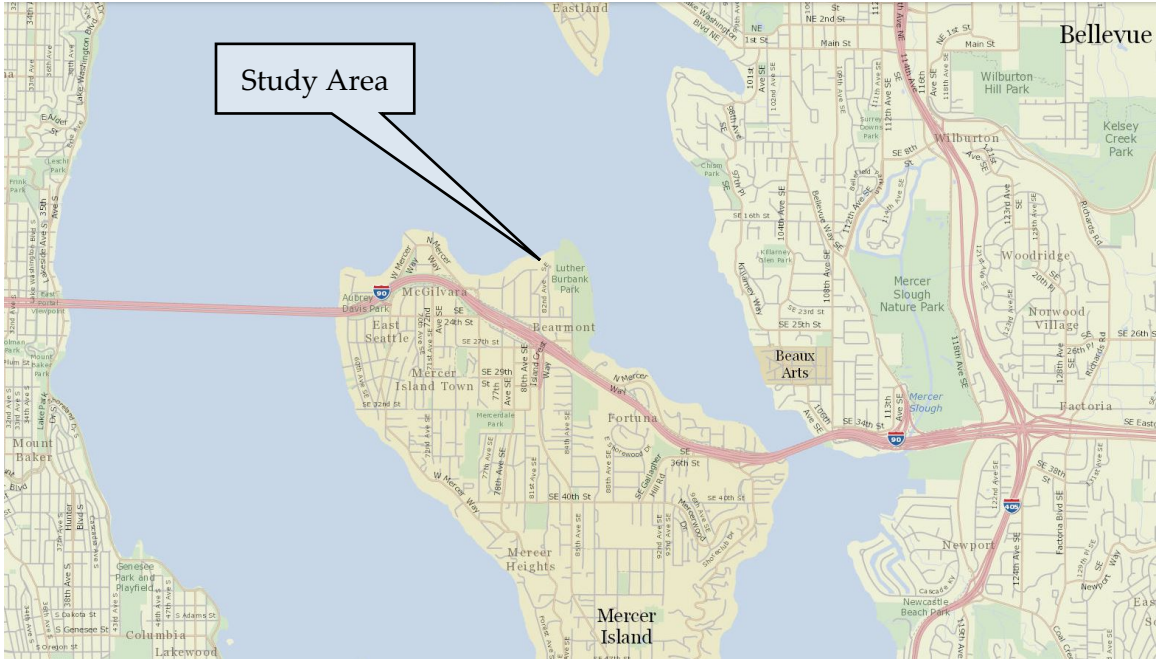


Figure 1. Vicinity map.



Figure 2. Approximate location of study area (yellow) and subject parcel boundary (red).

## 2 SITE DESCRIPTION

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The subject parcel is located on the northern tip of the City of Mercer Island, west of the intersection of 81<sup>st</sup> Avenue SE and 82<sup>nd</sup> Avenue SE, in Section 1 of Township 24N, Range 04E of the Public Land Survey System. The parcel is zoned Residential Single Family (R-12). It is 46,609 square feet in size, according to King County iMap, with approximately 40 feet of Lake Washington shoreline along the north parcel boundary.

The property is currently accessed from the east via 82<sup>nd</sup> Avenue SE. One single-family home and a small parking pad is located on the southeast portion of the parcel, at the top of a steeply sloped portion of the property. A secondary access point is located within the existing driveway easement south of the parcel. This gravel driveway continues north and terminates at the north end of the parcel near Lake Washington. A concrete bulkhead is located near the lake edge along the north parcel boundary. The subject parcel is otherwise unimproved.

The parcel contains a mixture of mature second-growth conifers and deciduous trees. Several large trees throughout the parcel have been previously topped or removed with tall stumps remaining. A significant portion of the vegetation in the southernmost portion of the parcel appears to have been previously cleared. These cleared areas have very few trees or shrubs; stumps of several large shrubs and trees (primarily western hazelnut and bigleaf maple) were present at the time of the site visit.

The parcel contains steep slope areas as documented in the City of Mercer Island GIS Portal maps. Additionally, these maps show erosion hazard and potential landslide hazard areas across the majority of the parcel. The site does not contain any wetlands or streams based on screening conducted by The Watershed Company on March 22, 2019.

The City of Mercer Island maps identify two eagle nests outside the study area, located approximately 140 feet east of the subject parcel (City of Mercer Island IGS). The 330-foot wide nest buffer encompasses the north portion of the parcel; the 660-foot nest buffer covers the entirety of the parcel. At the time of the site visit a mature bald eagle was identified flying over the northern portion of the subject parcel from the east, approximately where these nests are mapped (Figure 3).



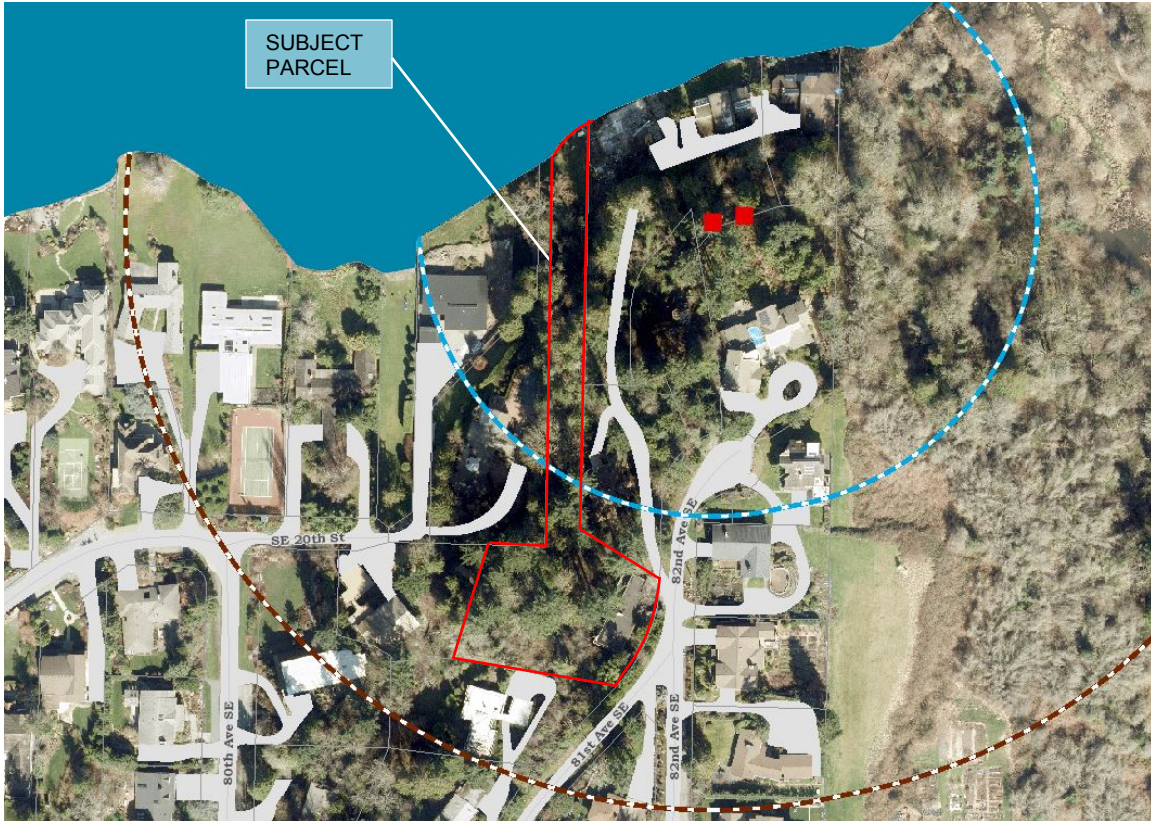


Figure 3. Eagle nest locations and buffers map (City of Mercer Island Information and Geographic Services) with subject parcel boundary outlined in red.

## 3 INVENTORY METHODOLOGY

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The Watershed Company (Watershed) arborist conducted a field-based tree inventory on March 22, 2019 using the methods detailed below. The methodology was developed to comprehensively identify, describe and map all regulated trees in the study area.

### 3.1 Trees Included in this Study – Regulated Trees

Subject trees within the study area were determined to be regulated using the definition in the Mercer Island City Code (MICC) Section 19.16. The City of Mercer Island defines a regulated tree as any large tree with a diameter of 10 inches or more, and any tree that meets the definition of an exceptional tree. See MICC 19.16 – Tree, Exceptional, for definition and table.

Trees meeting the definition of regulated tree were included in the tree inventory. A round one-and-one-quarter-inch-wide, four-digit numbered aluminum tag was affixed to the trunk of all regulated trees presumed to be located within the subject parcel.

### **3.1.1 Off-Site Trees located near the project area**

All visible regulated trees that have driplines extending over the subject property line or driveway easement line were included in this inventory, per MICC 19.10.090.C.1.b. Arborists inventoried these trees from the subject parcel or street right-of-way. The trees were not tagged but were given unique and sequential two-digit identification numbers (beginning with # 01 and ending at # 43).

## **3.2 Authority**

Online resources were referenced to verify both the scientific and common names of subject plants for reporting purposes. 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 2017) was referenced. Native trees and shrub names were verified using the University of Washington WTU herbarium website (University of Washington 2017) and the USDA plant database (United States Department of Agriculture 2017).

## **3.3 Mapping**

Cascade Land Surveying survey-located the subject trees and provided survey data to Watershed prior to the tree inventory. Survey data and proposed site plans including proposed house, driveway, and accessory structure locations were provided to Watershed in AutoCAD and PDF format.

## **3.4 Attribute Data Collection**

The attributes collected during the field survey are described in Table 1, below. The databases, included with this study (Appendix A, Appendix B and Appendix C), contains the data collected for each tree inventoried. General attributes documented for all inventoried trees include unique identification number of tree, name of plant species, and physical attributes include number of stems, diameter, height, canopy radius, and condition.

In general, tree diameter was measured at four feet above the ground surface (diameter at breast height, or “dbh”) using a graduated metal logger’s dbh tape. Trees with multiple trunks arising from the ground were measured using methodology from *The Guide for Plant Appraisal*, 9th Edition (Council of Tree & Landscape Appraisers, 2000). Briefly, the cross-sectional areas of stems contributing to the canopy were summed and used to generate a singular combined dbh for the tree. The singular dbh number allows for comparison to other single-stemmed trees and for more accurate permitting and tree retention calculations. When dbh resulted in a fraction, it was rounded to the nearest whole number.

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). Visual estimates of trunk diameter were used where direct access to the tree was not feasible.

### **3.5 Data Management**

Tree data and geospatial locations were collected in the field using an iPad with ArcGIS Collector application. Tree attribute information and related points were then provided to project applicant via PDF table and map. Attribute data collected in the field (as shown in Table 1) is summarized in Appendix A, Appendix B, and Appendix C.

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

Attribute	Description of Attribute
<b>ID NUMBER</b>	Unique number assigned to an assessed tree. This number corresponds to the tag number in the field. A 4-digit ID number indicates a tagged tree; a 2-digit number indicates an off-parcel tree that has not been tagged.
<b>SCIENTIFIC NAME</b>	Formal scientific name conforming to the International Code of Nomenclature.
<b>COMMON NAME</b>	Name that is based on normal or common language of the Pacific Northwest.
<b>DECIDUOUS/EVERGREEN</b>	Notes whether a tree is considered deciduous or evergreen.
<b>STEMS</b>	Number of trunks or shoots that contribute significantly to the canopy.
<b>DBH</b>	Diameter at Breast Height; or 4.5 feet from the ground surface. See Section 3.4 for variations.
<b>HEIGHT</b>	Approximate distance from the ground surface at the trunk to the highest point of the subject tree as visually estimated.
<b>CANOPY RADIUS</b>	Measurement from the stem to the average drip line, or end of branches. Otherwise referred to as the critical root zone.
<b>CONDITION</b>	<p>Health rating of an assessed tree using a 5-tier system as follows:</p> <ul style="list-style-type: none"> <li>1 – Excellent: No apparent problems with the tree. Form is exemplary for the species.</li> <li>2 – Good: Few minor defects such as crossed branches, minor foliage die-back, minor trunk damage, or unbalance canopy.</li> <li>3 – Fair: Several minor problems exist.</li> <li>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.</li> <li>5 – Dead or dying: Tree is dead or is in a state of significant decline.</li> </ul>
<b>EXEPTIONAL THRESHOLD (YES / NO)</b>	Per MICC 19.16 Definitions: Tree, Exceptional: A tree or group of trees that because of its unique historical, ecological, or aesthetic value constitute an important community resource. An exceptional tree is a tree that is rare or exceptional by virtue of its size, species, condition, cultural/historic importance, age, and/ or contribution as part of a tree grove. Trees with a diameter of more than 36 inches, or with a diameter that is equal to or greater than the diameter listed in the Exceptional Tree Table, are considered exceptional trees.

## 4 LIMITATIONS

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Trees presumed to be located outside of the subject parcel were not tagged and were assessed from various distances. For off-site trees, attribute data requiring direct contact (such as trunk diameter) is a visual estimate only and may vary slightly from the conditions at the time of the assessment. Trees were identified using the vegetative characteristics present at the time of the inventory. Tree size and condition vary with time. The attributes presented in this study represent a snapshot at the time of the field work and may not necessarily be accurate in the future.

The condition of any remaining tree following the proposed land use action will ultimately be affected by root disturbance, new wind exposure (windthrow), etc. The health condition ratings indicated in the supporting material attached to this report do not represent the condition of the tree following construction. Follow-up monitoring is recommended to ensure changing site conditions do not result in hazardous trees.

## 5 TREE INVENTORY RESULTS

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A total of 92 trees rooted within the subject parcel were determined to be regulated trees per MICC 19.16 (Appendix A). Evergreen trees comprise approximately 75 percent of the trees located within the subject parcel. The most common species is western red cedar, with 26 individuals. The subject parcel is also dominated by Austrian pine, Douglas-fir, and bigleaf maple. Seven additional tree species were identified within the parcel including red alder, black cottonwood, western hemlock, bitter cherry, ash, Pacific madrone, black locust, and strawberry tree. Bigleaf maple and western red cedar trees were, on average, rated in worse condition relative to other tree species included in the inventory.

The largest tree located within the subject parcel is a 49-inch-diameter Douglas-fir (#2868). As a species, Douglas-fir trees are the largest tree on the parcel, with an average dbh of 30.5-inches. Other dominant species including bigleaf maple, western red cedar, and Austrian pine have an average dbh of 18.5-inches, 16.2-inches, and 14.0-inches, respectively. A total of twenty trees (approximately 22 percent of the community) measure over 24-inches in diameter at 4.5 feet above the ground. Sixteen trees meet the definition of exceptional trees based on their size and species, including 7 Douglas-fir, 3 bigleaf maple, 5 Pacific madrone, and 1 black cottonwood.

An additional 40 regulated trees located off-parcel with driplines extending onto the subject property, or rooted within the driveway easement or right-of-way were also inventoried (Appendix B). Western red cedar and bigleaf maple are the most common off-parcel trees, each species with 15 individuals. The average dbh of off-parcel trees is 17.8-inches. Eight trees are estimated to be over 24-inches in diameter. Eight trees including Austrian pine, bigleaf maple, Pacific madrone, and western red cedar, are estimated to be exceptional based on size and species.

At the time that the tree inventory was conducted, an additional 11 trees were tagged, or virtually tagged if located off-parcel, and included in the original inventory database. Upon further analysis, it was determined that these trees do not meet the City of Mercer Island's definition of regulated trees (MICC 19.16). As such, these 11 trees have been excluded in the overall analysis of this tree inventory. For further details regarding these unregulated trees, see Appendix C.

## 6 LOCAL REGULATIONS

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Regulations regarding the removal, retention, replacement, and protection of trees within the project area are detailed under Chapter 19.10 (Trees) and Chapter 19.16 (Definitions) of the MICC.

### 6.1 Regulated Tree – MICC 19.16

According to MICC 19.16, large (regulated) trees are defined as any tree with a diameter of 10 inches or more, and any tree that meets the definition of an exceptional tree.

### 6.2 Exceptional Tree – MICC 19.16

According to MICC 19.16, a tree or group of trees that because of its unique historical, ecological, or aesthetic value constitutes an important community resource. An exceptional tree is a tree that is rare or exceptional by virtue of its size, species, condition, cultural / historical importance, age, and / or contribution as part of a tree grove. Trees with a diameter of more than 36 inches, or with a diameter that is equal to or greater than the diameter listed in the exceptional tree table are considered exceptional trees. See MICC 19.16 – Tree, Exceptional, for table.

### 6.3 Tree Code Overview – MICC 19.10.010

Per MICC 19.10.010.C, if a tree is being removed as part of a development then:

1. A full application is required. The application provides details on the trees on site, the removed trees, and the proposed protection measures for trees that will remain.
2. At a minimum, 30% of the trees will need to be retained. Trees that are exceptional, are large, and have a high likelihood for long term survival are prioritized for retention.
3. Replacement trees are required for the tree(s) removed; typically, between October 1 and April 1 following removal.

### 6.4 Tree Removal and Retention Associated with Single-Family Zoning Designation Development – MICC 19.10.060

Per MICC 19.10.060.A.1, for projects within a single-family zoning designation, a tree permit is required for the following development proposals:

1. An addition or remodel to an existing single-family dwelling that will result in the addition of more than 500 square feet of gross floor area on a lot with a net lot area of 6,000 square feet or more.
2. A new single-family dwelling on a lot with a net lot area of 6,000 square feet or more.
3. A subdivision or short subdivision.

Per MICC 19.10.060.A.2, for projects within a single-family zoning designation, trees shall be retained as follows:

1. A minimum of 30 percent of trees with a diameter of 10 inches or greater, or that otherwise meet the definition of large tree, shall be retained over a rolling five-year period.
2. The development proposal shall be designed to further minimize the removal of large trees and maximize on-site tree retention as follows;
  - a. Site improvements, including but not limited to new single-family homes, appurtenances, accessory structures, utilities, and driveways, shall be designed and located to minimize tree removal during and following construction.
  - b. The following trees shall be prioritized for retention:
    - i. Exceptional trees;
    - ii. Trees with a diameter of more than 24 inches;
    - iii. Trees that have a greater likelihood of longevity; and
    - iv. Trees that are part of a healthy grove.
  - c. Trees shall not be removed outside the area of land disturbance except where necessary to install site improvements (e.g., driveways, utilities, etc.).
  - d. Tree removal for the purposes of site landscaping should be limited to those trees that will pose a future safety hazard to existing or proposed site improvements.

Pursuant to MICC 19.10.060.A.3 through 5, tree retention shall comply with the following parameters:

3. Retention of Exceptional Trees. Development proposals specified under subsection (A)(1) of this section shall retain exceptional trees with a



diameter of 24 inches or more. Exceptional trees with a diameter of 24 inches or more that are retained shall be credited towards compliance with the retention requirements of subsection (A)(2) of this section. Removal of exceptional trees with a diameter of 24 inches or more, shall be limited to the following circumstances:

- a. Retention of an exceptional tree(s) with a diameter of 24 inches or more will result in an unavoidable hazardous situation; or
  - b. Retention of an exceptional tree(s) with a diameter of 24 inches or more will limit the constructible gross floor area to less than 85 percent of the maximum gross floor area allowed under Chapter 19.02 MICC; or,
  - c. Retention of an exceptional tree(s) with a diameter of 24 inches or more will prevent creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title.
4. Calculation of Rolling Five-Year Period. For the purposes of this section, the rolling five-year period begins five years prior to the date of application for a development approval that is subject to tree retention.
  5. Compliance Required. Development proposals on lots that have removed more than 70 percent of large trees within the rolling five-year period, such that the 30 percent tree retention requirement under subsection (A)(2) of this section cannot be met, shall not receive approval unless and until compliance has been achieved. For example, a lot that has removed all of the trees in year "one" may not receive a preliminary subdivision approval in year "four." However, the preliminary subdivision approval may be granted in year "six," such that the rolling five-year period does not include the tree removal in year "one."

Pursuant to MICC 19.10.110: Seasonal development limitations, No cutting of trees located in geologic hazard areas or protected slope areas is allowed between October 1 and April 1 unless: (A) a tree permit with explicit authorization for removal between October 1 and April 1 has been granted; or (B) removal is required due to an emergency situation involving immediate danger to life or property. The city arborist may authorize tree removal between October 1 and April 1 if the city arborist determines that such environmentally critical areas will not be adversely impacted by the proposed cutting and the applicant demonstrates compelling justification based on a geotechnical evaluation of the site. The city arborist may require hydrology, soils and storm water studies, erosion control measures, restoration plans, and/or an indemnification/release agreement. (Ord. 17C-15 § 1 (Att. A)).

**Plan Compliance.** Due to the proposed single-family dwelling being on a lot larger than 6,000 SF, tree retention is required. Both the proposed driveway and proposed single-family home have been designed and sited to minimize impacts to trees and critical areas, and will retain significantly more than 30 percent of the trees on-site. For further details see Section 8 (Tree Retention Plan), below. There is evidence of some site clearing in the southern portion of the property, though based on the number of stumps present, this did not exceed 70 percent of the trees on-site.

## 6.5 Tree Protection – MICC 19.10.080

Per MICC 19.10.080.A, to ensure long-term viability of trees identified for protection, permit plans and construction activity shall comply with the then-existing Best Management Practices (BMP) – *Managing Trees during Construction*, published by the International Society of Arboriculture, adopted by reference. The tree protection plan shall be prepared by a qualified arborist and the plan shall be reviewed for adequacy of the City arborist. All minimum required tree protection measures shall be shown on the development plan set and tree re-planting / restoration / protection plan.

Per MICC 19.10.080.B, the City arborist may approve construction related activity or work within the tree protection barriers if the City arborist concludes:

1. That such activity or work will not threaten the long-term health of the retained tree(s); and
2. That such activity or work complies with the protective methods and best building practices established by the International Society of Arboriculture.

Per MICC 19.10.090.C, to show that retained trees will be protected during construction activity, the development plan set must contain a Detailed Site Plan, Tree Retention Plan, and Arborist Report.

1. Detailed Site Plan:
  - a. Location of all proposed improvements
  - b. Accurate location of regulated trees on subject parcel and trunk location and critical root zone of large trees on adjacent property with driplines extending over the subject property;
  - c. Trees labeled corresponding to the tree inventory numbering system;
  - d. Location of tree protection measures;

- e. Limits of disturbance (LOD);
- f. Proposed tree status (remove or retained);
- g. Proposed location of any required replacement tree.

2. Tree Retention Plan and Arborist Report

- a. Tree inventory containing the following:
  - i. Numbered system for all existing large trees with corresponding tags on trees; inventory shall also include large trees on adjacent property with driplines or critical root zones extending into the development proposal site;
  - ii. Size (diameter);
  - iii. Proposed tree status (retained or removed);
  - iv. Tree type or species;
  - v. Brief general health or condition rating;
- b. An arborist report, prepared by a qualified arborist containing the following:
  - i. A complete description of each tree's diameter, species, critical root zone, limits of allowable disturbance, health, condition, and viability;
  - ii. A description of the method(s) used to determine the limits of allowable disturbance (i.e., critical root zone, root plate diameter, or a case-by-case basis description for individual trees);
  - iii. Any special instructions specifically outlining any work proposed within the limits of the disturbance protection area (i.e., hand-digging, air spade, tunneling, root pruning, any grade changes, clearing, monitoring, and aftercare);
  - iv. For trees not viable for retention, a description of the reason(s) for removal based on poor health, high risk of failure due to structure, defects, unavoidable isolation (windfirmness), or unsuitability of species, etc., and for which no reasonable alternative action is possible must be given (pruning, cabling, etc.);

- v. Describe the impact of necessary tree removal to the remaining trees, including those in a grove or on adjacent properties;
- vi. For development applications, a discussion of timing and installation of tree protection measures. Such measures must include fencing and be in accordance with the tree protection standards as outlined in this chapter;
- vii. The suggested location and species of supplemental trees to be used when required. The report shall include planting and maintenance specifications to ensure long-term survival.

**Plan Compliance.** Recommended mitigation measures are described in Section 8 (Tree Retention Plan), below.

## 6.6 Tree Replacement – MICC 19.10.070

Trees that are cut pursuant to a tree permit shall be replaced according to subsection “A” and “B” of 19.10.070, or a fee in lieu shall be paid as specified in subsection “C”.

Removed trees shall be replaced at the ratio provided in Table 2.

Table 2. Replacement ratios for tree removed per MICC 19.10.070(A.)

Trunk size (DBH) of healthy* tree to be removed (inches)	Number of required replacement trees
Less than 10 inches	1
10 inches up to 24 inches	2
24 inches up to 36 inches	3
More than 36 inches and any exceptional tree(s)	6

Replacement trees must meet the criteria outlined in MICC 19.10.070.B.3 and are required to be maintained in a healthy condition for a period of five years after planting per MICC 19.10.070.D.

The City arborist may reduce the number of replacement trees where other measures designed to mitigate the tree loss are considered to be effective and consistent with the purposes of this chapter. The City arborist may consider, but is not limited to, the following measures:

1. Replacement of hazardous, undesired, or short-lived trees with healthy new trees that have a greater chance of long-term survival;
2. Restoration of critical tree areas with native vegetation; and

3. Protection of small trees to provide for successional stages of tree canopy.

Additionally, the City arborist may authorize payment of a fee-in-lieu provided:

1. There is insufficient area on the lot or adjacent right-of-way for proposed on-site tree replacement to meet the tree replacement requirements of this chapter; or
2. Tree replacement or management provided within public right-of-way or a city park in the vicinity will be of greater benefit to the community.
3. Fees provided in lieu of on-site tree replacement shall be determined based upon:
  - a. The expected tree replacement cost including labor, materials, and maintenance for each replacement tree; and
  - b. The most current Council of Tree and Landscaper Appraisers Guide for Plant Appraisal.
4. Any fee-in-lieu is also optional for the applicant and requires an explicit written agreement.

**Plan Compliance.** Trees proposed for removal will be replaced as described in Section 8 (Tree Retention Plan), below.

# 7 PHOTOS

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Figure 4. View of gravel driveway looking north (Photo taken March 22, 2019).



Figure 5. View of gravel driveway looking south (Photo taken March 22, 2019).



Figure 6. Common root plate condition of trees along gravel drive (Photo taken March 22, 2019).



Figure 7. Typical canopy cover along gravel driveway (Photo taken March 22, 2019).



Figure 8. Proposed location of accessory structure in existing driveway with five trees (#2803, #2804, #2805, #2807, and #2808) proposed for removal. Rightmost tree in photo is off-parcel and to be retained (Photo taken March 22, 2019).





Figure 9. Tree # 2896, an Austrian pine with a dbh of 16.5-inches proposed for removal to accommodate proposed driveway and residence (Photo taken March 22, 2019).



Figure 10. Tree # 2890, an exceptional Douglas-fir (dbh 43-inches) rooted in close proximity to proposed residence deck structure (Photo taken March 22, 2019).



Figure 11. Tree # 2891, a Douglas-fir with a dbh of 26-inches, proposed for removal to accommodate construction of proposed residence (Photo taken March 22, 2019).



Figure 12. Proposed location of driveway access in existing easement with five bigleaf maples proposed for removal (Photo taken March 22, 2019).



Figure 13. Approximate location of driveway access facing south (Photo taken March 22, 2019).



Figure 14. Common condition of topped trees throughout subject parcel (Photo taken March 22, 2019).

## 8 TREE RETENTION PLAN

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Due to the proposed single-family dwelling being on a lot larger than 6,000 SF, tree retention is required. Both the proposed driveway and proposed single-family home have been designed and sited to minimize impacts to trees and critical areas.

### 8.1 Tree Retention

Based on the proposed site plan, this project will require the removal of 7 regulated trees rooted within the parcel. This proposed removal would result in retaining approximately 92 percent of trees of 10 inches or greater, or that otherwise meet the definition of a large tree on the subject parcel. A total of 86

trees will be retained, including all exceptional trees. The 30 percent tree retention requirement is well exceeded with the proposed site plan.

Six of the trees proposed to be removed on the parcel are less than 24-inches in dbh and are otherwise not regulated as exceptional trees. Tree #2803, #2804, #2805, and #2896 are Austrian pines in fair (3) condition with dbh measurements ranging from 10.3 to 16.5-inches. Tree #2807 is a 12.7-inch bigleaf maple, and #2808 is a 13.3-inch black locust, both in poor (4) condition. Removal of these six trees is necessary to accommodate the proposed residence and accessory structure.

The subject parcel contains sixteen trees which have a diameter of 24 inches or more, one of which (#2891) is proposed for removal to accommodate construction of the proposed residence. Tree #2891 is a 26-inch dbh Douglas-fir in fair (3) condition which is currently located immediately adjacent to the existing house. The proposed location of the single-family residence is sited in the approximate footprint of the existing building to minimize impacts to trees and critical areas. However, demolition of existing structures, and construction of the proposed residence is likely to significantly impact Tree #2891 due to the close proximity. This tree is therefore proposed for removal.

An additional five regulated trees (#28, #29, #30, #31, and #32) will be removed within the existing driveway easement on the east portion of parcels #5449300070 and #5449300075, to accommodate the construction of the proposed driveway access. None of these trees are over 24-inches in diameter or are exceptional per the MICC. These trees are all bigleaf maple species each with approximately 10 stems contributing to a dbh of 13-inches. Each tree has a condition rating of 5 (dead to dying) due to extensive topping. These trees are proposed for removal in order to construct the proposed driveway access.

Construction of the proposed residence and driveway will also require the removal of several non-regulated trees and shrubs. Two multi-stemmed trees, Tree #23 and #2904) were identified in the field inventory (Appendix C), however were determined to be unregulated trees per MICC 19.16 based upon their calculated combined dbh. Tree #23 is an apple with a dbh of 8-inches located within the right-of-way northwest of 81<sup>st</sup> Avenue SE. This unregulated tree will require removal to accommodate construction of the proposed driveway access. Tree #2904 is a 9-inch Japanese maple located adjacent to the foundation of the existing residence. This unregulated tree will be impacted with demolition of the existing residence and construction of the proposed residence and will also require removal.

Tree #2890 is a 43-inch dbh Douglas-fir tree with exceptional tree designation in fair (3) condition that will be retained. This tree is rooted adjacent to a proposed second story deck structure which is attached to the northwest side of the

proposed residence. Working with on-site constraints including steep topography, this development plan has sited the residence and deck to minimize impacts to exceptional trees.

The concrete foundation for the proposed residence will be located approximately 14 feet from the base of Tree #2890's trunk. The deck structure will encroach further within the critical root zone of this tree, however construction methods to reduce impacts to this tree have been incorporated into the design. The deck will be cantilevered from the residence structure, with a single support post proposed to be installed approximately 6 feet from base of the trunk of Tree #2890. No further impacts are expected within the critical root zone of this tree.

The proposed impacts to Tree #2890 are minimal enough for the tree to have a strong likelihood of survival following the proposed construction activities. This exceptional tree should therefore be retained. Douglas-fir trees as a species are prone to scaffold branch drop. Due to the close proximity of the residence and deck structure, it is recommended that roof construction methods consider the potential impact these limbs may have if they were to land on these structures.

Exploratory excavation using a pneumatic air-excavation tool may be recommended by the city arborist within the dripline of this tree, prior to final building permit submittal, to better understand where roots are growing. This will ensure impacts to this tree will not occur as part of this project. If exploratory excavation reveals the proposed structure may impact this tree, alternative building design will be utilized to limit disturbance. No further mitigation is needed except to comply with the standard tree protection measures as outlined below.

Retained trees should not be damaged during demolition of existing structures or construction of new features. Care should be taken to prevent damage to trees when driplines are located in construction work areas. In order to minimize drip-line impacts, mitigation measures should be employed when feasible while conducting work within the driplines of all retained trees. Recommended mitigation measures include the following:

- **Tree protection fencing:** Chain link or polyethylene fencing (minimum 4 feet in height) with "Tree Protection Area" signs should be placed around tree drip lines of critical root zones where feasible.
- **Trunk wrap protection:** Where trees to be retained are located in close proximity to proposed clearing, grading or construction activities, wrap orange plastic construction fence on top of vertical wood slats around tree trunk and tie with wire. If a project will last

more than 4 months, an arborist shall inspect and determine if protection needs to be adjusted.

- **Preventative measures:** Trees that will be impacted and retained should be supplemented with fertilizer, mulch, and water to limit stress and enhance vigor. Prior to any fertilizer application, a soil analysis to identify any nutrient deficiencies should occur.
- **Reduce compaction:** Where root removal will not be required, temporarily apply 6 to 12 inches of coarse mulch in retained tree driplines located outside of tree protection fencing to prevent compaction of soil by heavy equipment. This mulch layer should be reduced to 4 inches at the completion of work within the driplines.
- **Alternatives to trenching for utility installation:** Use an air-spade to air-excavate or hand-dig around tree roots to prevent significant damage or loss when installing utilities. Horizontal drilling, tunneling, or boring would also reduce impacts to roots and allow for installation of utilities.
- **Minimize injury:** When tree roots must be removed, cut roots cleanly using a sharp saw or pruners. Do not rip or cut tree roots with heavy equipment. When roots will be temporarily exposed as a result of excavation, cover roots with moist burlap or soil during non-working hours.
- **Construction observation:** An ISA-certified arborist should be present on-site during construction activities within the driplines of retained trees to monitor tree protection, assist with changes in the field, and document construction impacts.
- **Monitor:** An ISA-certified arborist should monitor retained trees after construction activities to identify changes in the health and structural conditions. Despite best efforts, retained trees may die as a result of construction and may require removal.

## 8.2 Tree Removal

The proposed residential construction directly or significantly impacts 7 regulated trees within the subject parcel, and an additional 5 trees in existing driveway easement. In total, 12 trees are proposed for removal. These trees should be removed prior to construction activities.

Table 3. Regulated trees to be removed within the study area

Tree ID	Scientific Name	DBH (in.)	Condition	Reason for Removal	Replace ment Ratio (X:1)
28	<i>Acer macrophyllum</i>	13*	5 – Dead or dying	Driveway construction	1.0
29	<i>Acer macrophyllum</i>	13*	5 – Dead or dying	Driveway construction	1.0
30	<i>Acer macrophyllum</i>	13*	5 – Dead or dying	Driveway construction	1.0
31	<i>Acer macrophyllum</i>	13*	5 – Dead or dying	Driveway construction	1.0
32	<i>Acer macrophyllum</i>	13*	5 – Dead or dying	Driveway construction	1.0
2803	<i>Pinus nigra</i>	12	3 - Fair	Accessory structure construction	1.0
2804	<i>Pinus nigra</i>	11	3 - Fair	Accessory structure construction	1.0
2805	<i>Pinus nigra</i>	10	3 - Fair	Accessory structure construction	1.0
2807	<i>Acer macrophyllum</i>	23	4 - Poor	Accessory structure construction	2.0
2808	<i>Robinia pseudoacacia</i>	13	4 - Poor	Accessory structure construction	2.0
2891	<i>Pseudotsuga menziesii</i>	26	3 - Fair	Residence construction	3.0
2896	<i>Pinus nigra</i>	17	3 - Fair	Driveway construction	1.0

\*DBH is estimated for all off-parcel trees.

During the tree inventory site visit, bald eagles were observed flying over the project area. Additionally, the City of Mercer Island 2016 Properties Affected by Bald Eagles Map documents the closest bald eagle nest approximately 140 feet east of the subject parcel. The City of Mercer Island directs applicants potentially conducting activities that may disturb bald eagles to follow recommendations outlined in the US Fish and Wildlife Service's *National Bald Eagle Management Guidelines* (FWS 2007). In this document, January 1 – Aug. 31 is described as the breeding season for bald eagles in the Pacific Region (WA, OR, CA, ID, MT, WY, and NV). During breeding season, clearing, construction, and landscaping within 660 feet of the nest is not recommended.

Additionally, the MICC recommends trees within geologic hazard areas or protected slopes to not be removed between October 1 and April 1.



### 8.3 Tree Replacement

Based on the tree replacement requirements outlined in MICC 19.10.070.A, trees should be planted on the property to compensate for impacts resulting from site development. Replacement trees should be primarily those species native to the Pacific Northwest. Large native coniferous trees (such as Douglas-fir, western red cedar, grand fir, and western white pine) should be used where practicable to preserve the character of the neighborhood.

Pursuant to the City's replacement ratios, a total of 25 trees are required to be planted based upon the number and size of trees proposed to be removed. Six trees located within the subject parcel and five trees located within the driveway easement measuring between 10 and 24-inches require a 1:2 tree replacement ratio. One tree (#2891) measures between 24 and 36-inches, requiring a tree replacement ratio of 1:3. To align with MICC 19.10.070.B.3, replacement coniferous trees shall be at least six feet tall and replacement deciduous trees shall be at least one and one-half inches in caliper.

Additional impacts to trees are not anticipated as construction permit plans develop. If additional impacts occur as a result of demolition or construction activities, the applicant will be held to the enforcement standards as outlined in MICC 19.10.160. Tree replacement should occur after on-site construction is complete, to avoid damage to replacement trees.

## 9 REFERENCES

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**APPENDIX A**

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**Subject Parcel Tree Inventory Table**



**MERCER ISLAND PHILLIPS**  
**2003 82nd Avenue SE, Mercer Island, WA 98040**  
 parcel # 5449300080

Table Issued: 4/17/2019  
 Site Visit: 3/22/2019

TAG #	TREE NAME	EV / DEC	# STEMS	COMB DBH (IN, ROUNDED)	CONDITION	EXCEPTIONAL PER MICC
2801	Pinus nigra (Austrian pine)	E	1	18	3	NO
2802	Populus balsamifera (Black cottonwood)	D	1	43	4	YES
2803	Pinus nigra (Austrian pine)	E	1	12	3	NO
2804	Pinus nigra (Austrian pine)	E	1	11	3	NO
2805	Pinus nigra (Austrian pine)	E	1	10	3	NO
2806	Acer macrophyllum (Bigleaf maple)	D	2	22	3	NO
2807	Acer macrophyllum (Bigleaf maple)	D	2	23	4	NO
2808	Robinia pseudoacacia (Black locust)	D	1	13	4	NO
2809	Pinus nigra (Austrian pine)	E	1	10	4	NO
2811	Acer macrophyllum (Bigleaf maple)	D	2	28	5	NO
2812	Acer macrophyllum (Bigleaf maple)	D	1	10	4	NO
2813	Thuja plicata (Western red cedar)	E	1	21	3	NO
2814	Acer macrophyllum (Bigleaf maple)	D	1	10	4	NO
2815	Acer macrophyllum (Bigleaf maple)	D	1	10	3	NO
2816	Thuja plicata (Western red cedar)	E	1	29	3	NO
2819	Alnus rubra (Red alder)	D	1	11	3	NO
2820	Acer macrophyllum (Bigleaf maple)	D	1	12	3	NO
2821	Thuja plicata (Western red cedar)	E	1	15	3	NO
2822	Acer macrophyllum (Bigleaf maple)	D	2	13	4	NO
2824	Acer macrophyllum (Bigleaf maple)	D	1	18	4	NO
2825	Thuja plicata (Western red cedar)	E	1	16	3	NO
2826	Thuja plicata (Western red cedar)	E	1	14	3	NO
2827	Thuja plicata (Western red cedar)	E	1	10	3	NO
2828	Thuja plicata (Western red cedar)	E	1	24	3	NO
2829	Thuja plicata (Western red cedar)	E	1	13	3	NO
2830	Thuja plicata (Western red cedar)	E	1	19	4	NO
2831	Fraxinus sp. (Ash species)	D	3	15	4	NO
2832	Thuja plicata (Western red cedar)	E	1	14	4	NO
2834	Pinus nigra (Austrian pine)	E	1	13	3	NO
2835	Pinus nigra (Austrian pine)	E	1	17	3	NO
2836	Pinus nigra (Austrian pine)	E	1	10	3	NO
2837	Pinus nigra (Austrian pine)	E	1	14	3	NO
2838	Pinus nigra (Austrian pine)	E	1	17	3	NO
2840	Pinus nigra (Austrian pine)	E	1	10	4	NO
2841	Pinus nigra (Austrian pine)	E	1	17	3	NO
2842	Pinus nigra (Austrian pine)	E	1	12	3	NO
2843	Acer macrophyllum (Bigleaf maple)	D	1	10	4	NO
2844	Acer macrophyllum (Bigleaf maple)	D	1	10	5	NO
2845	Pinus nigra (Austrian pine)	E	1	11	3	NO
2846	Pinus nigra (Austrian pine)	E	1	17	3	NO



**MERCER ISLAND PHILLIPS**  
**2003 82nd Avenue SE, Mercer Island, WA 98040**  
 parcel # 5449300080

Table Issued: 4/17/2019  
 Site Visit: 3/22/2019

TAG #	TREE NAME	EV / DEC	# STEMS	COMB DBH (IN, ROUNDED)	CONDITION	EXCEPTIONAL PER MICC
2847	Pinus nigra (Austrian pine)	E	1	11	3	NO
2849	Pinus nigra (Austrian pine)	E	1	13	4	NO
2850	Pinus nigra (Austrian pine)	E	1	20	3	NO
2852	Pseudotsuga menziesii (Douglas-fir)	E	1	10	3	NO
2853	Thuja plicata (Western red cedar)	E	1	17	4	NO
2854	Arbutus menziesii (Pacific madrone)	E	1	12	5	YES
2855	Acer macrophyllum (Bigleaf maple)	D	5	37	3	YES
2856	Thuja plicata (Western red cedar)	E	1	11	3	NO
2857	Arbutus menziesii (Pacific madrone)	E	1	6	2	YES
2858	Prunus emarginata (Bitter cherry)	D	1	14	4	NO
2859	Acer macrophyllum (Bigleaf maple)	D	7	28	5	YES
2861	Pseudotsuga menziesii (Douglas-fir)	E	1	27	3	NO
2862	Pinus nigra (Austrian pine)	E	1	18	5	NO
2863	Thuja plicata (Western red cedar)	E	1	10	4	NO
2864	Thuja plicata (Western red cedar)	E	1	12	3	NO
2865	Thuja plicata (Western red cedar)	E	1	25	3	NO
2866	Thuja plicata (Western red cedar)	E	2	15	4	NO
2867	Thuja plicata (Western red cedar)	E	1	12	3	NO
2868	Pseudotsuga menziesii (Douglas-fir)	E	1	49	3	YES
2869	Pseudotsuga menziesii (Douglas-fir)	E	1	41	3	YES
2870	Thuja plicata (Western red cedar)	E	1	11	2	NO
2871	Alnus rubra (Red alder)	D	2	12	3	NO
2872	Pseudotsuga menziesii (Douglas-fir)	E	1	34	2	YES
2873	Arbutus menziesii (Pacific madrone)	E	1	12	4	YES
2874	Arbutus menziesii (Pacific madrone)	E	1	17	5	YES
2875	Pseudotsuga menziesii (Douglas-fir)	E	1	29	3	NO
2876	Arbutus menziesii (Pacific madrone)	E	1	14	5	YES
2877	Thuja plicata (Western red cedar)	E	1	14	2	NO
2878	Thuja plicata (Western red cedar)	E	1	17	2	NO
2879	Pseudotsuga menziesii (Douglas-fir)	E	1	29	2	NO
2880	Pseudotsuga menziesii (Douglas-fir)	E	1	24	2	NO
2881	Pseudotsuga menziesii (Douglas-fir)	E	1	24	3	NO
2882	Acer macrophyllum (Bigleaf maple)	D	1	11	5	NO
2883	Acer macrophyllum (Bigleaf maple)	D	1	15	5	NO
2884	Pseudotsuga menziesii (Douglas-fir)	E	1	39	3	YES
2885	Pseudotsuga menziesii (Douglas-fir)	E	1	27	3	NO
2886	Pseudotsuga menziesii (Douglas-fir)	E	1	41	3	YES
2887	Pseudotsuga menziesii (Douglas-fir)	E	1	22	4	NO
2888	Acer macrophyllum (Bigleaf maple)	D	1	33	3	YES
2889	Thuja plicata (Western red cedar)	E	1	18	4	NO



MERCER ISLAND PHILLIPS  
2003 82nd Avenue SE, Mercer Island, WA 98040  
parcel # 5449300080

Table Issued: 4/17/2019  
Site Visit: 3/22/2019

TAG #	TREE NAME	EV / DEC	# STEMS	COMB DBH (IN, ROUNDED)	CONDITION	EXCEPTIONAL PER MICC
2890	Pseudotsuga menziesii (Douglas-fir)	E	1	43	3	YES
2891	Pseudotsuga menziesii (Douglas-fir)	E	1	26	3	NO
2892	Pseudotsuga menziesii (Douglas-fir)	E	1	34	3	YES
2893	Thuja plicata (Western red cedar)	E	1	19	4	NO
2894	Thuja plicata (Western red cedar)	E	1	14	4	NO
2895	Pseudotsuga menziesii (Douglas-fir)	E	1	19	3	NO
2896	Pinus nigra (Austrian pine)	E	1	17	3	NO
2897	Tsuga heterophylla (Western hemlock)	E	1	11	4	NO
2898	Thuja plicata (Western red cedar)	E	4	19	4	NO
2899	Thuja plicata (Western red cedar)	E	1	17	4	NO
2900	Thuja plicata (Western red cedar)	E	1	22	4	NO
2903	Arbutus unedo (Strawberry tree)	E	20	24	3	NO

**APPENDIX B**

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**Off-Parcel Tree Inventory Table**



**MERCER ISLAND PHILLIPS**  
**2003 82nd Avenue SE, Mercer Island, WA 98040**  
 parcel # 5449300080

Table Issued: 4/17/2019  
 Site Visit: 3/22/2019

TAG #	TREE NAME	EV / DEC	# STEMS	COMB DBH (IN, ROUNDED)	CONDITION	EXCEPTIONAL PER MICC
1	Acer macrophyllum (Bigleaf maple)	D	1	27	4	NO
2	Pseudotsuga menziesii (Douglas-fir)	E	1	24	4	NO
3	Pseudotsuga menziesii (Douglas-fir)	E	1	15	3	NO
4	Acer macrophyllum (Bigleaf maple)	D	1	14	5	NO
5	Pinus nigra (Austrian pine)	E	1	19	3	YES
6	Pinus nigra (Austrian pine)	E	1	33	3	YES
7	Pinus nigra (Austrian pine)	E	1	29	4	YES
8	Pinus nigra (Austrian pine)	E	1	28	4	YES
9	Pinus nigra (Austrian pine)	E	1	31	3	NO
10	Acer macrophyllum (Bigleaf maple)	D	1	11	4	NO
11	Acer macrophyllum (Bigleaf maple)	D	1	13	3	NO
12	Thuja plicata (Western red cedar)	E	1	11	3	NO
13	Thuja plicata (Western red cedar)	E	1	14	3	NO
14	Thuja plicata (Western red cedar)	E	1	43	3	YES
15	Acer macrophyllum (Bigleaf maple)	D	1	22	3	NO
16	Alnus rubra (Red alder)	D	1	20	4	NO
17	Thuja plicata (Western red cedar)	E	1	12	3	NO
18	Acer macrophyllum (Bigleaf maple)	D	1	13	4	NO
19	Thuja plicata (Western red cedar)	E	1	11	3	NO
20	Acer macrophyllum (Bigleaf maple)	D	1	38	3	YES
21	Acer macrophyllum (Bigleaf maple)	D	1	33	4	YES
22	Arbutus menziesii (Pacific madrone)	E	1	11	2	YES
25	Picea abies (Norway spruce)	E	1	14	4	NO
27	Acer macrophyllum (Bigleaf maple)	D	1	16	5	NO
28	Acer macrophyllum (Bigleaf maple)	D	10	13	5	NO
29	Acer macrophyllum (Bigleaf maple)	D	10	13	5	NO
30	Acer macrophyllum (Bigleaf maple)	D	10	13	5	NO
31	Acer macrophyllum (Bigleaf maple)	D	10	13	5	NO
32	Acer macrophyllum (Bigleaf maple)	D	10	13	5	NO
33	Thuja plicata (Western red cedar)	E	1	10	5	NO
34	Thuja plicata (Western red cedar)	E	2	14	5	NO
35	Thuja plicata (Western red cedar)	E	1	14	5	NO
36	Acer macrophyllum (Bigleaf maple)	D	5	13	3	NO
37	Thuja plicata (Western red cedar)	E	1	12	5	NO
38	Thuja plicata (Western red cedar)	E	1	12	5	NO
39	Thuja plicata (Western red cedar)	E	1	12	5	NO
40	Thuja plicata (Western red cedar)	E	1	12	5	NO
41	Thuja plicata (Western red cedar)	E	1	14	5	NO
42	Thuja plicata (Western red cedar)	E	1	14	5	NO
43	Thuja plicata (Western red cedar)	E	1	16	5	NO



**APPENDIX C**

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**Unregulated Tree Inventory Table**



MERCER ISLAND PHILLIPS  
2003 82nd Avenue SE, Mercer Island, WA 98040  
parcel # 5449300080

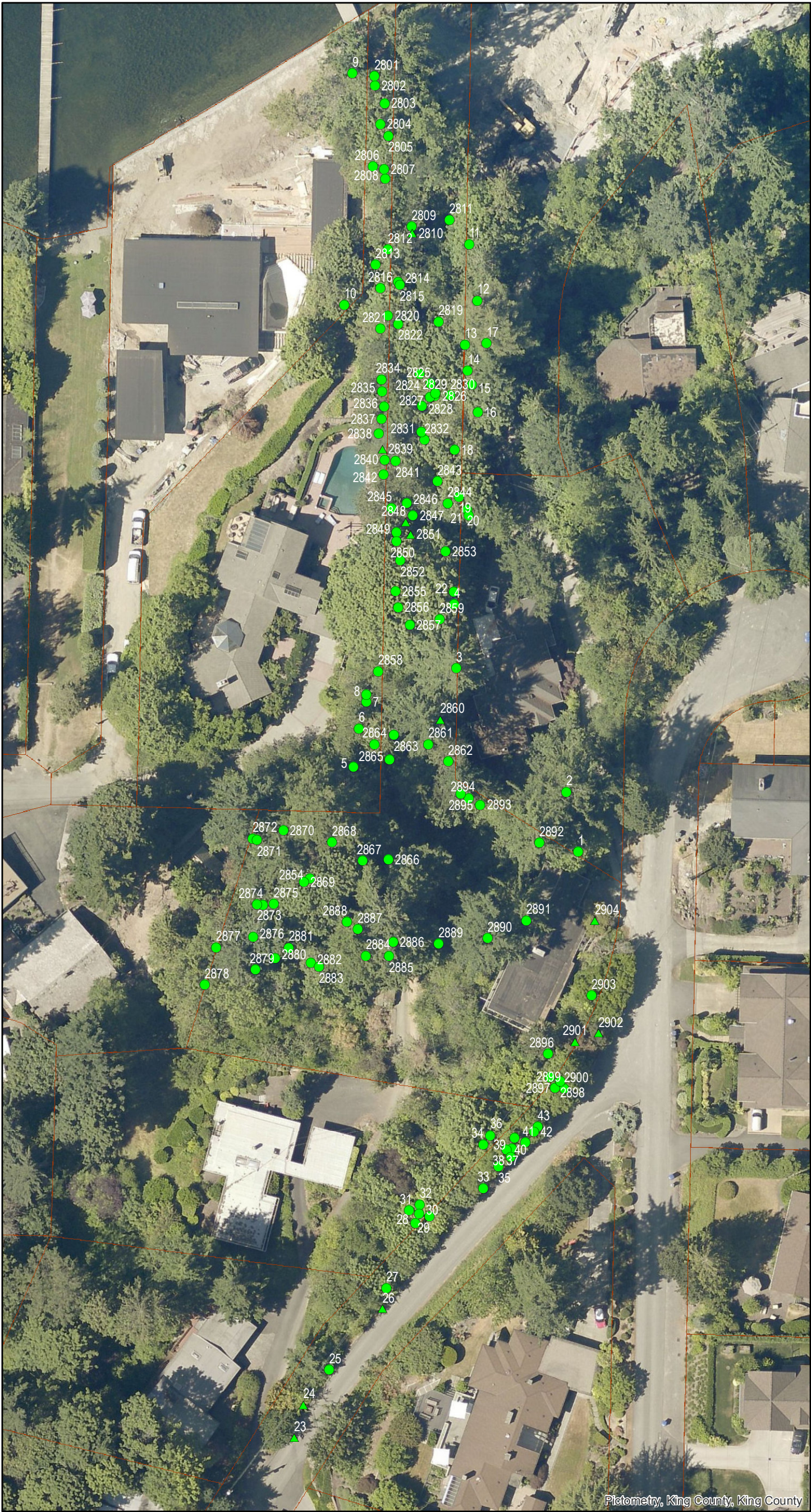
Table Issued: 4/17/2019  
Site Visit: 3/22/2019

TAG #	TREE NAME	EV / DEC	# STEMS	COMB DBH (IN, ROUNDED)	CONDITION	EXCEPTIONAL PER MICC
23	Malus domestica (Apple)	D	3	8	3	NO
24	Acer palmatum (Japanese maple)	D	3	5	3	NO
26	Acer macrophyllum (Bigleaf maple)	D	1	8	5	NO
2810	Pinus nigra (Austrian pine)	E	1	7	4	NO
2839	Pinus nigra (Austrian pine)	E	1	9	3	NO
2848	Pinus nigra (Austrian pine)	E	1	8	3	NO
2851	Pinus nigra (Austrian pine)	E	1	7	4	NO
2860	Arbutus unedo (Strawberry tree)	E	2	7	2	NO
2901	Acer palmatum (Japanese maple)	D	3	9	3	NO
2902	Pinus sylvestris (Scots pine)	E	2	8	3	NO
2904	Acer palmatum (Japanese maple)	D	2	9	3	NO

**APPENDIX D**

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**Tree Inventory Map**



**LEGEND**

- REGULATED TREE
- ▲ UNREGULATED TREE
- KING COUNTY PARCELS

**NOTES**

- ALL ON-PARCEL TREES WERE TAGGED WITH A NUMBERED ROUND ALUMINUM TAG ON THE SOUTH SIDE OF THE TRUNK AT OR NEAR EYE-LEVEL. ALL TAGS HAVE ORANGE FLAGGING HANGING OFF OF THEM.
- FOR QUESTIONS ON TREE LOCATIONS CONTACT ROEN HOLFELD AT THE WATERSHED COMPANY. PHONE: (425) 822-5242.

**PHILLIPS RESIDENCE TREE INVENTORY**

Mercer Island, WA



April 2019