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**TECHNICAL REPORT  
LAKE FOREST PARK WATER DISTRICT  
CRITICAL AQUIFER RECHARGE AREA DELINEATION**

Lake Forest Park, Washington

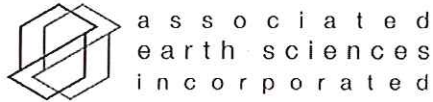
Prepared for

Lake Forest Park Water District

Project No. EH160195A  
August 29, 2016



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August 29, 2016  
Project No. EH160195A

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Subject:        Technical Report  
                  Critical Aquifer Recharge Area (CARA) Delineation  
                  Lake Forest Park Water District  
                  Lake Forest Park, Washington

Dear Mr. Alan Kerley:

We are pleased to present copies of the above-referenced technical report. This report summarizes the results of our delineation of the critical aquifer recharge areas for the Lake Forest Park Water District (District) water supply wells in the Horizon View and McKinnon Creek well fields.

We have enjoyed working with you on this study. If you should have any questions or if we can be of additional help to you, please do not hesitate to call.

Sincerely,  
**ASSOCIATED EARTH SCIENCES, INC.**  
**Everett, Washington**



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Jay W. Chennault, L.Hg., P.E.  
Associate Hydrogeologist/Engineer

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**TECHNICAL REPORT  
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REVISED DRAFT CRITICAL AQUIFER RECHARGE  
AREA DELINEATION**

**Lake Forest Park, Washington**

*Prepared for:*

**Lake Forest Park Water District**  
4029 N.E. 178<sup>th</sup> Street  
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## 1.0 INTRODUCTION

### 1.1 Project Background and Purpose

This report presents the results of Associated Earth Sciences, Inc. (AESI) assessment of the Lake Forest Park Water District (District) critical aquifer recharge areas (CARAs) for the District's production wells located in north King and south Snohomish Counties near the City of Lake Forest Park, Washington (City). The project area is as shown on the "Vicinity Map", Figure 1. The approximate locations of the District's wellfields and production wells, relative to surrounding physical features, are shown on the "Site Map", Figure 2.

The District provides municipal water to a residential population of approximately 2,662 people with 899 service connections generally located within the District service area (Figures 1 and 2). The City maintains two production wellfields (McKinnon Creek and Horizon View) at the locations shown on Figure 2.

In 1990 the Washington State Legislature adopted the Growth Management Act (RCW 36.70A), which requires local jurisdictions to adopt ordinances that classify, designate, and regulate land use in order to protect critical areas (Ecology, 2000). These critical areas include CARAs to protect ground water quantity and quality for potable supply. Although several comprehensive hydrogeologic studies have been completed in the general project area, CARAs have not been officially designated for the aquifers utilized by the District.

### 1.2 Project Scope

The District recently received grant funding to delineate CARA boundaries for their existing ground water supplies. The District contracted with AESI to perform a geologic and hydrogeologic study. The scope of services AESI provided for the study is summarized below:

- Performed a detailed review of the existing data and hydrogeologic studies of the project area and vicinity.
- Provided a detailed description of the project area and setting, surface soils, surface and subsurface geology and hydrogeology.
- Provided additional delineation and characterization of the aquifers utilized by the District.
- Delineated proposed CARAs for the aquifers utilized by the District.
- Characterized the susceptibility of the proposed CARAs, including areas of low, moderate and high susceptibility to contamination.
- Inventoried existing and potential sources of contamination within the CARAs.

- Reviewed existing local CARA and wellhead protection area (WHPA) regulations.
- Prepared geographic information system (GIS) data and maps of the aquifer boundaries, WHPAs, CARAs, and contaminant sources for each aquifer.
- Collaborated with North Seattle College (NSC) geology students regarding their work in the project area, and integrated their work into our study.

## 2.0 SETTING

The District service area is located within the City of Lake Forest Park at the north end of Lake Washington in northern King County, Washington (Figure 1). The District serves 899 connections with water from the McKinnon Creek (MC) wellfield and the Horizon View (HV) wellfields (Figure 2). Land use in the area is primarily residential, with little commercial or industrial development.

### 2.1 Topography

Topography in the Lake Forest Park Water District and surrounding area is varied, with ground surface elevations ranging from about 20 feet at the north shore of Lake Washington to approximately 550 feet in the vicinity of the HV wellfield (Figure 2). From the HV wellfield, the ground surface elevation decreases to the south toward Lake Washington, to the north as far as Abbey View Pond, and to the east and west.

### 2.2 Soils

Soils in the project area were mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in the 1970s and 1980s as a part of soils surveys conducted in Snohomish County (NRCS, 1983) and King County (NRCS, 1973). Current soils maps are available from the USDA Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>). Individual soil units are classified into a Hydrologic Soil Group (HSG) based on runoff potential, infiltration rate, texture, and rate of water transmission. Descriptions of HSGs are provided below (USDA, 1986). HSG designations for the soils in the project area are shown on the “*Surficial Soils Map*” – Figure 3.

**Group A** soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel that has a water transmission rate greater than 0.30 inches per hour (in/hr).

**Group B** soils have moderate infiltration rates when thoroughly wetted. They consist of predominantly moderately deep to deep, moderately well to well drained soils. These soils have a moderate rate of water transmission (0.15- 0.30 in/hr).

**Group C** soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

**Group D** soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).



Dual Hydrologic Soil Groups (A/D, B/D, and C/D) are assigned to certain wet soils that have the potential to be adequately drained. The first letter applies to the drained condition and the second to the undrained condition. For this determination, “adequately drained” means that the seasonal high water table is kept at least 24 inches below the ground surface (USDA, 2007).

Soil data are unavailable for the portion of the study area immediately north and west of Lake Washington, including the Lake Forest Park Water District service area and wellfields (Figure 3). These areas were removed from the King County soil survey due to the developed nature of the area that has modified the natural soil conditions.

### 3.0 GEOLOGIC CONDITIONS

Surface and subsurface geologic units north of Lake Washington largely consist of glacial outwash and till associated with the Vashon Stade of the Fraser Glaciation which occurred between approximately 12 – 16 thousand years before present (ka), underlain by pre-Fraser glacial and nonglacial sediments and Tertiary bedrock. Post-Fraser alluvium and landslide deposits are present at the surface in some areas. The geologic units present in the project area are presented on the “*Surficial Geology Map*” – Figure 4 and the “*Geologic Cross Section A-A*” – Figure 5. Water well reports from selected wells and borings for the project area are presented in Appendix A. The units are described below in order of youngest to oldest.

#### 3.1 Recent Alluvium and Landslide Deposits (Qyal, Qoal, Qls)

Recent alluvium in the project area consists of deposits mapped as older alluvium (**Qoal**) by Minard (1983) at the mouth of Lyon Creek near Lake Washington and consists of mostly stratified sand and gravel with some sandy, pebbly and organic rich silt. Younger alluvium (**Qyal**) is present primarily in the bottoms of modern streams that are actively incising and depositing typically thin layers of gravel, sand, silt and organics. The **Qoal** deposits are generally thicker than the **Qyal** deposits. There are also small areas mapped as landslide (**Qls**) deposits in the project area.

#### 3.2 Vashon Recessional Outwash (Qvr)

Vashon Recessional outwash (**Qvr**) sediments consisting of stratified sand and gravel were deposited by meltwater from the receding Vashon glacier. The sediments were deposited on small terraces on the slopes and sides of stream valleys including Swamp Creek and small deposits along Lyon and other drainages in the near the project area (Minard, 1983). In these areas it appears that the **Qvr** may directly overly the Vashon Advance outwash (**Qva**). The **Qvr** may also be present in small discontinuous pockets above Vashon Glacial till (**Qvt**) in the upland areas (Figures 4 and 5).

#### 3.2 Vashon Glacial Till (Qvt)

The Vashon Glacial Till (**Qgt**) mantles much of the upland areas in the project area, and drapes down-hill into many of the present stream channels (Figures 4 and 5). The till is generally a poorly sorted mixture of clay, silt, sand, and gravel in variable amounts (Minard, 1983). The till was deposited directly by the advancing Vashon glacier and subsequently overridden by a thick sheet of ice, resulting in a very dense deposit. In the project area it is generally about 10 to 15 feet thick, but may locally exceed 30 feet, and is absent in areas where stream incision and erosion have removed the till to expose older units (CDM, 2005). Students from NSC confirmed the presence of **Qgt** as the likely native surficial geologic unit in the area north of Abbey View Pond. Borings advanced in that area encountered glacial till and/or perched ground water at shallow depths that indicate the presence of a shallow perching layer of low permeability

material. A preliminary report of the field investigations conducted by NSC is provided in Appendix A.

### 3.3 Vashon Advance Outwash (Qva)

The Vashon Advance Outwash (**Qva**) is older and typically underlies the **Qgt** deposits, although it is exposed at the ground surface in many of the stream channels and lower elevations in the project areas where post-glacial erosion has removed the **Qgt** (Figures 4 and 5). In these areas the **Qva** may also directly underlie the more recent **Qyal**, **Qoal**, or **Qvr** deposits. **Qva** generally consists of sand and gravelly sand with little silt. The unit generally gets finer with depth, meaning fine grained sand and some silt are common in the lower part of the unit (Minard, 1983).

### 3.4 Pre-Fraser Fine Grained deposits (Qpfr)

Underlying the **Qva** deposits is an assortment of fine-grained sediments that were deposited prior to the Fraser glaciation. Although interpreted as the earliest Vashon-age glacial deposit, the Lawton Clay (**Qvlc**) is included in this unit. The **Qvlc** was deposited in a lacustrine environment well in advance of the Vashon glacier. The unit consists of primarily silt with some clay and occasional sand and gravel. The **Qvlc** likely correlates with the Transitional Beds (Tb) as described by Minard, (1983) which represent the sediments deposited between the Vashon glacial period and pre-Fraser non-glacial period. Also included in this unit are the non-glacial sands and silty sands (**Qpfnf**), clays, (**Qpfnl**) and thin beds of peat and organic silt (**Qpfnw**) described by CDM (2005). The non-glacial deposits are generally correlated with the Olympia Beds which were deposited approximately 16 – 60 ka. The **Qpfr** deposits also includes fine grained glaciolacustrine, glaciomarine and glacial till deposits of the Possession drift glacial sequence that were deposited approximately 60 – 80 ka (CDM, 2005). Older pre-Fraser non-glacial deposits are present below the Possession Drift and are correlated to the Whidbey formation (80 – 125 ka).

### 3.5 Pre-Fraser Coarse Grained deposits (Qpfc)

Pre-Fraser coarse grained deposits (**Qpfc**) are interpreted to be glaciofluvial deposits (glacial outwash) of the Possession Drift (CDM, 2005). Studies in the Lake Forest Park area indicate the proportion of glaciofluvial sediments in the Possession Drift in this area is higher than the regional average and form interconnected sand and gravel units (CDM, 2005). The outwash channel appears to be elongated to the north and south and limited in width.

#### 4.0 HYDROGEOLOGIC CONDITIONS

Ground water is defined as water present in the pore spaces of soils, unconsolidated sediments and bedrock. Ground water in the project area is part of a continuous hydrologic cycle which, in the natural state, begins with infiltration of precipitation and runoff (recharge) and ends with discharge to streams, wetlands, and ultimately to Lake Washington.

Ground water under saturated conditions flows preferentially through materials with greater porosity and permeability, such as clean gravels and sands. Where geologic conditions limit discharge, ground water accumulates in permeable zones, which, if they can support production from wells, are termed “aquifers”. The sustainability of wells, or the long-term aquifer capacity, depends both on the extent of the aquifer, its rate of recharge and natural discharge, and the amount of withdrawal by producing wells. Geologic units with low permeabilities that restrict ground water movement and are not considered a viable water source are termed “confining” units. Most confining units aren’t completely impermeable and transmit water very slowly from one aquifer to another and are commonly termed “leaky confining layers”.

Unconfined or “water-table” aquifers typically occur close to the land surface where the upper portion of the saturated zone is at atmospheric pressure and is free to rise and decline in response to ground water recharge and discharge. Recharge can occur from downward seepage through the unsaturated zone, or through lateral or upward ground water flow through a leaky confining layer. Discharge from an unconfined aquifer can occur as lateral ground water flow to surface water bodies (streams, rivers, wetlands, lakes, etc.) or as vertical ground water flow to another aquifer.

Confined, or “artesian” aquifers are overlain by a confining layer. Recharge can occur either in a recharge area where the aquifer unit is exposed at the land surface, or by slow downward ground water flow through a leaky confining layer. Ground water in confined aquifers is under pressure greater than atmospheric pressure.

Ground water resources located beneath the project area are present in both unconfined and confined aquifers. The uppermost aquifer in the project area is the Vashon Advance (**Qva**) Aquifer. Ground water in the **Qva** Aquifer occurs in both unconfined and confined conditions. A deeper confined aquifer, the Lake Forest Park (LFP) Aquifer occurs beneath the **Qva** Aquifer. These aquifers have been described in a regional study by the USGS (1997), documents related to the District’s water supply and water rights, (Converse, 1980; Ecology, 2013; Mundall Engineering, 2015) and in documents related to the Brightwater Project (King County, 2003; CDM 2005).



## 4.1 Vashon Advance Aquifer

The Vashon Advance (**Qva**) Aquifer consists of fine – to medium-grained sand and gravely outwash sand (**Qva**). The aquifer may also include some **Qvr** and alluvial deposits where the younger units directly overlie the **Qva** deposits. The **Qva** Aquifer occurs in both unconfined and locally confined/artesian conditions when capped by Vashon glacial till (**Qvt**) or low permeability silts within the **Qva** deposits.

### 4.1.1 Aquifer Extent and Thickness

The **Qva** Aquifer is an important regional aquifer in much of south western Snohomish County and north western King County (USGS, 1997), and is present beneath much of the project area. Regionally, the saturated thickness of the **Qva** Aquifer can be 120 feet thick or more (USGS, 1997). However, subsurface data in the project area indicate the saturated thickness of the **Qva** Aquifer near the MC and HV wellfields is only 10 to 30 feet, limiting the production capability of the aquifer in this area. Ground water within the **Qva** Aquifer is known to occur under both unconfined and confined conditions. The shallow wells at the MC wellfield appear to be completed the **Qva** Aquifer (King County, 2003; Ecology, 2013). Water well reports from the MC wellfield indicate that the **Qva** Aquifer thickness in this area is in the range of 11 to 36 feet. The extent of the **Qva** Aquifer is presented on the “Ground Water Elevation Contour Map – **Qva** Aquifer” – Figure 6.

### 4.1.2 Aquifer Parameters

The effective porosity of the **Qva** Aquifer likely ranges between 0.10 and 0.30 based on information presented in USGS (1997) and our understanding of the local geology/hydrogeology. The average hydraulic conductivity in the project area is approximately 40 feet per day (ft/d) based on information provided by the USGS (1997).

### 4.1.3 Ground Water Flow Direction and Gradient

The potentiometric surface in this aquifer is at or above the ground surface in the MC wellfield as evidenced by continuous ground water flow from the shallow artesian wells at the wellfield. The MC wellfield also includes a number of wetland areas which is further evidence of a shallow water table. The shallow wells in the MC well field are at elevations ranging from approximately 276 feet above mean sea level (msl) to 289 feet msl, indicating the ground water elevation in the **Qva** Aquifer in the MC well field is approximately 280 – 290 feet msl. Abbey View Pond, located approximately 1.5 miles north of the MC wellfield, is assumed to be an expression of the **Qva** Aquifer (unconfined) water table at an elevation of approximately 328 feet msl.

Ground water elevation contours for the **Qva** Aquifer based on the observed water levels in the shallow MC well field wells, the water surface elevation in Abby View Pond, and information provided by the USGS (1997) are presented on Figure 6. The ground water flow in the **Qva** Aquifer is generally from north to south, toward Lake Washington. Ground water flow directions is influenced where the **Qva** intersects the ground surface in the Lyon Creek, Swamp

Creek, and McKinnon Creek Valleys (USGS, 1997; King County, 2003). The ground water elevation contours and flow directions allowed us to delineate an area of the **Qva** Aquifer that we interpret to be hydraulically up gradient of the district's wellfields (Figure 6).

The average hydraulic gradient (slope) of the **Qva** Aquifer near the shallow wells in the MC wellfield is approximately 0.025, or about 132 feet per mile (ft/mi), although the gradient flattens significantly north of the MC wellfield to approximately 0.006 (32 ft/mi) as shown on Figure 6.

#### 4.1.4 Ground Water Flow Velocity

The average linear velocity of ground water flow in the **Qva** Aquifer can be estimated using the following equation:

$$Vel_{avg} = 1/n_e \times K \times i$$

Where:

- $n_e$  = Effective porosity (dimensionless)
- $K$  = Hydraulic conductivity (ft/d)
- $i$  = Aquifer hydraulic gradient (dimensionless)

Based on an effective porosity of 0.25, a hydraulic conductivity 40 ft/d (USGS, 1997) the average linear velocity equation indicates an average groundwater velocity in the **Qva** Aquifer in the immediate vicinity of the MC wellfield of approximately 4 ft/d and approximately 1 ft/d north of the MC wellfield where the gradient flattens.

#### 4.1.5 Aquifer Recharge and Discharge

Recharge to the **Qva** Aquifer where it is under unconfined conditions is from the downward percolation of precipitation into the aquifer. Recharge to the confined aquifer results primarily from the lateral inflow of ground water from the unconfined portion of the aquifer and, to a much more limited extent, from the vertical infiltration of precipitation through the low permeability confining units (**Qvt**). The USGS (2001) has developed formulas to estimate ground water recharge across a variety of soil and land cover types including developed lands. Based on the PRISM 30-year average annual precipitation value for the project area (<http://www.prism.oregonstate.edu/explorer/>) of 38.6 inches per year (in/yr), ground water recharge to the **Qva** Aquifer is estimated at 5.3 in/yr.

Discharge from the aquifer primarily occurs from pumping wells and to surface water where the water table and the base of the **Qva** Aquifer intersects ground surface in the Lyon Creek, Swamp Creek, and McKinnon Creek Valleys (King County, 2003). Ground water within the **Qva** also discharges downward into the LFP Aquifer through "leaky" portions of the confining layers that separate the two aquifers. The water levels in the **Qva** Aquifer are approximately 60 feet above the LFP Aquifer. This significant head difference between the two aquifers could drive

the downward percolation of ground water from the **Qva** to the LFP Aquifer. Ultimately, ground water within the **Qva** Aquifer discharges as subsurface flow to Lake Washington.

## 4.2 Lake Forest Park (LFP) Aquifer

The LFP Aquifer consists of coarse grained pre-Frasier glacial deposits (**Qpf<sub>c</sub>**). The aquifer consists of glaciofluvial deposits from sub-glacial channels – tunnel-like conduits that carried glacial meltwater and sediment at the base of the melting ice sheet (CDM, 2005).

### 4.2.1 Aquifer Extent and Thickness

As a result of the subglacial depositional environment the LFP Aquifer occurs as an interconnected series of elongated ribbons and lenses in the north-south direction (CDM, 2005). In general, the LFP aquifer is thinnest to the south, near Lake Washington (approximately 50 feet) and thicker to the north near the HV wellfield (approximately 130 feet) (CDM 2005). The LFP aquifer is only approximately 5,000 – 6,000 feet wide as the glaciofluvial deposits pinch out to the west at approximately the location of Lyon Creek, and pinch out to the east along a north-northwest trending line (CDM, 2005). The southern extent of the aquifer is Lake Washington. The northern extent of the aquifer is not well known, although Converse (1980) suggests the aquifer extends to an area approximately 3 miles north of the MC wellfield. The approximate extent of the LFP aquifer is presented on the “Ground Water Elevation Contour Map – LFP Aquifer” – Figure 7.

There are limited data from water well reports and geotechnical borings that are completed into the LFP Aquifer in the area north of the HV wellfield. These data limitations and the complex nature of the pre-Frasier deposits (**Qpf<sub>c</sub>**, **Qpf<sub>f</sub>**) that define the pre-Frasier aquitards and aquifers (including the LFP Aquifer) create uncertainty in mapping the LFP Aquifer boundaries. Limited water level data from several borings and monitoring wells in the area do suggest a ground water high may be present at approximately 228<sup>th</sup> Street SW that may limit the portion of the aquifer that is up gradient of the District’s wells.

### 4.2.2 Aquifer Parameters

Estimates of transmissivity in the LFP Aquifer from pumping tests in the MC wellfield range from 2,000 to 16,000 gallons per day per foot (gpd/ft), with storativity in the range of 0.00007 to 0.0001 (CDM, 2005). Assuming an average aquifer thickness of 80 feet, the range of transmissivity estimates corresponds to a hydraulic conductivity range of 3 to 27 f/d. Pumping tests performed by Robinson Noble on the HV wellfield wells indicated an estimated transmissivity of 8,000 to 23,000 gpd/ft and a storativity of 0.0001 (Ecology, 2013). Again, assuming an average aquifer thickness of 80 feet, the Robinson Nobel range of transmissivity corresponds to a hydraulic conductivity range for the aquifer at the HV wellfield between 13 to 38 ft/d.

#### 4.2.3 Ground Water Flow Direction and Gradient

The elevation of the potentiometric surface in the LFP Aquifer ranges from approximately 30 to over 250 feet. Ground water elevation contours for the LFP Aquifer based on depth to water measurements presented on water well reports for the District's wells, and data provided in CDM (2005) are presented on "LFP Aquifer", Figure 7. The static water level elevations in the HV wellfield are generally about 265 feet msl. Static water levels in the MC wellfield are approximately 235 feet msl. All of the deep wells at the MC and HV wellfields are confined, meaning that the potentiometric surface is higher than the top of the aquifer sediments due to confining pressure. The overall ground water flow direction in the Lake Forest Park Aquifer is from north to south (Figure 7).

The average hydraulic gradients of the LFP Aquifer near the MC wellfield and HV wellfield is approximately 0.01 (53ft/mi) based on static water level elevations in both wellfield and surrounding wells (CDM, 2005). The gradient becomes steeper south of the MC wellfield toward Lake Washington (Figure 7).

#### 4.2.4 Ground Water Flow Velocity

The average linear ground water flow velocity for the LFP Aquifer was estimated assuming an average effective porosity of 0.25. Given the average hydraulic conductivity for the LFP Aquifer in the project area of approximately 19 ft/d, and the average hydraulic gradient of 0.01, the average ground water velocity in the LFP Aquifer in the immediate vicinity of the MC and HV wellfields are approximately 0.75 ft/d. Based on the range of hydraulic conductivity values calculated for the LFP Aquifer of 2 to 38 ft/d, the corresponding ground water velocities would range between 0.13 to 1.5 ft/d.

#### 4.2.5 Aquifer Recharge and Discharge

Recharge to the LFP Aquifer is primarily is from the downward percolation of water from the **Qva** Aquifer through "leaky" confining layers that separate the two aquifers. Given the apparent limited extent of the LFP Aquifer (Figure 7), there does not appear to be a regional recharge area where Pre-Fraser coarse grained deposits (**Qpf<sub>c</sub>**) that make up the LFP Aquifer are exposed at the ground surface. However, the area over which ground water recharge occurs for the LFP Aquifer is somewhat unknown, particularly in the area to the north of the HV wellfield due to the uncertainty in mapping the aquifer boundaries in that area. The complex nature of the pre-Fraser deposits may result in interflow between other Pre-Fraser coarse grained deposits (**Qpf<sub>c</sub>**) and the LFP Aquifer may also be providing additional recharge to the aquifer.

King County has conducted long-term water level monitoring in five monitoring wells completed in the LFP Aquifer between the HV and MC wellfields since 2003 (King County, 2015; CDM Smith, 2012). The data demonstrate both decreasing and increasing ground water level trends that are attributed to periods of low and high precipitation, respectively (CDM Smith, 2012). The ground water level response to precipitation pattern indicates that overall, recharge to the LFP Aquifer appears to be significant. Additionally, ground water level data collected by the District from their wells indicate that the long-term water levels in the LFP Aquifer are



stable; another indication of adequate ground water recharge (personal communication, Mundall Engineering, 2016).

Discharge from the LFP Aquifer occurs from pumping wells and subsurface ground water discharge to Lake Washington.

## **5.0 SUMMARY OF EXISTING PRODUCTION WELLS AND WATER RIGHTS**

The District's well sources consist of eight shallow wells and four deep wells (MC-DW-1, MC-DW-2, MC-DW-3, and MC-DW-4) in the MC wellfield, and deep wells (HV-DW-1W#1 and HV-DW-2) (Figure 2). A summary of the production wells is presented in Table 1. Available water well reports for the District's production wells are included in Appendix B. As of December 2015, Well MC-DW-4 was not yet approved by the Washington State Department of Health (DOH) as a source for the District.

### **5.1 McKinnon Creek Wellfield Shallow Artesian Wells**

The eight shallow artesian wells in the MC wellfield are completed in the **Qva** Aquifer at depths ranging from 17 to 25 feet below ground surface (ft bgs). These are flowing artesian wells; water from the wells would discharge to the ground surface were it not redirected to a collection cistern. Each of the eight wells produces approximately 10 gallons per minute (gpm) for a total of about 80 gpm. Production capacity and water quality do not appear to vary seasonally in the wells.

### **5.2 McKinnon Creek and Horizon View Wellfield Deep Wells**

The deep wells in the MC and HV well fields are screened within the LFP Aquifer. The MC deep wells range in depth from 161 to 216 ft bgs. The wells are screened at depths ranging from 147 to 216 ft bgs. Both of the HV deep wells extend to 468 ft bgs and are screened at depths ranging from 398.5 to 457.5 ft bgs. Continuous pumping capacity is estimated at a combined 1,290 gpm for the MC deep wells and 550 gpm for the HV deep wells.

**Table 1**  
**Summary of Production Wells**

Well No.	Well Completion Depth (feet bgs)	Well Diameter (inches)	Well Field	Pumping Rate (gpm)	Ecology Tag #	DOH Source #	Aquifer Unit
MC-DW-1	216	8	McKinnon Creek	300	AJF-001	S05	LFP Aquifer
MC-DW-2	190	8	McKinnon Creek	300	AJF-002	S05	LFP Aquifer
MC-DW-3	161	12	McKinnon Creek	350	AJF-003	S05	LFP Aquifer
MC-DW-4 (backup well)	208	8	McKinnon Creek	340 <sup>1</sup>	AJF-004	S05	LFP Aquifer
MC-SW-1	18.5	6	McKinnon Creek	10	AJF-005	S06	Qva Aquifer
MC-SW-2	18	6	McKinnon Creek	10	AJF-006	S06	Qva Aquifer
MC-SW-3	25	6	McKinnon Creek	10	AJF-007	S06	Qva Aquifer
MC-SW-4	23	6	McKinnon Creek	10	AJF-008	S06	Qva Aquifer
MC-SW-5	23	8	McKinnon Creek	10	AJF-009	S06	Qva Aquifer
MC-SW-6	19	8	McKinnon Creek	10	AJF-010	S06	Qva Aquifer
MC-SW-7	17	6	McKinnon Creek	10	AJF-011	S06	Qva Aquifer
MC-SW-8	21.5	6	McKinnon Creek	10	AJF-012	S06	Qva Aquifer
HV-DW-1	467	16/12	Horizon View	300	BAM-416	S-10	LFP Aquifer
HV-DW-2	467.5	16/12	Horizon View	250	BAM-417	S-11	LFP Aquifer

### 5.3 Summary of Existing Water Rights

Water use by the Lake Forest Park community began with the development of springs in 1909 and later supplemented with water supplied from deeper wells (Ecology, 2013). The District holds four water right certificates that are summarized in Table 2.

**Table 2**  
**Summary of Water Rights**

File Number	Certificate Number	Priority Date	Qi (gpm)	Qa <sub>A</sub> (afy)	Qa <sub>N</sub> (afy)
S1-*01894C	498-A	10/1/1926	208	336	
G1-*00835S	767-D	4/1/1940	100	162	
G1-*05680C	4019-A	7/26/1960	440	704	
G1-*08167C	5839-A	8/27/1966	225		360
Total Available			973	1,202	360

The two well fields operated by the District are the current points of withdrawal for three municipal ground water rights (G1-\*00835S, G1-\*05680C, G1-\*08167C) and one surface water right (S1-\*01894C), which have a total instantaneous quantity (Qi) of 973 gpm. Water rights S1-\*01894C, G1-\*00835S and G1-\*05680C have a total additive annual quantity (Qa) of 1,202 afy and water right G1-\*08167C has a non-additive Qa of 360 afy (Table 2).

The original surface water right (S1-\*01894C) was issued for the eight shallow artesian wells in the MC wellfield. In 2014, the Department of Ecology (Ecology) processed four change applications for the District to consolidate their existing water rights. The purpose of the applications was to provide source flexibility. Currently, the eight shallow wells completed in the **Qva** aquifer draw a total of 100 gpm. This accounts for 161 afy of the total 1,202 afy of additive annual water rights. The remainder (1,041 afy) is pumped from the deep wells in the MC and HV wellfields.



## 6.0 CRITICAL AQUIFER RECHARGE AREA DELINEATION

### 6.1 General

The delineation of CARAs is required under the Growth Management Act (RCW 36.70A.050). A CARA ordinance aims to protect ground water quality and ensure that sufficient aquifer recharge occurs to maintain ground water as a potable water source. Although the specific methodology by which a CARA can be delineated is left to local jurisdictions, a guidance document published by the Washington Department of Community, Trade and Economic Development specifies that aquifer vulnerability should be the foundation for a determination of a CARA (Ecology 2000). Aquifer vulnerability incorporates both aquifer susceptibility and the presence of potential contaminants. With that in mind, Ecology (2000) published a guidance document for establishing critical aquifer recharge area ordinances. Ecology (2000) recommends starting with a susceptibility determination using a rating system which allows a jurisdiction to classify a CARA using a conservative approach, providing a worst-case-scenario for contaminant movement in the subsurface. This method is described in Section 6.2.

### 6.2 Susceptibility Determination Using Rating System

A CARA is delineated as the lateral extent of the uppermost aquifer beneath area of interest. The overall CARA is then categorized based on aquifer susceptibility into areas of low, moderate or high susceptibility to contamination. Aquifer susceptibility is generally based on the rating of three factors:

- 1) Permeability of vadose zone material,
- 2) Vadose zone thickness, and
- 3) Amount of ground water recharge.

#### 6.2.1 Vadose Zone Permeability

The vadose zone encompasses both the surface soils and geologic materials underlying the soil above the aquifer. The permeability of the vadose zone determines the overall ease with which water will travel downward from the land surface to the underlying aquifer. The permeability of the vadose zone is generally estimated based on the infiltration rate of soil types mapped by county soil surveys (Section 2.2, Figure 3). The susceptibility rating based on soil permeability can be assigned using Table 3, below (Ecology, 2000). The susceptibility rating from 0 (very low susceptibility to contamination) to 3 (high susceptibility) based on the mapped soils in the project area are presented on the “*Susceptibility - Soils*” - Figure 8. The area of missing soil survey data in King County (Section 2.2, Figure 3) were assigned a susceptibility rating of 1 (low susceptibility) based on data from surrounding areas.

**Table 3**  
**Soil Permeability Designations Based on Soil Survey (SCS) (Ecology, 2000)**

Condensed Description	Soil Survey Description	Permeability (in/hr)	Rating
Very Slow	Very Slow	<0.06	0
Slow	Slow	0.06 - 0.20	1
	Moderately Slow	0.20 – 0.60	
Moderate	Moderate	0.60 – 2.0	2
	Moderately Rapid	2.0 – 6.0	
Rapid	Rapid	6.0 - 20	3
	Very Rapid	> 20	

Permeability of the underlying geologic units can be estimated based on material type. Ecology (2000) provides guidance for assigning the susceptibility based on the information in Table 4.

**Table 4**  
**Geologic Matrix Designations (Ecology, 2000)**

Condensed Description	Geologic Matrix	Permeability (cm/sec)	Rating
Very Slow	Unfractured Bedrock, Shale	$10^{-9} - 10^{-13}$	0
	Marine Clay, Clay, Sandstone, Hardpan	$10^{-7} - 10^{-9}$	
Slow	Loess, Glacial Till, Fractured Bedrock	$10^{-5} - 10^{-8}$	1
	Silt, Clayey Sands, Weathered Basalt	$10^{-3} - 10^{-7}$	
Moderate	Silty Sands, Fine Sands, Permeable Basalt	$10^{-1} - 10^{-4}$	2
	Clean Sands, Karst Limestone	$10^0 - 10^{-1}$	
Rapid	Sand and Gravel	$10^1 - 10^0$	3
	Gravel	$10^2 - 10^1$	

The susceptibility rating from 0 (very low susceptibility) to 3 (high susceptibility) based on the mapped surficial geology in the project area are presented on the “*Susceptibility - Geology*” - Figure 9.

**6.2.2 Vadose Zone Thickness**

The thickness of the vadose zone is defined as the distance between the land surface and the ground water elevation in the uppermost aquifer, or the “depth to water” in the aquifer. Susceptibility ratings based on depth to water are recommended in Ecology (2000) as outlined in Table 5.

**Table 5**  
**Depth to Water Designations (Ecology, 2000)**

Condensed Description	Depth to Water (feet)	Rating
Very Low	Confined Aquifer	0
	>50	
Low	25-50	1
Moderate	10-25	2
High	0-10	3

The uppermost aquifer beneath the project area is the **Qva** Aquifer (Section 2.4). The depth to water in the **Qva** Aquifer was calculated based on estimated ground water elevation contours (Figure 6) and the elevation of the ground surface based on LiDAR topography data. The susceptibility rating from 0 (very low susceptibility) to 3 (high susceptibility) based on the depth to water in the project area are presented on the “*Susceptibility - Depth to Water*” - Figure 10.

**6.2.3 Ground Water Recharge**

Ground water recharge occurs when water (from precipitation) infiltrates into the ground and moves through the vadose zone into the uppermost aquifer. The guidance provided in Ecology (2000) allows for a simple calculation of recharge as precipitation minus potential evapotranspiration. The disadvantage of this approach is that it does not factor in surface water runoff as a component of the water balance to calculate ground water recharge. This approach would overestimate recharge particularly in areas that generate large volumes of runoff, such as developed (urban) areas. The project area is primarily developed with stormwater infrastructure to collect and convey runoff in ways that limit ground water recharge.

Table 6 presents the susceptibility rating from 0 (very low susceptibility) to 3 (high susceptibility) based on ground water recharge in the project area. Based on the ratings in Table 6, and the estimated annual ground water recharge rate to the Qva Aquifer of 5.8 in/year (Section 4.1.5) the susceptibility rating for the project area from ground water recharge is 2 (moderate).

**Table 6**  
**Ground Water Recharge Designations (Ecology, 2000)**

Condensed Description	Ground Water Recharge (in/yr)	Rating
Very Low	0 - 1	0
Low	1 - 3	1
Moderate	3 - 9	2
High	>9	3

**6.2.4 Overall Susceptibility**

To determine the overall susceptibility of a CARA is based on the sum of the four rating scores determined by the vadose zone permeability (both soil and geologic type), vadose zone thickness, and ground water recharge. The overall susceptibility rating recommended by Ecology (2000) is shown in Table 7.

**Table 7**  
**Overall CARA Susceptibility (Ecology, 2000)**

Description	Cumulative Rating
Low	0 - 3
Moderate	4-7
High	8-12

The overall susceptibility ratings (low, moderate, and high) in the project area are presented on the “CARA Susceptibility” - Figure 11. Note that the CARA susceptibility ratings are based on the uppermost aquifer in the area. This is the **Qva** Aquifer in the project area. There is no specific CARA defined for the deeper LFP Aquifer. The assumption is that if the uppermost **Qva** Aquifer is protected through the CARA designation, the deeper LFP Aquifer will also be protected.

## 7.0 WELL HEAD PROTECTION AREAS

### 7.1 General

Ecology (2000) recommends the use of WHPA boundaries to refine local aquifer susceptibility ratings within CARAs and/or differentiate priority areas within a CARA. A WHPA is defined as the surface and subsurface area surrounding a well or wellfield that supplies a public water supply through which contaminants can potentially pass and eventually reach the well. The Department of Health requires that the 1-, 5, and 10-year time of travel (TOT) boundaries be delineated as WHPAs for each water systems production well and/or wellfield. A 1-year TOT area would be that area around a well or wellfield in which a contaminant moving at the same rate as ground water could reach the wellhead within 1 year. The TOT areas are progressively larger for each increasing TOT boundary. Because the potential for any particular contaminant source to affect water quality in the well and/or wellfield is generally lower the further the source is located from the wellhead, management strategies are generally more restrictive for a 1-year TOT area than for 5- and 10-year TOT areas.

In addition to the 1-, 5-, and 10-year TOT boundaries, a Sanitary Control Area (SCA) is typically designated as a 100-foot radius around production wells. The purpose of the SCA is to delineate an area around production wells that should be tightly controlled to reduce the possibility of direct contamination at the well head. Water purveyors are required to prohibit the construction, storage, disposal or application of any source of contamination within the SCA without the permission of the purveyor (WAC 246-290-135).

WHPAs can be delineated a number of different ways including calculated fixed radius (CFR), analytical calculations, hydrogeologic mapping and numerical ground water flow modeling. The current WHPA boundaries on file with DOH

(<https://fortress.wa.gov/doh/eh/maps/SWAP/index.html>) for the District were delineated the CFR methodology. These WHPA boundaries large circular WHPAs with radii of approximately 1,250 feet for each of the deep wells and in the MC wellfield, and a single 1,250 foot radius WHPA for the eight shallow wells. WHPAs for the HV wellfield have not been submitted to DOH. No TOT boundaries have been submitted to DOH for any of the District's sources. As part of the updated comprehensive water system plan Mundell Engineering (2015) delineated draft WHPAs and TOT boundaries for the deep wells (LFP Aquifer) at the MC and HV wellfields were delineated using the WhAEM2000 model.

For this study, the WHPA and TOT boundaries were delineated for the shallow MC wellfield wells and the deep wells in the MC and HV wellfield using a combination of analytical calculations and hydrogeologic mapping. The following is a description of the methodology used to delineate the WHPA and TOT boundaries for aquifer and each wellfield.

## 7.2 Hydrogeologic Mapping and Analytical Calculations

### 7.2.1 General

Estimating the boundaries of a WHPA using hydrogeologic mapping and analytical calculations involves the identification of the capture zone of the well or wellfield based on aquifer parameters, ground water flow direction, ground water velocity, and boundary conditions that may affect ground water flow. For the purposes of the analyses presented in this report it was assumed that the three deep wells at the MC wellfield act as a single withdrawal point because the wells are located within roughly 350 feet of each other and completed at similar depths within the LFP aquifer. Similarly, the two deep wells at the HV wellfield were also assumed to act as a single withdrawal point. The eight shallow wells in the MC wellfield were treated independently. The pumping rates of the eight shallow MC wells were each assumed to be 10 gpm for a cumulative total of 80 gpm and an annual quantity of 129 afy. The total combined pumping rate from the deep MC wells and deep HV wells were assumed to be the continuous rate (444 and 222 gpm, respectively) necessary to pump the remainder of the annual maximum water right (Section 5.3).

### 7.2.2 WHPA and TOT Boundary Delineation

As the wellfield wells are pumped, they will create a cone of depression in the potentiometric which results in a zone of capture for the wells. The United States Environmental Protection Agency (EPA) defines the zone of capture as the area of the aquifer that recharges the well or wellfield under pumping conditions. Any ground water contamination introduced into the zone of capture will eventually be captured by the well or wellfield. TOT boundaries are used to further modify the zone of capture with respect to time. For example, the TOT area around a well or wellfield can be termed a time-dependent capture zone in that a 1-year TOT represents an area where contaminants could potentially reach the well or wellfield within one year after entering the aquifer.

The capture zone of the deep MC and HV wellfield wells and the eight individual shallow wells in the MC wellfield were determined using the methodology defined by Todd (1980) and Grubb (1993), as summarized in Fetter (1994). The methodology requires input data regarding the continuous pumping rate of the wellfield and wells, the hydraulic conductivity of the aquifer, the initial saturated thickness of the aquifer, and the average hydraulic gradient of the aquifer hydraulically up gradient of the wellfield. A summary of each of these parameters is provided in Table 8. The wellhead protection areas delineated for the shallow wells, including a 100-foot radius SCA around each well, are presented on the “*Well Head Protection Area Map – Qva Aquifer*” – Figure 12. The deep wells at the MC and HV wellfields, including 100-foot radius SCAs, are presented on the “*Wellhead Protection Areas Map LFP Aquifer*” - Figure 13.

**Table 8**  
**Wellfield Pumping Rates and Hydrogeologic Parameters**

Well Field	Pumping Rate (gpm)	Hydraulic Conductivity (ft/d)	Initial Saturated Thickness of Aquifer (ft)	Hydraulic Gradient
MC Shallow Wells	10	40	20	0.025
MC Deep Wells	444	19	80	0.01
HV Deep Wells	222	19	80	0.01

The capture zone analyses estimated that the general WHPA for the shallow wells at the MC wellfield would extend only a few feet down gradient from each well, and would be a maximum of roughly 10 feet wide around each well. Based on the estimated average ground water velocities along the up gradient ground water flow path, the 6-month TOT boundary is located 750 feet up gradient of the wellfield. At that point, the ground water gradient flattens, resulting in the 1-year TOT, 5-year TOT and 10-year TOT boundaries at approximately 1000 feet, 2000 feet, and 3,500 feet up gradient from each well, respectively. Because the shallow wells are located in a close proximity to each other, a single WHPA was delineated to encompass the individual capture zones of each well, and include the 100-foot radius SCA around each well (Figure 12).

The capture zone analyses estimated that the general WHPA for the deep wells at the MC wellfield would extend approximately 880 feet down from the wellfield, and would be a maximum of roughly 5,500 feet wide. Based on the estimated average ground water velocities along the upgradient ground water flow path, the 6-month TOT boundary is located 140 feet upgradient of the wellfield. The 1-year TOT, 5-year TOT and 10-year TOT boundaries are located 275 feet, 1,370 feet, and 2,750 feet upgradient from the wellfield, respectively (Figure 13).

The capture zone analyses estimated that the general WHPA for the deep wells at the HV wellfield would extend approximately 440 feet down gradient from the wellfield, and would be a maximum of roughly 2,770 feet wide. Based on the estimated average ground water velocities along the upgradient ground water flow path, the 6-month TOT boundary is located 140 feet upgradient of the wellfield. The 1-year TOT, 5-year TOT and 10-year TOT boundaries are located 275 feet, 1,370 feet, and 2,750 feet up gradient from the wellfield, respectively (Figure 13).

The WHPAs delineated using the hydrogeologic mapping and analytical calculations methods for both the MC and HV wellfields were generally consistent with the WHPAs delineated by Mundall Engineering using the WhAEM2000 model (Mundell Engineering, 2015).

## 8.0 POTENTIAL CONTAMINANT SOURCES

A potential contaminant source inventory was conducted by Mundall Engineering for their recent update to the District's comprehensive water system plan (Mundall Engineering, 2015). The inventory included database inquiries for both Ecology and the U.S. Environmental Protection Agency (EPA) databased for known contaminated sites. In addition, Mundall Engineering (2015) conducted field surveys to inventory additional potential sources of contamination.

AESI reviewed the Ecology list of active potential contamination sites through the DOH Source water Assessment Program (SWAP) mapping application (<https://fortress.wa.gov/doh/eh/maps/SWAP/index.html>, retrieved August 1, 2016)). In addition, AESI reviewed the EPA database of potential contaminant sources through the EnviroMapper application (<https://www.epa.gov/emefdata/em4ef.home>, retrieved August 1, 2016). The results of those two database queries are presented geographically on the "Contaminant Sources Map" - Figure 14. The potential contaminant sources within the CARA are identified on Figure 14. Facility/site reports for each potential contaminant source within the CARA are included in Appendix C.

Additionally, there are three outfalls that discharge largely untreated stormwater to McKinnon Creek within the MC wellfield. Mundall Engineering (2015) has estimated that the three outfalls (Figure 14) convey runoff from approximately 46 acres of primarily residential development. Runoff from residential properties and streets can become contaminated with metals, petroleum products and other vehicle liquids, fertilizers pesticides and other residential chemicals, and turbidity and suspended solids from erosion. These potential pollutants can contaminate the District's wells depending on the surface-water ground water interactions within the wellfield. The District has recently initiated a testing program to characterize the water quality of the runoff that enters the MC wellfield and evaluate these risks.



## 9.0 LOCAL CARA AND WHPA REGULATIONS

The District currently utilizes two aquifers (**Qva** Aquifer, LFP Aquifer) for potable supply. The interpreted contributing area of the **Qva** Aquifer to the District's MC wellfield and the approximate extent of the LFP Aquifer are presented on Figure 11. The areas of the **Qva** and LFP aquifers up-gradient from the District's wellfields are within the cities of Lake Forest Park and Brier (Figure 11).

In accordance with the GMA (RCW 36.70A), local jurisdictions are required to classify, designate and regulate land use in order to protect critical areas, including CARAs. RCW 36.70A, combined with Article 11 of the Washington State Constitution mandates that local jurisdictions adopt ordinances to protect critical areas. A summary of these local ordinances are provided below and in Table 9.

### 9.1 City of Brier

The City Brier Municipal Code (BMC) Title 18.30 currently regulates land use in CARAs and designates a CARA as:

*“having prevailing geologic conditions associated with infiltration rates that create a high potential for contamination of ground water resources or contribute significantly to the replenishment of ground water.”*

BMC 18.30 also identifies activities allowed within CARAs, requirements for critical areas reports and performance standards for activities within CARAs, and prohibited activities. A copy of BMC 18.30 is included in Appendix D.

### 9.2 City of Lake Forest Park

The City of Lake Forest Park Municipal Code (LFPMC) Chapter 16.16 (Environmentally Sensitive Areas) regulates land use for designated sensitive areas including landslide hazard areas, steep slope hazard areas, wetlands, and streams. Ground water and aquifers are protected through LFPMC 16.16 via wetlands as a means to protect wetland functions (LFPMC 16.15.320-340) including recharge for aquifers and for designated wellhead protection areas (LFPMC 16.16.390). Currently LFPMC 16.16 does not include CARAs as regulated sensitive areas. A copy of LFPMC 16.16 is included in Appendix D.

### 9.3 City of Mountlake Terrace

The City of Mountlake Terrace (City) Municipal Code (MTMC) Chapter 16.15 (Critical Areas) indicates that the City contains no known aquifer recharge areas. However, the code (16.15.080) states that aquifer recharge areas, if identified, shall be classified as “low”, “medium” or “high” significance based on the soil and ground water conditions and risks to

potable water supplies. Land use restrictions including prohibited activities, mitigation measures, and performance standards for certain activities within low, medium or high significance CARAs. A Copy of MTMC 16.15 is included in Appendix D.

### **9.3 King County**

King County has designated areas of low, moderate and high susceptibility for ground water contamination, and designated three categories of CARAs. Category 1 CARAs are mapped as only those areas of high susceptibility and are located within a sole source aquifer or WHPA (KCC 21A.24.311.A). Category 2 CARAs are mapped as those areas of moderate susceptibility within a sole source aquifer or WHPA, or areas of high susceptibility and are not located within a sole source aquifer or WHPA (KCC 21A.24.311.B). Category 3 CARAs areas with low susceptibility to ground water contamination and are located over an aquifer underlying an island that is surrounded by saltwater (KCC 21A.24.311.C). KCC 21A.24 includes development standards for activities and requires a hydrogeologic site evaluation for projects within designated CARAs.

### **9.4 Snohomish County**

Snohomish County (SCC 30.62C.220) has designated CARAs as: sole source aquifers, areas within the 10-year TOT Group A WHPA boundaries, and areas mapped as high, moderate, or low susceptibility to ground water contamination (SCC 30.62C.220). SCC30.62C prohibits certain activities within sole source aquifers, WHPAs and areas of high susceptibility to ground water contamination. SCC 30.62C also requires a hydrogeologic report for any activities within sole source aquifers, WHPAs, or areas with high or moderate susceptibility to ground water contamination.

**Table 9**  
**Local CARA Regulations**

<b>Jurisdiction</b>	<b>Code</b>	<b>CARA Designations</b>	<b>Land-Use Restrictions</b>	<b>Hydrogeologic Assessment Required</b>
City of Brier	BMC 18.30.010	Areas of High Infiltration Rates	Code prohibits certain activities, and requires performance standards for specific activities.	Level 1 or Level 2 Report required, depending on proposed activity.
City of Lake Forest Park	LFPMC 16.16	No CARA designated, WHPA's defined as sensitive areas	Development limited to single family residential development with impervious surface restrictions within WHPAs.	No.
City of Mountlake Terrace	MTMC 16.15	No CARAs designated, however low, medium or high significance aquifer recharge area may be identified based on soil and ground water conditions.	Code prohibits certain activities in high significance CARAs, mitigation is required for some activities in medium or low significance CARAs. Code also included performance standards or best management practices for certain activities in high or low significance CARAs.	No.
King County	KCC 21A.24	Category I, II, and III based on susceptibility ratings and WHPA TOT boundaries	Development standards for certain activities,	Hydrogeologic site evaluation required for projects within CARAs, as determined during critical area review
Snohomish County	SCC 30.62C	Sole Source Aquifers, areas within 10-year TOT WHPAs, areas of low, medium and high sensitivity to ground water contamination	Code prohibits certain activities within sole source aquifers, WHPAs and areas of high sensitivity, identifies activities with special conditions.	Required for any regulated activity within a sole source aquifer, WHPA or areas with high or moderate sensitivity to ground water contamination.

## 10.0 CONCLUSIONS

- The District currently provides municipal water to a residential population of approximately 2,662 people with 889 service connections by utilizing ground water from two production wellfields (Figure 2).
- The District's wellfields include shallow artesian wells completed within the **Qva** Aquifer in the MC wellfield and deep wells completed in the LFP Aquifer in both the MC and HV wellfields (Figures 4 and 5).
- The portion of the **Qva** Aquifer interpreted to contribute to the MC wellfield appears to be primarily beneath the cities of Lake Forest Park and Brier (Figure 6).
- The LFP Aquifer appears to be limited laterally to approximately 5,000 to 6,000 feet east to west and approximately 3 miles north to south. The LFP Aquifer is primarily beneath the cities of Lake Forest Park and Brier (Figure 7).
- In accordance with Ecology (2000) a susceptibility assessment incorporating the permeability of the surface soils (Figure 8), geologic units (Figure 9), depth to ground water (Figure 10), and ground water recharge for the uppermost aquifer (**Qva** Aquifer) utilized by the District.
- The susceptibility assessment categorized CARAs as low, moderate, and high susceptibility of ground water contamination and aquifer recharge (Figure 11).
- A WHPA was delineated for the shallow wells in the MC wellfield using hydrogeologic mapping and analytical calculations (Figure 12).
- WHPAs were delineated for the deep wells in the MC and HV wellfields using hydrogeologic mapping and analytical calculations (Figure 13).
- A contaminant source inventory for the project area was conducted by searing Ecology and EPA databases of potential contaminated sites (Figure 14).
- The Cities of Lake Forest Park, Brier and Mountlake Terrace currently have municipal codes and ordinances designed to regulate land uses and protect critical areas within their city limits.

## 11.0 RECCOMENDATIONS

Our susceptibility assessment has identified CARAs with low, moderate, and high susceptibility of ground water contamination and aquifer recharge for the potable water supply sources for the District. We also identified the SCAs, and the 6-month, 1-, 5-, and 10-year WHPAs for each of the District's wellfields. These areas are primarily beneath the cities of Lake Forest Park and Brier. There are also areas within the City of Mountlake Terrace and unincorporated Snohomish County that we have identified CARAs in relatively close proximity to the District's wellfields. It is our understanding that King County has also expressed interest in our findings. These jurisdictions all have existing regulations in place to regulate land uses and protect critical and sensitive areas.

We recommend the following steps to complete the CARA designation:

- 1. Submit the SCAs and WHPAs to DOH.**

The City of Lake Forest Park, Snohomish County and King County all include WHPAs in their critical or sensitive areas codes. Once the WHPAs are adopted by DOH, these areas will be protected in accordance with these existing codes.

- 2. Submit the CARA classifications of low, moderate, and high susceptibility (Figure 11) to the City of Brier, City of Mountlake Terrace, Snohomish County, and King County.**

These jurisdictions have regulations in place to protect CARAs of different susceptibilities. Once the susceptibility map is incorporated into their respective codes, the CARAs would be protected by their existing regulations.

- 3. Submit the CARA classifications of low, moderate, and high susceptibility (Figure 11) to the City of Lake Forest Park.**

The City of Lake Forest currently does not have any CARAs designated as sensitive areas (LFPMC 16.16). The District should encourage the City of Lake Forest Park to include areas of low, moderate and high susceptibility to ground water contamination and recharge (Figure 11) as sensitive areas in LFPMC 16.16. CARAs. At a minimum, land use regulations for WHPAs outlined in LFPMC 16.16.390 should be applied to the areas mapped as high susceptibility. Land uses in areas mapped as moderate and low susceptibility, outside the WHPAs should be compatible with maintaining natural ground water recharge and protecting ground water quality.

In addition to the land use regulations applied to WHPAs, the District should encourage the City of Lake Forest Park to adopt land use regulations specific to CARAs such as those recommended by Ecology (2000, 2005), including a list of prohibited land uses,

requirements for allowed land uses, exempt activities, special cases, and site specific evaluations for activities allowed within the CARAs

**4. Encourage the City of Brier to include WHPAs and susceptibility ratings in their existing CARA designations.**

Currently, BMC 18.30.010 designates CARAs in a broad sense identifying them as “areas with a critical recharge effect on aquifers used for potable water”. The District should encourage the City of Brier to include areas of low, moderate and high susceptibility to ground water contamination and recharge (Figure 11), and the WHPAs (Figures 12 and 13) as CARAs. At a minimum, land use regulations outlined in BMC 18.30 should be applied to the areas mapped as high susceptibility and areas within the WHPAs. Land uses in areas mapped as moderate and low susceptibility, outside the WHPAs should be compatible with maintaining natural ground water recharge and protecting ground water quality.

Lastly, the District should also continue to monitor and review water production and ground water levels for each production well. Long-term monitoring data is critical to identifying and interpreting seasonal, annual and long term water level trends in the aquifers.

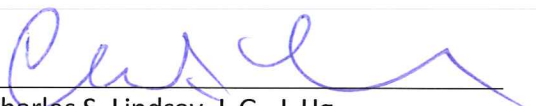
## 12.0 LIMITATIONS

We have prepared this report for the Lake Forest Park Water District regarding the delineation of critical aquifer recharge areas for the District's water supply wells. The information presented in the report is based on the above-described research and limited reconnaissance. AESI has relied upon information provided by others in the description of the relevant geologic/hydrogeologic conditions and water right applications.

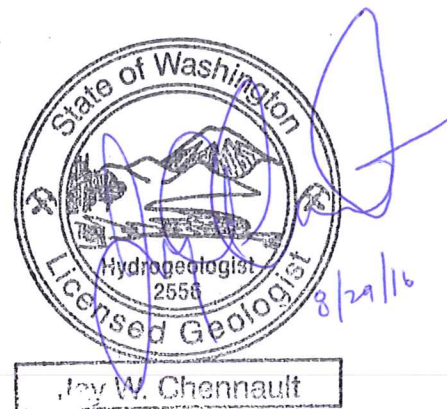
Within the limitations of scope, schedule, and budget, AESI attempted to execute these services in accordance with generally accepted professional principles in the fields of geology and hydrogeology at the time this report was prepared. No warranty, express or implied, is made.

We appreciate the opportunity to be of service to the District on this interesting project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,  
**ASSOCIATED EARTH SCIENCES, INC.**  
Everett, Washington



Charles S. Lindsay, L.G., L.Hg.  
Senior Principal Geologist/Hydrogeologist



Jay W. Chennault, L.Hg., P.E.  
Senior Hydrogeologist

### 13.0 REFERENCES

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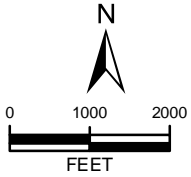
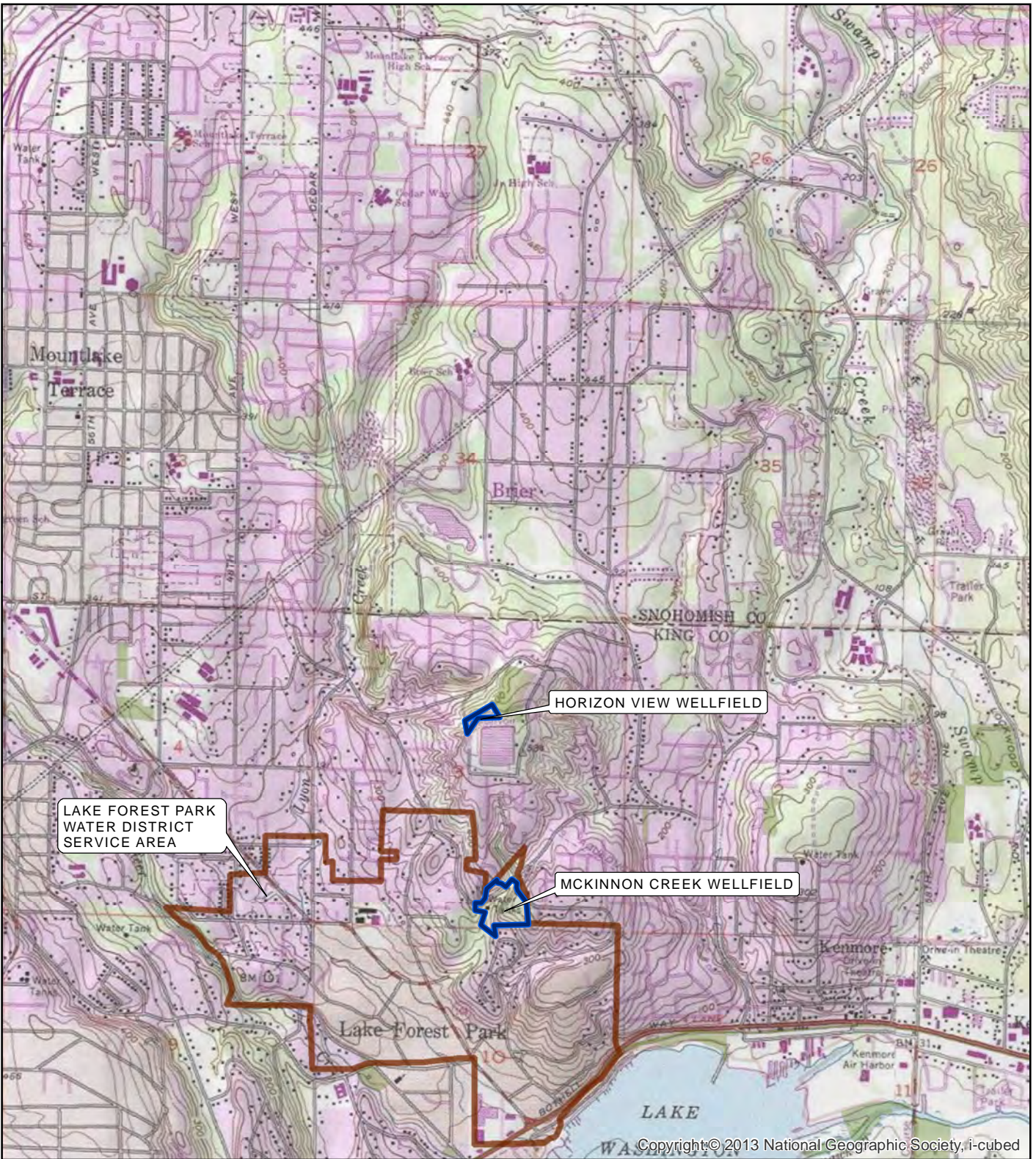


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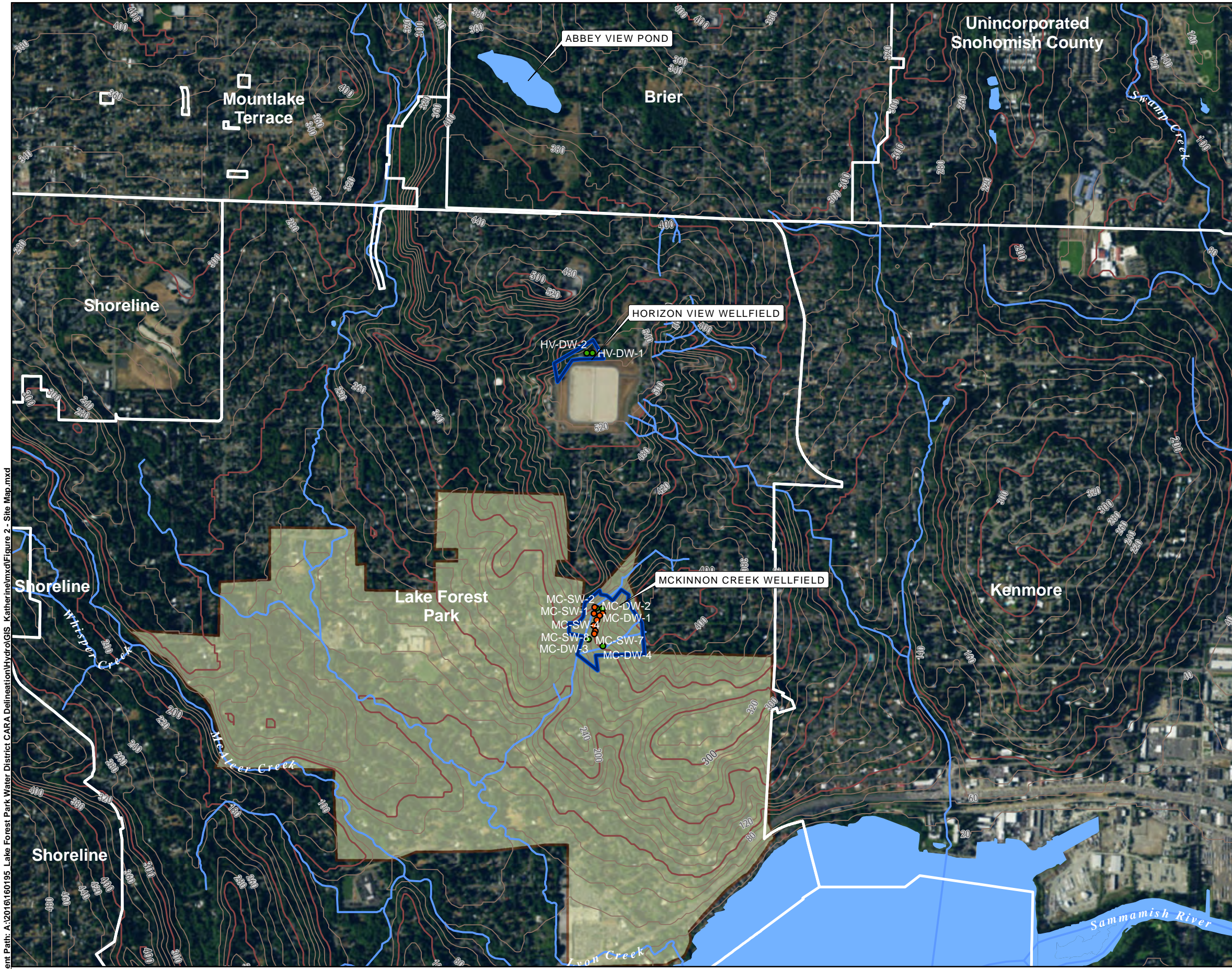
**VICINITY MAP**  
**LAKE FOREST PARK WATER DISTRICT**  
**CARA DELINEATION**  
**LAKE FOREST PARK, WASHINGTON**

DATA SOURCES / REFERENCES:  
 USGS: 24K SERIES TOPOGRAPHIC MAPS  
 KING CO: STREETS, PARCELS 2015  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

NOTE: BLACK AND WHITE  
 REPRODUCTION OF THIS COLOR  
 ORIGINAL MAY REDUCE ITS  
 EFFECTIVENESS AND LEAD TO  
 INCORRECT INTERPRETATION

PROJ NO.	EH160195A	DATE:	7/16	FIGURE:	1
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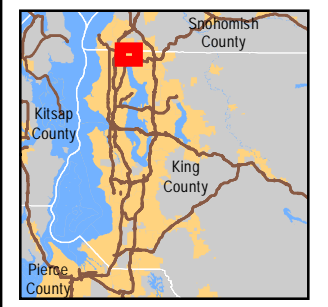


Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS Katherine\mxd\Figure 2 - Site Map.mxd

**LEGEND:**

- DISTRICT PRODUCTION WELLS**
- DEEP WELLS
  - SHALLOW WELLS
  - CONTOUR 100 FT
  - CONTOUR 20 FT
  - LAKE FOREST PARK WATER DISTRICT SERVICE AREA
  - WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



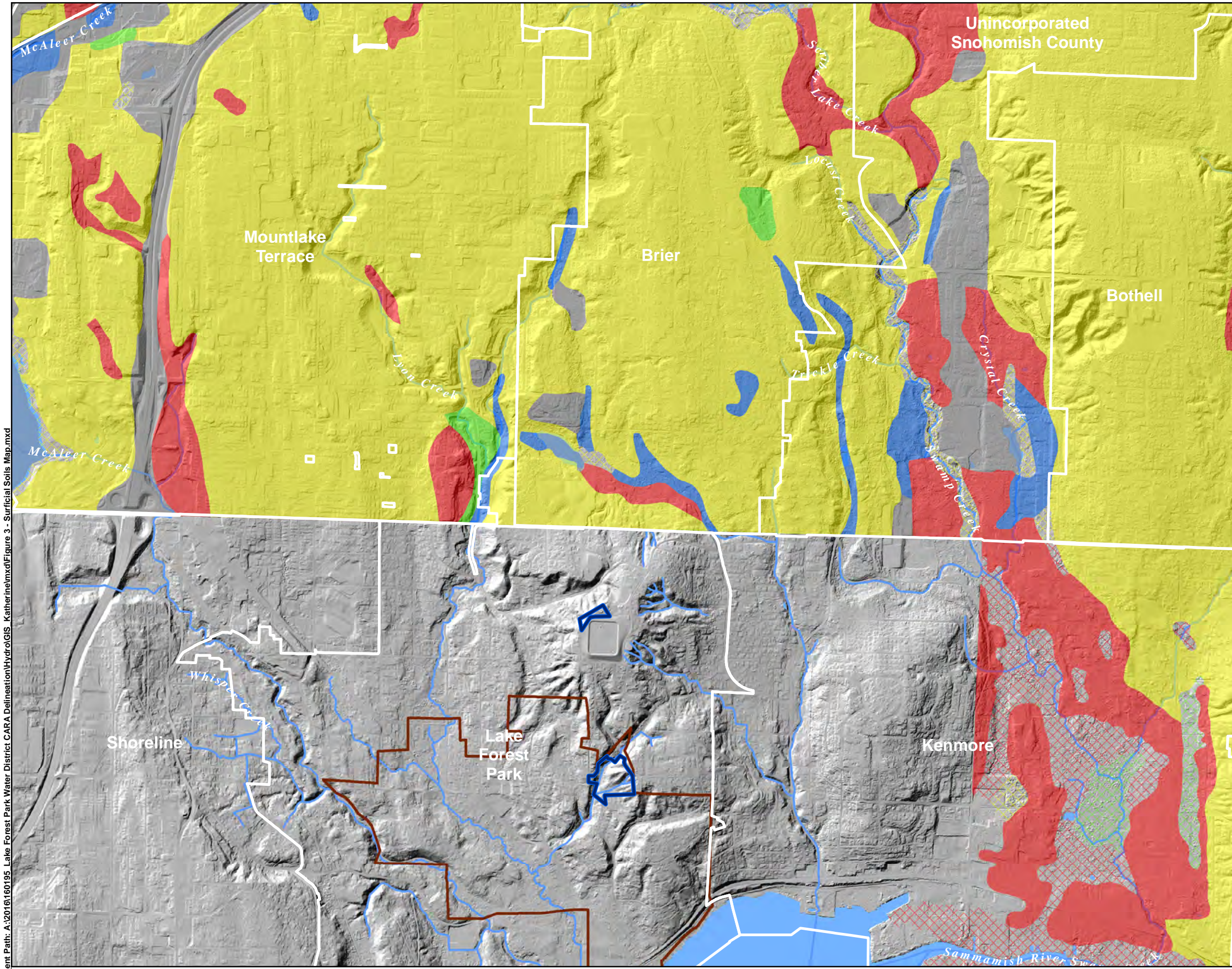
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**SITE MAP**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

PROJ NO.	EH160195A	DATE:	7/16	FIGURE:	2
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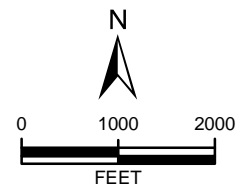
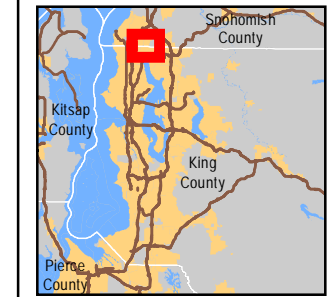
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\HydroGIS\_Katherine.mxd\Figure 3 - Surficial Soils Map.mxd

**LEGEND:**

**Hydrologic Soil Group/Permeability**

- A (>0.3 in/hr)
- A/D (>0.3 in/hr if drained, <0.05 in/hr if undrained)
- B (0.15-0.3 in/hr)
- B/D (0.15-0.3 in/hr if drained, <0.05 in/hr if undrained)
- C (0.05-0.15 in/hr)
- C/D (0.05-0.15 in/hr if drained, <0.05 in/hr if undrained)
- D (<0.05 in/hr)
- No Data
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
- WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

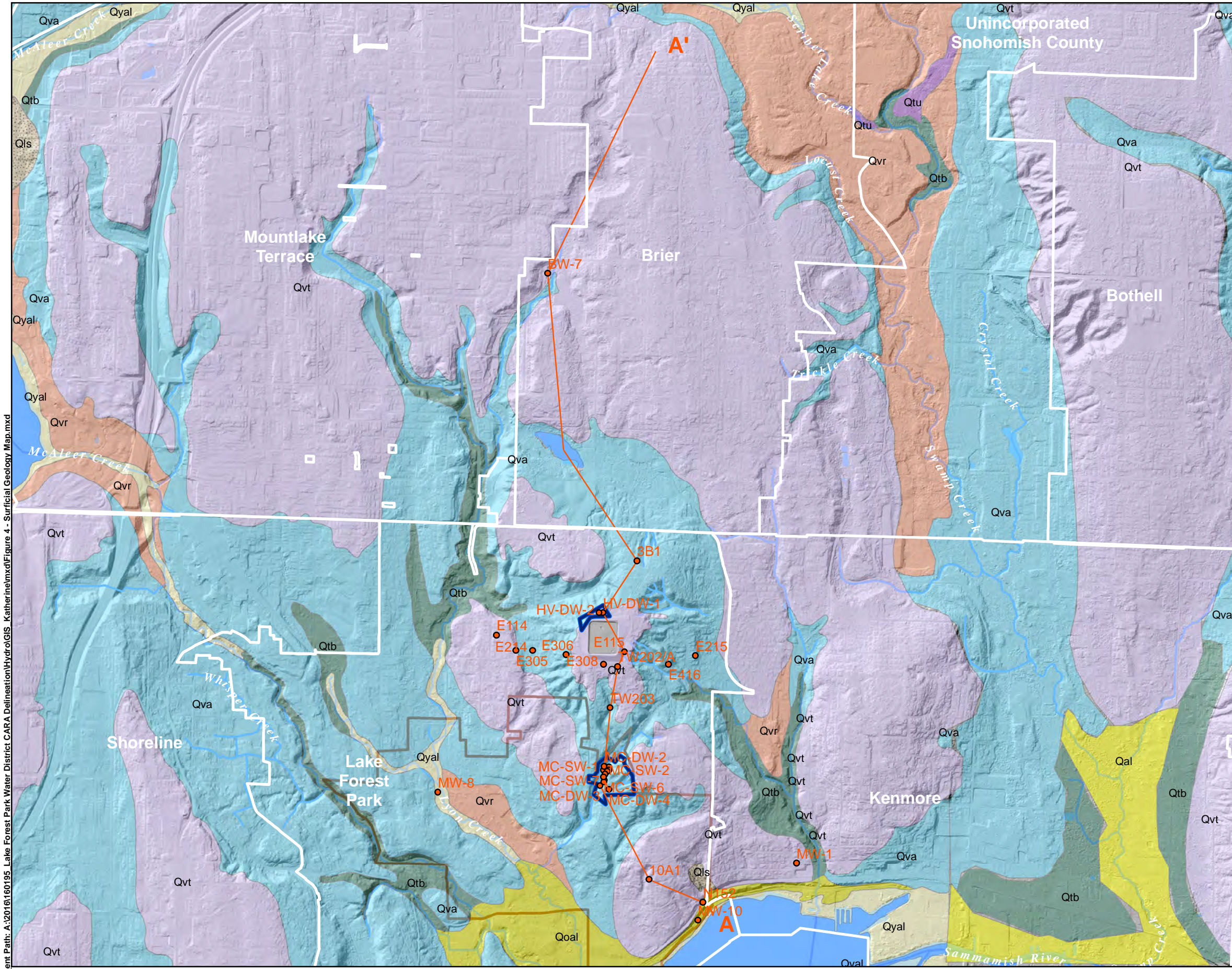


BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**SURFICIAL SOILS MAP**  
**LAKE FOREST PARK WATER DISTRICT**  
**CARA DELINEATION**  
**LAKE FOREST PARK, WASHINGTON**



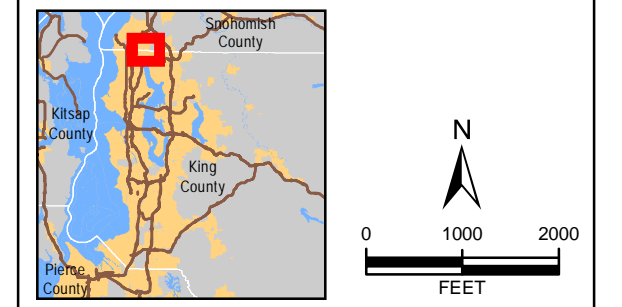


Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\HydroGIS\_Katherine.mxd Figure 4 - Surficial Geology Map.mxd

**LEGEND:**

- SELECTED WELLS
  - GEOLOGIC CROSS SECTION A-A'
- Geologic Unit Symbol**
- Qp - Peat
  - Qls - Landslide deposits
  - Qal - Alluvium
  - Ql - Lake deposits
  - Qyal - Younger alluvium
  - Qoal - Older alluvium
  - Qvr - Vashon recessional outwash
  - Qvt - Vashon till
  - Qva - Vashon advance outwash
  - Qtb - Transitional beds
  - Qtu - Till, undivided
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
  - WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



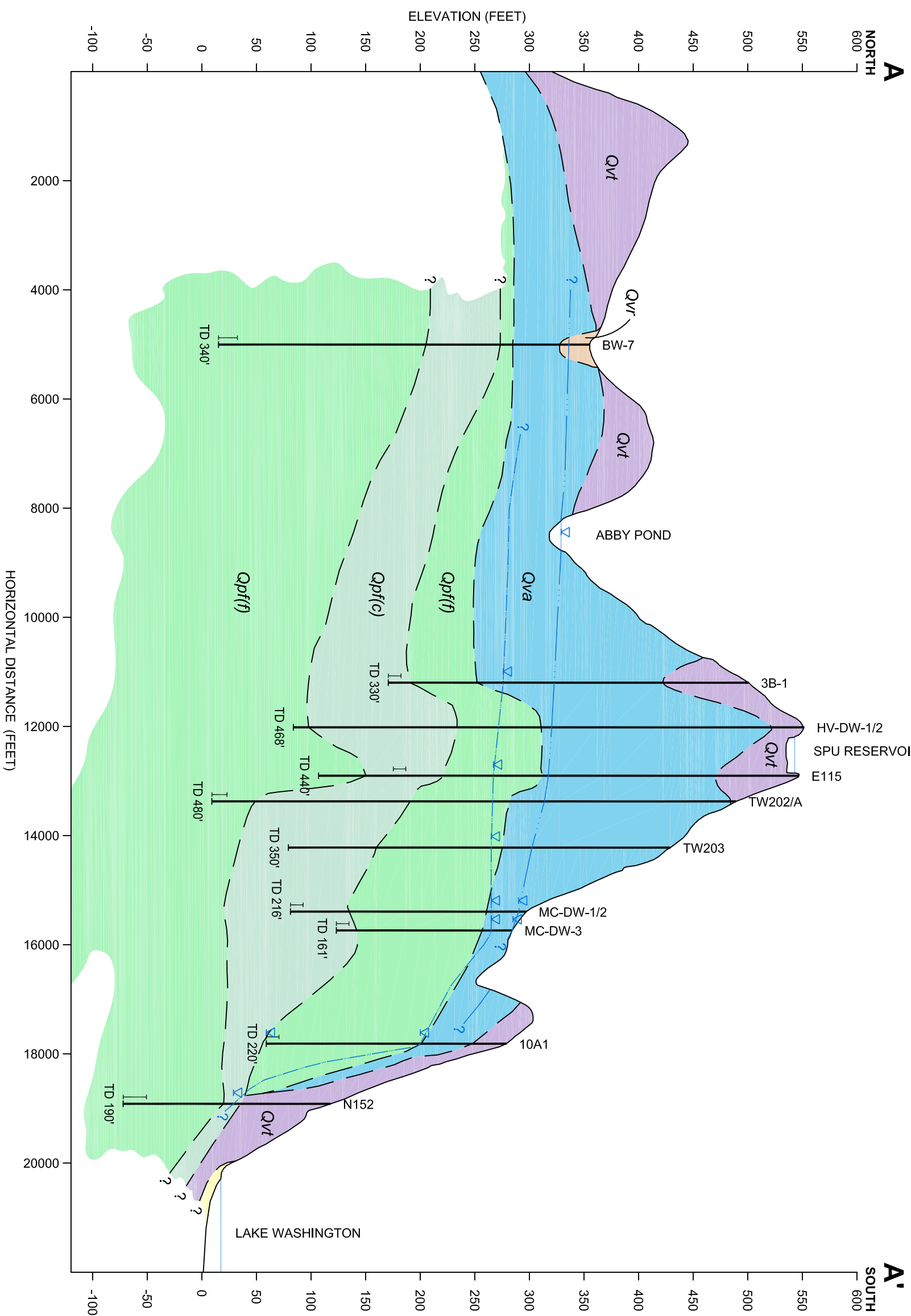
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**SURFICIAL GEOLOGY MAP**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

PROJ NO. EH160195A	DATE: 7/16	FIGURE: 4
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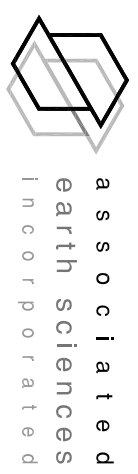
- LEGEND:**
- QUATERNARY ALLUVIUM
  - VASHON RECESSONAL OUTWASH
  - VASHON LODGEMENT TILL
  - VASHON ADVANCE OUTWASH
  - PRE-FRASER DEPOSITS - PREDOMINATELY FINE GRAINED
  - PRE-FRASER DEPOSITS - PREDOMINATELY COARSE GRAINED UNDIFFERENTIATED

- BORING
  - SCREENED INTERVAL
  - TD TOTAL DEPTH OF BORING
  - GEOLOGIC CONTACT
  - INFERRED GROUND WATER TABLE - Qva AQUIFER
  - INFERRED PIEZOMETRIC SURFACE - LFP AQUIFER
- VERTICAL EXAGGERATION = 20X

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE

NOTES:  
 1. THE SUBSURFACE CONDITIONS PRESENTED IN THIS GEOLOGIC CROSS-SECTION ARE BASED ON AN INTERPRETATION OF CONDITIONS ENCOUNTERED IN WIDELY SPACED EXPLORATIONS COMPLETED AT THE SUBJECT SITE AND RELEVANT SITE INFORMATION DEVELOPED AND PROVIDED BY OTHERS. THE SUBSURFACE INTERPRETATIONS PRESENTED IN THIS GEOLOGIC CROSS-SECTION SHOULD NOT BE CONSTRUED AS A WARRANTY OF ACTUAL SUBSURFACE CONDITIONS AT THE SITE. OUR EXPERIENCE HAS SHOWN THAT SOIL AND GROUND WATER CONDITIONS CAN VARY SIGNIFICANTLY OVER SMALL DISTANCES.

NOTE: BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

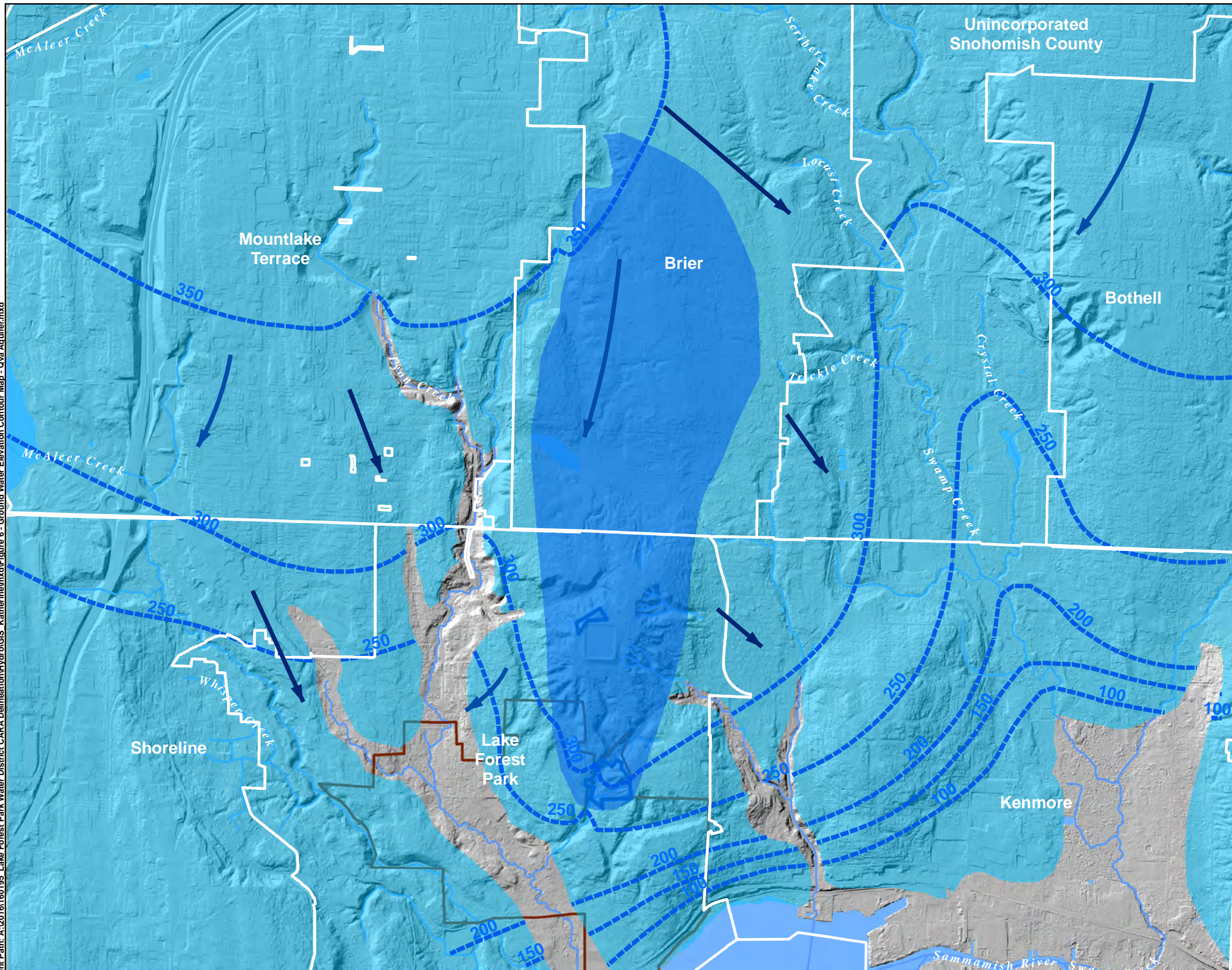


**SCHEMATIC HYDROGEOLOGIC CROSS-SECTION A - A'**  
 LAKE FOREST PARK W.P. CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

PROJ. NO.: EH160195A    DATE: 7/16    FIGURE: 3

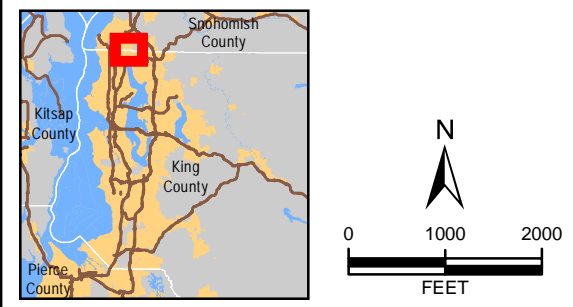


Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 6 - Ground Water Elevation Contour Map - Qva Aquifer.mxd



- LEGEND:**
- GROUND WATER ELEVATION (FT)
  - QVA AQUIFER - POTENTIALLY UPGRADIENT FROM DISTRICT WELLFIELDS
  - QVA AQUIFER EXTENT
  - WELLFIELDS
  - LAKE FOREST PARK WATER DISTRICT SERVICE AREA

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



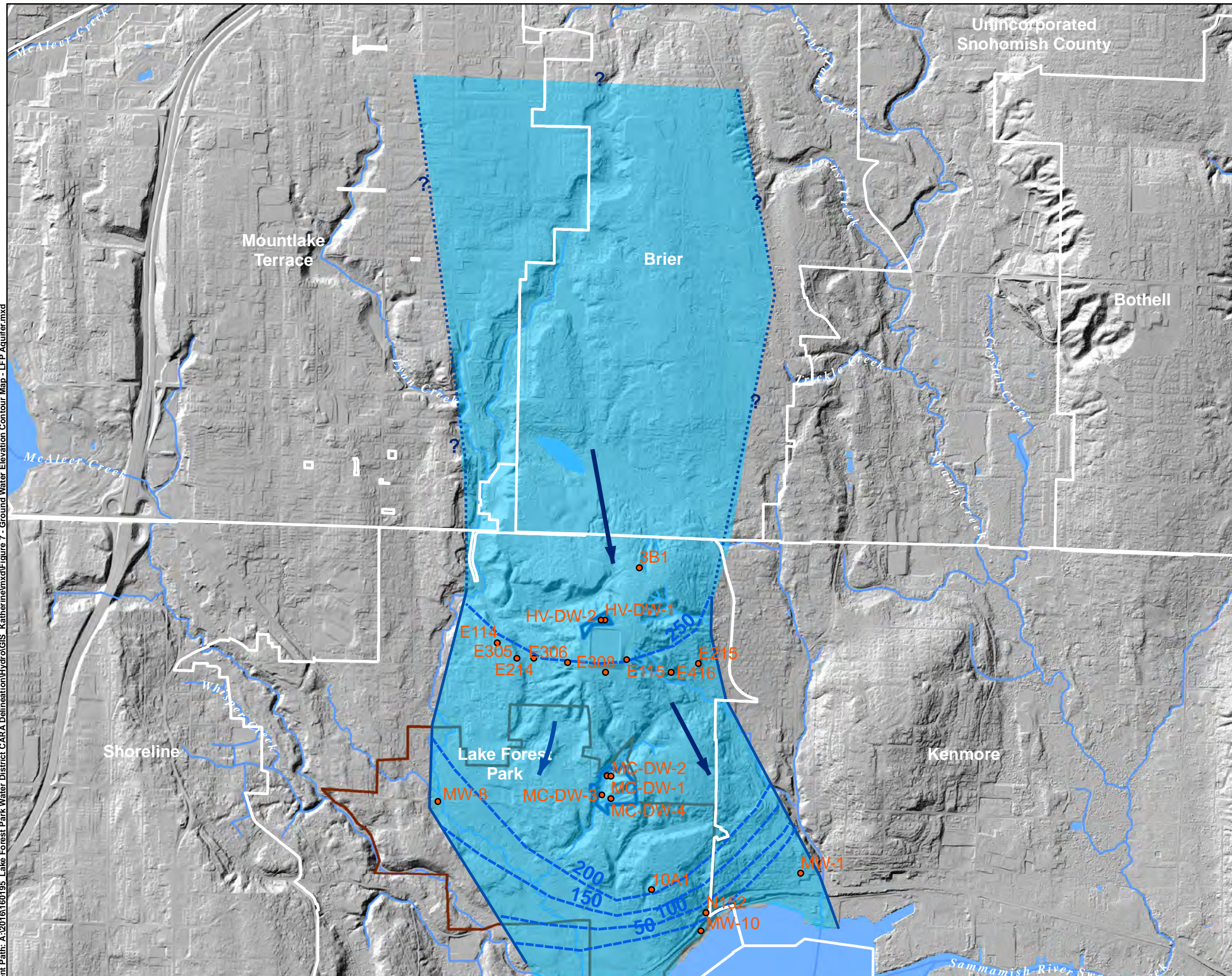
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**QVA AQUIFER**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

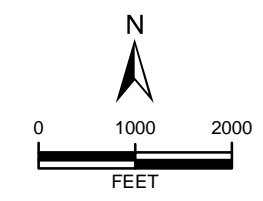
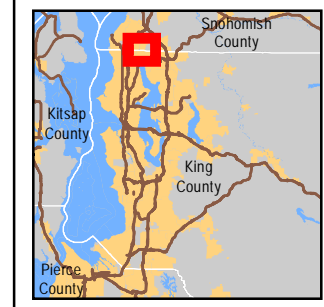


Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 7 - Ground Water Elevation Contour Map - LFP Aquifer.mxd



- LEGEND:**
- GROUND WATER FLOW DIRECTION
  - SELECTED WELLS
  - GROUND WATER ELEVATION (FT)
  - PROJECTED LFP AQUIFER BOUNDARY
  - LFP AQUIFER BOUNDARY (CDM, 2005)
  - LFP AQUIFER EXTENT
  - WELLFIELDS
  - LAKE FOREST PARK WATER DISTRICT SERVICE AREA

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

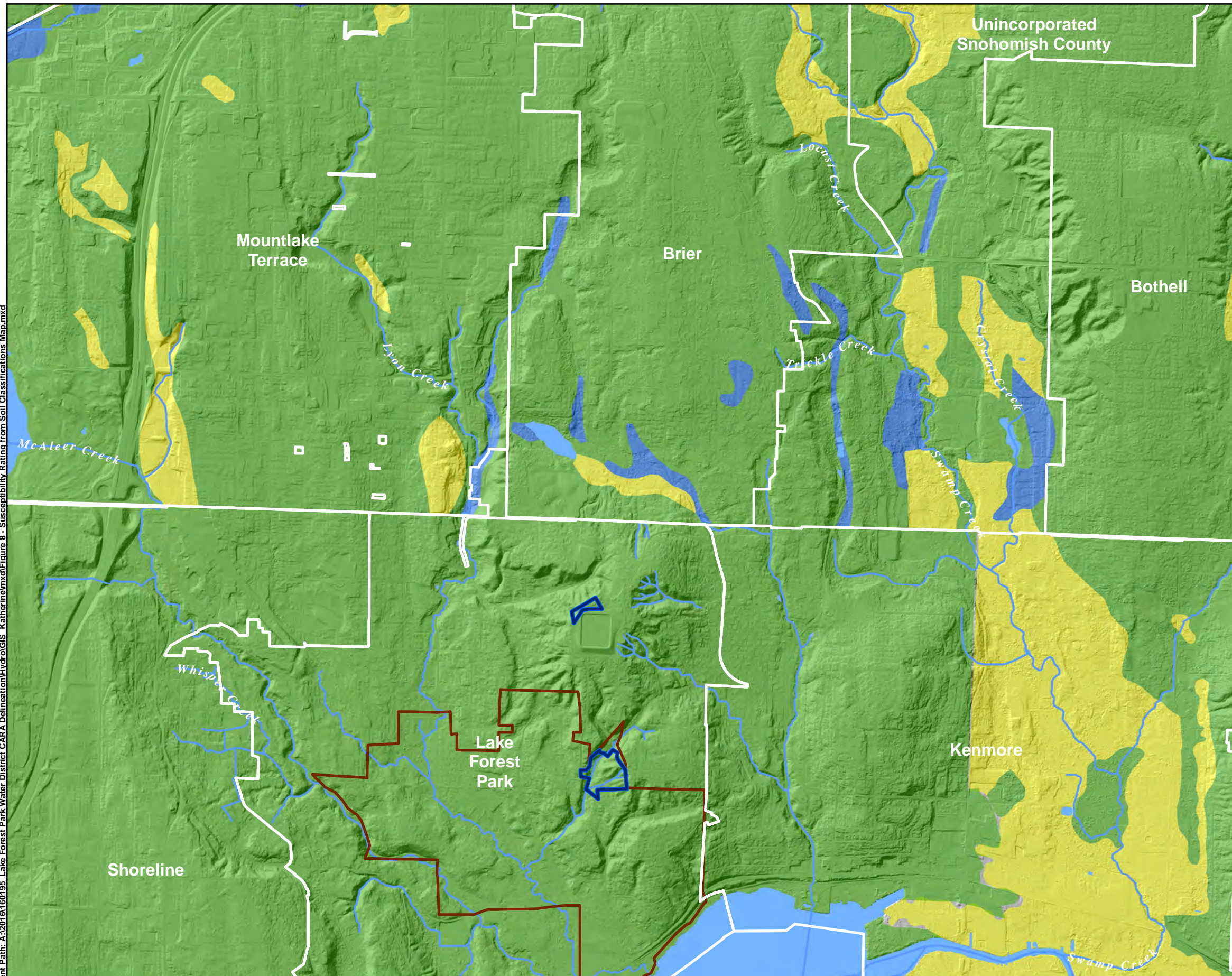


**LFP AQUIFER**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

PROJ NO.	DATE:	FIGURE:
EH160195A	7/16	7



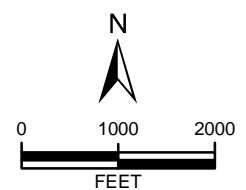
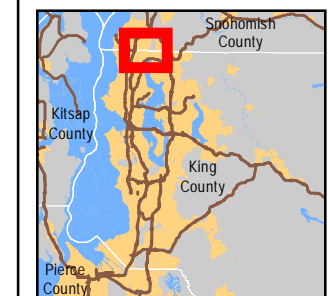
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 8 - Susceptibility Rating from Soil Classifications Map.mxd



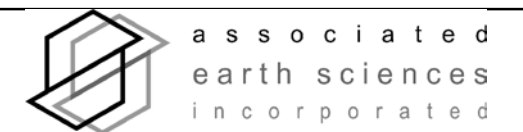
**LEGEND:**

- Susceptibility Rating = 0 (very slow permeability)
- Susceptibility Rating = 1 (slow permeability)
- Susceptibility Rating = 2 (moderate permeability)
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
- WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



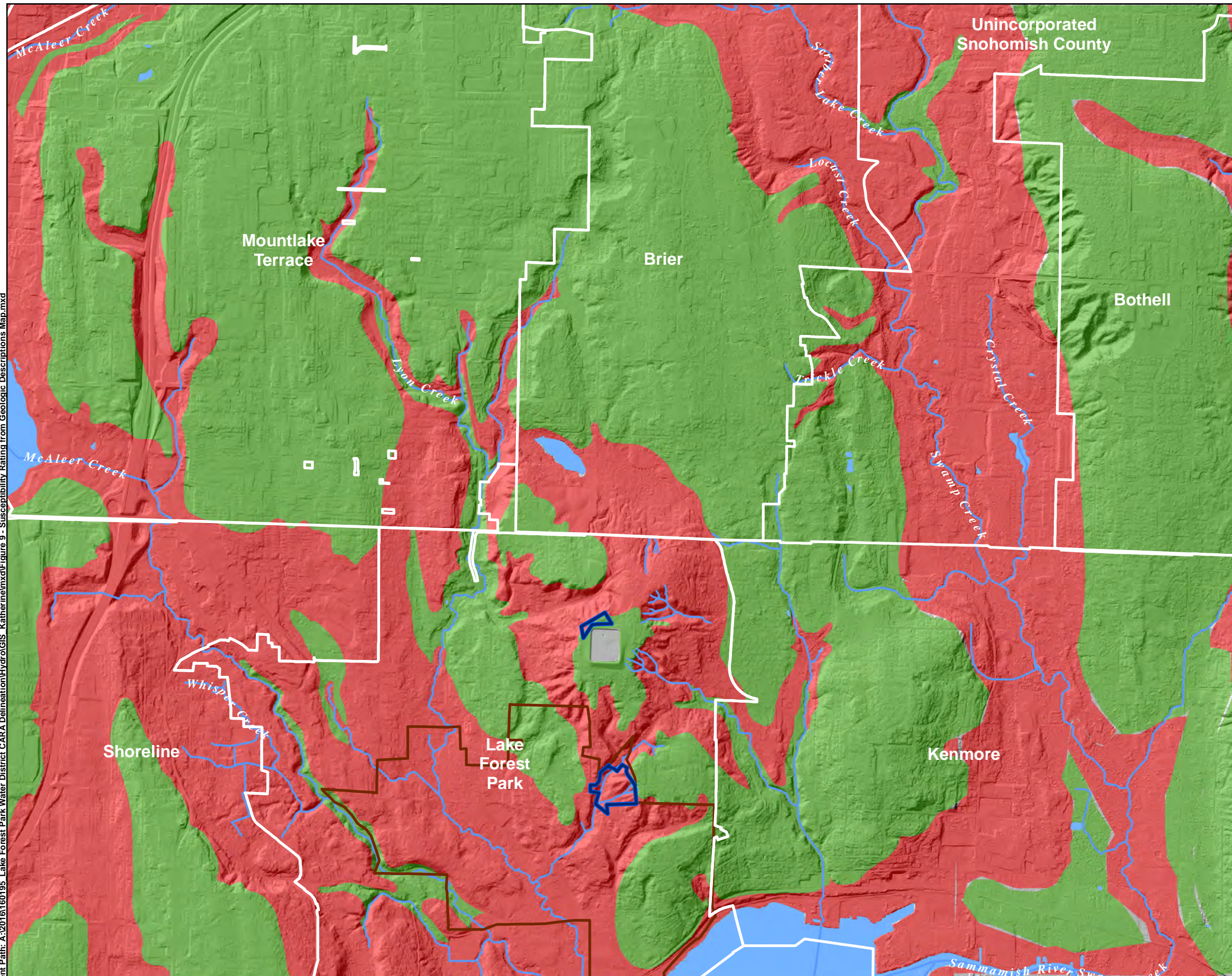
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**SUSCEPTIBILITY - SOILS**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON



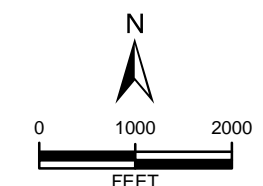
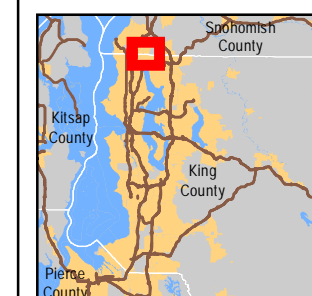
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 9 - Susceptibility Ratings from Geologic Descriptions Map.mxd



**LEGEND:**

- Susceptibility Rating = 1 (glacial till)
- Susceptibility Rating = 3 (sand and gravel)
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
- WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

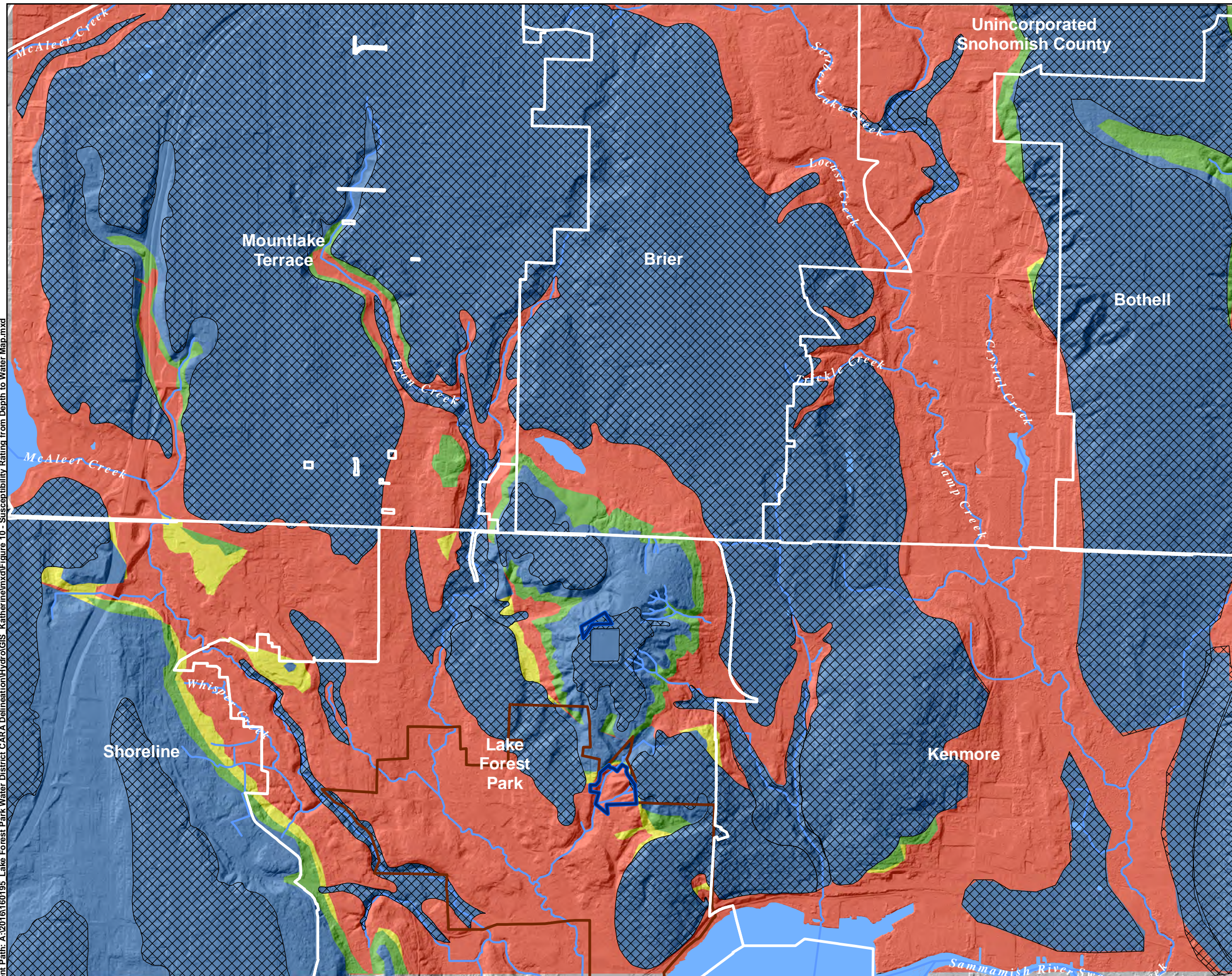


**SUSCEPTIBILITY - GEOLOGY**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON

PROJ NO.	EH160195A	DATE:	7/16	FIGURE:	9
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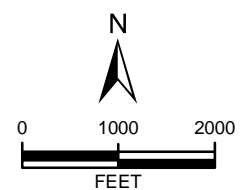
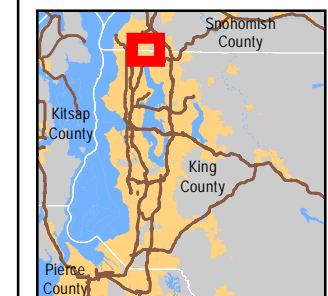
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS Katherine\mxd\Figure 10 - Susceptibility Rating from Depth to Water Map.mxd



**LEGEND:**

-  CONFINED
-  Susceptibility Rating = 0 (confined; >50 FT)
-  Susceptibility Rating = 1 (25-50 FT)
-  Susceptibility Rating = 2 (10-25 FT)
-  Susceptibility Rating = 3 (0-10 FT)
-  LAKE FOREST PARK WATER DISTRICT SERVICE AREA
-  WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



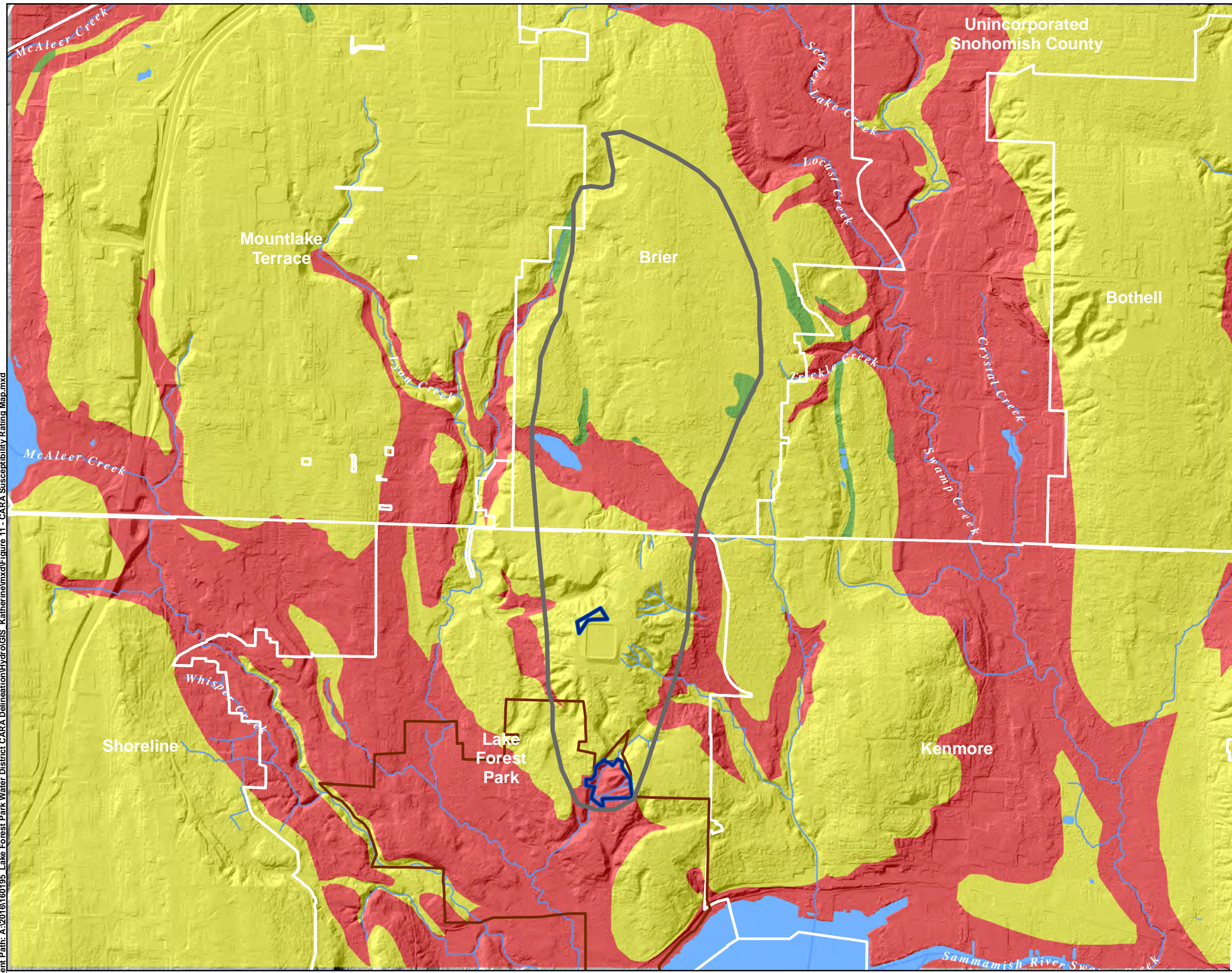
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**SUSCEPTIBILITY - DEPTH TO WATER**  
**LAKE FOREST PARK WATER DISTRICT**  
**CARA DELINEATION**  
**LAKE FOREST PARK, WASHINGTON**



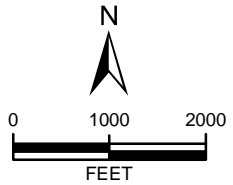
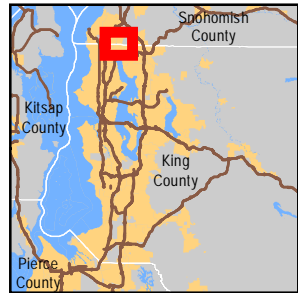
Document Path: A:\2016\160195\_Lake Forest Park Water District CARA Delineation\HydroGIS\_Katherine\mxd\Figure 11 - CARA Susceptibility Rating Map.mxd



**LEGEND:**

- QVA AQUIFER - POTENTIALLY UPGRADIENT FROM DISTRICT WELLFIELDS
- Low Susceptibility
- Moderate Susceptibility
- High Susceptibility
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
- WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



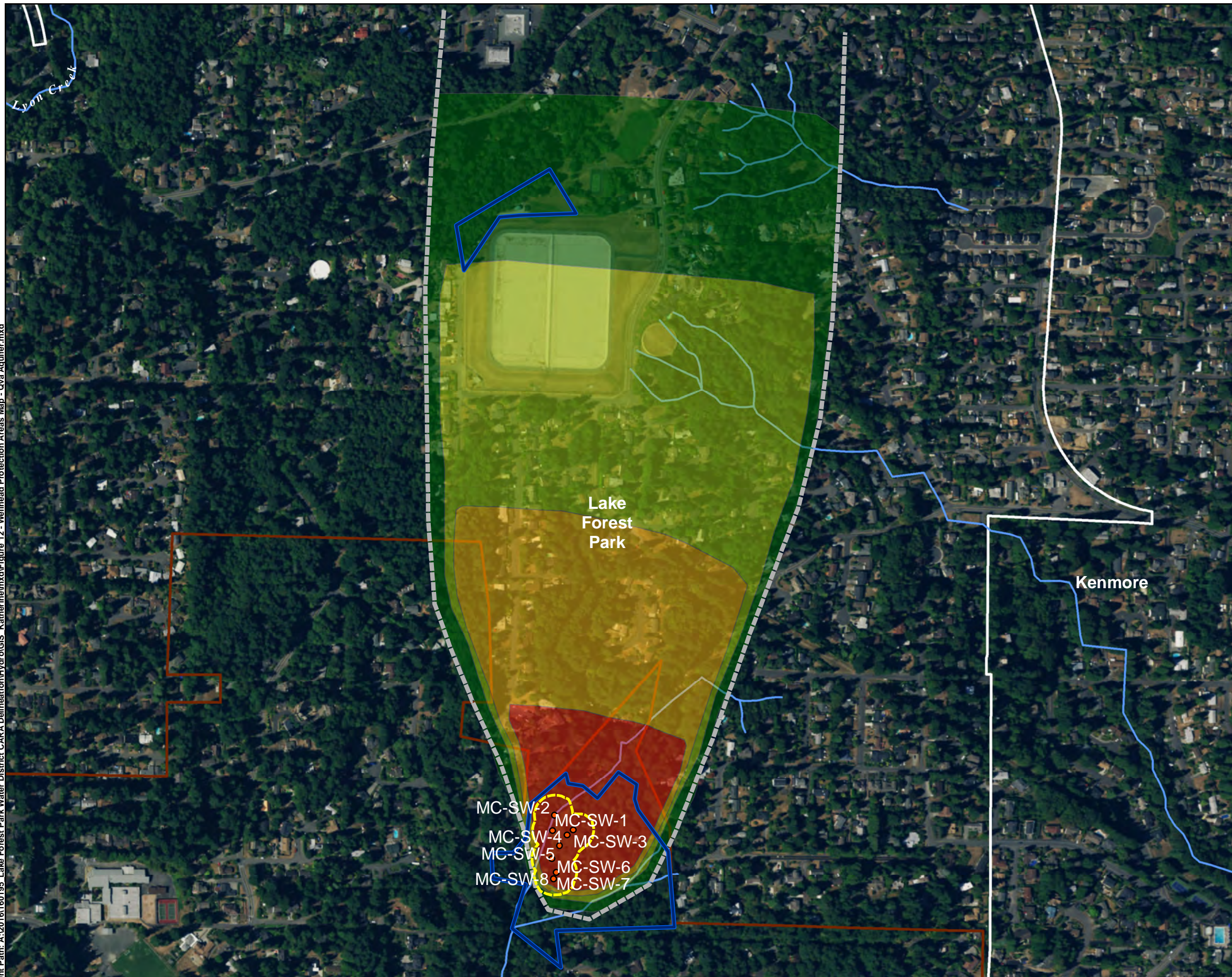
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**CARA SUSCEPTIBILITY**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON



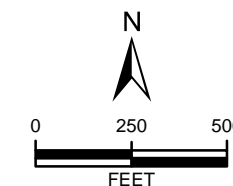
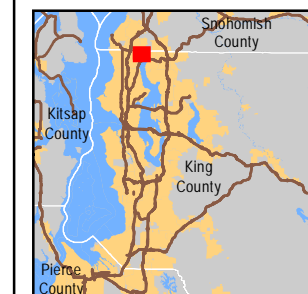
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 12 - Wellhead Protection Areas Map - Qva Aquifer.mxd



**LEGEND:**

- SANITARY CONTROL AREA
- DISTRICT SHALLOW WELLS
- CAPTURE ZONE
- Time of Travel Boundaries**
- 6-MONTH
- 1-YEAR
- 5-YEAR
- 10-YEAR
- WELLFIELDS
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



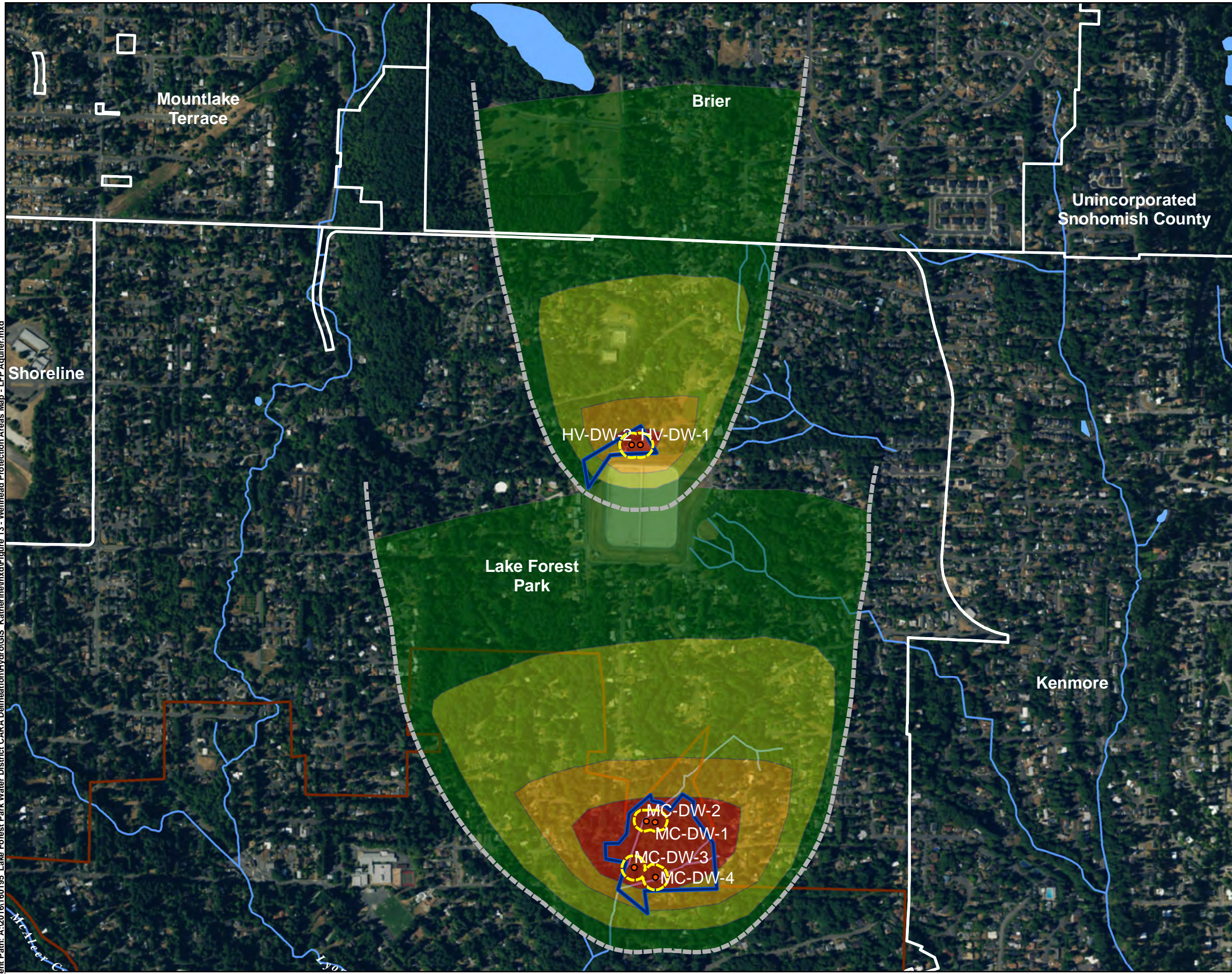
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**WHPA - QVA AQUIFER**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON



Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS Katherine\mxd\Figure 13 - Wellhead Protection Areas Map - LFP Aquifer.mxd



**LEGEND:**

- SANITARY CONTROL AREA
- DISTRICT DEEP WELLS
- CAPTURE ZONE
- Time of Travel Boundaries**
- 6-MONTH
- 1-YEAR
- 5-YEAR
- 10-YEAR
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA
- WELLFIELDS

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



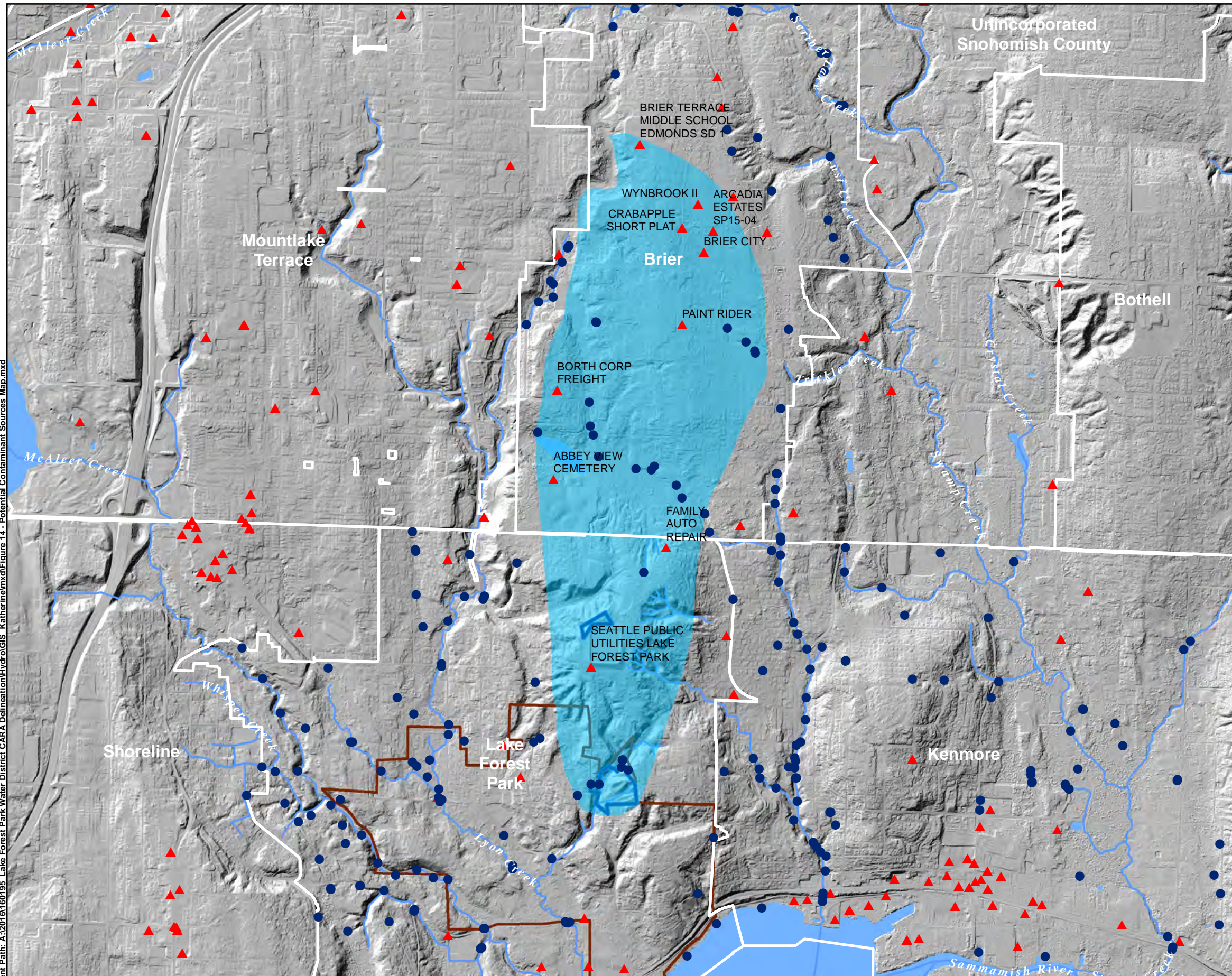
BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**WHPA - LFP AQUIFER**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON



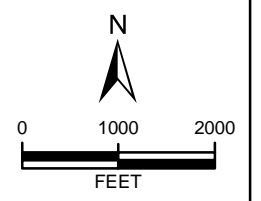
Document Path: A:\2016\160195 Lake Forest Park Water District CARA Delineation\Hydro\GIS\_Katherine\mxd\Figure 14 - Potential Contaminant Sources Map.mxd



**Legend:**

- ▲ ACTIVE POTENTIAL CONTAMINANT SITES
- STORMWATER OUTFALL
- QVA AQUIFER - POTENTIALLY UPGRADIENT FROM DISTRICT WELLFIELDS
- WELLFIELDS
- LAKE FOREST PARK WATER DISTRICT SERVICE AREA

DATA SOURCES / REFERENCES:  
 PSLC: LIDAR 2000-2010 SUPERMOSAIC, GRID CELL SIZE IS 6'.  
 WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.  
 KING CO: STREETS, HYDRO  
 WADNR: GEOLOGY 24K  
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION



**POTENTIAL CONTAMINANTS**  
 LAKE FOREST PARK WATER DISTRICT  
 CARA DELINEATION  
 LAKE FOREST PARK, WASHINGTON



## **APPENDIX A**

### **North Seattle College Preliminary Report of Field Investigations**



# Preliminary Report of Field Investigations

Lake Forest Park Water District / Resource Protection Evaluation Project

John Figge, North Seattle College

*This project was undertaken as an academic research exercise, conducted by students and faculty at North Seattle College. This report is prepared in an advisory capacity to professional geotechnical consultants who have been contracted for this project, and should not be taken as a professional report. None of the participants in this project are licensed to provide professional advice to the public in this field.*

## **Project Description:**

The Lake Forest Park Water District taps both deep and shallow local aquifers to provide water for its community. The deep aquifers are in pre-Vashon sediments, while the shallow aquifer appears to reside in advance outwash deposits (Esperance Sand) of the Vashon Stage. While the recharge area for the deeper aquifers remains somewhat speculative, the recharge area for the shallow aquifer is exposed around Abbey View Pond, and in scattered locales to the south. Here, surface exposures of advance outwash sands permit water to infiltrate into the groundwater system.

Above (north of) Abbey View Pond, the upper portion of the potential recharge area is mapped as being covered in Vashon Till. Glacial till being relatively impermeable, this would exclude this parcel from being part of the recharge area. This study was undertaken to confirm that this area is, as mapped, surfaced in glacial till.

## **Research Methodology:**

Eight sites were selected from across this area for sampling (see Figure 1). Two were in park settings, while the rest were on road right-of-way corridors. Sampling was conducted using a 4-inch bucket auger, capable of reaching depths of 6 feet. In the majority of cases, this was an inadequate depth to sample the native sediments.

## **Synopsis:**

Preliminary borehole logs are shown in Table 1

While analytical work on the samples is still pending, a few observations can be gained from our field experience

- There is good reason to believe that the western half of the area surveyed is indeed covered in till. While two of our sites (1 and 4) were likely in fill material, sites 2 and 3 appear to be in glacial till. Of equal significance, the presence of shallow ground-water (site 1) and a shallow sub-surface stream (site 4) support the existence of an impermeable surface over this area.
- None of our samples in the eastern half of the area encountered material which was definitively glacial till. In each case, it would appear that we were sampling fill material. All were relatively soft sediments, despite an abundance of rocks. Much of the fill does appear to have been derived from glacial till, which would suggest that it is a local material, but none of our samplings encountered in-situ strata.

The greater amount of fill material encountered in the eastern half may be coincidental, or might reflect different patterns of utility installation. In most ROW locations, we were sampling in close proximity to utility lines, somewhat assuming that they were installed in narrow trenches. Particularly with heavy

sewer and water lines, this is not always the practice. None of the locations (aside from Bobcat Park) were settings which appear to have been filled on a broader scale, making it more likely that we were sampling from the disturbed periphery of the utility corridor. In the western half, site 4 was likely in similar material.

The unfortunate fact is that in communities with extensive underground utilities, much of the right-of-way is used for this purpose. Moreover, utility trenches can be pretty deep, particularly for sewer lines. Along the periphery of deeper trenches, sampling to depths of 5-6 feet wouldn't always be enough to reach undisturbed material. Because the fill material contains rocks of substantial dimensions, attempts at sampling deeper using hand equipment would probably not be successful.

### Further Study

Further study for this project will include a more detailed survey of the area to determine if there are surface exposures, construction projects, or other settings where the native surface can be determined. The results of that survey, including the analytical work on sediment samples, will be included in the concluding report for this project.

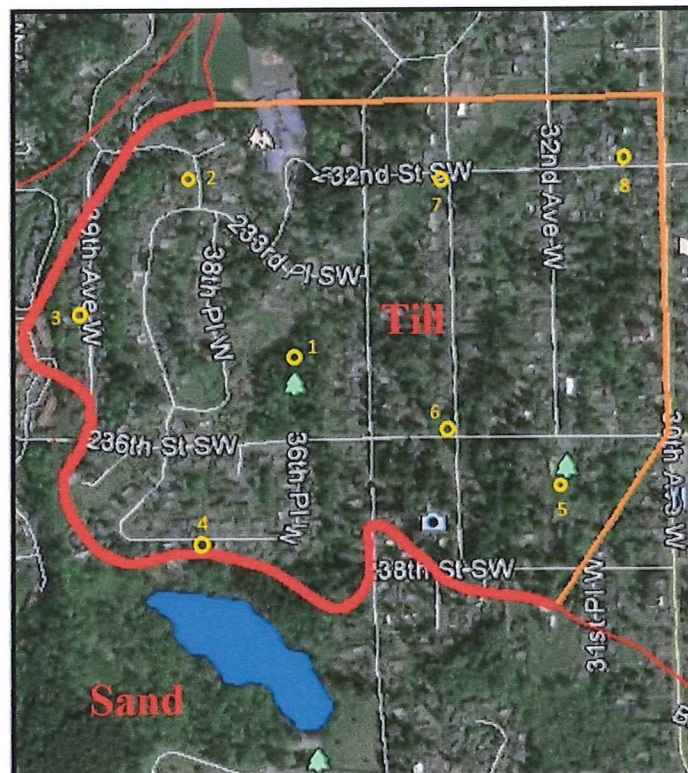
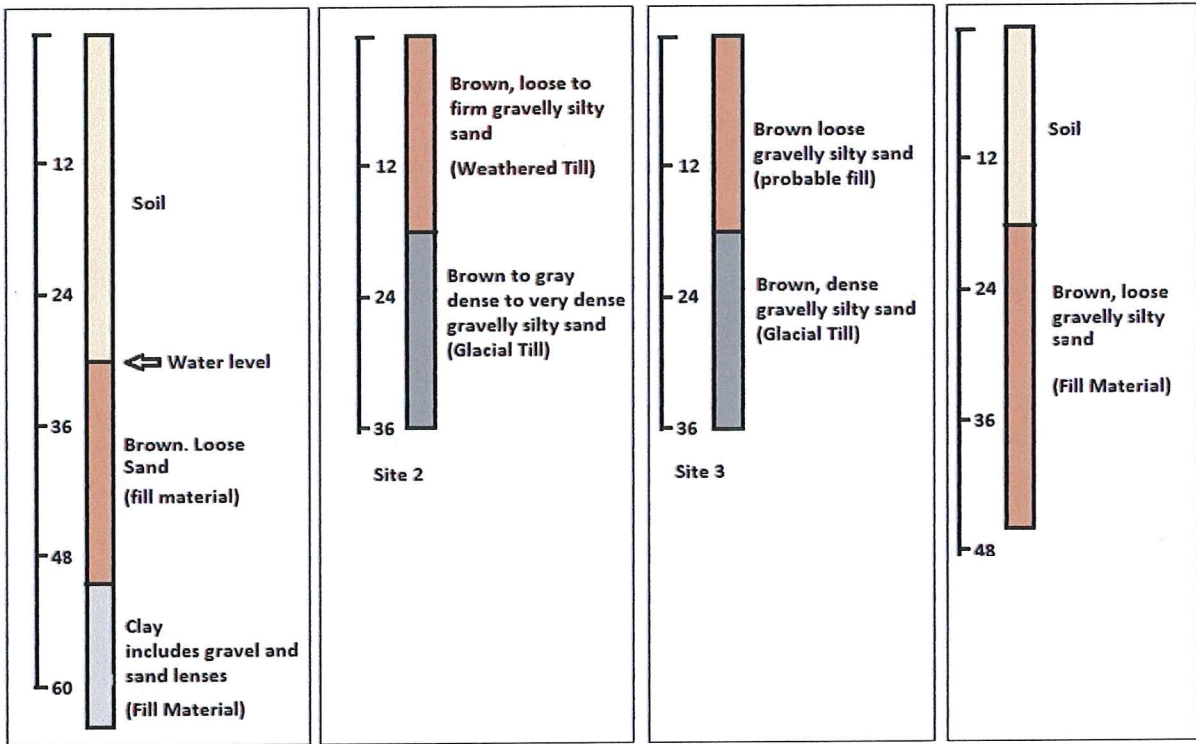


Figure 1: Study Area

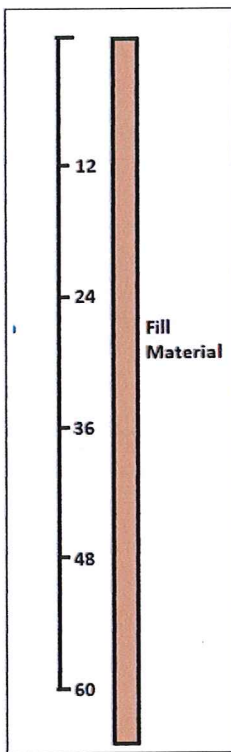


SITE 1

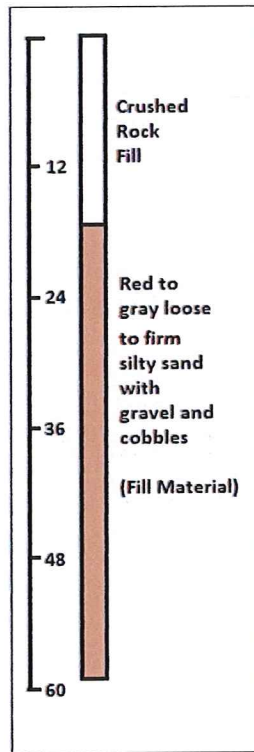
SITE 2

SITE 3

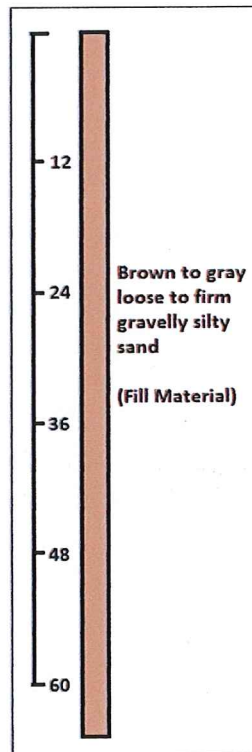
SITE 4



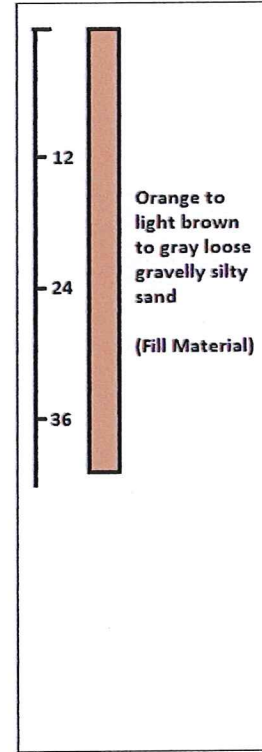
SITE 5



SITE 6



SITE 7



SITE 8

TABLE 1: BOREHOLE LOGS (depths are shown in inches below surface)

## **APPENDIX B**

### **Selected Geotechnical Boring Logs and Water Well Reports**

WELL #1

STATE OF WASHINGTON  
DEPARTMENT OF CONSERVATION  
AND DEVELOPMENT

WELL LOG

Date 1940, 19        No. Decla/ 835  
 Cert. # 767-D

Record by J. W. Hueter

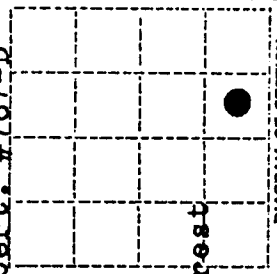
Source G. W. Decla. Claim

Location: State of WASHINGTON  
 County King

~~xxx~~ Firtst Add. to Lake Forest  
xxx Lot 15, Block 13

1/4 3 T. 26 N., R. 4 E. W.

Drilling Co.                         



Address                         

Method of Drilling drilled Date        19       

Owner Lake Forest Park Water Co., a Corp.

Address Seattle, Wash.

Land surface, datum                          ft. above        below       

CORRE- LATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
------------------	----------	---------------------	-----------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	<u>no record</u>		
Pump	<u>Test:</u>		
	<u>Dim:</u> <u>172'</u>		
	<u>Dd:</u> <u>70'</u>		
	<u>Pump:</u> <u>Turbine, 100 g.p.m.</u>		
	<u>Motor:</u> <u>3 hp</u>		
	<u>Yield:</u> <u>100 g.p.m. (Claim)</u>		
	<u>Perfor:</u> <u>Screen from 6' to 10' perfo</u>		





# WATER WELL REPORT

WELL # 3

Application MC-DW-3

26/4E/09/12

STATE OF WASHINGTON

Permit No. 26

(1) OWNER: Name City of Lake Forest Park Address \_\_\_\_\_

(2) LOCATION OF WELL: County King — ne. 1/4 NW. 1/4 Sec. 9 T. 26 N., R. 4 E. W. 1

Bearing and distance from section or subdivision corner \_\_\_\_\_

(3) PROPOSED USE: Domestic  Industrial  Municipal   
 Irrigation  Test Well  Other

(4) TYPE OF WORK: Owner's number of well NEW 3  
 (if more than one) 4  
 New well  Method: Dug  Bored   
 Deepened  Cable  Driven   
 Reconditioned  Rotary  Jetted

(5) DIMENSIONS: Diameter of well 12 inches.  
 Drilled 161 ft. Depth of completed well 161 ft.

(6) CONSTRUCTION DETAILS:  
 Casing installed: 12" Diam. from 0 ft. to 161 ft.  
 Threaded  " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Welded  " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes  No   
 Type of perforator used \_\_\_\_\_  
 SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes  No   
 Manufacturer's Name Johnson  
 Type stainless Model No. \_\_\_\_\_  
 Diam. 12 Slot size .060 from 144 ft. to 159 ft.  
 Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes  No  Size of gravel: \_\_\_\_\_  
 Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes  No  To what depth? 20 ft.  
 Material used in seal cement  
 Did any strata contain unusable water? Yes  No   
 Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
 Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name Fairbanks Morse  
 Type line shaft turbine HP 15

(8) WATER LEVELS: Land-surface elevation \_\_\_\_\_ ft.  
 Static level 18' 1" above mean sea level \_\_\_\_\_ ft.  
 \_\_\_\_\_ ft. below top of well Date 7-5-74  
 Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
 Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
 Was a pump test made? Yes  No  If yes, by whom? city  
 Yield: 350 gal./min. with 20 ft. drawdown after 8 hrs.  
 " " " " " "  
 " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_  
 Bailor test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
 Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
 Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes  No

(10) WELL LOG:  
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation

MATERIAL	FROM	TO
sand and gravel	0	5
brn silty sand and gravel	5	11
blue silty sand and gravel	11	24
brn silty sand and gravel	24	29
blue silty sand and gravel	29	46
blue silty sand	46	98
blue silty sand and gravel	98	142
water bearing sand and gravel	142	159
blue silty sand	159	161

Work started 6-20-74, 19\_\_\_\_ Completed 7-9-74, 19\_\_\_\_

**WELL DRILLER'S STATEMENT:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Northwest Pump & Drilling Co.  
 (Person, firm, or corporation) (Type or print)

Address 3245 Auburn Way So. Auburn, Wa.

[Signed] Richard B. DeTener  
 (Well Driller)

License No. 0097 Date 8-29-74, 19\_\_\_\_

(USE ADDITIONAL SHEETS IF NECESSARY)





# WATER WELL REPORT

Start Card No. 004586

STATE OF WASHINGTON

MC-DW-1

Water Right Permit No. \_\_\_\_\_

(1) OWNER: Name King County Water Dist 83 Address 17705 Bullinger Way NE  
 (2) LOCATION OF WELL: County King N. R. \_\_\_\_\_ W.M. \_\_\_\_\_  
 (2a) STREET ADDRESS OF WELL (or nearest address) \_\_\_\_\_

(3) PROPOSED USE:  Domestic  Industrial  Municipal   
 Irrigation  Test Well  Other   
 DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) #4  
 Abandoned  New well  Method: Dug  Bored   
 Deepened  Cable  Driven   
 Reconditioned  Rotary  Jetted

(5) DIMENSIONS: Diameter of well 8 inches.  
 Drilled 235 feet. Depth of completed well 210 ft.

(6) CONSTRUCTION DETAILS:  
 Casing installed: 8 Diam. from 2 ft. to 191 ft.  
 Welded  Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Liner installed  Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Threaded  Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes  No   
 Type of perforator used \_\_\_\_\_  
 Size of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 \_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes  No   
 Manufacturer's Name Johnson  
 Type 304 Model No. \_\_\_\_\_  
 Diam. 8 Slot size 40 from 210 ft. to 200 ft.  
 Diam. 8" Slot size 20 from 200 ft. to 190 ft.

Gravel packed: Yes  No  Size of gravel \_\_\_\_\_  
 Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes  No  To what depth? 20 ft.  
 Material used in seal Cement  
 Did any strata contain unusable water? Yes  No   
 Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
 Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
 Type: \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
 Static level 57 ft. below top of well Date \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
 Static level 57 ft. below top of well Date \_\_\_\_\_  
 Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
 Artesian water is controlled by \_\_\_\_\_ (Op. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
 Was a pump test made? Yes  No  If yes, by whom? Driller  
 Yield: 350 gal./min. with 19 ft. drawdown after 3 hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_  
 Boiler test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
 Airstat \_\_\_\_\_ gal./min. with stem set at \_\_\_\_\_ ft. for \_\_\_\_\_ hrs.  
 Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
 Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes  No

## (10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown sand	0	6
Brown silty sand + gravel	6	16
Gray sand + gravel	16	20
Gray silty sand	20	33
Gray silt	33	43
Dark silty organics	43	47
Gray silt	47	111
Gray silty sand - gravel	111	136
Sand + gravel (water)	136	151
Sand (water)	151	158
Sand much coarser (water)	158	161
Sand + gravel (water)	161	174
Sand	174	187
Sand - gravel (water)	187	205
Sand some gravel	205	210
Sand	210	214
Sand + gravel	214	218
Sand + gravel silty clay	218	227
Gray clay sand + gravel	227	232
Gray clay	232	235

Work started 4-1-88 19. Completed 4-20-88 19.

### WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc  
 (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Tule Rd R

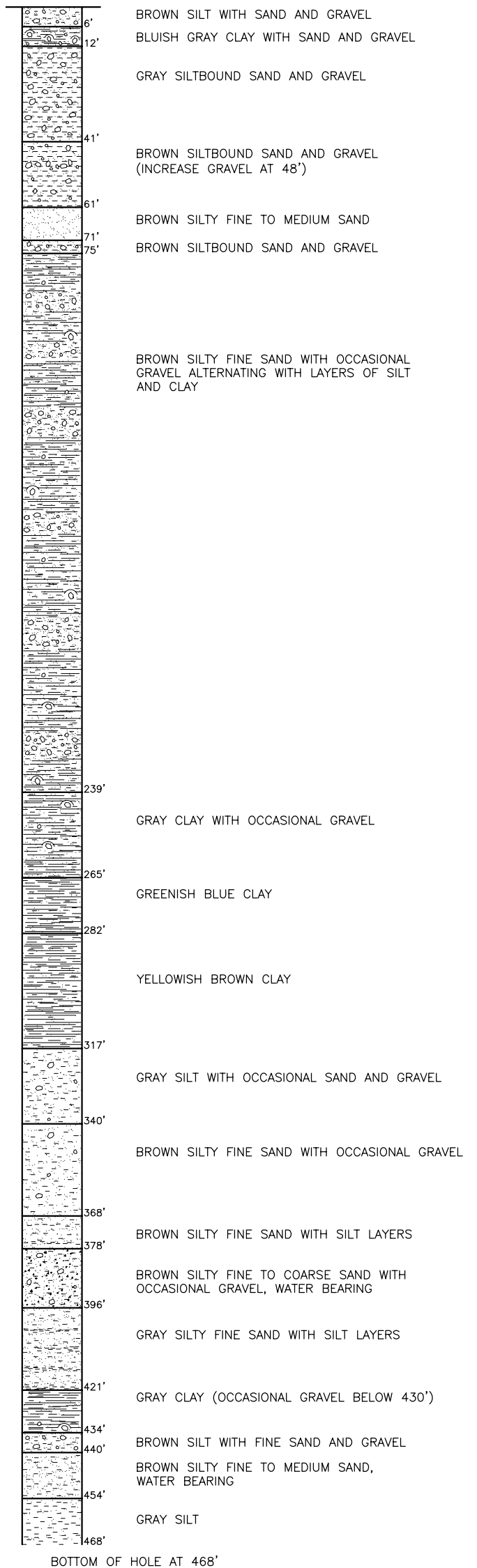
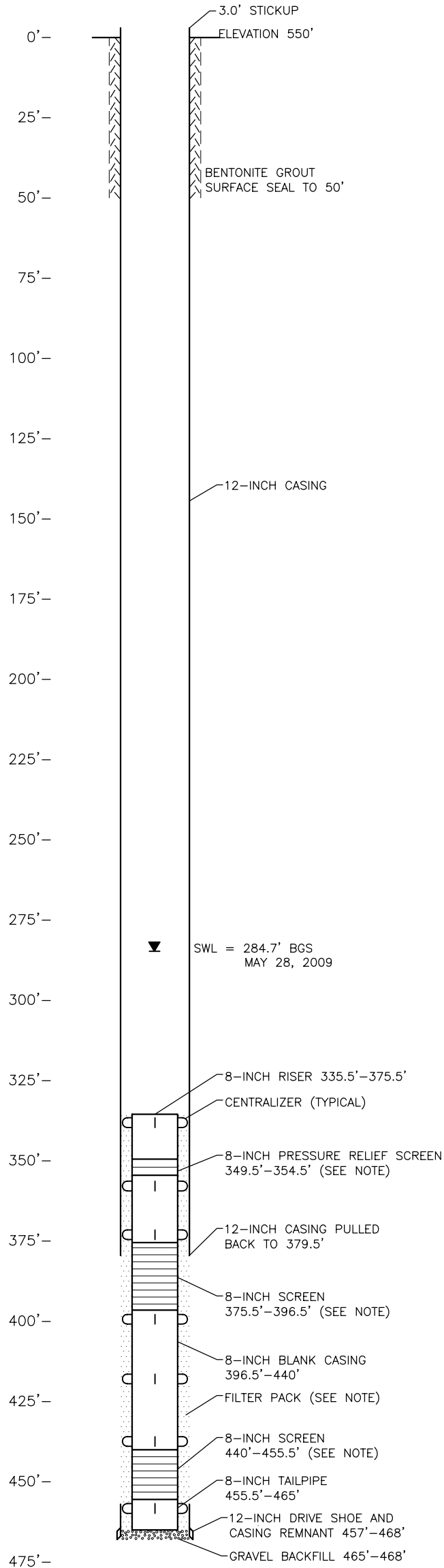
(Signed) [Signature] License No. 1094  
 (WELL DRILLER)

Contractor's Registration No. \_\_\_\_\_ Date 4-21 1988



Construction Detail

Geologic Log



NOTES:  
ALL WELL SCREENS ARE 40-SLOT (0.040-INCH OPENING) STAINLESS STEEL  
V-WIRE WRAP. FILTER PACK IS 8x12 COLORADO SILICA SAND PRODUCT.

Figure 3



PM: MTW  
August 2009  
2093-002A

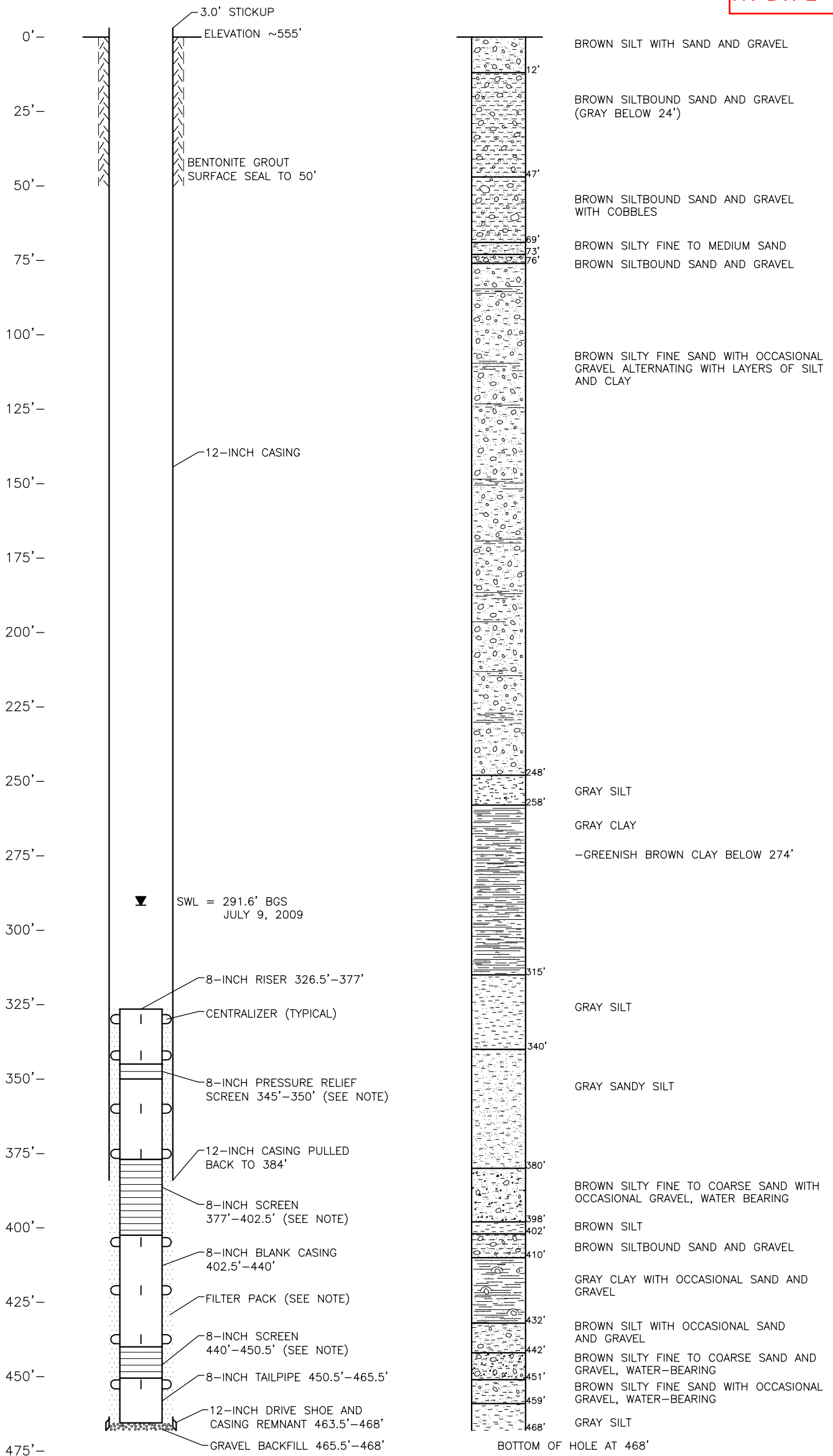
King County  
T 26 N/R 04 E - 03

Figure 3  
Construction Detail and Geologic Log for Well 1  
Lake Forest Park Water District: SPU-AS Wells 1 & 2

Construction Detail

Geologic Log

HV-DW-2



NOTES:  
ALL WELL SCREENS ARE 40-SLOT (0.040-INCH OPENING) STAINLESS STEEL  
V-WIRE WRAP. FILTER PACK IS 8x12 COLORADO SILICA SAND PRODUCT.

Figure 12



PM: MTW  
August 2009  
2093-002A

King County  
T 26 N/R 04 E - 03

Figure 12  
Construction Detail and Geologic Log for Well 2  
Lake Forest Park Water District: SPU-AS Wells 1 & 2



# WATER WELL REPORT

Original & 1<sup>st</sup> copy - Ecology, 2<sup>nd</sup> copy - owner, 3<sup>rd</sup> copy - driller

## Construction/Decommission ("x" in circle)

- Construction
- Decommission **ORIGINAL INSTALLATION** Notice of Intent Number \_\_\_\_\_

**PROPOSED USE:**  Domestic  Industrial  Municipal  
 DeWater  Irrigation  Test Well  Other \_\_\_\_\_

**TYPE OF WORK:** Owner's number of well (if more than one) 1  
 New well  Reconditioned  Deepened  
 Method:  Dug  Bored  Driven  Cable  Rotary  Jetted

**DIMENSIONS:** Diameter of well 12 inches, drilled 468 ft.  
 Depth of completed well 465 ft.

**CONSTRUCTION DETAILS**  
 Casing  Welded 12" Diam. from +2 ft. to 329 ft.  
 Installed:  Liner installed \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
 Threaded \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations:  Yes  No  
 Type of perforator used \_\_\_\_\_  
 SIZE of perfs \_\_\_\_\_ in. by \_\_\_\_\_ in. and no. of perfs \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens:  Yes  No  K-Pac Location \_\_\_\_\_  
 Manufacturer's Name \_\_\_\_\_

Type \_\_\_\_\_ Model No. \_\_\_\_\_  
 Diam. 8 Slot size 40 from 465 ft. to 440 ft.  
 Diam. 8 Slot size 40 from 396 ft. to 379 ft.

Gravel/Filter packed:  Yes  No  Size of gravel/sand 2x12  
 Materials placed from 465 ft. to 335 ft.

Surface Seal:  Yes  No To what depth? 50 ft.  
 Material used in seal Quick Grout

Did any strata contain unusable water?  Yes  No  
 Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
 Method of sealing strata off Trim pump

PUMP: Manufacturer's Name \_\_\_\_\_  
 Type: \_\_\_\_\_ H.P. \_\_\_\_\_

**WATER LEVELS:** Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
 Static level \_\_\_\_\_ ft. below top of well Date \_\_\_\_\_  
 Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
 Artesian water is controlled by \_\_\_\_\_ (cap, valve, etc.)

### WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made?  Yes  No If yes, by whom? \_\_\_\_\_  
 Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
 Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
 Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_

Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Airtest \_\_\_\_\_ gal./min. with stem set at \_\_\_\_\_ ft. for \_\_\_\_\_ hrs.

Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made?  Yes  No

### CURRENT

Notice of Intent No. WE09749

Unique Ecology Well ID Tag No. BAM 416

Water Right Permit No. \_\_\_\_\_

Property Owner Name Lake Forest Park Water Dis

Well Street Address 4510 195th St NE

City Lake Forest Park County King

Location SE 1/4-1/4 NE 1/4 Sec 3 Twn 26R 4  EWM or  WWM circle one

Lat/Long (s, t, r) Lat Deg \_\_\_\_\_ Lat Min/Sec \_\_\_\_\_

Still **REQUIRED** Long Deg \_\_\_\_\_ Long Min/Sec \_\_\_\_\_

Tax Parcel No. \_\_\_\_\_

### CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Brown silt & cobb	0	10
Gray Green silt, gravels	10	24
Silt bound Sand & Gravel	24	60
Brown silt, Sand Gravel	60	71
Silt bound Sand, Gravel	71	78
Silty Sand some Gravel	78	100
Sand Gravel	100	227
Sand some Gravel w/ silt layers	227	239
Gray silty clays	239	265
Green Blue Yellow & Tan clay	265	308
Gray silt	308	340
Sandy silt & clay Gravel	340	345
Fine silty Sand w/B	345	378
med. some coarse Sand w/ some Gravel	378	396
Fine to med Sand	396	401
Fine Sand silt layers	401	420
Gray clay	420	434
Brown clay	434	440
med Sand Brown	440	452
Fine silty Sand	452	454
Gray clay	454	468

Start Date 4-8-09 Completed Date 5-22-09

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller  Engineer  Trainee Name (Print) Wade Iversen  
 Driller/Engineer/Trainee Signature Wade Iversen  
 Driller or trainee License No. 0597

Drilling Company Bart Longyear  
 Address Po Box 1890  
 City, State, Zip Milton WA 98354

If TRAINEE,  
 Driller's Licensed No. \_\_\_\_\_  
 Driller's Signature \_\_\_\_\_

Contractor's  
 Registration No. BOARTLC941RA Date 8/12/09

Ecology is an Equal Opportunity Employer.





# WATER WELL REPORT

Original & 1<sup>st</sup> copy - Ecology, 2<sup>nd</sup> copy - owner, 3<sup>rd</sup> copy - driller

### Construction/Decommission ("x" in circle)

Construction

Decommission **ORIGINAL INSTALLATION** Notice of Intent Number \_\_\_\_\_

### CURRENT

Notice of Intent No. WE09989

Unique Ecology Well ID Tag No. BAM 417

Water Right Permit No. \_\_\_\_\_

Property Owner Name Lake Forest Water Dist

Well Street Address 4510 195th St NE

City Lake Forest Park County King

Location SE 1/4-1/4 NE 1/4 Sec 3 Twn 26 R 4 EWM of WWM circle one

Lat/Long (s, t, r) Lat Deg \_\_\_\_\_ Lat Min/Sec \_\_\_\_\_

Still **REQUIRED** Long Deg \_\_\_\_\_ Long Min/Sec \_\_\_\_\_

Tax Parcel No. \_\_\_\_\_

**PROPOSED USE:**  Domestic  Industrial  Municipal  
 DeWater  Irrigation  Test Well  Other \_\_\_\_\_

**TYPE OF WORK:** Owner's number of well (if more than one) 2

New well  Reconditioned  Deepened Method:  Dug  Bored  Driven  
 Cable  Rotary  Jetted

**DIMENSIONS:** Diameter of well 12 inches, drilled 468 ft.  
Depth of completed well 465 ft.

### CONSTRUCTION DETAILS

Casing  Welded 12" Diam. from +2 ft. to 384 ft.

Installed:  Liner installed \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Threaded \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations:  Yes  No

Type of perforator used \_\_\_\_\_

SIZE of perfs \_\_\_\_\_ in. by \_\_\_\_\_ in. and no. of perfs \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens:  Yes  No  K-Pac Location \_\_\_\_\_

Manufacturer's Name \_\_\_\_\_

Type \_\_\_\_\_ Model No. \_\_\_\_\_

Diam. 8 Slot size 40 from 450 ft. to 440 ft.

Diam. 8 Slot size 40 from 402 ft. to 384 ft.

Gravel/Filter packed:  Yes  No  Size of gravel/sand 8x2

Materials placed from 465 ft. to 326 ft.

Surface Seal:  Yes  No To what depth? 53 ft.

Material used in seal Quick Grout

Did any strata contain unusable water?  Yes  No

Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_

Method of sealing strata off \_\_\_\_\_

**PUMP:** Manufacturer's Name \_\_\_\_\_

Type: \_\_\_\_\_ H.P. \_\_\_\_\_

**WATER LEVELS:** Land-surface elevation above mean sea level \_\_\_\_\_ ft.

Static level 294 ft. below top of well Date 7-8-09

Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_

Artesian water is controlled by \_\_\_\_\_ (cap, valve, etc.)

### WELL TESTS:

 Drawdown is amount water level is lowered below static level

Was a pump test made?  Yes  No If yes, by whom? \_\_\_\_\_

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_

Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Air test \_\_\_\_\_ gal./min. with stem set at \_\_\_\_\_ ft. for \_\_\_\_\_ hrs.

Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made?  Yes  No

### CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Brown Silty Sub Soil	0	10
Green & Gray Clay	10	12
Brown Silty Bound Sand & Gravels	12	22
Gray Silty bound Sand & Gravels	22	47
Brown Silty bound sand & Gravels	47	73
Sand some Gravels	73	217
Sand & Silty Layers	217	230
Sand Brown	230	248
Green Clay	248	274
Green Clay	274	287
Brown, Green & Gray Clays	287	315
Gray Clay & Silty	315	340
Silty Sand & Gravels	340	355
Brown Fine Sand w/ Silty Layers	355	363
Gray Silty Fine Sand	363	378
med Brown Sand	378	402
Brown Silty Bound Sand & Gravels	402	410
Brown Silty Fine Sand	410	418
Gray Clay	418	432
Brown Silty	432	443
med Sand	443	459
Gray Clay	459	468

Start Date 6-1-09 Completed Date 7-13-09

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller  Engineer  Trainee Name (Print) Wade Iversen

Driller/Engineer/Trainee Signature Wade Iversen

Driller or trainee License No. 0597

Drilling Company Boart Longyear

Address Po Box 1890

City, State, Zip Milton WA 98354

Contractor's Registration No. BOART LC941RA Date 8-12-09

Ecology is an Equal Opportunity Employer.

If TRAINEE, Driller's Licensed No. \_\_\_\_\_  
Driller's Signature \_\_\_\_\_

5466 5-6-99 4617 2 10A01

File Original and First Copy with Department of Ecology  
Second Copy - Owner's Copy  
Third Copy - Driller's Copy

# ENTERED WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. N166001

UNIQUE WELL I.D. ACK 182  
Water Right Permit No. 26-4E-10H

(1) OWNER: Name VICTOR JABLONSKI Address 5150 NE 180 SEATTLE

(2) LOCATION OF WELL: County KING SE 1/4 NE 1/4 Sec 10 T. 26 N. R. 4 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 5150 NE 180 SEATTLE

(3) PROPOSED USE:  Domestic  Industrial  Municipal   
 Irrigation  Test Well  Other   
 DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
Abandoned  New well  Method: Dug  Bored   
Deepened  Cable  Driven   
Reconditioned  Rotary  Jetted

(5) DIMENSIONS: Diameter of well 6 inches.  
Drilled 211 feet. Depth of completed well 211 feet.

(6) CONSTRUCTION DETAILS:  
Casing installed: 6 Diam. from +1 ft. to 206 ft.  
Welded  Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Liner installed  \_\_\_\_\_ Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Threaded  \_\_\_\_\_ Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes  No   
Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes  No   
Manufacturer's Name COOK  
Type TALE SCOPE Model No. \_\_\_\_\_  
Diam. 6" Slot size .020 from 206 ft. to 211 ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes  No  Size of gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes  No  To what depth? 18 ft.  
Material used in seal BENTONITE  
Did any strata contain unusable water? Yes  No   
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name FLINT-WALLING  
Type: SUBMERSIBLE H.P. 2

(8) WATER LEVELS: Land-surface elevation 390 ft.  
Static level 179 ft. below top of well Date 5-27-99  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes  No  If yes, by whom? DRILLER  
Yield: 22 gal./min. with 4 ft. drawdown after 1 hrs.  
" " " " " "  
" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_  
Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Airstest \_\_\_\_\_ gal./min. with stem set at \_\_\_\_\_ ft. for \_\_\_\_\_ hrs.  
Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes  No

## (10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
BLACK TOP SOIL	0	1
GREY SILT SAND CLAY WOOD	1	35
BROWN SILT SAND	35	75
GREY CLAY	75	164
II SILT CLAY SAND	164	192
II SAND GRAVEL H2O	192	198
II II SOME GRAVEL	198	200
II FINE SAND	200	206
II SAND MED GRAVEL	206	210
II SAND	210	211

RECEIVED  
JUN 1 1999  
DEPT OF ECOLOGY

Work Started 5-6 1999 Completed 5-27 1999

## WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME A & J DRILLING (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)  
Address 10410 NE 142ND ST BOTHELL  
(Signed) [Signature] License No. 1534  
(WELL DRILLER)

Contractor's Registration No. RTDRKIC\*0999 5-28 1999

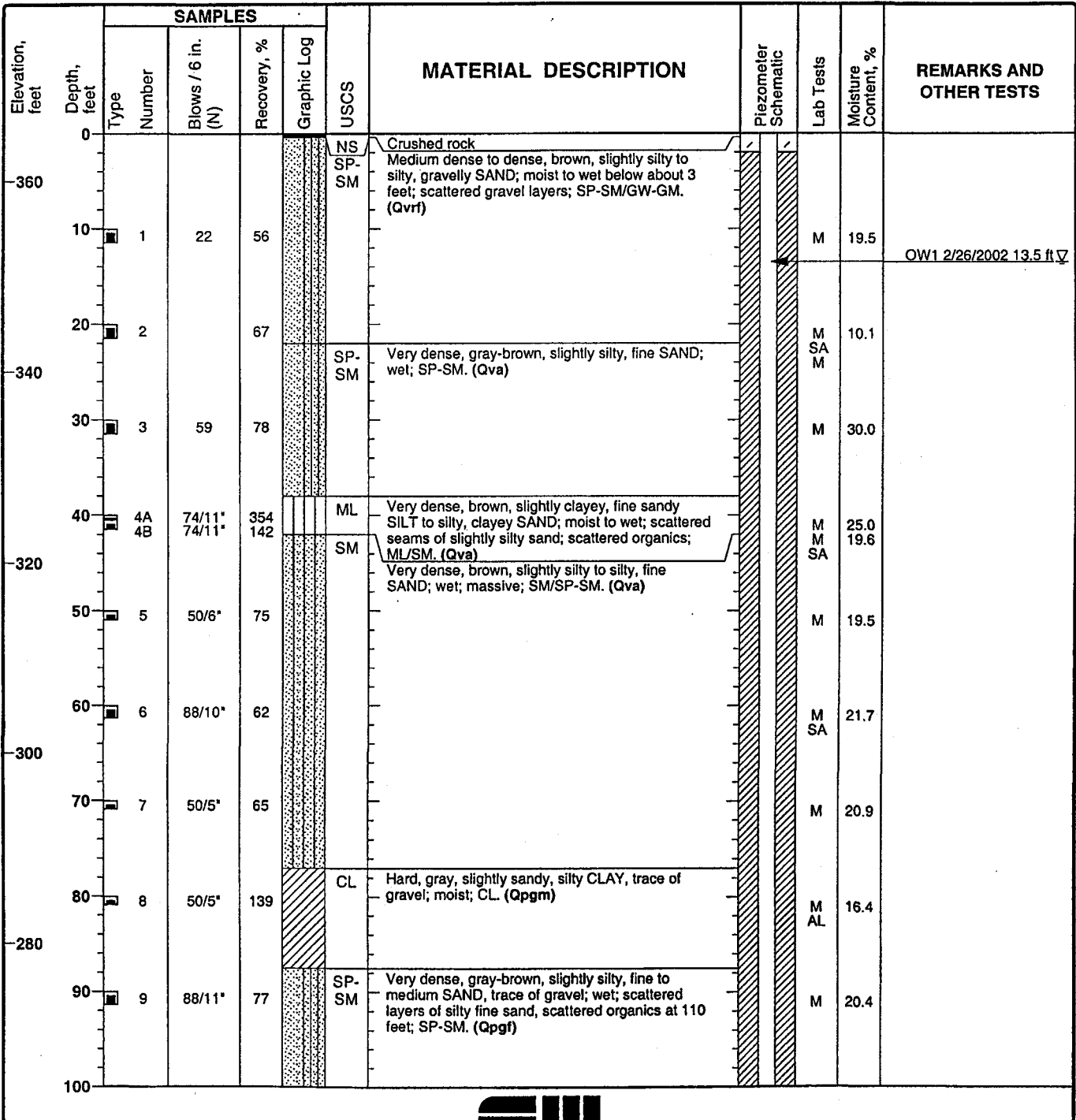
(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

D5 P5

Project: <b>Brightwater Project</b>	<b>Log of Boring BW-7</b> Sheet 1 of 4
Project Location: <b>N. King County/S. Snohomish County</b>	
Contract Number:	

Date(s) Drilled: <b>1/3/02 - 1/2/02</b>	Geotechnical Consultant: <b>SHANNON &amp; WILSON</b>	Logged By: <b>PVH</b>	Checked By: <b>TWH</b>
Drilling Method/ Rig Type: <b>mud rotary/ Mobile B-59</b>	Drilling Contractor: <b>Geo-Tech Explorations, Inc.</b>	Total Depth of Borehole: <b>340.4 feet</b>	
Drill Bit Size/Type: <b>6-inch Tricone</b>	Hammer Weight/Drop (lbs/in.): <b>300#/30"</b>	Ground Surface Elevation/Datum: <b>365 feet / NAVD88</b>	
Location: <b>E of 22912-39th Ave. W, Brier</b>	Coordinates: <b>N 291908.0 E 1283717.0</b>	Elevation Source: <b>Topo</b>	



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Figure: B-6.1



Project: Brightwater Project  
 Project Location: N. King County/S. Snohomish County  
 Contract Number:

### Log of Boring BW-7

Sheet 2 of 4

Elevation, feet	Depth, feet	SAMPLES				USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS	
		Type	Number	Blows / 6 in. (N)	Recovery, %							Graphic Log
100				50/6"	100		Very dense SAND; SP-SM (cont.) (Qpgf)		M	20.7		
-260												
110				50/4"	78					M SA	23.7	
120				50/5"	63					M	23.2	
-240												
130				50/5.5"	0							
140				50/5"	21					M	16.8	
-220												
150				50/5"	21					M	19.9	
160				50/6"	100	ML		Very dense, gray SILT, trace of clay and sand; wet; ML. (Qpgl(m))		M	25.4	
-200												
170				50/5"	354	CL		Hard, gray, silty CLAY, trace of sand and gravel; moist; scattered slightly sandy zones; CL. (Qpgm)		M M	16.5 17.5	
180				50/6"	217			- rare wood and without sand below about 175 feet		M M	17.5 18.9	
-180								- slightly sandy again at about 185 to 195 feet				
190				50/6"	300					M AL M	15.3 23.6	
200				50/6" 50/6"	300 300	CL	Hard, dark gray, slightly gravelly, sandy, silty CLAY; moist; massive; CL/CH. (Qpgm)		M SA M AL	15.8 16.7		
-160												
210				50/5"	125				M	19.8		

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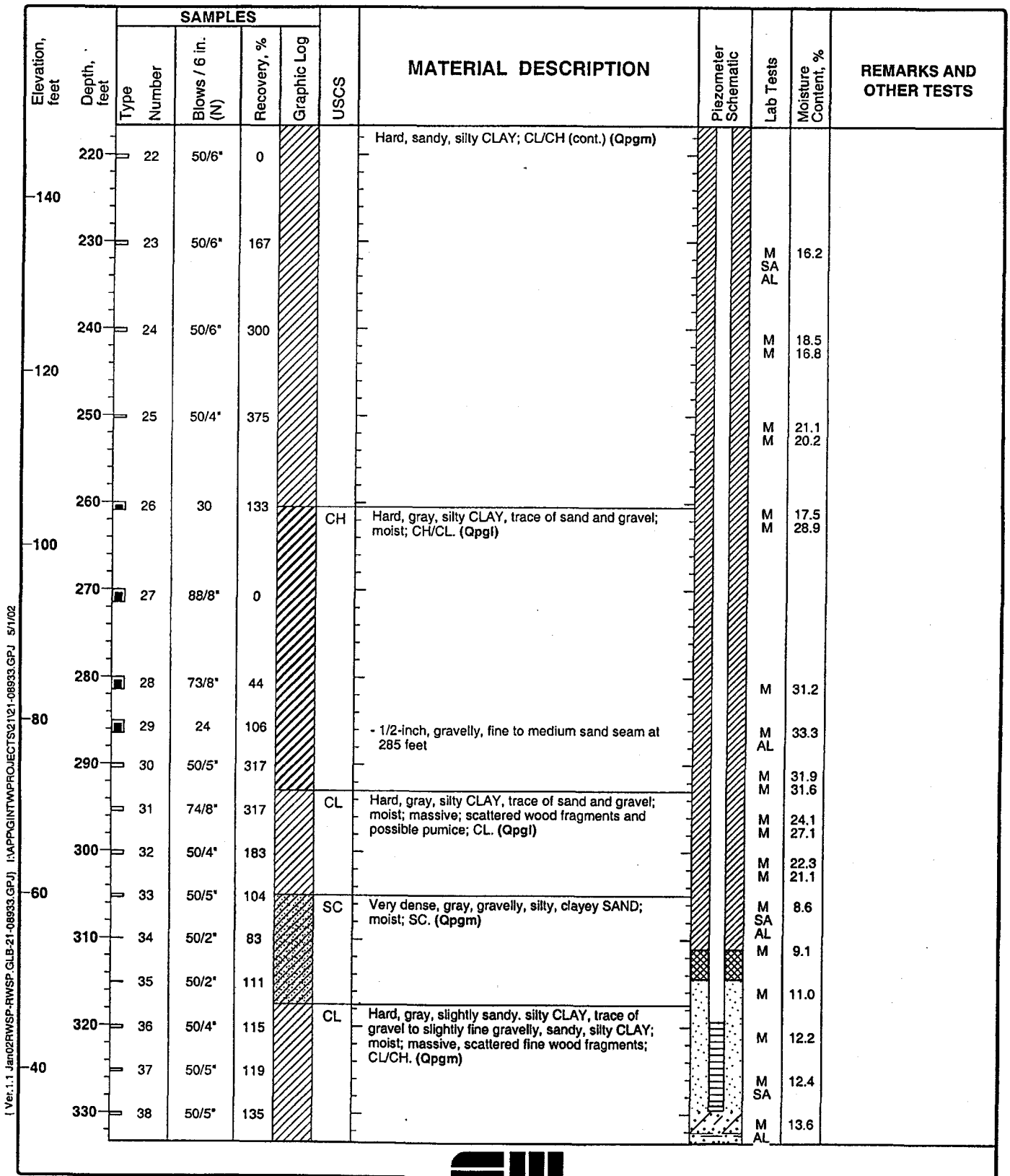


Figure: B-6.2

Project: Brightwater Project  
 Project Location: N. King County/S. Snohomish County  
 Contract Number:

### Log of Boring BW-7

Sheet 3 of 4



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Figure: B-6.3

Project: Brightwater Project  
 Project Location: N. King County/S. Snohomish County  
 Contract Number:

### Log of Boring BW-7

Sheet 4 of 4

Elevation, feet	Depth, feet	SAMPLES				USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS
		Type	Number	Blows / 6 in. (N)	Recovery, %						
			39	50/5*	125		Hard, silty CLAY; CL/CH (cont.)		M	14.0	
	340		40	50/4*	119		BOTTOM OF BORING COMPLETED 01/10/2002		M	12.7	
-20											
	350										
	360										
0											
	370										
	380										
-20											
	390										
	400										
-40											
	410										
	420										
-60											
	430										
	440										
-80											
	450										

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Figure: B-6.4

## **APPENDIX C**

### **Potential Contaminant Source Site Reports**

Facility/Site: 4952    Brier Terrace Middle School Edmonds  
SD 1

Also known as:    BRIER TERRACE MIDDLE SCHOOL, Brier Terrace Middle School Edmonds SD 1



**Address**

22200 BRIER RD  
BRIER WA 98036-8099

**Decimal Coordinates**

Latitude: 47.79694  
Longitude: -122.27375

### Geographic Information

Ecology Region: NWRO

Legislative District: 1

WRIA: 8

County: Snohomish

Congressional District: 2

Tribal Land: No

### Ecology Interactions

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Revised Site Visit Program	HAZWASTE	(360) 407-6736		12/15/2014	
Construction SW GP	WATQUAL		WAR011671	5/23/2009	10/23/2009
Hazardous Waste Generator	HAZWASTE	(360) 407-6023	WAH000019406	12/31/2006	12/31/2013
Haz Waste Management Activity	HAZWASTE	(360) 407-6023	WAH000019406	12/31/2005	12/31/2006
Hazardous Waste Generator	HAZWASTE	(360) 407-6023	WAH000019406	12/31/2003	12/31/2005
Haz Waste Management Activity	HAZWASTE	(360) 407-6023	WAH000019406	12/31/2002	12/31/2003
Hazardous Waste Generator	HAZWASTE	(360) 407-6023	WAH000019406	10/11/2002	10/13/2003

### Industrial Codes (External Links Below)

NAICS Code	NAICS Description
<u>61111</u>	ELEMENTARY AND SECONDARY SCHOOLS

No SIC information is available for this facility site.



Related Topics: Envirofacts

FRS

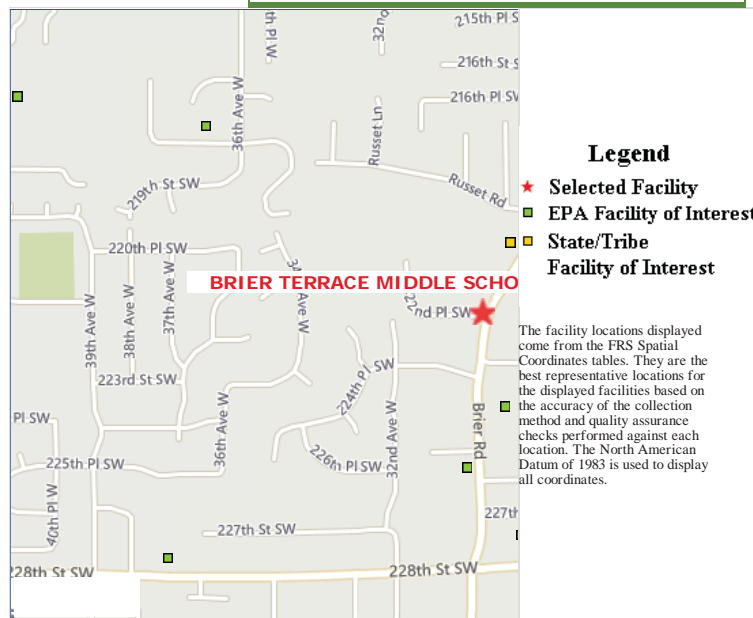
## FRS Facility Detail Report

**BRIER TERRACE  
MIDDLE  
SCHOOL  
EDMONDS SD 1**

**EPA Registry Id:**  
110015568786  
22200 BRIER RD  
BRIER, WA 980368099

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated
BIENNIAL REPORTERS	BRIER TERRACE MIDDLE SCHOOL EDMONDS SD 1	WAH000019406	HAZARDOUS WASTE BIENNIAL REPORTER	RCRAINFO	12/
RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM	BRIER TERRACE MIDDLE SCHOOL EDMONDS SD 1	WAH000019406	CESQG (Y)	RCRAINFO	11/
WASHINGTON - FACILITY / SITE IDENTIFICATION SYSTEM	BRIER TERRACE MIDDLE SCHOOL EDMONDS SD 1	4952 <a href="#">EXIT Disclaimer</a>	STATE MASTER	WA-FSIS	

Additional EPA Reports: [MyEnvironment](#) [Enforcement and Compliance](#) [Site Demographics](#) [Facility Coordinates Viewer](#) [Environmental Justice Map Viewer](#) [Watershed Rep](#)

Standard Industrial Classification Codes (SIC)		National Industry Classification System Cod		
No SIC Codes returned.		Data Source	NAICS Code	Description
		RCRAINFO	61111	ELEMENTARY AND SECONDARY
		WA-FSIS	061111	
Facility Codes and Flags		Facility Mailing Addresses		
EPA Region:	10	Affiliation Type	Delivery Point	City Name
Duns Number:		OWNER	20420 68TH AVE W	LYNNWOC
Congressional District Number:	02	MAILING ADDRESS	22200 BRIER RD	BRIER
Legislative District Number:	NW	REGULATORY		
HUC Code/Watershed:	17110012 / LAKE WASHINGTON	CONTACT	20420 68TH AVE W	LYNNWOC
US Mexico Border Indicator:				
Federal Facility:	NO			
Tribal Land:	NO			

Alternative Names					OPERATOR	2927 ALDERWOOD MALL	LYNNWOOD	
Alternative Name					Source of Data	BLVD		
BRIER TERRACE MIDDLE SCHOOL BTM					NCES	22200 BRIER RD	BRIER	
Organizations					Contacts			
Affiliation Type	Name	DUNS Number	Information System	Mailing Address	Affiliation Type	Full Name	Office Phone	Info
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OPERATOR	JIM TRAUTMAN		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI
OWNER	NA EDMONDS SCHOOL		RCRAINFO	View	REGULATORY CONTACT	JERRY SAULTER	(000)000-0000	RCI

Query executed on: AUG-03-2016

Last updated on September 24, 2015



Facility/Site:  
13870

Wynbrook II

Also known as: Wynbrook II



**Address**

22415 BRIER RD  
BRIER WA 98036

**Decimal Coordinates**

Latitude: 47.79506  
Longitude: -122.27276

**Geographic Information**

Ecology Region: NWRO      Legislative District: 1      WRIA: 8  
County: Snohomish      Congressional District: 2      Tribal Land: No

**Ecology Interactions**

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Construction SW GP	WATQUAL		WAR301223	7/10/2013	

**Industrial Codes (External Links Below)**

No NAICS information is available for this facility site.

No SIC information is available for this facility site.



Related Topics: Envirofacts

FRS

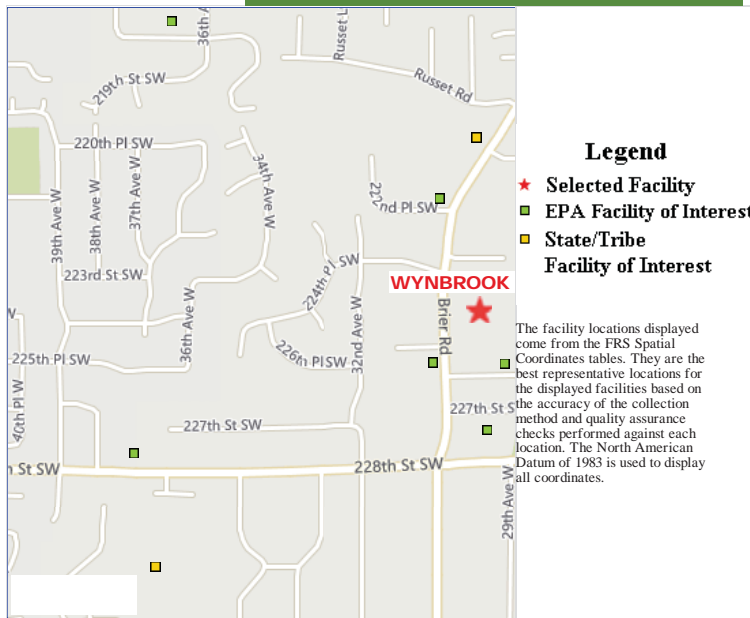
# FRS Facility Detail Report

## WYNBROOK II

**EPA Registry Id:**  
110056164216  
22415 BRIER RD  
BRIER, WA 98036

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Legend

- ★ Selected Facility
- EPA Facility of Interest
- State/Tribe Facility of Interest

The facility locations displayed come from the FRS Spatial Coordinates tables. They are the best representative locations for the displayed facilities based on the accuracy of the collection method and quality assurance checks performed against each location. The North American Datum of 1983 is used to display all coordinates.

### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date	Si Ir
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	WYNBROOK II	WAR301223	STORM WATER CONSTRUCTION	ICIS	05/26/2015	IC E A
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	WYNBROOK II	WAR301223	ICIS-NPDES NON-MAJOR	ICIS	05/26/2015	IC E A
WASHINGTON - FACILITY / SITE IDENTIFICATION SYSTEM	WYNBROOK II	13870 <a href="#">EXIT Disclaimer</a>	STATE MASTER	WA-FSIS		W N

Additional EPA Reports: [MyEnvironment](#) [Enforcement and Compliance](#) [Site Demographics](#) [Facility Coordinates Viewer](#) [Environmental Justice Map Viewer](#) [Watershed Rep](#)

#### Standard Industrial Classification Codes (SIC)

No SIC Codes returned.

#### Facility Codes and Flags

EPA Region: 10  
 Duns Number:  
 Congressional District Number: 02  
 Legislative District Number: 01  
 HUC Code/Watershed: 17110012 / LAKE WASHINGTON  
 US Mexico Border Indicator:  
 Federal Facility: NO  
 Tribal Land: NO

#### National Industry Classification System Cod

No NAICS Codes returned.

#### Facility Mailing Addresses

Affiliation Type	Delivery Point	City Name	State	Zip
MAILING ADDRESS	22415 BRIER RD	BRIER	WA	98

#### Alternative Names

No Alternative Names returned.

#### Contacts

No Contacts returned.

#### Organizations

No Organizations returned.

Facility/Site: Arcadia Estates SP15-04  
17979

Also known as: Arcadia Estates SP15 04, Arcadia Estates SP15-04



**Address**  
2840 226TH ST SW  
BRIER WA 98036

**Decimal Coordinates**  
Latitude: 47.7937  
Longitude: -122.27149

### Geographic Information

Ecology Region: NWRO

Legislative District: 1

WRIA: 8

County: Snohomish

Congressional District: 2

Tribal Land: No

### Ecology Interactions

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Construction SW GP	WATQUAL		WAR303890	3/16/2016	

### Industrial Codes (External Links Below)

No NAICS information is available for this facility site.

No SIC information is available for this facility site.



Related Topics: Envirofacts

FRS

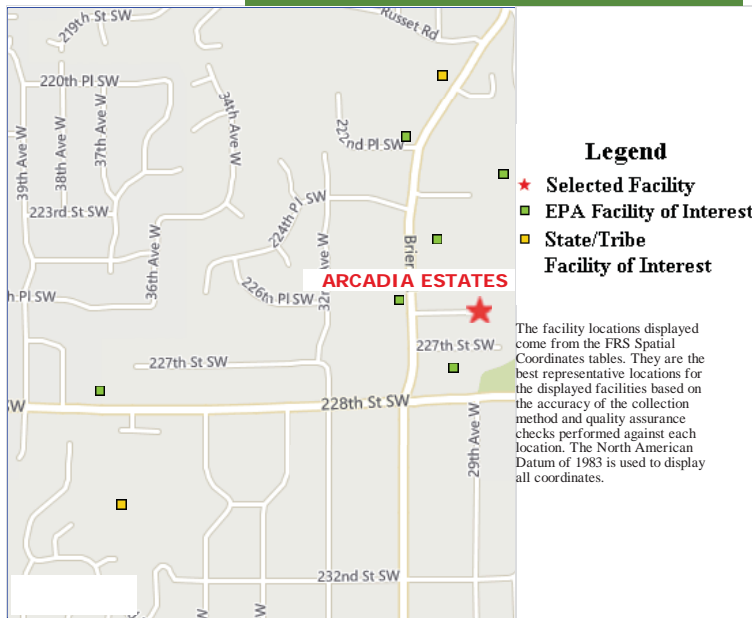
## FRS Facility Detail Report

**ARCADIA  
ESTATES SP15 04**

**EPA Registry Id:**  
110069210712  
2840 226TH ST SW  
BRIER, WA 98036

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date	S I E A
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	ARCADIA ESTATES SP15 04	WAR303890	ICIS-NPDES NON-MAJOR	ICIS	03/17/2016	
<b>Additional EPA Reports:</b> MyEnvironment Enforcement and Compliance Site Demographics Facility Coordinates Viewer Environmental Justice Map Viewer Watershed Rep						
<b>Standard Industrial Classification Codes (SIC)</b>						
No SIC Codes returned.						
<b>Facility Codes and Flags</b>						
<b>EPA Region:</b> 10			<b>National Industry Classification System Cod</b>			
<b>Duns Number:</b>			No NAICS Codes returned.			
<b>Congressional District Number:</b> 02			<b>Facility Mailing Addresses</b>			
<b>Legislative District Number:</b>			No Facility Mailing Addresses returned.			
<b>HUC Code/Watershed:</b> 17110012 / LAKE WASHINGTON			<b>Contacts</b>			
<b>Federal Facility:</b>			No Contacts returned.			
<b>Tribal Land:</b>						
<b>Alternative Names</b>						
No Alternative Names returned.						
<b>Organizations</b>						
No Organizations returned.						

Query executed on: AUG-03-2016



Facility/Site:  
24717

# Crabapple Short Plat

Also known as: Crabapple Short Plat



**Address**

226TH SW & BRIER RD  
Brier WA 98036

**Decimal Coordinates**

Latitude: 47.79395  
Longitude: -122.27172

**Geographic Information**

Ecology Region: NWRO      Legislative District: 1      WRIA: 8  
County: Snohomish      Congressional District: 2      Tribal Land: No

**Ecology Interactions**

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Construction SW GP	WATQUAL		WAR301714	2/19/2014	

**Industrial Codes (External Links Below)**

No NAICS information is available for this facility site.

SIC Code	SIC Description
<u>1794</u>	EXCAVATION WORK





Related Topics: Envirofacts

FRS

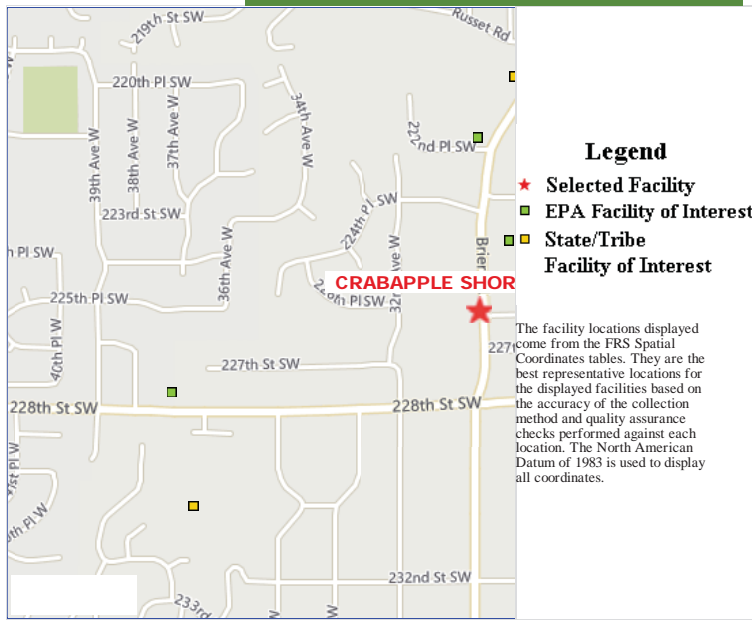
# FRS Facility Detail Report

## CRABAPPLE SHORT PLAT

**EPA Registry Id:**  
110058230935  
226TH SW & BRIER RD  
BRIER, WA 98036

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	CRABAPPLE SHORT PLAT	WAR301714	ICIS-NPDES NON-MAJOR	ICIS	05/26/2015
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	CRABAPPLE SHORT PLAT	WAR301714	STORM WATER CONSTRUCTION	ICIS	05/26/2015
WASHINGTON - FACILITY / SITE IDENTIFICATION SYSTEM	CRABAPPLE SHORT PLAT	24717 <a href="#">EXIT Disclaimer</a>	STATE MASTER	WA-FSIS	

Additional EPA Reports: [MyEnvironment](#) [Enforcement and Compliance](#) [Site Demographics](#) [Facility Coordinates Viewer](#) [Environmental Justice Map Viewer](#) [Watershed Rep](#)

#### Standard Industrial Classification Codes (SIC)

No SIC Codes returned.

#### Facility Codes and Flags

EPA Region: 10  
 Duns Number:  
 Congressional District Number: 02  
 Legislative District Number: 01  
 HUC Code/Watershed: 17110012 / LAKE WASHINGTON  
 US Mexico Border Indicator:  
 Federal Facility: NO  
 Tribal Land: NO

#### National Industry Classification System Cod

No NAICS Codes returned.

#### Facility Mailing Addresses

Affiliation Type	Delivery Point	City Name	State
MAILING ADDRESS	226TH SW & BRIER RD	BRIER	WA

#### Alternative Names

No Alternative Names returned.

#### Contacts

No Contacts returned.

#### Organizations

No Organizations returned.

Facility/Site: **BRIER CITY**  
85633679

Also known as: BRIER CITY OF



**Address**  
2901 228TH ST SW  
BRIER WA 98036-8321

**Decimal Coordinates**  
Latitude: 47.79172  
Longitude: -122.27314

### Geographic Information

Ecology Region: NWRO

Legislative District: 1

WRIA: 8

County: Snohomish

Congressional District: 2

Tribal Land: No

### Ecology Interactions

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Municipal SW Phase II Western WA GP	WATQUAL	(360) 407-6400	WAR045508	2/16/2007	
Underground Storage Tank	TOXICS	(360) 407-7224	3978	6/8/1998	5/3/2000

### Industrial Codes (External Links Below)

No NAICS information is available for this facility site.

SIC Code	SIC Description
<u>0</u>	UNKNOWN



Related Topics: Envirofacts

FRS

## FRS Facility Detail Report

### BRIER CITY

**EPA Registry Id:**  
110015405836  
2901 228TH ST SW  
BRIER, WA 98036-8397

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date	Supp
WASHINGTON - FACILITY / SITE IDENTIFICATION SYSTEM	BRIER CITY	85633679 <a href="#">EXIT Disclaimer</a>	STATE MASTER	WA-FSIS		TOX UND PROC WAT NPDJ WAT NPDJ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	BRIER CITY OF	WAR045508	PHASE II MS4	ICIS	08/01/2012	ICIS- ENFC ACTJ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (ICIS-NPDES)	BRIER CITY OF	WAR045508	ICIS-NPDES NON-MAJOR	ICIS	08/01/2012	ICIS- ENFC ACTJ

**Additional EPA Reports:** MyEnvironment Enforcement and Compliance Site Demographics Facility Coordinates Viewer Environmental Justice Map Viewer Watershed Report

Standard Industrial Classification Codes (SIC)		National Industry Classification System Cod			
No SIC Codes returned.					
Facility Codes and Flags		Facility Mailing Addresses			
EPA Region:	10	No NAICS Codes returned.			
Duns Number:					
Congressional District Number:	02				
Legislative District Number:	01				
HUC Code/Watershed:	17110012 / LAKE WASHINGTON				
US Mexico Border Indicator:		Affiliation Type	Delivery Point	City Name	State F
Federal Facility:	NO	MAILING ADDRESS	2901 228TH ST SW	BRIER	WA 9
Tribal Land:	NO				
Alternative Names		Contacts			
Alternative Name		No Contacts returned.			
Source of Data					
BRIER CITY OF	ICIS				

Facility/Site:           Paint Rider  
15160

Also known as:   Paint Rider



**Address**

23117 BRIER RD  
BRIER WA 98036

**Decimal Coordinates**

Latitude: 47.78863  
Longitude: -122.27384

**Geographic Information**

Ecology Region: NWRO      Legislative District: 1      WRIA: 8  
County: Snohomish      Congressional District: 2      Tribal Land: No

**Ecology Interactions**

Interaction Description	Ecology Program	Ecology Program Phone	Program ID	Start Date	End Date
Revised Site Visit Program	HAZWASTE	(360) 407-6736		2/29/2012	

**Industrial Codes (External Links Below)**

No NAICS information is available for this facility site.

No SIC information is available for this facility site.



Related Topics: Envirofacts

FRS

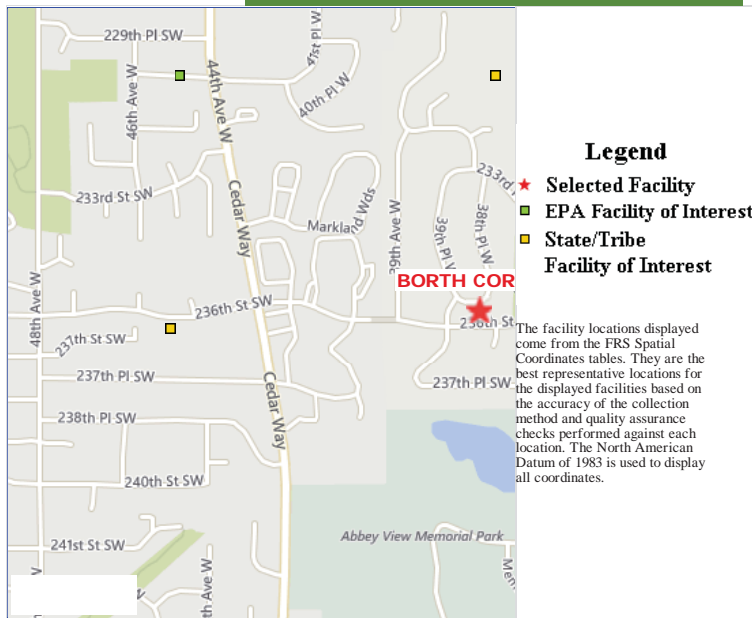
## FRS Facility Detail Report

### BORTH CORP

**EPA Registry Id:**  
110005321188  
3716 235TH PL SW  
BRIER, WA 98036-8241

### Facility Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model



### Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date
RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM	BORTH CORP	WAD048673800	UNSPECIFIED UNIVERSE (N)	RCRAINFO	02/16/2012
<b>Additional EPA Reports:</b> MyEnvironment Enforcement and Compliance Site Demographics Facility Coordinates Viewer Environmental Justice Map Viewer Watershed Rep					
<b>Standard Industrial Classification Codes (SIC)</b>					
No SIC Codes returned.					
<b>Facility Codes and Flags</b>					
EPA Region:	10		<b>Data Source</b>	<b>NAICS Code</b>	<b>Description</b>
Duns Number:			RCRAINFO	48422	SPECIALIZED FREIGHT (EXCEPT USED C LOCAL
Congressional District Number:	02		<b>Facility Mailing Addresses</b>		
Legislative District Number:	WA		<b>Affiliation Type</b>	<b>Delivery Point</b>	<b>City Name</b> <b>State</b>
HUC Code/Watershed:	17110012 / LAKE WASHINGTON		OWNER	3716 235TH PL SW	BRIER WA
US Mexico Border Indicator:			REGULATORY CONTACT	3716 235TH PL SW	BRIER WA
Federal Facility:	NO		<b>Contacts</b>		
Tribal Land:	NO		<b>Affiliation Type</b>	<b>Full Name</b>	<b>Office Phone</b>
No Alternative Names returned.					
<b>Organizations</b>					
Affiliation Type	Name	DUNS Number	Information System	Mailing Address	
OWNER	BORTH CORP B		RCRAINFO	View	

Query executed on: AUG-03-2016

## **APPENDIX D**

### **Local CARA and WHPA Regulations**



## Chapter 18.30 CRITICAL AQUIFER RECHARGE AREAS

Sections:

### Article I. Designation

[18.30.010](#) Critical aquifer recharge areas designation.

### Article II. Allowed Activities – Critical Aquifer Recharge Areas

[18.30.020](#) Activities allowed in critical aquifer recharge areas.

### Article III. Additional Report Requirements – Critical Aquifer Recharge Areas

[18.30.030](#) Critical area report – Additional requirements for critical aquifer recharge areas.

### Article IV. Performance Standards – Critical Aquifer Recharge Areas

[18.30.040](#) Performance standards – General requirements.

[18.30.050](#) Performance standards – Specific uses.

### Article V. Prohibited Uses

[18.30.060](#) Uses prohibited from critical aquifer recharge areas.

### Article I. Designation

#### **18.30.010 Critical aquifer recharge areas designation.**

.....  
Critical aquifer recharge areas (CARA) are those areas with a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2). CARA have prevailing geologic conditions associated with infiltration rates that create a high potential for contamination of ground water resources or contribute significantly to the replenishment of ground water. (Ord. 389 § 1 (Exh. A) (part), 2011)

### Article II. Allowed Activities – Critical Aquifer Recharge Areas

#### **18.30.020 Activities allowed in critical aquifer recharge areas.**

.....  
The following activities are allowed in critical aquifer recharge areas and do not require submission of a critical area report:

A. Construction of structures and improvements, including additions, resulting in less than five percent or two thousand five hundred square feet (whichever is greater) total site impervious surface area that do not result in a change of use or increase the use of a hazardous substance.

B. Development and improvement of parks, recreation facilities, open space, or conservation areas resulting in less than five percent total site impervious surface area and that does not increase the use of a hazardous substance.

C. On-site domestic septic systems releasing less than fourteen thousand five hundred gallons of effluent per day and that are limited to a maximum density of one system per one acre. (Ord. 389 § 1 (Exh. A) (part), 2011)

### Article III. Additional Report Requirements – Critical Aquifer Recharge Areas

#### **18.30.030 Critical area report – Additional requirements for critical aquifer recharge areas.**

In addition to the general critical area report requirements of BMC [18.10.160](#), critical area reports for critical aquifer recharge areas must meet the requirements of this section.

A. Hydrogeologic Assessment Required. For all proposed activities to be located in a critical aquifer recharge area, a critical area report shall contain a level one hydrogeological assessment. The director may require a level two hydrogeologic assessment.

B. Level One Hydrogeologic Assessment. A level one hydrogeologic assessment shall include the following site- and proposal-related information at a minimum:

1. Available information regarding geologic and hydrogeologic characteristics of the site including the surface location of all critical aquifer recharge areas located on site or immediately adjacent to the site, and permeability of the unsaturated zone.
2. Ground water depth, flow direction and gradient based on available information.
3. Currently available data on wells and springs within one thousand three hundred feet of the project area.
4. Location of other critical areas, including surface waters, within one thousand three hundred feet of the project area.
5. Available historic water quality data for the area to be affected by the proposed activity.
6. Best management practices proposed to be utilized.

C. Level Two Hydrogeologic Assessment. A level two hydrogeologic assessment shall include the following site- and proposal-related information at a minimum, in addition to the requirements for a level one hydrogeological assessment:

1. Historic water quality data for the area to be affected by the proposed activity compiled for at least the previous five-year period.
2. Ground water monitoring plan provisions.
3. Discussion of the effects of the proposed project on the ground water quality and quantity, including:
  - a. Predictive evaluation of ground water withdrawal effects on nearby wells and surface water features; and
  - b. Predictive evaluation of contaminant transport based on potential releases to ground water.
4. A spill plan that identifies equipment and/or structures that could fail, resulting in an impact. Spill plans shall include provisions for regular inspection, repair, and replacement of structures and equipment that could fail. (Ord. 389 § 1 (Exh. A) (part), 2011)

#### **Article IV. Performance Standards – Critical Aquifer Recharge Areas**

##### **18.30.040 Performance standards – General requirements.**

---

A. Activities may only be permitted in a critical aquifer recharge area if the applicant can show that the proposed activity will not cause contaminants to enter the aquifer and that the proposed activity will not adversely affect the recharging of the aquifer.

B. The proposed activity must comply with the water source protection requirements and recommendations of the federal Environmental Protection Agency, State Department of Health, and the Snohomish County Health

Department.

C. The proposed activity must be designed and constructed in accordance with the Department of Ecology 2005 Stormwater Management Manual for Western Washington. (Ord. 389 § 1 (Exh. A) (part), 2011)

### **18.30.050 Performance standards – Specific uses.**

---

A. Storage Tanks. All storage tanks proposed to be located in a critical aquifer recharge area must comply with city building code requirements and must conform to the following requirements:

1. Underground Tanks. All new underground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:

- a. Prevent releases due to corrosion or structural failure for the operational life of the tank;
- b. Be protected against corrosion, constructed of noncorrosive material, steel clad with a noncorrosive material, or designed to include a secondary containment system to prevent the release or threatened release of any stored substances; and
- c. Use material in the construction or lining of the tank that is compatible with the substance to be stored.

2. Aboveground Tanks. All new aboveground storage facilities proposed for use in the storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:

- a. Not allow the release of a hazardous substance to the ground, ground waters, or surface waters;
- b. Have a primary containment area enclosing or underlying the tank or part thereof; and
- c. A secondary containment system either built into the tank structure or a dike system built outside the tank for all tanks.

B. Vehicle Repair and Servicing.

1. Vehicle repair and servicing must be conducted over impermeable pads and within a covered structure capable of withstanding normally expected weather conditions. Chemicals used in the process of vehicle repair and servicing must be stored in a manner that protects them from weather and provides containment should leaks occur.

2. No dry wells shall be allowed in critical aquifer recharge areas on sites used for vehicle repair and servicing. Dry wells existing on the site prior to facility establishment must be abandoned using techniques approved by the State Department of Ecology prior to commencement of the proposed activity.

C. Residential Use of Pesticides and Nutrients. Application of household pesticides, herbicides, and fertilizers shall not exceed times and rates specified on the packaging.

D. Spreading or Injection of Reclaimed Water. Water reuse projects for reclaimed water must be in accordance with the adopted water or sewer comprehensive plans that have been approved by the Departments of Ecology and Health.

1. Surface spreading must meet the ground water recharge criteria given in RCW 90.46.080 and 90.46.010(10).

2. Direct injection must be in accordance with the standards developed by authority of RCW 90.46.042. (Ord. 389 § 1 (Exh. A) (part), 2011)

**Article V. Prohibited Uses****18.30.060 Uses prohibited from critical aquifer recharge areas.**

---

The following activities and uses are prohibited in critical aquifer recharge areas:

A. Underground Injection Wells. Class I, III, and IV wells and subclasses 5F01, 5D03, 5F04, 5W09, 5W10, 5W11, 5W31, 5X13, 5X14, 5X15, 5W20, 5X28, and 5N24 of Class V wells.

B. Other.

1. Activities that would significantly reduce the recharge to aquifers currently or potentially used as a potable water source.
2. Activities that would significantly reduce the recharge to aquifers that are a source of significant baseflow to a regulated stream.
3. Activities that are not connected to an available sanitary sewer system are prohibited from critical aquifer recharge areas associated with sole source aquifers. (Ord. 389 § 1 (Exh. A) (part), 2011)

**The Brier Municipal Code is current through Ordinance 437, passed June 28, 2016.**

Disclaimer: The City Clerk's Office has the official version of the Brier Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

## Chapter 16.16 ENVIRONMENTALLY SENSITIVE AREAS

### Sections:

- [16.16.010](#) Purpose.
- [16.16.020](#) Sensitive areas protected.
- [16.16.030](#) Applicability.
- [16.16.040](#) Definitions.
- [16.16.050](#) Maps and study – Adoption.
- [16.16.060](#) Sensitive area – Authority of planning director – Review process.
- [16.16.070](#) Applications – Content – Fee.
- [16.16.080](#) Applications – Approval – Permits – General condition.
- [16.16.090](#) Applications – Approval – Criteria – Revocation.
- [16.16.100](#) Sensitive area – Special study requirement.
- [16.16.110](#) Contents of sensitive areas study.
- [16.16.120](#) Mitigation and monitoring.
- [16.16.130](#) Mitigation sequencing.
- [16.16.140](#) Timing.
- [16.16.150](#) Bond requirements.
- [16.16.160](#) Vegetation management plan.
- [16.16.170](#) Sensitive areas – Markers and signs.
- [16.16.180](#) Sensitive areas – Tract designations.
- [16.16.190](#) Notice to title.
- [16.16.200](#) Performance standards for subdivisions.
- [16.16.210](#) Sensitive areas rules.
- [16.16.220](#) Exemptions.
- [16.16.230](#) Authorized exceptions to work in sensitive areas.
- [16.16.240](#) Setback exception.
- [16.16.250](#) Reasonable use exception to allow for reasonable economic use.
- [16.16.260](#) Public agency and utility exception.
- [16.16.270](#) Development standards – Sensitive area permits.
- [16.16.280](#) Erosion hazard areas – Development standards – Permitted alterations.
- [16.16.290](#) Landslide hazard areas – Development standards – Permitted alterations.
- [16.16.300](#) Seismic hazard areas – Development standards – Permitted alterations.
- [16.16.310](#) Steep slope hazard areas – Development standards – Permitted alterations.
- [16.16.320](#) Wetlands – Development standards.
- [16.16.330](#) Wetlands – Permitted alterations.
- [16.16.340](#) Wetlands – Mitigation requirements.
- [16.16.350](#) Streams – Development standards.
- [16.16.360](#) Streams – Permitted alterations.
- [16.16.370](#) Streams – Mitigation requirements.
- [16.16.380](#) Wildlife habitat conservation areas.
- [16.16.390](#) Wellhead protection areas.
- [16.16.400](#) Enforcement.

### **16.16.010 Purpose.**

---

The provisions of this chapter implement the goals and policies of the Washington State Growth Management Act, the Lake Forest Park Municipal Code, the Washington State Environmental Policy Act and the

comprehensive plan for the city of Lake Forest Park to protect the public health and safety and to protect the natural environment, in particular the Lyon and McAleer creek basins, but also all sensitive areas of the city, including their structures, functions and values.

This chapter is adopted, in part, to:

- A. Protect sensitive areas;
- B. Protect unique, fragile and irreplaceable elements of the environment;
- C. Protect public and private property from damage due to landslide, seismic hazard, flooding, sedimentation, or erosion;
- D. Minimize stormwater runoff;
- E. Prevent losses from turbidity and pollution of wetlands and fish-bearing waters such as lakes and streams which are used in the life cycles of anadromous salmon, steelhead, or other species of fish and to maintain wildlife habitat;
- F. Achieve a goal of no net loss of wetland function, value, and acreage within each drainage basin;
- G. Maintain stream, habitat and riparian corridor functions; and
- H. Provide the planning director and others with decision making authority with supplemental information for use concerning public or private development or work that affects sensitive areas, including decisions to approve or deny an application or to impose conditions thereon, and for use by the city with respect to determinations under the State Environmental Policy Act, Chapter [43.21C](#) RCW, the Washington Administrative Code provisions, and city ordinances adopted in conjunction therewith. (Ord. 930 § 2, 2005)

#### **16.16.020 Sensitive areas protected.**

---

Unless expressly authorized herein, any alteration of or work in or development of a sensitive area is prohibited. (Ord. 930 § 2, 2005)

#### **16.16.030 Applicability.**

---

- A. The provisions of this chapter shall apply to development proposals for sites in the city on which are located sensitive areas or sensitive area buffers or that are contiguous to sensitive areas or sensitive area buffers.
- B. Whenever the planning director determines that a development proposal is for a site described in LFPMC [16.16.020](#), all work shall be performed and all construction completed in compliance with sensitive area permits issued by the city according to the requirements of this chapter. Permit decisions shall be Type III decisions and processed according to Chapter [16.26](#) LFPMC.
- C. The decision of the city to issue a sensitive area permit conditioned by the requirements of this chapter does not relieve the applicant from complying with all other applicable city ordinances and plans. In case of a conflict among ordinances or between this chapter and adopted city plans, the more stringent shall apply. (Ord. 930 § 2, 2005)

#### **16.16.040 Definitions.**

---

Words and phrases used in this chapter shall have the meaning set forth in this section. Undefined words and phrases that are defined in LFPMC Title [18](#) shall have the meaning ascribed therein unless the context clearly requires otherwise or another code provision is referenced. For purposes of interpretation, the present tense includes the future, the singular form includes the plural, and the plural form includes the singular. "Shall" is

mandatory and not discretionary. The words “person” or “applicant” shall include an individual(s), a corporation, partnership or other legal entity. Whenever a specific document or regulation is referenced herein, the reference shall refer to the most recent edition of such document or regulation, unless the context clearly indicates otherwise.

A. “Alteration” means any human activity that results or might result in any impact upon a sensitive area; provided, that alteration does not include walking, fishing, or any other passive recreation or other similar activities.

B. “Best management practices” means regularly accepted principles and practices or systems of practices and management measures that are recommended by a qualified professional as most likely to:

1. Control soil loss and reduce water quality degradation caused by high concentrations of nutrients, animal waste, toxics, and sediment;
2. Minimize adverse impacts to surface water and groundwater flow, circulation patterns, and to the chemical, physical, and biological characteristics of streams and wetlands;
3. Protect trees and vegetation designated to be retained during and following site construction;
4. Protect wildlife habitat; and
5. Protect and enhance sensitive areas and their function and values.

C. “Buffer” means an area contiguous to a sensitive area that is established to protect the sensitive area.

D. “Development proposal” means any proposed activity relating to the use and/or development of land requiring a permit or approval from the city.

E. “Enhancement” means an action which increases the functions and values of a stream, wetland or other sensitive area.

F. “Erosion hazard area” means an area with soil characteristics that, according to the USDA Soil Conservation Service Soil Classification System, may experience severe to very severe erosion hazard, including slopes greater than 15 percent with erodible soils that are exposed. Any activity which exposes erodible soils to rainfall or running water will create erosion hazard conditions on slopes greater than 15 percent. Soils which are particularly susceptible to erosion include fill constructed of virtually all soil types, loose sandy native soils such as Vashon recessional outwash (Qvr), Esperance sand (Qe), Vashon till (weathered Qvt), and the dense fine-grained clay (Qcl). Improper fill methods, especially near flowing water, can produce an erosion hazard in areas not identified as hazard areas.

G. “Landslide” means any episodic downslope movement of a mass including, but not limited to, soil, rock or snow.

H. Landslide Hazard Areas.

1. “Landslide hazard areas” means slopes that are potentially subject to landslides. All landslide hazard areas are classified as:

- a. “Class I”: a slope that is less than 15 percent and is considered relatively stable;
- b. “Class II”: a slope that is greater than 15 percent and is underlain by permeable soils that are relatively stable in their natural state but may become unstable if slope configurations or draining conditions are modified;

- c. "Class III": a slope that is greater than 15 percent and is underlain by impermeable soils, and may be characterized by springs or seeping groundwater during the wet season.
2. "Landslide hazard areas" include Class II and Class III if any of the following are present:
- a. Any area that has shown movement during the Holocene epoch (from 10,000 years ago to present) or which is underlain by significant waste debris of that epoch; or
  - b. An area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting; or
  - c. Any area located on an alluvial fan or delta potentially subject to inundation by debris flows; or
  - d. Any area with a slope of 40 percent or greater and with a vertical relief of 10 or more feet except any area composed of consolidated rock.
- I. "Light equipment" means nonmotorized hand-held tools and construction equipment, such as handsaws, wheelbarrows, and post-hole diggers.
- J. "Mitigation" means any of the following actions or combination of actions:
1. Avoiding impacts to environmentally sensitive areas by avoiding actions or parts of actions; or
  2. Minimizing impacts by limiting the degree of an action and its implementation by affirmative acts designed to avoid or reduce impacts; or
  3. Restoration measures that reduce or eliminate over time the adverse impacts to sensitive areas by preservation and maintenance operations; or
  4. Compensation for an impact by means of replacement or enhancement of a sensitive area or providing for substitute resources; or
  5. Monitoring the impact and initiating appropriate corrective measures.
- K. "Monitoring" means the evaluation of the impacts of development proposals on biologic, hydrologic and geologic systems through the collection and analysis of data over a designated period of time and producing periodic reports for the purpose of understanding and documenting changes in natural ecosystems, functions and features.
- L. "Pervious material" means any material that permits full or partial absorption of stormwater into previously unimproved land.
- M. "Priority habitats" means a seasonal range or habitat element with which a priority species has a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term.
- N. "Priority species" means those species that are listed in the Washington Department of Wildlife Priority and Habitat Species (PHS) list for forested and urban areas.
- O. "Qualified professional" means a person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant sensitive area subject according to WAC [365-195-905\(4\)](#). A qualified professional must also have obtained a Bachelor of Science or Bachelor of Arts or equivalent degree in biology, engineering, environmental studies, fisheries, geomorphology, or related field, with at least three years' experience in the related profession, such as botany, wetlands, fisheries, wildlife, soils, ecology, and similar areas of specialization; provided, that a qualified professional for:



1. Habitat must have a degree from an accredited college or university in biology and professional experience related to the subject species.
2. Wetlands must be a certified professional wetlands scientist or have, at a minimum: (a) a bachelor's degree in hydrology, soil science, biology, botany, ecology, or related field; and (b) at least two years of full-time work experience as a wetlands professional, including experience in delineating wetlands using the state or federal manuals, preparing wetland reports, conducting function assessments, and developing and implementing mitigation plans.
3. A geological hazard must be a professional engineer or geologist, licensed in the state of Washington.
4. Wellhead protection areas must be a hydrogeologist, geologist, engineer, or other scientist with experience in preparing hydrogeologic assessments.

P. "Recommended development practices" means guidelines for development in or near sensitive areas as may be utilized by the planning director from time to time.

Q. "Restorations" or "restoration" means the actions or action taken to return a sensitive area to a state in which the stability, functions and values approach the natural state as closely as possible.

R. "Salmonid" means a member of the fish family salmonidae, which include chinook, coho, chum, sockeye, and pink salmon; rainbow, steelhead, and cutthroat trout; brown trout; bull trout; brook and dolly varden; char; kokanee and whitefish.

S. "Seismic hazard areas" means areas underlain by low-strength fill and floodplain deposits with soil and groundwater conditions that are more susceptible to seismic hazards than other areas.

T. "Sensitive areas" means erosion hazard areas, landslide hazard areas, seismic hazard areas, steep-slope hazard areas, streams, wetlands, wellhead protection areas, wildlife habitat conservation areas and flood hazard areas. "Sensitive areas" also means and includes any buffers established by this chapter, or any buffer or setback established by state law or other city ordinance that serves to protect sensitive areas. "Sensitive areas" also means and includes sensitive areas that are located on neighboring lots.

U. "Setback" means the area delineated on a development proposal site permit that separates building structures from sensitive area buffers present on the development site or on neighboring lots, unless otherwise specified in this chapter.

V. "Slope" means an inclined ground surface, the inclination of which is expressed as a ratio (percent) of vertical distance to the horizontal distance, using the formula:

$$\frac{\text{Vertical distance}}{\text{Horizontal distance}} \times 100 = \text{percent (\%)} \text{ slope}$$

A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least 10 feet of vertical relief.

1. "Steep slope hazard areas" means areas not composed of consolidated rock with slope gradients of 40 percent or greater within a vertical elevation change of at least 10 feet.
2. "Toe of a slope" is a distinct topographic break in slope that separates slopes inclined at less than 40 percent from slopes equal to or in excess of 40 percent. Where no distinct break exists, the toe of a steep slope is the lowermost limit of the area where the ground surface drops 10 feet or more vertically within the

horizontal distance of 25 feet.

3. "Top of a slope" is a distinct, topographic break in slope that separates slopes inclined at less than 40 percent from slopes equal to or in excess of 40 percent. Where no distinct break in slope exists, the top of the slope shall be the uppermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet.

X. "Streams" means surface water carried in defined channels or beds, intermittently or perennially, excluding irrigation ditches, canals, storm or surface water runoff devices or other entirely artificial streams, unless used by salmonids or to convey surface water naturally occurring prior to the alteration of the land. A defined channel or bed shall constitute an area which demonstrates clear evidence of the passage of water and includes, but is not limited to, bedrock channels, gravel beds, sand and silt beds, and defined channel swales. A channel or bed need not contain water year-round, but should show evidence of annual intermittent flow to meet the requirements of this definition. The upstream reach of a stream shall end at the most upstream segment of open water channel flow; provided, that segments that have been culverted shall continue to be considered streams for the purpose of this title. Streams shall be designated as Type 1, Type 2, and Type 3 according to the following criteria.

1. "Type 1": streams that are used at least seasonally by fish for spawning, rearing or migration. Streams that are fish passable from Lake Washington are presumed to be Type 1. Fish passage should be determined by using a qualified professional. Type 1 streams include streams or parts thereof that are waters of the state according to law.

2. "Type 2": streams that are not fish bearing and that do not go dry any time during a year of normal rainfall (perennial streams); provided, however, Type 2 streams include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow; provided further, that if the uppermost point of perennial flow cannot be identified with simple, nontechnical observations, then the point of perennial flow should be determined by a qualified professional.

3. "Type 3": streams that are not Type 1 or 2. These are seasonal, non-fish-bearing streams in which surface flow is not present for a significant portion of a year of normal rainfall and that are not located downstream from any Type 2 or higher stream.

Y. "Utilities" means facilities providing services to lots within the city through wires, pipes, or lines provided by a public or private utility. "Utilities" do not include wireless facilities.

Z. "Wellhead protection area" means the surface and subsurface area surrounding a water well or wellhead, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellhead.

AA. "Wetlands" means land that is inundated or saturated with water, such as swamps, marshes, bogs, and similar, or areas that under normal circumstances support a prevalence of vegetation typically adapted for life in saturated soil conditions; excluding artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. "Wetlands" may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands. Wetlands shall be delineated in accordance with the Washington State Wetland Identification and Delineation Manual (Department of Ecology Publication No. 96-94).

To differentiate between levels of wetland protection and the application of development standards, wetlands are rated as follows:

1. "Category 1": wetlands that meet any of the following:
  - a. The wetland contains species listed by the federal government as endangered or threatened; or
  - b. The wetland is listed by the federal or the state government as containing critical or outstanding actual habitat for endangered or threatened species; or
  - c. Wetlands with 40 percent to 60 percent permanent open water in dispersed patches with two or more classes of vegetation; or
  - d. Wetlands equal to or greater than 10 acres in size and having three or more wetland classes, one of which is open water; or
  - e. Wetlands with plant associations of infrequent occurrence that are associated with wetland values and functions.
2. "Category 2": wetlands that are not Category 1 wetlands and meet any of the following criteria:
  - a. Wetlands greater than one acre in size;
  - b. Wetlands equal to or less than one acre in size and having three wetland classes;
  - c. Wetlands equal to or less than one acre that have a forested wetland class; or
  - d. Wetlands with heron rookeries or raptor nesting trees.
3. "Category 3": wetlands that are not Category 1 or 2 wetlands and that are equal to or less than one acre in size with two or fewer wetland classes.

BB. "Wetland boundary" means the line delineating the outer edge of a wetland as determined by a qualified professional using the Washington State Wetland Identification and Delineation Manual (Department of Ecology Publication No. 96-94) as required by RCW [36.70A.175](#).

CC. "Wetland functions" means the natural processes performed by wetlands, including functions that are important in facilitating food chain production, providing sites for nesting, rearing and resting for aquatic, terrestrial and avian species, maintaining the availability and quality of water, acting as recharge and discharge areas for groundwater aquifers and moderating surface and stormwater flows, as well as performing other functions including, but not limited to, those set forth in the U.S. Army Corps of Engineers regulations at 33 C.F.R. Section 320.4(b)(2), 1988.

DD. "Wildlife habitat conservation area" means feeding, breeding and nesting sites for priority, endangered or threatened species, regardless of number. These lands are managed for maintaining species in a wild state in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created.

"Wildlife habitat conservation areas" include:

1. Priority habitats with priority species;
2. Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat;
3. Waters of the state;
4. Lakes, ponds, streams and rivers planted with game fish by a governmental or tribal entity; or
5. State natural area preserves and natural resource conservation areas. (Ord. 930 § 2, 2005)

### **16.16.050 Maps and study – Adoption.**

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A. The approximate location and extent of sensitive areas are shown on the sensitive area maps adopted by the city of Lake Forest Park, as most recently updated. The following sensitive area maps are hereby adopted:

1. City of Lake Forest Park official sensitive area maps known as the “Lake Forest Park Sensitive Areas Mapping Project,” completed in December 1991, and updates that are the result of sensitive areas studies by a qualified professional subject to review by the planning commission and approval by the planning director. Updates and original plates may be consolidated into a new official map subject to approval of the planning director.
2. Washington Department of Fish and Wildlife Priority Habitat and Species Maps;
3. Maps of wellhead protection areas included in the Lake Forest Park Water District Comprehensive Water System Plan, 2001.

B. These maps are for the guidance of the city of Lake Forest Park, project applicants, and/or property owners. They are a reference and do not provide a final sensitive area designation or delineation. (Ord. 930 § 2, 2005)

### **16.16.060 Sensitive area – Authority of planning director – Review process.**

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A. The planning director is authorized to administer this chapter and to make all decisions required by this chapter unless specifically provided otherwise.

B. The planning director shall perform a review for any development proposal permit application or other request for permission to proceed with an alteration on a site to:

1. Determine whether any sensitive area exists on the property and confirm its nature and type;
2. Determine whether a sensitive area study is required and, if so, the nature of that study;
3. Evaluate the sensitive area study;
4. Determine whether any proposed alteration to the sensitive area is necessary; and
5. Determine whether the mitigation and monitoring plans and bonding measures proposed by the applicant are sufficient to protect the public health, safety and welfare, consistent with the purposes of this chapter. (Ord. 930 § 2, 2005)

### **16.16.070 Applications – Content – Fee.**

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A. Whenever the planning director determines that work on or development of a site will affect a sensitive area, an application for a sensitive area permit shall be filed with the planning director on forms provided by the city.

B. The applicant is responsible for providing and the application shall include information known to the applicant indicating whether the subject property is located in, adjacent to, contains, or has characteristics of an environmentally sensitive area as defined in this chapter or other adopted ordinances. The applicant responsibility includes informing the planning director of the discovery of sensitive areas during the development process that had not been earlier discovered or disclosed.

C. An application shall not be complete until:

1. The applicant has submitted a study prepared by a qualified professional that identifies and assesses any sensitive areas and buffers located on or adjacent to the proposed development site, the potential impacts to the sensitive areas; provided, however, that the planning director may waive the requirement for a study

whenever the planning director determines that sufficient information is otherwise available to decide upon the application consistent with the requirements of this chapter, the city's comprehensive plan, and city ordinances; and

2. The applicant has executed a hold harmless and release agreement in a form approved by the city releasing the city from liability for any damage arising from the location of improvements within the sensitive area or sensitive area buffer; and
3. The applicant has agreed that should the applicant fail to perform mitigation and monitoring as required the city may enter onto the property for the purpose of mitigation and monitoring as required by city permit at the applicant's expense; and
4. The applicant has paid the fee established by the city council. An applicant shall be responsible for all costs associated with the employment of qualified professionals and any review conducted by city employees or city-retained consultants. The planning director may require a deposit to pay for city expenses related to the application as a condition of approval. (Ord. 930 § 2, 2005)

#### **16.16.080 Applications – Approval – Permits – General condition.**

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A. In accordance with the provisions of this chapter, the planning director may approve, deny, or approve with conditions any application for a sensitive area permit. The planning director's decision shall be in writing that sets forth the basis of the decision and cites the relevant code provision. Sensitive area permits shall be of two types:

1. A major sensitive area permit shall be required for all activities subject to this chapter, except as provided in subsection (A)(2) of this section.
2. A minor sensitive area permit shall be required for all activities:
  - a. Performed only by light equipment.
  - b. Authorized by LFPMC [16.16.230](#) and performed only by light equipment.
  - c. Authorized by the setback exceptions of LFPMC [16.16.240](#).

B. All work authorized by a sensitive area permit shall be conducted using the best management practices that result in the least amount of impact to the sensitive areas, including for tree and vegetation protection, construction management, erosion and sedimentation control, water quality protection, and regulation of chemical applications. The city may observe the use of best management practices as necessary to ensure that the activity does not result in degradation to the sensitive area. Any damage to, or alteration of, a sensitive area shall be restored, rehabilitated, or replaced as determined by the planning director at the responsible party's expense. (Ord. 930 § 2, 2005)

#### **16.16.090 Applications – Approval – Criteria – Revocation.**

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A. The planning director shall make final sensitive area determinations and issue sensitive area permits according to the requirements of this chapter, best available science, and sensitive area studies prepared by qualified professionals.

B. The planning director is authorized to conduct review of the sensitive area study submitted by the applicant using a qualified professional to verify the study's findings, conclusions and recommendations. Before initiating a professional review, the city shall inform the applicant of the review and anticipated expense.

C. When reviewing an application, the planning director may consider any recommended development practices that may be used in conjunction with the adopted sensitive areas map and study. Recommended development

practices may serve as a guideline for interpretation of both the study and sensitive areas map.

D. A permit issued on the basis of false information provided by the applicant is void and the holder of such permit shall have no rights thereunder. (Ord. 930 § 2, 2005)

#### **16.16.100 Sensitive area – Special study requirement.**

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A. An applicant for a development proposal on a site determined by the planning director to be subject to the requirements of this chapter shall submit a sensitive area study that in the judgment of the planning director adequately evaluates the proposal and all probable impacts to the satisfaction of the planning director.

B. The planning director may require information from the applicant in addition to the sensitive area study as necessary to ensure compliance with this chapter. (Ord. 930 § 2, 2005)

#### **16.16.110 Contents of sensitive areas study.**

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A. Sensitive area studies shall be in writing and:

1. Identify and characterize sensitive area as a part of a larger development proposal site;
2. Assess hazards posed by the development proposal to any sensitive areas or sensitive area buffers on or adjacent to the proposed site;
3. Propose adequate mitigation, maintenance, monitoring and contingency plans and bonding measures, if necessary;
4. Provide a scale map of the development proposal site;
5. Provide detailed studies, as required.

B. Sensitive area studies shall incorporate the best available science.

C. The planning director may permit a sensitive area study to incorporate studies required by other laws and regulations or other sensitive area studies performed under this chapter. (Ord. 930 § 2, 2005)

#### **16.16.120 Mitigation and monitoring.**

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A. The planning director may require such mitigation as may be indicated as beneficial by the sensitive area study.

B. Mitigation of sensitive area impacts shall be conducted according to an approved mitigation plan that shall describe the existing functions and values of the affected sensitive areas, the nature and extent of impacts to those areas, and proposed mitigation measures to offset those impacts. The mitigation plan shall also contain a drawing that illustrates the compensatory mitigation elements. The plan and/or drawing shall list plant materials and other habitat features to be installed.

C. The applicant shall submit a monitoring and maintenance program prepared by a qualified professional that shall, at a minimum, include the following:

1. The goals and objectives for the mitigation plan;
2. The criteria for assessing the mitigation;
3. A monitoring plan that includes annual site visits by a qualified professional, with annual progress reports submitted to the planning director and that lasts for a period sufficient to establish that performance standards have been met as determined by the planning director, but no less than five years;

4. A contingency plan; and

5. A signed copy of the written contract with a qualified professional who will perform the monitoring program. The contract shall incorporate the terms of the required monitoring program.

D. Whenever the planning director determines that monitoring has established a significant adverse deviation from predicted impacts, or that mitigation or maintenance measures have failed, the applicant or the property owner shall be required to institute correction action, which shall also be subject to further monitoring as provided in this section.

E. All costs associated with the mitigation/monitoring and planning therefor, including city expenses, shall be the responsibility of the applicant. (Ord. 930 § 2, 2005)

#### **16.16.130 Mitigation sequencing.**

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Applicants shall demonstrate that all reasonable efforts to avoid and minimize impacts to sensitive areas and buffers have been examined and that impacts have been avoided, minimized, or compensated for in the following order of preference:

A. Minimizing impacts by limiting the degree or magnitude of the action by using appropriate technology, or by taking affirmative steps to avoid or reduce the impact;

B. Rectifying the impact by repairing, rehabilitating, or restoring the affected sensitive area(s) and/or buffer(s);

C. Reducing or eliminating the impact or hazard over time through preservation and/or maintenance operations;

D. Compensating for the impact by replacing, enhancing, or providing substitute sensitive areas and/or buffers; and

E. Monitoring the impact and/or hazard and making appropriate corrective measures when necessary. (Ord. 930 § 2, 2005)

#### **16.16.140 Timing.**

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A. All work approved or mitigation required by a sensitive areas permit shall be completed prior to the final inspection and occupancy of a project or sooner as prescribed by the planning director.

B. Failure to complete such action within the required time limit or any approved extension thereof shall render the sensitive area permit void, the project shall be subject to abatement, and the applicant shall be subject to sanctions as provided herein.

C. Upon showing of good cause, the planning director may extend the completion period. (Ord. 930 § 2, 2005)

#### **16.16.150 Bond requirements.**

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A. The planning director may require a performance bond(s) or other security in an amount sufficient to guarantee that all required mitigation measures will be completed in a manner that complies with conditions of approval and to guarantee satisfactory workmanship and materials for a period not to exceed five years. The planning director shall establish the conditions of the bond or other security according to the nature of the proposed mitigation, maintenance or monitoring and the likelihood and expense of correcting mitigation or maintenance failures.

B. Performance and maintenance/monitoring bonds or other security shall also be required for restoration of a sensitive area or buffer not performed as part of a mitigation or maintenance plan, except that no bond shall be required for minor stream restorations carried out in compliance with applicable ordinances. The bond or other

security shall be in a form and amount deemed acceptable by the planning director.

C. Posting of a bond or other security shall not discharge the obligation of an applicant or violator to complete required mitigation, monitoring or restoration. The requirement of a bond or other security is not intended and shall not be construed to relieve an applicant of any obligation imposed under this chapter. (Ord. 930 § 2, 2005)

#### **16.16.160 Vegetation management plan.**

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A. Whenever the planning director determines that preservation of existing vegetation is required, a vegetation management plan prepared by a qualified professional shall be approved by the planning director before permit approval.

B. The vegetation plan shall identify the proposed clearing limits for the project and any areas where the sensitive area or buffer is proposed to be disturbed.

C. Clearing limits will be marked in a prominent and durable manner. Proposed methods of field marking shall be approved by the planning director and remain in place and visible until final project approval is granted.

D. The vegetation plan may be incorporated into a temporary erosion and sediment control plan (TESCP) or landscaping plan where either of these measures are required by the city or other laws. (Ord. 930 § 2, 2005)

#### **16.16.170 Sensitive areas – Markers and signs.**

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A. Before work commences, the applicant shall mark the property with permanent survey markings, and stakes delineating the boundary between sensitive areas and adjoining areas shall be set, as established by current survey standards.

B. Temporary survey markings shall be highly visible and shall remain in place until the planning director authorizes their removal at the completion of the work.

C. The planning director may require fencing when needed to best protect the sensitive area.

D. The boundary between a sensitive area and adjoining land shall be identified with permanent signs. (Ord. 930 § 2, 2005)

#### **16.16.180 Sensitive areas – Tract designations.**

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A. Sensitive areas tracts shall be established or legally described to delineate and protect all sensitive areas and buffers and shall be recorded on all documents of title or record for all affected lots. Development proposals, including subdivisions, short subdivisions, lot line adjustments, variance requests, conditional use permits and reasonable use requests shall be required to meet the provisions of this section when one or more of the following areas are present:

1. Landslide hazard areas and buffers;
2. Steep slope hazard areas and buffers;
3. Wetlands and buffers; and
4. Streams and buffers.

B. Site plans submitted as a part of development proposals shall include and delineate all sensitive areas attached and shall be attached to the notice on title as required by the planning director. (Ord. 930 § 2, 2005)

#### **16.16.190 Notice to title.**

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- A. A condition of a major sensitive area permit shall be a requirement that the property owner shall record a notice that the property is subject to regulation under this chapter.
- B. The planning director may require that as a condition of approval of any development proposal or minor sensitive area permit a notice on title be filed putting on record that the property is subject to regulation under this chapter.
- C. Notice on title shall include any requirement for mitigation and monitoring imposed as a condition of a sensitive area permit. (Ord. 930 § 2, 2005)

#### **16.16.200 Performance standards for subdivisions.**

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The subdivision and short subdivision of land in sensitive areas and associated buffers is subject to the following:

- A. Land that is located wholly within a wetland, stream, landslide hazard area or their buffers may not be subdivided.
- B. Land on which a wetland, stream, landslide hazard area, or their buffers are located may not be subdivided unless each new lot that is created can be developed under city ordinances without resort to variance or other exemption and contains a buildable area of no less than 1,000 square feet.
- C. Access roads and utilities serving the proposed subdivision may be permitted within the sensitive area and associated buffers only if the planning director determines that no other feasible alternative exists and then only in a manner consistent with the requirements of this chapter. (Ord. 930 § 2, 2005)

#### **16.16.210 Sensitive areas rules.**

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The mayor shall adopt such administrative rules and regulations, including recommended development practices, deemed necessary to implement this chapter. (Ord. 930 § 2, 2005)

#### **16.16.220 Exemptions.**

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The following are exempt from regulation under this chapter, unless specifically provided otherwise.

##### A. Emergency Actions.

1. Actions taken to prevent an immediate threat to public health, safety, or welfare, or that are necessary to address an immediate risk of damage to public or private property; provided, that emergency actions that create an impact to a sensitive area or its buffer shall be taken with reasonable methods that are least likely to affect sensitive areas.
2. The person undertaking such action shall notify the planning director within one working day following commencement of the emergency activity and shall apply to the planning director for review of the work performed. The planning director may require a study by a qualified professional or mitigation and monitoring as provided in LFPMC [16.16.100](#) through [16.16.130](#). Restoration and/or mitigation activities must be initiated within one year of the date of the emergency and completed in a timely manner as prescribed by the planning director, with the goal of no net loss of critical area functions and values.

B. Operation, maintenance, or repair of existing structures, infrastructure improvements, utilities, public or private roads, or drainage systems, that do not require construction permits, including vegetation management; provided, that the activity does not alter or increase the impact to, or encroach further within, the sensitive area or buffer.

C. Use, preservation, or continuation of landscaping and landscaped areas existing as of the effective date of the ordinance codified in this chapter or gardens planted and maintained before the effective date of the ordinance

codified in this chapter; provided, that such use does not expand the landscaped areas into sensitive areas or their buffers and does not involve the applying of herbicides, pesticides or any other hazardous substance. However, property owners shall be encouraged to allow sensitive areas and buffers to become naturalized whenever possible.

D. Passive recreation, education, and scientific research activities that do not degrade sensitive areas or buffers, such as fishing, hiking and bird watching, not including trail building or clearing.

E. Construction or modification of navigational aids and boundary markers.

F. The removal of the following vegetation with hand labor and light equipment:

1. Invasive and noxious weeds as listed by state and county agencies;
2. English ivy (*Hedera helix*);
3. Himalayan blackberry (*Rubus discolor*, *R. procerus*); and
4. Evergreen blackberry (*Rubus laciniatus*). (Ord. 930 § 2, 2005)

### **16.16.230 Authorized exceptions to work in sensitive areas.**

The planning director may issue a sensitive area permit for work in sensitive areas or sensitive area buffers as follows:

A. Work necessary for land use submittals, such as surveys, soil logs, percolation tests, and other related activities, where such activities do not require construction of new access roads or excavation activities that involve the removal of more than 10 cubic yards of material. In every case, impacts to sensitive areas and buffers shall be minimized and disturbed areas shall be immediately restored.

B. Conservation, preservation, restoration and/or enhancement unrelated to development proposals.

1. Conservation and/or preservation of soil, water, native vegetation, fish and/or other wildlife that does not entail modification of the location, size, dimensions or negatively impact the functions of an existing sensitive area and/or buffer; and
2. Restoration and/or enhancement of sensitive areas or buffers; provided, that the actions do not: (a) alter the location, dimensions or size of the sensitive area and/or buffer; (b) negatively impact the native vegetation or wildlife habitat attributes; and (c) reduce, but improve, the existing functions of the sensitive areas or buffers; and
3. All actions under this section must be actions that are implemented according to a restoration and/or enhancement plan that has been approved by the planning director. The planning director may waive the fee for permits issued under this subsection (B).

C. Structural modification of, addition to, or replacement of an existing legally constructed structure, constructed on or before the effective date of the ordinance codified in this chapter as long as the structure is enlarged not more than the lesser of 10 percent or 250 square feet than its footprint as of the effective date of the ordinance codified in this chapter, and that no portion of the modification or replacement is located closer to the sensitive area; provided, that restoration of structures damaged by fire, flood, or act of nature must be initiated within one year of the date of such damage, as evidenced by the issuance of a valid building permit, and diligently pursued to completion.

D. Activities within the improved right-of-way.

E. Utility projects that have minor or short-duration impacts to sensitive areas, and do not significantly impact the function or values of a sensitive area(s), as determined by the planning director according to the following criteria:

1. There is no practical alternative to the proposed activity with less impact on sensitive areas;
2. The activity involves the placement of a utility pole, street signs, anchor, or vault or other small component of a utility facility;
3. The activity involves disturbance of an area less than 75 square feet;
4. The project does not result in the permanent transportation of sediment or increased stormwater flow.

F. Public and Private Pedestrian Trails. Public and private pedestrian trails, except in wetlands or streams, subject to the following:

1. The trail surface shall be made with pervious materials and meet all other requirements including city surface water management standards;
2. The mitigation may include increase of sensitive area and/or buffer widths equal to the width of the trail corridor, including disturbed areas; and
3. Trails proposed to be located in landslide or erosion hazard areas shall be constructed in a manner that does not increase the risk of landslide or erosion and in accordance with an approved geotechnical report.

G. Select Vegetation Removal Activities.

1. Notwithstanding the provisions of Chapter [16.14](#) LFPMC, trees shall not be removed from sensitive areas, except for trees that are hazardous or pose an imminent risk of damage to private property; provided, that:
  - a. The applicant submits a report from a certified arborist, registered landscape architect, or professional forester that documents the hazard and provides a replanting schedule for the replacement trees;
  - b. Tree cutting shall be limited to pruning and crown thinning, unless otherwise justified by a qualified professional. Where pruning or crown thinning is not sufficient to address the hazard, trees should be removed or converted to wildlife snags;
  - c. All vegetation cut (tree stems, branches, etc.) shall be left within the sensitive area or buffer unless removal is warranted because of the potential for disease or pest transmittal to other healthy vegetation or the potential fire hazard;
  - d. The landowner shall replace any trees that are removed with new trees at a ratio of one replacement tree for each tree removed (1:1) within one year in accordance with an approved restoration plan. Replacement trees may be planted at a nearby location if it can be determined that planting in the same location would create a new hazard or potentially damage the sensitive area. Replacement trees shall be species that are native and indigenous to the watershed and a minimum of one inch in diameter-at-breast height (dbh) for deciduous trees and a minimum of six feet in height for evergreen trees as measured from the top of the root ball;
  - e. If a tree to be removed provides critical habitat, such as an eagle perch, a qualified wildlife biologist shall be consulted to determine timing and methods of removal that will minimize impacts; and
  - f. Hazard trees determined to pose an imminent threat or danger to public health or safety, to public or

private property, or of serious environmental degradation may be removed or pruned by the landowner prior to receiving written approval from the city; provided, that within 14 days following such action, the landowner shall submit a restoration plan that demonstrates compliance with the provisions of this title.

2. Measures to control a fire or halt the spread of disease or damaging insects consistent with the State Forest Practices Act, Chapter [76.09](#) RCW; provided, that the removed vegetation shall be replaced in-kind or with similar native species or other nonnative plants as may be approved by the city within one year in accordance with an approved restoration plan.

3. Unless otherwise provided, or as a necessary part of an approved alteration, removal of any vegetation or woody debris from a habitat conservation area or wetland shall be prohibited. (Ord. 930 § 2, 2005)

#### **16.16.240 Setback exception.**

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A. Whenever in the judgment of the planning director the presence of a sensitive area makes it impractical to locate a building pad on the lot except by intruding into required setbacks, the planning director may permit a deviation from the front and rear yard zoning setbacks required by this code for residential development proposals for single lots, long subdivisions, lot line revisions and short subdivisions.

B. Aggregate setbacks for new short subdivisions, long subdivisions, and lot line revisions shall be recorded on final documents.

C. The decision to grant a deviation shall be based on the following criteria:

1. The aggregate setbacks for the zoning front, rear, and side yard setbacks total 60 feet or more;
2. Front and rear zoning setbacks are no less than 10 feet;
3. Side zoning setbacks are no less than five feet;
4. Significant vegetation is preserved;
5. The applicant demonstrates to the city through submittal of an application and supporting documentation that the use of aggregate zoning setbacks will not:
  - a. Be materially detrimental to the public welfare or injurious to adjacent property or development or alterations; and
  - b. Alter the neighborhood character or the appropriate use or development of adjacent property; and
  - c. Conflict with the general purposes and objectives of the comprehensive plan; and
  - d. Degrade sensitive areas and sensitive areas buffer functions. (Ord. 930 § 2, 2005)

#### **16.16.250 Reasonable use exception to allow for reasonable economic use.**

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A. If the application of this chapter will prevent any reasonable economic use of the owner's property, then the applicant may apply to the planning department for an exception from the requirements of this chapter; may be applied for in accordance with the provisions of Chapter [16.26](#) LFPMC.

B. The planning director shall forward the application, along with the record submitted to the city and the director's recommendation, to the hearing examiner for decision.

C. The hearing examiner shall grant an exception only if:

1. Application of the requirements of this chapter will deny all reasonable economic use of the property; and

2. There is no other reasonable economic use with less impact on the sensitive area; and
3. The proposed development does not pose an unreasonable threat to the public health, safety, or welfare, on or off the proposed site, and is consistent with the general purposes of this chapter and the comprehensive plan; and
4. Any alteration is the minimum necessary to allow for reasonable economic use of the property.

D. The hearing examiner shall grant an exemption from the requirements of this chapter only to the minimum necessary extent to allow for reasonable economic use of the applicant's property.

E. The hearing examiner shall condition any exception from the requirements of this chapter upon conditions recommended by the city and upon compliance with any mitigation plan approved by the city. (Ord. 930 § 2, 2005)

#### **16.16.260 Public agency and utility exception.**

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A. Whenever requirements of this chapter would prohibit a development proposal by a public agency or public utility, the agency or utility may apply to the planning director for an exception pursuant to this section.

B. An application for a public agency and utility exception shall include a sensitive area study, including mitigation plan, if required. The planning director shall prepare and submit a recommendation to the hearing examiner.

C. The hearing examiner shall review and decide upon the application pursuant to the provisions of Chapter [16.26](#) LFPMC. The hearing examiner shall approve, approve with conditions, or deny the request according to the following criteria:

1. There is no other practical alternative to the proposed development with less impact on the sensitive areas;
2. The application of this chapter would unreasonably restrict the ability to provide utility services to the public;
3. The proposal does not pose an unreasonable threat to the public health, safety, or welfare on or off the development proposal site;
4. The proposal attempts to protect and mitigate impacts to the sensitive area functions and values consistent with the best available science with the objective of no net loss of critical area functions and values; and
5. The proposal is consistent with other applicable regulations and standards. (Ord. 930 § 2, 2005)

#### **16.16.270 Development standards – Sensitive area permits.**

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Work or development authorized by a sensitive area permit shall be subject to the development standards of this chapter. (Ord. 930 § 2, 2005)

#### **16.16.280 Erosion hazard areas – Development standards – Permitted alterations.**

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- A. Clearing is allowed between April 1st and September 30th.
- B. Development proposals shall include a temporary erosion control plan approved by the planning director.
- C. Clearing of roads and utilities shall remain within construction limits, which must be marked in the field prior to the beginning of any site work.

- D. Clearing of roads and utilities shall be the minimum necessary to accomplish project-specific designs and shall remain within approved rights-of-way.
- E. Clearing of trees, as permitted by the Lake Forest Park Municipal Code, may occur in conjunction with clearing for roadways and utilities.
- F. Only that clearing necessary to install temporary sedimentation and erosion control measures shall occur before clearing of roadways or utilities.
- G. All trees and understory shall be retained on lots or parcels during clearing for roadways and utilities; provided, that understory damaged during approved clearing operations may be pruned.
- H. Retained trees, understory and stumps may be cleared only if such action is a necessary element of any site plan approval.
- I. Erosion control measures including but not limited to hydroseeding shall be required.
- J. All development proposals shall include an erosion control plan consistent with this chapter and other adopted requirements prior to plan approval.
- K. Whenever, in the judgment of the planning director erosion from a development site poses a risk of damage to downstream receiving waters, the applicant shall be required to provide regular monitoring of surface water discharge from the site. If the project does not meet water quality standards established by other applicable code or rules, the city may suspend further development work until the project meets such standards.
- L. The use of pesticides, herbicides, fertilizers and hazardous substances in erosion hazard areas shall be prohibited unless demonstrated to the satisfaction of the planning director that special circumstances require their use. (Ord. 930 § 2, 2005)

#### **16.16.290 Landslide hazard areas – Development standards – Permitted alterations.**

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- A. A minimum buffer of 50 feet shall be established from all edges of the landslide hazard area. Buffer widths shall be extended or adjusted as needed to mitigate a steep slope or erosion hazard or to promote the health and safety of the public. The buffer may be reduced to a minimum of 25 feet when a qualified professional demonstrates to the planning director's satisfaction that the reduction will adequately protect the proposed development, adjacent developments, and uses and the landslide hazard area.
- B. Unless permitted by a sensitive area permit, vegetation may not be removed from a landslide hazard area or buffer except as required for surveying purposes.
- C. Vegetation that has been damaged by any activity or invaded by noxious weeds or nonnative vegetation may be replaced within a landslide hazard area with approved native vegetation or nonnative plants as may be approved by the city as part of an approved enhancement plan. The use of pesticides, herbicides, fertilizers and hazardous substances in landslide hazard areas shall be prohibited unless demonstrated to the satisfaction of the planning director that special circumstances require their use.
- D. Permitted alterations to landslide hazard areas and buffers are allowed only as follows:
1. Landslide hazard areas located on a slope of 40 percent or steeper may only be altered if the alteration meets the standards and limitations established for steep slope hazard areas;
  2. Alteration of landslide hazard areas located on slopes of less than 40 percent are permitted only under the following conditions or circumstances:

- a. The development proposal will not decrease slope stability on the site or on adjoining properties;
  - b. A licensed geologist or geotechnical engineer certifies that the landslide hazard area can be safely modified or the development proposal designed so the landslide hazard risk to the property or adjacent property is eliminated or mitigated;
  - c. The alteration will not adversely impact other sensitive areas, such as streams; and
  - d. The alteration will not result in an increase in peak surface water flows or sedimentation to adjacent properties;
3. Where such alterations are approved, buffers may not be required. (Ord. 930 § 2, 2005)

### **16.16.300 Seismic hazard areas – Development standards – Permitted alterations.**

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Development proposals for developments other than single-family residences may require review standards of critical facilities based on larger earthquake recurrence intervals and implementation of measures to mitigate the risk are implemented that meet accepted engineering standards for safety. (Ord. 930 § 2, 2005)

### **16.16.310 Steep slope hazard areas – Development standards – Permitted alterations.**

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A. Buffer Width Requirements. A minimum buffer shall be established at a horizontal distance of 50 feet from the top, toe and along all sides of any slope 40 percent or greater. The buffer may be reduced to a minimum of 25 feet when a qualified professional demonstrates to the planning director's satisfaction that the reduction will adequately protect the proposed development, adjacent developments, uses and the steep slope hazard area.

1. Removal of existing vegetation from a steep slope hazard area or buffer is prohibited unless otherwise provided for in an approved alteration plan. Limited removal for surveying purposes is permitted;
2. All buildings and structures shall have a minimum setback of 15 feet from the edge of the slope buffer. The 15-foot setback shall be measured at an angle that is perpendicular to the edge of the slope buffer.

B. Alterations to steep slopes and buffers will be permitted only as follows:

1. An approved surface water conveyance may be allowed on steep slopes if in the judgment of the planning director it can be installed in a manner to minimize disturbance to the slope and vegetation;
2. Approval of public and private trails may be allowed on steep slopes subject to compliance with recognized construction and maintenance standards. Construction of impervious surfaces, such as asphalt and concrete, that would contribute to surface water runoff is prohibited unless the applicant demonstrates to the satisfaction of the planning director such action is necessary for soil stabilization or prevention of soil erosion;
3. Utility corridors on steep slope hazard areas may be permitted if a study performed by a qualified professional establishes to the satisfaction of the planning director that the risk of landslide or erosion will not increase;
4. Limited trimming, limbing and pruning may be allowed on steep slopes for the creation and maintenance of views based on an approved vegetation management plan if soils are not disturbed and applicable administrative rules are followed.

C. The following may be permitted:

1. Alteration of slopes that are 40 percent or steeper with a vertical elevation change of up to 20 feet; provided, that a soils report prepared by a qualified professional satisfies the planning director that no

adverse impact will result from the exception;

2. Any slope that was created through legal grading activity may be regraded as part of an approved development plan; provided, that any slope that remains 40 percent or steeper following site development shall be subject to all requirements for steep slopes.

D. When steep slope alterations are allowed by this section, the proposal shall:

1. Not decrease slope stability on the site or on adjoining properties; and
2. Be subject to certification by a qualified professional that the landslide hazard area can be modified safely or that the development proposal eliminates or mitigates the landslide hazard risk to the property or adjacent property; and
3. Not adversely impact other sensitive areas, such as streams; and
4. Not result in an increase in peak surface water flows or sedimentation to adjacent properties. (Ord. 930 § 2, 2005)

### **16.16.320 Wetlands – Development standards.**

A. Wetland buffers, measured from the outer edge of the wetland boundary, are established as follows:

<b>Wetland Type</b>	<b>Standard Buffer Width (feet)</b>	<b>Minimum Buffer Width with Enhancement (feet)</b>
Category 1	150	105
Category 2	100	70
Category 3	50	35

B. Except as otherwise permitted herein, alteration of any wetland buffer is prohibited.

C. Wetlands within 25 feet of the toe of a slope 30 percent or steeper, but less than 40 percent, shall have the following buffers:

1. Where the horizontal length of the slope including small benches and terraces is within the buffer for the wetland class, the buffer width shall be the greater of:
  - a. The minimum standard for that wetland class;
  - b. Twenty-five feet beyond the top of the slope.
2. Where the horizontal length of the slope extends beyond the standard buffer for that wetland class, the buffer shall extend to a point 25 feet beyond the standard buffer for that wetland class.

D. Buffer width averaging may be allowed only where the applicant demonstrates to the satisfaction of the planning director:

1. That the wetland contains variations in sensitivity because of existing physical characteristics; and
2. That low-intensity land uses would be located adjacent to areas where buffer width is reduced and that such low-intensity land uses are guaranteed in perpetuity by covenant deed restriction, easement or other legally binding mechanism; and



3. That buffer width averaging will not adversely impact the wetland's functional values; and
  4. The buffer averaging provides additional protection; and
  5. That the total area contained in the buffer on the development proposal site does not decrease, and the buffer is not reduced in any one location to less than the minimum buffer specified in subsection A of this section.
- E. The planning director may reduce a standard wetland buffer to not less than the minimum buffer as follows:
1. In accordance with an approved sensitive area study, mitigation plan, and the best available science; provided, that a smaller area is adequate to protect the wetland functions based on site-specific characteristics and the proposal will result in a net improvement of wetland and buffer functions.
  2. A plan for mitigating buffer-reduction impacts must be prepared that incorporates from the list below incentive-based mitigation to achieve a buffer no less than the minimum buffer listed in subsection A of this section. Whenever the reduced buffer area is degraded, the buffer reduction plan shall provide for revegetation of the degraded area with native plants or other nonnative plants as may be approved by the city and shall provide for a five-year monitoring and maintenance plan. Mitigation options include:
    - a. Removal of impervious surfaces.
    - b. Installation of biofiltration/infiltration mechanisms, such as the installation of bioswales, created and/or enhanced wetlands, or ponds.
    - c. Removal of invasive, nonnative vegetation subject to monitoring (minimum of five years) and continued-removal maintenance of relatively dense stands of invasive, nonnative vegetation from significant portions of the remaining buffer area in conjunction with dense planting of native trees and shrubs or other nonnative plants as may be approved by the city.
    - d. If not already required under an existing development proposal, installation of oil/water separators for stormwater quality control.
    - e. Use of pervious material for driveway/road construction.
    - f. Construction of roofs for on-site buildings built in accordance with the standards of the LEED Green Building Rating System.
    - g. Removal of significant refuse or sources of toxic material.
    - h. Revegetation enhancement of degraded buffer outside of the reduced buffer area if the remaining buffer beyond the enhanced buffer reduction area is degraded and a substantial portion of this degraded area is enhanced through revegetation with native plants or other nonnative plants as may be approved by the city subject to a five-year monitoring and maintenance plan.
- F. Increased buffer widths shall be required when necessary to protect wetlands. The criteria used to determine increased buffer widths shall include:
1. The presence of critical drainage areas;
  2. Location of hazardous materials;
  3. The presence of critical fish and wildlife habitat;
  4. The presence of landslide or erosion hazard areas adjacent to wetlands;

5. The presence of groundwater recharge and discharge;
6. The location of trail or utility corridors; and
7. Such other factors as may be adopted by administrative rule.

G. All buildings or other structures shall have a minimum setback of at least 15 feet from any place on the edge of a wetland buffer. The setback line shall be established by measuring perpendicularly from the edge of a wetland buffer.

H. Development proposals that would permit the introduction of livestock shall protect wetlands by the use of fencing located not closer than the buffer edge, or by use of other measures approved by the planning director.

I. The use of hazardous substances, pesticides or fertilizers in the wetland, its buffer, or in its setback shall be prohibited unless demonstrated to the satisfaction of the planning director that special circumstances require their use. (Ord. 930 § 2, 2005)

### **16.16.330 Wetlands – Permitted alterations.**

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A. Exceptions to the wetlands requirements may be allowed only if it is determined by the planning director that the development site proposal will enhance or protect the wildlife habitat, natural drainage or other functions and will be consistent with the purposes of this chapter.

1. The applicant shall submit a report prepared by a qualified professional. The report shall assess the habitat, water quality, stormwater detention, groundwater recharge, and erosion protection functions of the buffer; assess the effects of the proposed modification on those functions; and address other criteria listed in this subsection. The report shall include specific recommendations for mitigation including, but not limited to, construction techniques or design, drainage or density specifications.
2. If a wetland is located in a flood hazard area, the applicant shall notify in writing the affected parties and the appropriate responsible officials of the proposed alterations before undertaking any alteration.
3. Introduction of nonnative plant material or wildlife into any wetland or buffer is prohibited unless authorized by a city-approved nonnative plant list or a state or federal permit or approval.

B. Sewer utility corridors may be allowed in wetland buffers only if:

1. The applicant demonstrates that there are no feasible alternatives;
2. The corridor is not located in a wetland or buffer that is used by species listed as endangered, threatened or priority by the state or federal government or that contains critical or outstanding actual habitat for those species or rookeries or raptor nesting sites;
3. The corridor alignment including, but not limited to, any allowed maintenance roads follows a path beyond a distance equal to 75 percent of the standard buffer width from the wetland edge;
4. Any corridor construction or maintenance protects the wetland and buffer, the corridor is aligned to avoid cutting trees greater than 12 inches in diameter when possible, and use of pesticides, fertilizers, or herbicides is consistent with best management practices to avoid wetland and habitat impacts;
5. Provision is made for an additional contiguous buffer of equal width to the proposed corridor, including any maintenance roads to protect the wetland;
6. The corridor is revegetated with native vegetation to a state equal to or greater than preconstruction densities immediately upon completion of construction or as soon as possible. Maintenance and monitoring

provisions for the revegetation will be a part of any revegetation plan;

7. Additional access for maintenance shall be limited to specific points rather than via parallel roads; and

8. The width of any necessary parallel road providing maintenance access is as narrow as possible, not to exceed 15 feet, and maintenance is carried out in accordance with wetland management standards.

C. Joint use of an approved sewer utility corridor by other utilities shall be encouraged.

D. Surface water management activities and facilities may be allowed in wetland buffers as allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guide Sheet 1B in Appendix I-D of the Department of Ecology Stormwater Management Manual for Western Washington (2005) and only as follows:

1. Surface water may discharge to a wetland from a detention facility, presettlement pond or other surface water management activity or facility; provided, that the discharge does not increase the rate of flow, change the plant composition or decrease the water quality of the wetland;

2. A Category 3 wetland or buffer may be used for a regional detention/retention facility only when:

- a. A public agency or utility is authorized by LFPMC [16.16.260](#);
- b. The rating or factors used in rating the wetlands will not alter the use;
- c. There are no adverse impacts to the wetland;

3. A Category 3 wetland or buffer with the major function of water storage may be used as a regional retention/detention facility; provided, that presettlement ponds are required and all other applicable standards are met and:

- a. No other practical alternative exists; and
- b. The functions of the buffer or wetland are not adversely affected.

E. Wetlands shall not be used for retention/detention facilities other than for regional facilities as allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guide Sheet 1B in Appendix I-D of the Department of Ecology Stormwater Management Manual for Western Washington (2005) and as provided for in this section.

F. Alterations to isolated wetlands will be permitted only pursuant to an approved mitigation plan.

G. Wetland crossings may be allowed; provided, that the planning director determines that:

1. No possible alternative exists;
2. All crossings minimize impact to the wetland and provide mitigation for unavoidable impacts through restoration, enhancement or replacement of disturbed areas;
3. The overall wetland hydrology is not changed;
4. Important habitat functions are not disturbed;
5. Construction is scheduled during periods of low water tables, generally during the drier summer months. (Ord. 1011 § 1, 2010; Ord. 930 § 2, 2005)

#### **16.16.340 Wetlands – Mitigation requirements.**

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A. Mitigation shall be conducted pursuant to LFPMC [16.16.100](#) through [16.16.130](#).

B. Restoration shall be required when a wetland or its buffer is altered in violation of this chapter or other applicable standards. To the extent practicable and applicable, restoration will conform to the following minimum requirements:

1. The original wetland shape and form shall be replicated, including its depth, width, length and gradients at the original location;
2. The original soil types and configuration should be restored;
3. The wetland edge and buffer configuration shall be restored to original condition;
4. The wetland edge and buffer shall be replanted with native vegetation which recreates the original in species, sizes and densities; and
5. The original wetland functions shall be restored, including but not limited to hydrologic and biologic functions.

C. The requirements of subsection A of this section may be modified if it is demonstrated that greater wetlands functions can be obtained otherwise.

D. Replacement shall be required when a buffer is altered pursuant to an approved development proposal or a wetland is used for a regional retention/detention facility or other approved use. The minimum standards required for the restoration of a wetland listed under subsection B of this section shall be followed.

E. Enhancement may be allowed when a wetland or buffer will be altered pursuant to a development proposal, but the wetland's water quality or wildlife habitat functions will be improved. Minimum requirements for enhancement shall be established in administrative rules.

F. Surface water management or flood control alterations shall not constitute replacement or enhancement unless other functions are simultaneously improved.

G. Replacement or enhancement for approved wetland alterations shall meet the following minimum requirements unless upon review it is shown that a different ratio would enhance the wetland values and functions:

1. Unless it is shown upon review that different ratios would benefit the wetland, wetlands that are altered shall be replaced or enhanced on site with equal or greater biological values including habitat value, and with equivalent hydrological values, including storage capacity, using the following formulas:
  - a. Category 1 wetlands on a 6:1 ratio basis;
  - b. Category 2 wetlands on a 3:1 ratio basis;
  - c. Category 3 wetlands on a 2:1 ratio basis.

Mitigation shall result in equal or greater biological values including habitat and hydrological values, including storage capacity;

2. Replacement or enhancement off the site may be allowed; provided, that the applicant demonstrates that the off-site location is in the same drainage subbasin as the original wetland and that water quality or wildlife habitat functions will be increased. The formulas and requirements of subsection (G)(1) of this section will apply.

H. Monitoring shall be required in accordance with LFPMC [16.16.120](#). (Ord. 930 § 2, 2005)

### **16.16.350 Streams – Development standards.**

A. Stream buffers measured from the ordinary high water mark, if such can be identified, otherwise from the top of the bank are established as follows:

<b>Stream Type</b>	<b>Standard Buffer Width (feet)</b>	<b>Minimum Buffer Width with Enhancement (feet)</b>
Type 1	115	70
Type 2	50	35
Type 3	35	25

B. Except as otherwise permitted herein, alteration of any stream buffer is prohibited.

C. Any stream restored, relocated, replaced or enhanced because of stream alteration shall have the standard required buffer.

D. Any stream with an ordinary high water mark within 25 feet of the toe of a slope 30 percent or steeper shall have a buffer equal to the greater of:

1. The standard stream buffer; or
2. A buffer 25 feet beyond the top of the slope; provided, that a stream buffer shall not be required to be greater than 25 feet beyond the standard stream buffer if the horizontal length of the slope including benches and terraces extends beyond the buffer.

E. Any stream abutted by riparian wetlands or other contiguous sensitive areas shall have the largest buffer required.

F. Buffer Width Averaging. Buffer width averaging may be allowed if it is demonstrated to the satisfaction of the planning director that averaging will provide additional protection, provided the total area contained in the buffer on the development proposal site does not decrease, and the buffer is not reduced in any one location to less than the minimum buffer listed above.

G. Reduction of Stream Buffer Widths.

1. The planning director may reduce the standard buffer to no less than the minimum buffer allowed by subsection A of this section, whenever, in the judgment of the planning director, a smaller width is adequate to protect the stream and habitat functions and the development proposal will result in a net improvement of stream and buffer functions.
2. The planning director's decision shall be based upon a sensitive area study. If the planning director determines that mitigation is necessary, such mitigation shall be performed in accordance with LFPMC [16.16.120](#) through [16.16.130](#).
3. In addition, a plan for mitigating buffer-reduction impacts must be prepared that incorporates from the list below incentive-based mitigation options to achieve a buffer no less than the minimum buffer listed above. Whenever the reduced buffer area is degraded, the buffer reduction plan shall provide for revegetation of the degraded area with native plants and shall provide for a five-year monitoring and maintenance plan.

Mitigation options include:

- a. Removal of impervious surfaces.
- b. Installation of biofiltration/infiltration mechanisms, such as the installation of bioswales, created and/or enhanced wetlands, or ponds supplemental to existing storm drainage and water quality requirements.
- c. Removal of invasive, nonnative vegetation subject to monitoring (minimum of five years) and continued-removal maintenance of relatively dense stands of invasive, nonnative vegetation from significant portions of the remaining buffer area in conjunction with dense planting of native trees and shrubs.
- d. In-stream habitat enhancement, such as log structure placement, bioengineered bank stabilization, culvert removal or replacement, improving fish passage and/or creation of side channel or backwater areas.
- e. If not already required under an existing development proposal, installation of oil/water separators for stormwater quality control.
- f. Use of pervious material for driveway/road construction.
- g. Construction of roofs for on-site buildings in accordance with the standards of the LEED Green Building Rating System.
- h. Removal of significant refuse or sources of toxic material.
- i. Revegetation enhancement of degraded buffer outside of the reduced buffer area if the remaining buffer beyond the enhanced buffer reduction area is degraded and a substantial portion of this degraded area is enhanced through revegetation with native plants and subject to a five-year monitoring and maintenance plan.

H. As an alternative to the standard buffers listed in subsection A of this section, stream buffers in the town center zone may be determined by the planning director according to a sensitive area study prepared by a qualified professional. The planning director may approve the site-specific stream buffers, provided the following criteria are met:

1. Multiple fish and wildlife habitat functions will be enhanced;
2. Risk of flood or geologic hazards will be reduced;
3. Encroachment of paved areas into the standard buffer area is reduced;
4. Impacts of existing and proposed development are mitigated; and
5. The proposal results in a significant net benefit to sensitive areas protection.

I. Increased buffer widths will be required whenever in the judgment of the planning director an increase is necessary to protect streams. Provisions for additional buffer widths will be set forth in administrative rules and will include but not be limited to critical drainage areas, location of hazardous substances, fish and wildlife habitat, contiguous landslide or erosion hazard areas, groundwater recharge and discharge and location of trail or utility corridors.

J. The planning director may prohibit the use of herbicides, fertilizers, and pesticides in stream corridors or buffers unless it is demonstrated that special circumstances require their use and they are used in accordance



with best management practices to avoid adverse habitat and wetland impacts.

K. LFPMC [16.16.320](#)(H) applies to streams and their buffers.

L. Compliance with this chapter shall be in addition to, and not a fulfillment of, all requirements under Chapter [90.58](#) RCW, the Shoreline Management Act, and any development proposal shall, in addition to the requirements of this chapter, comply with the permitting and substantive requirements of Chapter [90.58](#) RCW, the Shoreline Management Act.

M. All buildings or structures shall have a setback of at least 15 feet from any place on the edge of a stream buffer. The setback line shall be established by measuring perpendicularly from the edge of a stream buffer. (Ord. 930 § 2, 2005)

### **16.16.360 Streams – Permitted alterations.**

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Alterations to streams and buffers may be allowed only as follows:

A. In accordance with a sensitive area study.

B. If a stream is located in a flood hazard area, the applicant shall notify affected parties in writing, as well as the appropriate responsible officials, of proposed alterations prior to any alteration.

C. Introduction of nonnative plant material or wildlife into any stream or buffer is prohibited unless authorized by a city-approved nonnative plant list or a state or federal permit or approval.

D. LFPMC [16.16.330](#)(B) applies to streams and their buffers.

E. Joint use of an approved sewer utility corridor by other utilities shall be encouraged.

F. Surface water discharge to a stream from a detention facility, presettlement pond or other surface water management activity or facility may be allowed in a stream buffer if the discharge does not increase the rate of flow or decrease the water quality of the stream.

G. Stream crossings may be allowed if:

1. All crossings minimize impact to the stream and provide mitigation according to LFPMC [16.16.120](#);
2. All road crossings use bridges or other construction techniques which do not disturb the stream bank or bed;
3. All crossings are constructed during the low summer flow and are scheduled to avoid disturbances during critical salmonid use periods;
4. Crossings do not decrease the flood-carrying capacity of the stream;
5. Crossings are minimized and serve multiple purposes whenever possible or no other possible crossing site exists; and
6. Underground utility crossings are laterally drilled and located below the maximum depth of scour for the base flood, as determined by a qualified professional.

H. Stream relocations may be allowed only in the following instances:

1. As part of a public road project for which a public agency or utility exception is granted pursuant to LFPMC [16.16.260](#); and

2. For the purpose of enhancing resources in the stream if:

- a. Appropriate floodplain protection measures are used; and
- b. The relocation occurs on site, except that relocation off-site may be allowed if no practical on-site location exists, the applicant provides necessary easements and waivers from affected property owners and the off-site location is in the same drainage subbasin as the original stream.

I. Based on information provided by a civil engineer and biologist, approved relocations must demonstrate to the satisfaction of the planning director the following:

1. Equivalent base flood storage volume and function will be enhanced;
2. There will be no adverse impact to local groundwater;
3. There will be no increase in velocity;
4. There will be no interbasin exchange of water;
5. There will be no increased sediment load; and
6. Requirements of a mitigation plan are met.

J. A stream channel may be stabilized if:

1. Movement of the stream channel threatens existing improvements, natural resources or the sole access to property; and
2. The stabilization is done in compliance with the requirements of LFPMC [16.24.250](#) through [16.24.270](#).

K. Stream enhancement not part of any other development proposal may be permitted if the enhancement is carried out using a plan addressing design, implementation, maintenance and monitoring and prepared by a civil engineer and biologist.

L. A minor stream restoration project for fish habitat enhancement may be allowed if:

1. The restoration is completed by an authorized public agency;
2. The restoration plan is unassociated with mitigation of a specific development project;
3. The restoration is limited to specific salmonid habitat improvements as determined by appropriate public agencies; and
4. Disturbance to the area being restored is limited.

M. Restoring Piped Streams.

1. The city encourages the opening of previously channelized/culverted streams and the rehabilitation and restoration of streams.
2. When piped stream sections are restored, the minimum buffers listed in LFPMC [16.16.350](#) shall apply.
3. Modifications to the stream and buffer area to be restored shall include habitat improvements and measures to prevent erosion, landslide and water quality impacts. Opened channels shall be designed to support fish access, unless determined to be unfeasible by the planning director.
4. Removal of pipes conveying streams shall only occur when the planning director determines that the

proposal will result in a net improvement of ecological functions and will not significantly increase the threat of on-site or off-site erosion, flooding, slope stability or other hazards.

N. All projects involving perennial streams shall make adequate accommodation for fish passage, as approved by the Washington State Department of Fisheries and Game. No obstructions shall be placed within the stream that would prohibit the free passage of fish under all flow conditions. (Ord. 930 § 2, 2005)

### **16.16.370 Streams – Mitigation requirements.**

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A. Restoration may be required as a condition of a sensitive area permit and shall be required when a stream or its buffer is altered in violation of this chapter or when done without permission. A mitigation plan for the restoration shall demonstrate that:

1. The stream has been degraded and restoration activity will not cause further damage;
2. The restoration will improve the water quality and fish and wildlife habitat of the stream;
3. The restoration will have no lasting adverse impact on the stream or its functions; and
4. The action of restoration will include, but not be limited to, the use of bioengineering principles to assist in stream stabilization.

B. Minimum requirements for stream restoration will include:

1. Basin analysis to determine hydrologic conditions;
2. The natural channel dimensions will be restored, including its depth, width, length and gradient at the original location, and the original horizontal alignments shall be replaced;
3. The stream bottom will be restored with identical or similar materials;
4. The bank and buffer configuration shall be restored to the original condition;
5. The channel, bank and buffer areas will be replanted with native vegetation or other nonnative plants as may be approved by the city;
6. The original biologic functions of the stream will be recreated.

C. The requirements of subsection B of this section may be modified if the applicant demonstrates that a greater biologic function can be achieved.

D. Replacement or enhancement will be required when a stream or buffer is altered pursuant to an approved development proposal. There will be no net loss of stream functions on a development proposal site and no impact on stream functions above or below the site due to approved alterations.

E. Relocation of streams must meet the requirements of subsection B of this section unless it can be demonstrated that the relocation will result in increased biologic function.

F. Replacement or enhancement for approved stream alterations shall be done in streams and on site unless it can be demonstrated that:

1. Enhancement or replacement on the site is not practical or possible;
2. The off-site location is in the same drainage subbasin as the original stream; and
3. Greater biologic and hydrologic functions will be obtained.

G. Surface water management or flood control alterations shall not be considered enhancement of a stream unless other functions are improved at the same time by the action. (Ord. 930 § 2, 2005)

### **16.16.380 Wildlife habitat conservation areas.**

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A. A sensitive area study for a habitat conservation area shall contain the information listed in LFPMC [16.16.110](#) and an assessment of habitats and potential for priority species including the following site- and proposal-related information:

1. Identification of any nonaquatic species of local importance, priority species, or endangered, threatened, sensitive or candidate species that have a primary association with habitat on or adjacent to the project area, and assessment of potential project impacts to the use of the site by the species;
2. A discussion of any federal, state, or local special management recommendations, including Washington Department of Fish and Wildlife habitat management recommendations, that have been developed for species or habitats located on or adjacent to the project area;
3. A discussion of any ongoing management practices that will protect habitat after the project site has been developed, including any proposed monitoring, maintenance, and adaptive management programs;
4. When appropriate, because of the type of habitat or species present or the project area conditions, the planning director may also require the habitat management plan to include an evaluation by the Washington Department of Fish and Wildlife or other qualified professional regarding the applicant's analysis and the effectiveness of any proposed mitigating measures or programs, to include any recommendations as appropriate;
5. Such other information that is required in the judgment of the planning director.

B. Development Standards.

1. Wildlife Habitat Conservation Area Buffers.

- a. Establishment of Buffers. The planning director shall require the establishment of buffer areas for activities in, or adjacent to, habitat conservation areas when needed to protect wildlife habitat conservation areas.
- b. Seasonal Restrictions. When a species is more susceptible to adverse impacts during specific periods of the year, seasonal restrictions may apply. Activities may be further restricted and buffers may be increased during the specified season.

2. General Requirements.

- a. A wildlife habitat conservation area and associated buffer may be altered only if the proposed alteration of the habitat and associated buffer does not degrade the functions of the habitat and associated buffer.
- b. Whenever activities are proposed in or adjacent to a wildlife habitat conservation area or associated buffer, such area shall be protected through the application of measures in accordance with a sensitive area study prepared by a qualified professional and approved by the city of Lake Forest Park, and guidance provided by the appropriate state and/or federal agencies.
- c. Mitigation sites should be located to achieve contiguous wildlife habitat corridors in accordance with a mitigation plan that is part of an approved sensitive area study to minimize the isolating effects of development on habitat areas.



d. The planning director shall condition approvals of activities allowed within or adjacent to a wildlife habitat conservation area or its buffers, as necessary to minimize or mitigate any potential adverse impacts. Conditions may include, but are not limited to, the following:

- i. Establishment of buffer zones;
  - ii. Preservation of critically important vegetation;
  - iii. Limitation of public access to the habitat area, including fencing to deter unauthorized access;
  - iv. Seasonal restriction of activities;
  - v. Establishment of a duration and timetable for periodic review of mitigation activities; and
  - vi. Requirement of a performance bond, when necessary, to ensure completion and success of proposed mitigation.
- e. Mitigation of alterations to wildlife habitat conservation areas shall achieve equivalent or greater biologic functions. Mitigation shall address each function affected by the alteration to achieve functional equivalency or improvement on a per function basis. (Ord. 930 § 2, 2005)

#### **16.16.390 Wellhead protection areas.**

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A. To prevent uses that may be incompatible with groundwater protection, development in wellhead protection areas shall be limited to those uses allowed under single-family residential zoning.

B. Site impervious surfaces shall be limited to a total of 5,000 square feet or 35 percent of lot size, whichever is greater; provided, that this limit may be increased if a special study submitted by the applicant indicates that the proposed development includes on-site infiltration and will not have a negative impact on groundwater recharge. (Ord. 930 § 2, 2005)

#### **16.16.400 Enforcement.**

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Except as provided in subsection E of this section, violations of this chapter shall be enforced as follows:

A. Except as otherwise provided in this section, a first offense shall be a civil infraction and proceeded against as provided in Chapter [18.71](#) LFPMC.

B. Except as otherwise provided in this section, a second offense shall be a civil violation subject to a fine not to exceed \$5,000. Each day of violation shall be a separate offense. Civil violations shall be filed by civil complaint in the Lake Forest Park municipal court, which shall hear the matter without a jury.

C. A third offense shall be a gross misdemeanor.

D. Notwithstanding anything to the contrary in subsections A and B of this section, the planning director may refer any violation for criminal prosecution as a gross misdemeanor if the planning director determines that the estimated cost of mitigation or restoration will exceed \$5,000, or that failure to comply with the provisions of this chapter result in environmental damage that, in the planning director's judgment, cannot be corrected by mitigation or restoration.

E. Notwithstanding anything to the contrary in subsections A and B of this section, any person who works in a sensitive area without obtaining a sensitive area permit, when such a permit is required, is guilty of a gross misdemeanor

F. Notwithstanding anything to the contrary in subsections A and B of this section, any person who fails to

comply with a stop-work order issued under Chapter [18.71](#) LFPMC with respect to a violation of this chapter shall be guilty of a gross misdemeanor. (Ord. 930 § 2, 2005)

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**The Lake Forest Park Municipal Code is current through Ordinance 1129, passed May 26, 2016.**

Disclaimer: The City Clerk's Office has the official version of the Lake Forest Park Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

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## Chapter 16.15 CRITICAL AREAS

### Sections:

- 16.15.010 Purpose and intent.**
- 16.15.020 Definitions.**
- 16.15.030 Applicability – Regulated activities.**
- 16.15.040 Exemptions.**
- 16.15.050 Critical areas maps.**
- 16.15.060 Relationship to other regulations.**
- 16.15.070 Critical area review process and application requirements.**
- 16.15.080 Classification and rating of critical areas.**
- 16.15.090 Buffer areas and setbacks.**
- 16.15.100 Alteration or development of critical areas – Standards and criteria.**
- 16.15.110 Mitigation standards, criteria and plan requirements.**
- 16.15.120 Performance standards for mitigation planning.**
- 16.15.130 Monitoring program and contingency plan.**
- 16.15.140 Procedural provisions.**
- 16.15.150 Reasonable use provision.**

### **16.15.010 Purpose and intent.**

A. The City of Mountlake Terrace contains numerous areas that can be identified and characterized as critical or environmentally sensitive. Such areas within the City include wetlands, streams, wildlife habitat, geologic hazards, and flood hazards. The City contains no known aquifer recharge areas.

B. The City finds that these critical areas perform a variety of valuable and beneficial biological and physical functions that benefit the City and its residents. Alteration of certain critical areas may also pose a threat to public safety or to public and private property or the environment. The City finds, therefore, that identification, regulation and protection of critical areas is necessary to protect the public health, safety and general welfare. The City further finds that the functions of critical areas, and the purpose of these regulations, include the following:

1. Wetlands. Wetlands perform a variety of functions that include maintaining water quality; storing and conveying storm water and flood water; recharging ground water; providing

important fish and wildlife habitat; and as areas for recreation, education and scientific study and aesthetic appreciation.

Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect wetland resources from harmful intrusion.

The primary goals of wetland regulation are to avoid and/or otherwise mitigate wetland impacts; to achieve no net loss of wetland function and value; to provide levels of protection that reflect the sensitivity of individual wetlands and the intensity of proposed land uses; and to restore and/or enhance existing wetlands, where possible.

2. Streams. Streams and their associated riparian corridors provide important fish and wildlife habitat, including habitat for threatened and endangered species; help to maintain water quality; store and convey storm water and flood water; recharge ground water; and serve as areas for recreation, education and scientific study and aesthetic appreciation. Stream buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; and protect stream resources from harmful intrusion.

The primary goals of stream regulation are to avoid and/or otherwise mitigate impacts to streams and associated riparian corridors; to protect threatened and endangered species; to protect water quality through appropriate management techniques; and, where possible, to provide for stream enhancement and rehabilitation.

3. Wildlife Habitat. Wildlife habitat provides opportunities for food, cover, nesting, breeding and movement for fish and wildlife within the City; maintains and promotes diversity of species and habitat within the City; coordinates habitat protection with elements of the City's open space system; helps to maintain air and water quality; helps control erosion; serves as areas for recreation, education and scientific study and aesthetic appreciation; and provides neighborhood separation and visual diversity within urban areas.

The primary goals of wildlife habitat regulation are to avoid impacts to critical habitats for fish and wildlife; to implement the goals of the Endangered Species Act; to promote connectivity between habitat areas to allow for wildlife movement; to provide multipurpose open space corridors; and where possible to provide for wildlife habitat enhancement and rehabilitation. The City has not identified any specific "species of local concern" on its maps or in this chapter, but protects habitat and open space for a broad range of species that may live in the urban area.

4. Geologic Hazard Areas. Geologic hazard areas include land areas characterized by geologic, hydrologic and topographic conditions that render them susceptible to varying degrees of risk of landslides, erosion, or seismic or volcanic activity.

The primary goals of regulating geologic hazards are to avoid and minimize potential impacts to life and property; to regulate and/or limit land uses where necessary; and to conduct appropriate levels of analysis and ensure sound engineering and construction practices to address identified hazards.

5. Aquifer Recharge Areas. Aquifer recharge areas provide a source of potable water and contribute to stream discharge/flow during periods of low flow. The City finds that such



locations are susceptible to contamination of water supplies through infiltration of pollutants through soil to ground water aquifers.

The primary goals of aquifer recharge regulations are to protect critical aquifer recharge areas and ground water quality by avoiding or limiting land use activities that pose potential risk of aquifer contamination; and to minimize impacts to significant aquifer recharge areas through the application of performance standards.

6. Flood Hazard Areas. Floodplains help to store and convey storm water and flood water; recharge ground water; provide important areas for riparian habitat; and serve as areas for recreation, education and scientific study. Development within floodplain areas can be hazardous to those inhabiting such development, and to those living upstream and downstream. Floods also cause substantial damage to public and private property that results in significant costs to the public and individuals.

The primary goals of flood hazard regulations are to limit or condition development within the 100-year floodplain to avoid substantial risk and damage to public and private property, and that results in significant costs to the public and individuals; and to avoid significant increases in peak storm water flows or loss of flood storage capacity.

C. This chapter of the MTMC contains standards, procedures, criteria and requirements intended to identify, analyze and mitigate potential impacts to the City's critical areas and to enhance and restore degraded resources, such as wetlands, streams or habitat, where possible. The general intent of these regulations is to avoid impacts to critical areas. In appropriate circumstances, impacts to specified critical areas resulting from regulated activities may be reduced, minimized, rectified, and/or compensated for, consistent with the requirements of this chapter.

D. It is the further intent of this chapter to:

1. Comply with the requirements of the Growth Management Act (Chapter [36.70A](#) RCW) and implementing rules to identify and protect critical areas, and to use the "best available science" in its development regulations as required by WAC [365-195-900](#) et seq.;
2. Develop and implement a comprehensive, balanced and fair regulatory program that avoids impacts to critical resources where possible, that requires that mitigation be performed by those affecting critical areas, and that thereby protects the public from injury, loss of life, property or financial losses due to flooding, erosion, landslide, seismic events, soil subsidence or steep slope failure;
3. Implement the goals and policies of the Mountlake Terrace Comprehensive Plan and zoning code, including those pertaining to natural features and environmental protection; as well as goals relating to land use, housing, economic development, transportation, and adequate public facilities;
4. Serve as a basis for exercise of the City's substantive authority under the State Environmental Policy Act (SEPA) where necessary to supplement these regulations, while also reducing the City's reliance on project-level SEPA review to protect regulated critical areas;
5. Provide consistent standards, criteria and procedures that will enable the City to effectively manage and protect critical areas while accommodating the rights of property owners to use their property in a reasonable manner;

6. Provide greater certainty to property owners regarding uses and activities that are permitted, prohibited and/or regulated due to the presence of critical areas;
7. Coordinate environmental review and permitting of proposals involving critical areas with existing development review and approval processes to avoid duplication and delay pursuant to Chapter [36.70B](#) RCW;
8. Establish conservation and protection measures for threatened and endangered fish species in compliance with the requirements of the Endangered Species Act and WAC [365-195-925](#);
9. Alert members of the public, including appraisers, assessors, owners, and potential buyers or lessees, to the development limitations or critical areas and their required buffers.

E. Best Available Science. The City has considered and included the best available science in developing these regulations, consistent with the requirements of RCW [36.70A.172](#) and WAC [365-900](#) et seq. This has included identification and review of relevant technical sources of information, including “Citations of Recommended Sources of the Best Available Science for Designating and Protecting Critical Areas” (CTED, 2002). In some instances, the City has found conflicts in the scientific information, lack of consensus as to what constitutes the best available science, and/or lack of information or direction from resource agencies.

Preparation of these regulations has also included the use of relevant nonscientific information, including consideration of legal, social, policy, economic and land use issues. This reflects the City’s responsibilities under numerous laws and programs, including other provisions of the Growth Management Act, and the need to weigh and balance various factors as part of decision making to accomplish municipal objectives. This may result in some risk to the functions and values of some critical areas. The City will also use its authority under the State Environmental Policy Act (SEPA) to identify, consider and mitigate, where appropriate, significant adverse effects on critical resources not otherwise addressed by the regulations of this chapter. The City intends to review and monitor implementation of its critical areas regulations and to use an adaptive management approach. It will make adjustments to its regulations, as appropriate, in response to changing conditions, new information about best available science, or empirical data indicating the effectiveness of its regulatory program. This will occur in the context of the City’s ongoing review and revision of its Comprehensive Plan and development regulations pursuant to the Growth Management Act.

Additional information, both scientific and nonscientific, regarding compliance with WAC [365-195-915\(c\)](#), including identification of risks to resources, is contained in the findings and conclusions and the overall record supporting adoption of Mountlake Terrace’s critical areas regulations. (Ord. 2370 § 3, 2004).

#### **16.15.020 Definitions.**

For the purposes of this chapter, the following definitions shall apply:

“Anadromous fish” means fish, such as wild salmon, that migrate up rivers from the sea to breed in fresh water.

“Applicant” means the person, party, firm, corporation, or other entity that proposes or has performed any activity that affects a critical area.

“Aquifer” means, generally, any water-bearing soil or rock unit. Specifically, a body of soil or rock that contains sufficient saturated permeable material to conduct ground water and yield

economically significant quantities of ground water to wells or springs.

“Aquifer recharge area” means an area where, due to permeable soils, water infiltrates from the surface to ground water aquifers. Recharge areas are classified as “low,” “medium” or “high” based on the soil and ground water conditions and risks depending on the combined effects of hydrogeological susceptibility to contamination and contaminant loading potential, as follows:

A. Low significance/low susceptibility recharge areas – uplands and sloping areas underlain by soils consisting largely of silt, clay or glacial till.

B. Medium significance/medium susceptibility – upland areas underlain by soils consisting largely of sand and gravel, and valley floors underlain by soils consisting largely of sand, silt and clay in which there is a significant upward component to ground water flow within the valley alluvium.

C. High significance/high susceptibility – valley floors, uplands and sloping areas underlain by soils consisting largely of sand and gravel in which there is a predominantly downward or lateral component to ground water flow, and which serve as a source of drinking water.

“Aquifer susceptibility” means a contributory factor of potential contamination of an aquifer that results from soil, rock and ground water characteristics within a recharge area.

“Aquifer vulnerability” means the combined effect of aquifer susceptibility and contaminant loading potential; it includes hydrogeologic, land use and other factors that affect the potential for ground water contamination.

“Artificially created wetland” means wetlands created from nonwetland sites through purposeful, legally authorized human action, such as irrigation and drainage ditches, grass-lined swales, canals, retention or detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities.

“Base flood” or “100-year flood” means a flood having a one percent chance of being equaled or exceeded in any given year, also referred to as the “100-year flood.” The base flood is determined for existing conditions, and is shown on Flood Insurance Rate Maps (FIRM), current version; unless a more complete basin plan including projected flows under future developed conditions has been completed and adopted by the City of Mountlake Terrace, in which case these future flow projections shall be used. In areas where the flood insurance study for the City includes detailed base flood calculations, those calculations may be used.

“Buffer” or “buffer area, critical area” means a naturally vegetated and undisturbed, enhanced or revegetated zone surrounding a critical area and which protects the critical area from adverse impacts to its integrity and value and is an integral part of the resource’s ecosystem.

“Building setback” means an area that is the outermost portion of a critical area buffer and that may provide a transition between the primary portion of the critical area buffer and the potential location of a building.

“City” means the City of Mountlake Terrace.

“Clearing” means the removal of timber, brush, grass, ground cover or other vegetative matter from a site which exposes the earth’s surface of the site, or any actions which disturb the existing ground surface.

“Comprehensive Plan” means the City of Mountlake Terrace Comprehensive Plan as now adopted or hereafter amended.

“Contaminant loading potential” means the availability within an aquifer recharge area of any potential physical, chemical, biological, or radiological substance that enters the hydrological cycle and may cause a deleterious effect on ground water resources.

“Creation of critical areas” means the purposeful and legally authorized construction or forming of a wetland or stream from an upland (nonwetland or dry) site through artificial means.

“Critical aquifer recharge areas” means areas where an aquifer that is a source of drinking water is both highly susceptible and vulnerable to contamination. High significance/high susceptibility recharge areas – generally uplands and sloping areas underlain predominantly by sand and gravel, and valley floors underlain by relatively coarse alluvium – are considered to be critical recharge areas unless site-specific information demonstrates little or no contaminant loading potential.

“Critical area” or “environmentally critical area” means areas that possess important natural functions and embody a variety of important natural and community values. Such areas include wetlands, streams, fish and wildlife habitat, geologic hazard areas, aquifer recharge areas, flood hazard areas, and areas with significant trees and vegetation. If not conducted properly, development or alteration of such areas may cause significant impacts to the valuable functions and values of these areas and/or may generate risks to the public health and general welfare, and/or to public and private property.

“Critical area report” means a report prepared by a “qualified consultant” (as that term is defined in this section) to determine the presence, type, class, size, function and/or value of an area subject to these regulations. Also see “Stream reconnaissance report,” “Wetland impact assessment report,” and “Wildlife report.”

“Critical erosion hazard areas” means lands or areas underlain by soils identified by the U.S. Department of Agriculture Soil Conservation Service (SCS) (now known as the Natural Resource Conservation Service) as having “severe” or “very severe” erosion hazards. This includes, but is not limited to, the following group of soils when they occur on slopes of 15 percent or greater: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD) and Indianola (InD). Additional soil groups may be identified through site-specific analysis.

“Critical geologic hazard areas” means lands or areas subject to high or severe risks of geologic hazard, including critical erosion hazard areas, critical landslide hazard areas, and critical seismic hazard areas.

“Critical habitat,” “critical wildlife habitat,” or “critical fish and wildlife conservation area” means habitat areas associated with threatened, endangered, sensitive, monitor or priority species of plants or wildlife and which, if altered, could reduce the likelihood that the species will maintain and reproduce over the long term. Such areas are identified herein with reference to lists, categories and definitions of species promulgated by the Washington Department of Fish and Wildlife (Nongame Data System Special Animal Species) as identified in WAC [232-12-011](#) or [232-12-014](#); in the Priority Habitat and Species (PHS) program of the Department of Fish and Wildlife; or by rules and regulations adopted currently or hereafter by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.



“Critical landslide hazard areas” means lands or areas where there is a high (Class III) or very high (Class IV) risk of landslide due to a combination of slope, soil permeability and water.

“Critical seismic hazard areas” means lands or areas where there is a high risk of seismic events and damage.

“Department” means the City of Mountlake Terrace Department of Community Development, Planning and Development Services, or successor agency, unless the context indicates a different City department.

“Development” means any human-made change to real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment and materials.

“Director” means the Director of the City of Mountlake Terrace Department of Community Development, Planning and Development Services, or his/her designee.

“Earth/earth material” means naturally occurring rock, soil, stone, sediment, or a combination thereof.

“Enhancement” means the improvement of an existing viable wetland, stream or habitat area or the buffers established for such areas, through such measures as increasing plant diversity, increasing wildlife habitat, installing environmentally compatible erosion controls, increasing structural diversity or removing plant or animal species that are not indigenous to the area. Enhancement also includes actions performed to improve the quality of an existing degraded wetland, stream or habitat area. See also “Restoration.”

“Erosion” means a process whereby wind, rain, water and other natural agents mobilize and transport soil particles.

“Erosion hazard areas” means lands or areas that, based on a combination of slope inclination and the characteristics of the underlying soils, are susceptible to varying degrees of risk of erosion. Erosion hazard areas are classified as “low” (areas sloping less than 15 percent) or “high” (areas sloping 15 percent or more) on the following Soil Conservation Service (SCS), now known as the Natural Resource Conservation Service (NRCS), soil types: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD) and Indianola (InD). Additional soil groups may be identified through site-specific analysis.

“Excavation” means the removal or displacement of earth material by human or mechanical means.

“Exotic” means any species of plant or animal that is foreign and not indigenous to the Mountlake Terrace area.

“Fill/fill material” means a deposit of earth material placed by human or mechanical means.

“Filling” means the act of transporting or placing (by any manner or mechanism) fill material from, to, or on any surface water body or wetland, soil surface, sediment surface, or other fill material.

“Flood hazard areas” means those areas subject to inundation by the base flood. A flood hazard area consists of the following components, as determined by the City:

A. Floodplain. The total area subject to inundation by the base flood.

B. Flood Fringe. That portion of the floodplain outside of the floodway which is generally covered by flood waters during the base flood; it is generally associated with shallow, slower moving water rather than rapidly flowing water.

C. Floodway. The channel of the stream or river and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without increasing the base flood elevation more than one foot. It is generally associated with rapidly flowing water.

“Flood Insurance Rate Map (FIRM)” means the official map prepared as part of (but published separately from) the Flood Insurance Rate Study on which the Federal Emergency Management Agency has delineated both the areas of special flood hazards and the applicable risk premium zones.

“Frequently flooded areas” means observed areas of localized flooding.

“Geologic hazard areas” means lands or areas characterized by geologic, hydrologic and topographic conditions that render them susceptible to varying degrees of potential risk of landslides, erosion, or seismic or volcanic activity; and areas characterized by geologic and hydrologic conditions that make them vulnerable to contamination of ground water supplies through infiltration of contaminants to aquifers.

“Grading” means any excavating, filling, clearing, leveling, or contouring of the ground surface by human or mechanical means.

“Habitat management” means management of land and its associated resources/features to maintain species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created. This does not imply maintaining all habitat or individuals of all species in all cases.

“High impact land use” means land uses which are likely to have significant adverse impacts to critical areas because of the intensity of the use, levels of human activity, use of machinery or chemicals, site design or arrangement of buildings and structures. High impact land uses include, but are not limited to, active recreation, residential, institutional, commercial, and industrial land uses.

“Hydrologically isolated” means wetlands which: (1) have no surface water connection to a lake, river, or stream during any part of the year; (2) are outside of and not contiguous to any 100-year floodplain of a lake, river, or stream; and (3) have no contiguous hydric soil between the wetland and any lake, river, or stream. May also be a pond excavated from uplands with no surface water connection to a stream, lake, or other wetland.

“In-kind wetland mitigation” means replacement of wetlands with substitute wetlands whose characteristics closely approximate those destroyed or degraded by a regulated activity.

“Intentionally created streams” means streams created through purposeful human action, such as irrigation and drainage ditches, grass-lined swales, and canals. This definition does not include stream modifications performed pursuant to City authorization, such as changes or redirection of stream channels.

“Landslide” means episodic downslope movement of a mass of soil or rock.

“Landslide hazard areas” means areas that, due to a combination of slope inclination, relative soil permeability, and hydrologic conditions are susceptible to varying degrees of risk of landsliding. Landslide hazard areas are classified as Classes I through IV based on the degree of risk as follows:

- A. Class I/Low Hazard. Areas with slopes of less than 15 percent.
- B. Class II/Moderate Hazard. Areas with slopes of between 15 percent and 40 percent and that are underlain by soils that consist largely of sand, gravel or glacial till.
- C. Class III/High Hazard. Areas with slopes between 15 percent and 40 percent that are underlain by soils consisting largely of silt and clay.
- D. Class IV/Very High Hazard. Areas with slopes steeper than 15 percent with mappable zones of emergent water (e.g., springs or ground water seepage), areas of known (mappable) landslide deposits regardless of slope, and all areas sloping more steeply than 40 percent.

The slopes referenced above include only those where the surface drops 10 feet or more vertically within a horizontal distance of 25 feet.

“Low impact land use” means land uses which are not likely to have significant adverse impacts to critical areas because of the intensity of the use, levels of human activity, use of machinery or chemicals, site design or arrangement of buildings and structures. Depending on the specific context, examples of low impact land uses may include utility facilities and passive recreation.

“Mitigation” includes:

- A. Avoiding the impact altogether by not taking a certain action or parts of actions.
- B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- E. Compensating for the impact by replacing or providing substitute resources or environments.

While monitoring without additional actions is not considered mitigation for the purposes of these regulations, it may be part of a comprehensive mitigation program.

“Mitigation sequencing” means considering or performing mitigation actions, as defined in the definition of “mitigation,” in a preferred sequence from subsections A through E of the definition. Avoidance is generally preferred and must be considered prior to pursuing other forms of mitigation.

“Native vegetation” means vegetation existing on a site or plant species which are or were indigenous to the area in question.

“Off-site mitigation” means performance of mitigation actions, pursuant to standards established in this chapter, on a site or in an area other than that proposed for conduct of a regulated activity.

“Out-of-kind mitigation” means replacement of wetlands or habitat with substitute wetlands or habitat whose characteristics do not closely approximate those adversely affected, destroyed or

degraded by a regulated activity.

“Permanent erosion control” means continuous on-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity or pollutants after development, construction, or restoration.

“Plant association of infrequent occurrence” means one or more plant species which because of the rarity of the habitat and/or the species involved, or for other botanical or environmental reasons, do not often occur in the City of Mountlake Terrace. Examples include but are not limited to:

A. Wetlands with a coniferous forested class or subclass consisting of trees such as western red cedar, Sitka spruce or lodge pole pine growing on organic soils;

B. Bogs with a predominance of sphagnum moss, or those containing sphagnum moss, and typically including one or more species such as Labrador tea, sundew, bog laurel or cranberry.

“Priority habitat/species” or “priority wildlife habitat/species” means habitats and species of local importance and concern in urban areas, as identified by the Washington Department of Fish and Wildlife Priority Habitat and Species (PHS) program. “Priority species” are wildlife species of concern due to their population status and their sensitivity to habitat alteration. “Priority habitats” are areas with one or more of the following attributes: comparatively high wildlife density; high wildlife species richness; significant wildlife breeding habitat; significant wildlife seasonal ranges; significant movement corridors for wildlife; limited availability; and/or high vulnerability. General types of priority habitat identified in the PHS program – some of which do not occur in the City of Mountlake Terrace – include Aspen stands, cliffs, meadows, oak woodlands, old-growth/ mature forests, riparian areas, shrub-steppe, snag-rich areas and wetlands.

Qualified Consultant. For purposes of these regulations, “qualified consultant” shall mean a person who has attained a degree from an accredited college or university in the subject matter necessary to evaluate the critical area in question (e.g., biology, ecology or horticulture/arboriculture for wetlands, streams and wildlife habitat and significant vegetation, geology and/or civil engineering for geologic hazards and aquifer recharge areas), and/or who is professionally trained and/or certified or licensed by the state of Washington to practice in the scientific disciplines necessary to identify, evaluate, manage and mitigate impacts to the critical area in question and who has at least two years of experience in the relevant discipline.

“Redevelopment” means development of a site that contains or has contained real estate improvements such as buildings or other structures, mining, dredging, filling, grading, paving, or excavation.

“Regulated activity” means activities that have a potential to significantly impact a critical area that is subject to the provisions of this chapter. Regulated activities generally include but are not limited to any filling, dredging, dumping or stockpiling, draining, excavation, flooding, clearing or grading, construction or reconstruction, driving pilings, obstructing, shading, clearing or harvesting.

“Restoration” means actions taken to reestablish wetland, stream or habitat functional values and characteristics that have been destroyed or degraded by past alterations (e.g., filling or grading). See also “Enhancement.”

“Secondary habitat” means areas that offer less diversity of animal and plant species than priority habitat but that are important for performing the essential functions of habitat.



“Seismic hazard areas” means areas that, due to a combination of soil and ground water conditions, are subject to risk of ground shaking, subsidence or liquefaction of soils during earthquakes. These areas are typically underlain by soft or loose saturated soils (such as alluvium), have a shallow ground water table and are typically located on the floors of river valleys.

“Site” means the location containing a regulated critical area and on which a regulated activity is proposed. The location may be a parcel or portion thereof, or any combination of contiguous parcels where a proposed activity may impact a critical area.

“Slope” means an inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance.

“Stream reconnaissance report” means a type of critical area report prepared by an applicant’s qualified consultant to describe a stream and to characterize its conditions, wildlife, habitat values and water quality.

“Streams” means those areas where surface waters produce a defined channel or bed. A “defined channel or bed” is an area which demonstrates clear evidence of the passage of water and includes, but is not limited to, bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed need not contain water year-round. This definition is not intended to include artificially created irrigation ditches, canals, storm or surface water devices or other entirely artificial watercourses unless they are used by salmonids or created for the purposes of stream mitigation.

“Structural diversity, vegetative” means the relative degree of diversity or complexity of vegetation in a wildlife habitat area as indicated by the stratification or layering of different plant communities (e.g., ground cover, shrub layer and tree canopy); the variety of plant species; and the spacing or pattern of vegetation.

“Substantial improvement” means any repair, reconstruction or improvement the cost of which, during any three-year period, is more than 50 percent of the market value of the structure either (A) before the improvement is started, or (B) before the damage occurred if the structure damaged is being replaced. An improvement occurs when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not the alteration affects the external dimensions of the structure. Substantial improvement does not include (A) an improvement undertaken solely to comply with existing state or local health, sanitary or safety code specifications which are necessary to assure safe conditions; or (B) alteration of a structure listed on the national register of historic places or a state inventory of historic places.

“Substrate” means the soil, sediment, decomposing organic matter or combination of those located on the bottom surface of the wetland, lake, stream or river.

“Temporary erosion and sedimentation control” means on-site and off-site control measures to control conveyance or deposition of earth, turbidity or pollutants during development, construction, or restoration.

“Utility” includes natural gas, electric, telephone and telecommunications, cable communications, water, sewer, or storm drainage and their respective facilities, lines, pipes, mains, equipment and appurtenances.

“Water dependent use” means a principal use which can only exist when the land/water interface provides biological or physical conditions necessary for the use.

“Wetland” or “wetlands” means areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street or highway. However, wetlands include those artificial wetlands intentionally created to mitigate conversion of wetlands.

**Wetland Class.** The U.S. Fish and Wildlife Service wetland classification scheme uses an hierarchy of systems, subsystems, classes and subclasses to describe wetland types (refer to USFWS, December 1979, “Classification of Wetlands and Deepwater Habitats of the United States” for a complete explanation of the wetland classification scheme). Eleven class names are used to describe wetland and deepwater habitat types. These include: forested wetland, scrub-shrub wetland, emergent wetland, moss-lichen wetland, unconsolidated shore, aquatic bed, unconsolidated bottom, rock bottom, rocky shore, streambed, and reef.

“Wetland delineation manual” or “wetland delineation methodology” means the manual and methodology used to identify wetlands in the field, as described in the “Washington State Wetlands Identification and Delineation Manual,” adopted by the Department of Ecology in 1997 (pursuant to RCW [36.70A.175](#) and [90.58.380](#)), and which is based on the U.S. Corps of Engineers Wetlands Delineation Manual (1987). Use of this manual is required by RCW [36.70A.175](#) and [90.58.380](#).

“Wetland impact assessment report” means a report prepared by a “qualified consultant,” as that term is defined in this section, that identifies, characterizes and analyzes potential impacts to wetlands consistent with applicable provisions of these regulations. A wetland impact assessment may be combined with and include a formal wetland delineation.

**Wetland Subclass.** Twenty-eight subclass names are used in the USFWS wetland classification scheme to distinguish between different types of wetland classes. Subclass names include, but are not limited to, the following: persistent, nonpersistent, broad-leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen, dead. The classification system is fully described in Cowardin et al., “Classification of Wetlands and Deepwater Habitats of the United States U.S. Fish and Wildlife Service, Washington, DC, 1979.”

“Wildlife habitat” means areas, including naturally occurring ponds, that provide food, protective cover, nesting, loafing, breeding or movement for fish and wildlife and with which individual species have a primary association.

“Wildlife report” means a report, prepared by a qualified consultant, that evaluates plant communities and wildlife functions and values on a site, consistent with the format and requirements established by this chapter. (Ord. 2370 § 4, 2004).

### **16.15.030 Applicability – Regulated activities.**

A. The provisions of this chapter shall apply to any activity that potentially affects a critical area or its buffer unless otherwise exempt, including but not limited to the following:

1. Removing, excavating, disturbing or dredging soil, sand, gravel, minerals, organic matter or materials of any kind;

2. Dumping, discharging or filling with any material;
3. Draining, flooding or disturbing the water level or water table, or diverting or impeding water flow;
4. Driving pilings or placing obstructions;
5. Constructing, reconstructing, demolishing or altering the size of any structure or infrastructure;
6. Destroying or altering vegetation through clearing, grading, harvesting, shading or planting vegetation that would alter the character of a critical area;
7. Activities that result in significant changes in water temperature, physical or chemical characteristics of water sources, including quantity and pollutants; and
8. Any other activity potentially affecting a critical area or buffer not otherwise exempt from the provisions of this chapter as determined by the Department.

B. To avoid duplication, the following permits and approvals shall be subject to and coordinated with the requirements of this chapter: land clearing; grading; subdivision or short subdivision; temporary erosion and sedimentation control; building permit; planned unit development; shoreline substantial development; variance; conditional use permit and other permits or approvals leading to the development or alteration of land, except that any permits and approvals within the shoreline jurisdiction shall be regulated by Chapter [16.10](#) MTMC, Shoreline Management.

C. Nonproject actions, including but not limited to rezones, annexations, and the adoption of plans and programs, shall be subject to the requirements of this chapter. However, the Department may, at its discretion, permit any studies or evaluations required by this chapter to use methodologies and provide a level of detail appropriate to the action proposed and its level of planning. (Ord. 2631 § 3, 2013; Ord. 2370 § 5, 2004).

#### **16.15.040 Exemptions.**

A. The following activities performed on sites containing critical areas as defined by this chapter shall be exempt from the provisions of this chapter:

1. Activities involving artificially created wetlands or streams intentionally created from nonwetland sites, including but not limited to grass-lined swales, irrigation and drainage ditches, retention or detention facilities, and landscape features, except wetlands or streams created as mitigation or that provide critical habitat for anadromous fish;
2. Normal and routine maintenance, operation and reconstruction of existing roads, streets, utilities and associated structures; provided, that reconstruction of any structures may not increase the impervious area and may not cause further encroachment on the critical area or its buffer;
3. Normal maintenance, repair and reconstruction of residential or commercial structures, facilities and landscaping; provided, that reconstruction of any structures may not increase the previous floor area; and further provided, that the provisions of this chapter and MTMC [19.120.250](#) are followed;
4. The addition of floor area within an existing building which does not increase the building footprint;

5. Site investigative work and studies that are prerequisite to preparation of an application for development authorization including soils tests, water quality studies, wildlife studies and similar tests and investigations; provided, that any disturbance of the critical area shall be the minimum necessary to carry out the work or studies;
6. Educational activities, scientific research, and outdoor recreational activities, including but not limited to interpretive field trips, bird watching and hiking, that will not have a significant effect on the critical area;
7. Emergency activities necessary to prevent an immediate threat to public health, safety, property or the environment which requires immediate action within a time too short to allow full compliance with this chapter as determined by the Department;
8. Previously legally filled wetlands or wetlands accidentally created by human actions prior to January 1, 1990. The latter shall be documented through photographs, statements and/or other conclusive evidence;
9. Development vested prior to the effective date of the ordinance codified in this chapter; and
10. Minor activities not mentioned above and determined in advance and in writing by the Department to have minimal impacts to a critical area.

B. Notwithstanding the exemptions provided by this section, any otherwise exempt activities occurring in or near a critical area shall comply with the intent of these standards and shall consider on-site alternatives that avoid or minimize significant adverse impacts.

C. With the exception of subsections (A)(1) through (9) of this section, no property owner or other entity shall undertake exempt activities prior to providing 14 days' notice to the City and receiving confirmation in writing that the proposed activity is exempt. In case of any question as to whether a particular activity is exempt from the provisions of this section, the City's determination shall prevail and shall be confirmed in writing.

D. Reconstruction of existing structures that intrude into critical area buffers is subject to the nonconformance provisions of MTMC [19.120.250](#) unless otherwise provided by this chapter and, if permitted, shall not further intrude into the buffer area.

E. Exempt activities occurring in flood hazard areas shall not alter flood storage capacity or conveyance. (Ord. 2370 § 6, 2004).

#### **16.15.050 Critical areas maps.**

A. The approximate location and extent of critical areas within the City and its Urban Growth Area are shown on the critical areas map adopted as part of this chapter. This map shall be used only for informational purposes and as a general guide for the assistance of property owners and other interested parties. The boundaries and locations shown are generalized and do not delimit or precisely depict the extent of regulated critical areas. The actual presence or absence, type, extent, boundaries, and classification of critical areas on a specific site shall be identified in the field by a qualified consultant and determined by the City, according to the procedures, definitions and criteria established by this chapter. In the event of any conflict between the location, extent, designation or type of critical area shown on the City's maps and the criteria or standards of this section, the criteria and standards of this chapter shall prevail.



B. Any critical areas located within the Shoreline Jurisdiction Area Map adopted as part of Chapter [16.10](#) MTMC, as amended, shall be regulated per that chapter. (Ord. 2631 § 4, 2013; Ord. 2370 § 7, 2004).

#### **16.15.060 Relationship to other regulations.**

A. These critical area regulations shall apply as an overlay and in addition to zoning, land use and other regulations established by the City of Mountlake Terrace. In the event of any conflict between these regulations and any other regulations of the City, the regulations which provide greater protection to critical areas and/or require more detailed critical area information shall apply.

B. Areas characterized by a particular critical area may also be subject to other regulations established by this chapter due to the overlap or multiple functions of some critical areas. Wetlands, for example, may be defined and regulated according to the wetland, habitat and stream management provisions of this chapter. In the event of any conflict between regulations for particular critical areas in this chapter, the regulations which provide greater protection to environmentally critical areas shall apply. (Ord. 2370 § 8, 2004).

#### **16.15.070 Critical area review process and application requirements.**

A. Preapplication Conference. All applicants proposing development within 200 feet of a wetland, stream, or critical wildlife habitat area are required to meet with the City prior to submitting an application subject to this chapter. The Director may waive this requirement for minor projects that do not involve grading. The purpose of this meeting shall be to discuss the City's critical area requirements, processes and procedures; to review any conceptual site plans prepared by the applicant; to identify potential impacts to critical areas and appropriate mitigation measures; and to the extent it can be determined inform the applicant of any federal or state regulations or approvals applicable to the subject critical area. Such conference shall be for the convenience of the applicant and any recommendations shall not be binding on the applicant or the City.

B. Application Requirements.

1. Timing of Submittals. Concurrent with submittal of a SEPA checklist, or concurrent with submittal of an application for a project that is exempt from SEPA, a critical area report must be submitted to the City for review. The purpose of the report is to determine the extent, characteristics and functions of any critical areas located on or potentially affected by activities on a site where regulated activities are proposed. The report will also be used by the City to determine the appropriate critical area classification and to establish appropriate buffer requirements. Critical area reports shall be required for proposed development within 200 feet of a stream or wetland and for any development containing a critical wildlife habitat area or a critical geologic hazard.

2. Report Contents. Reports and studies to be submitted by this chapter shall contain detailed information, as required by the Department, to analyze impacts and options for development within or adjacent to critical areas. The Department may tailor the information required to reflect the complexity of the proposal and the sensitivity of critical areas that may be present.

C. Consultant Qualifications and City Review. All reports and studies required of the applicant by this section shall be prepared by a "qualified consultant" as that term is defined in these regulations. The City may, at its discretion, retain a qualified consultant to review and confirm the applicant's reports, studies and plans. Such review shall be paid for by the applicant.

D. Review Process. This section is not intended to create a separate critical area review permit process for development proposals. To the extent possible, the City shall consolidate and integrate the review and processing of critical area-related aspects of proposals with other land use and environmental considerations and approvals. Any permits required by separate codes or regulations, such as a flood hazard permit or shoreline substantial development permits, shall continue to be required. (Ord. 2370 § 9, 2004).

**16.15.080 Classification and rating of critical areas.**

A. To promote consistent application of the standards and requirements of this chapter, critical areas within the City of Mountlake Terrace shall be classified according to their characteristics, function and value, and/or their sensitivity to disturbance.

B. Classification of critical areas shall be determined by the Department based on consideration of the following factors and in the following order:

1. Consideration of the technical reports submitted by qualified consultants in connection with applications subject to these regulations;
2. Application of the criteria contained in these regulations; and
3. Maps adopted pursuant to this chapter.

C. Wetland Classification. Wetlands shall be designated Category I, Category II, Category III, Category IV and Artificial according to the criteria in this section. Wetland classifications incorporate the Washington State Wetlands Rating System for Western Washington (DOE, 1993). (Note: As of this draft, Ecology is in the process of revising its wetland rating system. The City will follow the progress of Ecology's process and may consider modifications to its wetland classification system in the future.) Wetland rating categories shall not be altered to recognize illegal modifications. Categories may be modified in accordance with permitted activities.

1. "Category I wetlands" are those wetlands which meet any of the following criteria:
  - a. The documented occurrence, as documented by federal or state agencies, within the wetland of plant, animal or fish species listed by the federal government or state of Washington as "endangered," or "threatened"; or
  - b. High quality native wetland communities listed in or which qualify for inclusion in Washington Natural Heritage Program maintained by the state Department of Natural Resources; or
  - c. Documented, by federal or state agencies, as regionally significant waterfowl concentration areas; or
  - d. Wetlands with irreplaceable ecological attributes per WDFW criteria; or
  - e. Wetlands of local significance, as now or hereafter designated by the City of Mountlake Terrace, pursuant to criteria in the Washington State Wetland Rating System for Western Washington.

2. "Category II wetlands" are those wetlands which are not Category I wetlands and which meet any of the following criteria:

- a. Wetlands with a documented occurrence within the wetland of a federal or state listed “candidate” or “sensitive” species of plant, animal or fish species; or
- b. Wetlands that contain “priority” species or habitats documented by the Washington Department of Wildlife Priority Habitat and Species program; or
- c. Wetlands with significant functions, as determined by the wetland report required by these regulations, which may not be adequately replicated through creation or restoration; or
- d. Wetlands with significant habitat value (greater than or equal to 22 points using the wetlands rating field form required by these regulations); or
- e. Wetlands of local significance, as now or hereafter designated by the City of Mountlake Terrace.

3. “Category III wetlands” are those wetlands that are not Category I or II wetlands, and which meet any of the following criteria:

- a. Wetlands with significant habitat value (where the habitat score is less than or equal to 21 points using the wetlands rating field data form, as required by these regulations); or
- b. Wetlands of local significance, as now or hereafter designated by the City of Mountlake Terrace.

4. “Category IV wetlands” are those wetlands which meet any of the following criteria:

- a. Wetlands that are less than one acre, that are hydrologically isolated, and that are comprised of only one vegetated class which is dominated (greater than 80 percent areal cover) by either soft rush, hard hack, buck brush, or cattail; or
- b. Wetlands that are less than two acres, that are hydrologically isolated, and that are comprised of one vegetated class, and 90 percent of the areal coverage is any combination of invasive or exotic plants (as listed in Table 3 of the Washington State Wetlands Rating System for Western Washington, 1993).

5. “Artificially created wetlands” are wetlands as defined in MTMC [16.15.020](#). Such wetlands, except for those that were created as mitigation or that were previously modified for approved land use activities, are excluded from regulation under this section; provided, that their purposeful creation is demonstrated to the Department through documentation, photographs, statements and/or other evidence.

D. Stream Classification. Streams shall be designated Class I, Class II, Class III, and Class IV according to the criteria in this section. When more than one stream class is present on the property in question (e.g., the stream changes character in short alternating segments), it will be classified according to the stream class present along the majority of the length within a given section. The stream class shall change at the point at which the majority of the length receives a different classification.

1. “Class I streams” are those natural streams identified as “shorelines of the state” under the City of Mountlake Terrace Shoreline Master Program.

2. "Class II streams" are those natural streams that are not Class I streams and are either perennial or intermittent and have one of the following characteristics:

- a. Anadromous fish use;
- b. Significant potential for anadromous fish use; if the fish or its habitat have not been designated or documented by federal or state agencies, the guidance in Appendix 3 of the Recording Requirements shall be used to determine potential for anadromous fish use; or
- c. Significant recreational value, as determined by the Department.

3. "Class III streams" are those natural streams with perennial (year-round) or intermittent flow and are not used by anadromous fish.

4. "Class IV streams" are those natural streams and drainage swales with channel width less than two feet taken at the ordinary high water mark that are not used by salmonid fish.

5. "Class V streams" are those natural streams that are not Class I, II, III or IV streams, which are seasonal (i.e., surface flow is not present for at least some portion of the year), which do not contain fish, and which are not located downstream of a Class IV stream reach.

6. "Intentionally created streams" are those manmade streams defined as such in these regulations, and do not include streams created as mitigation. Purposeful creation must be demonstrated through documentation, photographs, statements and/or other evidence. Intentionally created streams may include irrigation and drainage ditches, grass-lined swales and canals. Intentionally created streams are excluded from regulation under this section, except manmade streams that provide "critical habitat," as designated by federal or state agencies, for anadromous fish.

E. Wildlife Habitat Classification. Wildlife habitat areas shall be classified as critical or secondary according to the criteria in this section.

1. "Critical habitat" are those habitat areas which meet any of the following criteria:

- a. The documented presence of species or habitat listed by federal or state agencies as "endangered," "threatened," "candidate" or "sensitive" or "priority"; or
- b. The presence of unusual nesting or resting sites such as heron rookeries or raptor nesting trees; or
- c. "Category I wetlands," as defined in these regulations; or
- d. "Class I streams," as defined in these regulations.

2. "Secondary habitat" is habitat which is valuable to wildlife and support a wide variety of species due to its undisturbed nature, a diversity of plant species and structure, presence of water, or the area's size, location or seasonal importance.

F. Aquifer Recharge Areas. Aquifer recharge areas, if identified, shall be classified as "low," "medium" and "high" significance based on the soil and ground water conditions and risks to potable water and to surface water during periods of low hydrology. Classification depends on the



combined effects of hydrogeological susceptibility to contamination and contaminant loading potential, as follows:

- a. Low significance recharge areas – uplands and sloping areas underlain by silt, clay or glacial till.
- b. Medium significance – valley floors underlain by relatively fine-grained alluvial soils.
- c. High significance – uplands and sloping areas underlain predominantly by sand and gravel, and valley floors underlain by relatively coarse alluvium.

G. Geologic Hazard Classifications. Geologic hazard areas shall be classified according to the criteria in this section.

1. Critical Erosion Hazard Areas. “Critical erosion hazard areas” are lands or areas underlain by soils identified by the U.S. Department of Agriculture Soil Conservation Service (SCS), now known as the Natural Resource Conservation Service, as having “severe” or “very severe” erosion hazards. This includes the following group of soils when they occur on slopes of 15 percent or greater: Alderwood-Kitsap (AkF), Alderwood gravelly sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD) and Indianola (InD).

2. Landslide Hazard Areas. “Landslide hazard areas” are classified as “Class I,” “Class II,” “Class III” or “Class IV” as follows:

- a. Class I/Low Hazard. Areas with slopes of 15 percent or less.
- b. Class II/Moderate Hazard. Areas with slopes of between 15 percent and 40 percent and that are underlain by soils that consist largely of sand, gravel or glacial till.
- c. Class III/High Hazard. Areas with slopes between 15 percent and 40 percent that are underlain by soils consisting largely of silt and clay.
- d. Class IV/Very High Hazard. Areas with slopes steeper than 15 percent with mappable zones of emergent water (e.g., springs or ground water seepage), areas of known (mappable) landslide deposits regardless of slope, and all areas with slopes 40 percent or greater.

3. Seismic Hazard Areas. “Seismic hazard areas” are lands that, due to a combination of soil and ground water conditions, are subject to severe risk of ground shaking, subsidence or liquefaction of soils during earthquakes. These areas are typically underlain by soft or loose saturated soils (such as alluvium), have a shallow ground water table and are typically located on the floors of river valleys. (Ord. 2370 § 10, 2004).

#### **16.15.090 Buffer areas and setbacks.**

A. General Provisions. The establishment of buffers, buffer areas or setbacks shall be required for all development proposals and activities in or adjacent to critical areas. The purpose of the buffer shall be to protect the integrity, function and value of the subject critical area (wetlands, streams, and wildlife habitat areas), and/or to protect life, property and resources from risks associated with development on unstable or critical lands (geologic hazard areas, flood hazard areas, aquifer recharge). Buffers shall typically consist of an undisturbed area of native vegetation. No buildings or structures shall be allowed unless otherwise permitted by this chapter. If the site has previously been disturbed, the buffer area shall be revegetated pursuant to an approved enhancement plan.

Buffers shall be protected during construction by placing a temporary barricade, posting notice of the presence of the critical area, and implementing appropriate erosion and sedimentation controls. Restrictive covenants or conservation easements may be required to provide long-term preservation and protection of buffer areas.

B. Required buffer widths shall reflect the sensitivity of the particular critical area or the risks associated with development. In those circumstances permitted by these regulations, the type and intensity of human activity proposed to be conducted on or near the critical area should also be considered. Buildings shall be set back a minimum of 15 feet from the edge of the buffer. Buffers shall be measured as follows:

1. Wetland buffers – the buffer shall be measured perpendicular from the wetland edge as delineated and marked in the field using the 1997 Washington State Wetlands Identification and Delineation Manual;
2. Stream buffers – the buffer shall be measured from the ordinary high water mark;
3. Geologic hazard area setbacks – buffers shall be measured from the top and toe and along the sides of the hazardous slope.

C. Buffer widths shall be established according to the following standards and criteria:

1. Wetland Buffers.

a. Wetland buffers shall be established as follows:

<b>Wetland Category</b>	<b>Buffer Width</b>	<b>Building Setback</b>
Category I	300 feet	25 feet
Category II	100 feet	15 feet
Category III	65 feet	15 feet
Category IV	50 feet	15 feet

b. Wetland buffer widths may be modified either by averaging buffer widths or by enhancing buffer quality as set forth herein.

i. Buffer width averaging shall be allowed only where the applicant demonstrates to the Department that the wetland contains variations in sensitivity due to existing physical characteristics and/or that lower intensity land uses would be located adjacent to areas where buffer width is reduced; and that averaging will not adversely impact the wetland functional values. In any case, the total area contained within the buffer after averaging shall be no less in area than contained within the standard buffer prior to averaging. The required building setback shall not be included in the area used to calculate buffer averaging.

ii. Buffer width on a site with existing development that has a legal nonconforming buffer and is proposed for redevelopment, notwithstanding the provisions of [MTMC 19.120.250](#), may be reduced by up to 25 percent if an applicant undertakes measures approved by the Department to enhance or restore the buffer; provided, that best available science indicates such measures are likely to enhance the

functions and values of the wetland compared to existing conditions. The restoration or enhancement may include, but is not limited to, planting of native trees or shrubs, increasing the diversity of plant cover types, or replacement of exotic species with native species which approximate in composition a naturally occurring plant community.

iii. Application of subsection (C)(1)(b)(i) or (ii) of this section shall not result in buffer width being reduced on any part of the parcel by more than 25 percent of the buffer otherwise required under subsection (C)(1)(a) of this section; provided, that buffers for hydrologically isolated Type IV wetlands smaller than 250 square feet may not be reduced by more than 35 percent.

c. Limited uses and activities which are consistent with the purpose and function of the wetland buffer, are consistent with the sensitivity of the wetland, and do not detract from its integrity may be permitted by the Department within the buffer. Examples of uses and activities with minimal impacts which may be permitted in appropriate cases include permeable pedestrian trails or viewing platforms, and utility easements; provided, that any impacts to the buffer resulting from such permitted activities shall be mitigated.

d. Low impact uses may be permitted within the building setback. Examples of such uses include utilities, recreation, and temporary construction staging required for such uses, and permitted accessory uses; provided, that any building or structure shall not be of such size as to require issuance of a building permit.

e. Long-term protection of a regulated wetland and its associated buffer shall be provided by one of the following methods: placing in a separate tract on which development is prohibited; execution of an easement; dedication to a conservation organization or land trust; or preserved through a comparable permanent protective mechanism acceptable to the City. The location and limitations associated with the wetland and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the Snohomish County Department of Records.

## 2. Stream Buffers.

a. The following minimum buffers are established for streams:

<b>Stream Class</b>	<b>Minimum Buffer Width (ft)</b>	<b>Additional Buffer (ft) for Threatened or Endangered Species</b>	<b>Building Setback (ft)</b>
I	150	75	15
II	100	50	15
III	65	0 (no anadromous fish)	15
IV	50	0 (no anadromous fish)	15
V	Determined based on review of		

	required technical information		
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The buffer widths required in this section are minimums, except as provided below, and may be increased by the Department in response to site-specific conditions and based on the information submitted to characterize the functions and values of the stream.

- b. A buffer width greater than the minimum may be required by the Department based on the findings of site-specific studies.
- c. The applicant may propose to implement one or more enhancement measures, listed below, which may be considered in establishing buffer requirements under subsection (C)(2)(b) or (C)(2)(f) of this section:
- i. Removal of fish barriers to restore accessibility to anadromous fish;
  - ii. Enhancement of fish habitat using log structures incorporated as part of a fish habitat enhancement plan;
  - iii. Landscaping outside the buffer area with native vegetation or a reduction in the amount of clearing outside the buffer area;
  - iv. Planting native vegetation within the buffer area, especially vegetation that would increase value for fish and wildlife, increase stream bank or slope stability, improve water quality, or provide aesthetic/recreational value;
  - v. Creating a surface channel where a stream was previously culverted or piped;
  - vi. Removing or modifying existing stream culverts (such as at road crossings) to improve fish passage and flow capabilities which are not detrimental to fish;
  - vii. Upgrading retention/detention facilities or other drainage facilities beyond required levels; or
  - viii. Similar measures determined applicable by the Department.
- d. No structures or improvements shall be permitted within the stream buffer area, including buildings, decks, and docks, except as otherwise permitted under one of the following circumstances:
- i. When the improvements are part of an approved enhancement, restoration or mitigation plan; or
  - ii. For construction of new public roads and utilities, and accessory structures, when no feasible alternative location exists; or
  - iii. Construction of foot trails, according to the following criteria:
    - (A) Constructed of permeable materials;
    - (B) Designed to minimize impact on the stream system;
    - (C) Of a maximum width of eight feet;



(D) Located within the outer half of the buffer, i.e., the portion of the buffer that is farther away from the stream; or

iv. Construction of footbridges; or

v. Construction of educational facilities, such as viewing platforms and informational signs.

e. The Department may permit buffer widths to be averaged for segments of Class II, III, IV or V streams based on the findings of the stream report, subject to the following criteria: stream functions will not be reduced; fish habitat will not be adversely affected; additional enhancement of habitat is provided in conjunction with the reduced buffer; the buffer is not reduced more than 25 percent in any location; and the total buffer area after averaging is not less than what would be contained in the standard buffer. For averaging purposes, stream buffer widths shall be calculated based only on the stream segment located on the parcel being developed.

f. Buffer width on a site with existing or prior commercial development that has a legal nonconforming buffer and is proposed for redevelopment with improvements that will increase the economic viability of the development, notwithstanding the provisions of MTMC [19.120.250](#), may be reduced by up to 25 percent if an applicant undertakes measures approved by the Department to enhance or restore the buffer; provided, that best available science indicates such measures are likely to enhance the functions and values of the wetland compared to existing conditions. The restoration or enhancement measures may include, but are not limited to, those measures listed in subsection (C)(2)(c) of this section.

g. Long-term protection of a regulated stream and its associated buffer shall be provided by one of the following methods: placing in a separate tract on which development is prohibited; protected by execution of an easement; dedicated to a conservation organization or land trust; or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the stream and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with Snohomish County.

### 3. Wildlife Habitat Areas.

a. Buffer widths for critical habitat areas shall be determined by the Department based on consideration of the following factors: (i) species recommendations of the Washington Department of Fish and Wildlife, based on consideration of published species-specific information and consultation with the Department; (ii) recommendations contained in the wildlife study submitted by a qualified consultant, following the reporting requirements of these regulations; and (iii) the nature and intensity of land uses and activities occurring on the site and on adjacent sites. Buffers shall not be required for secondary habitat unless such habitat includes another regulated critical area for which a buffer is required by this chapter.

b. Wildlife habitat buffer widths may be modified by averaging buffer widths or by enhancing or restoring buffer quality, pursuant to scientific analysis that the functions and values of the wildlife habitat will be retained or enhanced.

c. Certain uses and activities which are consistent with the purpose and function of the habitat buffer and do not detract from its integrity may be permitted by the Department within the buffer depending on the sensitivity of the habitat area. Examples of uses and activities with minimal impact which may be permitted in appropriate cases include permeable pedestrian trails and viewing platforms, and utility easements; provided, that any impacts to the buffer resulting from permitted facilities shall be mitigated. When permitted, such facilities shall be located in the outer 10 feet of the buffer.

d. Long-term protection of critical habitat areas and their associated buffer(s) shall be provided by one of the following methods. It shall be placed in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the wetland and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with Snohomish County.

#### 4. Critical Geologic Hazard Areas.

a. Required buffers for critical geologic hazard areas shall vary between 15 feet and 50 feet in most cases. The width of the buffer shall reflect the sensitivity of the geologic hazard area in question and the types and density of uses proposed on or adjacent to the geologic hazard. In determining the appropriate buffer width, the Department shall consider the recommendations contained in any technical report required by these regulations and prepared by an applicant's qualified consultant.

b. Buildings and structures shall be set back an additional minimum of 15 feet from the edge of the critical area buffer.

c. Setbacks may be reduced when the applicant demonstrates through technical studies that the reduction will adequately protect the geologic hazard and the proposed development in view of proposed engineering techniques.

D. Buffer Width Variances. A "minor critical area buffer width variance," defined as up to and including 10 percent of the standard requirement under subsection (C)(1)(a) or (C)(2)(a) of this section, may be granted by the Hearing Examiner pursuant to the following:

1. A complete application for a minor critical area buffer width variance, including the appropriate variance fee, has been received by the Department;
2. Procedural requirements, including those in MTMC [18.05.420](#), [18.05.500](#), and [18.05.620](#), have been met; and
3. The minor critical area buffer width variance being requested is consistent with the following criteria:
  - a. There are unique physical conditions peculiar and inherent to the affected property which make it difficult or infeasible to strictly comply with the provisions of this section;
  - b. The variance is the minimum necessary to accommodate the building footprint and access;

- c. The proposed variance would preserve the functions and values of the critical area, and/or the proposal does not create or increase a risk to the public health, safety and general welfare, or to public or private property;
- d. The proposed variance would not adversely affect surrounding properties;
- e. Adverse impacts to critical areas resulting from the proposal are minimized; and
- f. The special circumstances or conditions affecting the property are not a result of the actions of the applicant or previous owner. (Ord. 2370 § 11, 2004).

#### **16.15.100 Alteration or development of critical areas – Standards and criteria.**

Alteration of critical areas and/or their established buffers may be permitted by the Department subject to the criteria of this section. Standards for mitigation of impacts to critical areas are identified in MTMC [16.15.110](#).

##### A. Wetlands.

1. Category I Wetlands. Alterations of Category I wetlands shall be avoided subject to the reasonable use provisions of this chapter.
2. Category II Wetlands.
  - a. Alteration and mitigation shall comply with the mitigation performance standards and requirements of these regulations; and
  - b. No net loss of wetland functions and values may occur.
3. Category III and IV Wetlands.
  - a. Alteration and mitigation shall comply with the mitigation performance standards and requirements of these regulations;
  - b. Where enhancement restoration or creation is proposed, replacement ratios shall comply with the requirements of these regulations; and
  - c. No net loss of wetland functions and values may occur.

##### B. Streams.

1. Relocation of a Class I stream shall be prohibited. Relocation of other streams may take place only when it is part of an approved mitigation or enhancement or restoration plan, will result in equal or better habitat and water quality, and will not diminish the flow capacity of the stream. Relocation of a Class II, III and IV stream exclusively to facilitate general site design shall not be permitted.
2. Bridges shall be used to cross Class I streams; boring/micro-tunneling may be considered for utility crossings if it would result in the same or lower impacts as bridging.
3. Culverts are allowable only under the following circumstances:
  - a. Only in Class II, III, and IV streams;
  - b. When fish passage will not be impaired;

c. When the following design criteria are met:

- i. Oversized culverts will be installed;
- ii. Culverts will include gradient controls and creation of pools within the culvert for Class II streams;
- iii. Gravel substrate will be placed in the bottom of the culvert to a minimum depth of one foot for Class II and Class III streams;

d. The applicant or successors shall, at all times, keep any culvert free of debris and sediment to allow free passage of water and, if applicable, fish.

4. The City may require that a culvert be removed from a stream as a condition of approval, unless the culvert is not detrimental to fish habitat or water quality, or removal would be a long-term detriment to fish or wildlife habitat or water quality.

#### C. Wildlife Habitat.

1. Critical Habitat. Alterations of critical habitat shall be avoided, subject to the reasonable use provisions of this chapter.

2. Secondary Habitat. Alterations of secondary habitat may be permitted; provided, that the applicant mitigates adverse impacts consistent with the performance standards of MTMC [16.15.120](#), and other requirements of this chapter.

#### D. Geologic Hazard Areas.

1. General Standard. The City may approve, condition or deny proposals for the alteration of geologic hazard areas based on the degree to which significant risks posed by critical hazard areas to public and private property and to public health and safety can be mitigated. The objective of mitigation measures shall be to render a site containing a critical geologic hazard site as safe as one not containing such hazard or one characterized by a low hazard. In appropriate cases, conditions may include limitations of proposed uses, modification of density, alteration of site layout and other appropriate changes to the proposal. Where potential impacts cannot be effectively mitigated, or where the risk to public health, safety and welfare, public or private property, or important natural resources is significant notwithstanding mitigation, the proposal shall be denied, unless permitted as a reasonable use exception under MTMC [16.15.150](#).

2. Class IV Landslide Hazard Areas. Alteration shall be prohibited in Class IV (very high) landslide hazard areas, subject to the reasonable use provisions of this chapter.

3. Critical Seismic Hazard Areas.

a. For one-story and two-story residential structures, the applicant shall conduct an evaluation of site response and liquefaction potential based on the performance of similar structures under similar foundation conditions; and

b. For all other proposals, the applicant shall conduct an evaluation of site response and liquefaction potential including sufficient subsurface exploration to provide a site coefficient (S) for use in the static lateral force procedure described in the International Building Code.



4. When development is permitted in geologic hazard areas by these regulations, an applicant and/or its qualified consultant shall provide assurances which, at the City's discretion, may include one or more of the following:

- a. A letter from the geotechnical engineer and/or geologist who prepared the studies required by these regulations that risks of damage from the proposal, both on-site and off-site, are minimal subject to the conditions set forth in the report, that the proposal will not increase the risk of occurrence of the potential geologic hazard, and that measures to eliminate or reduce risks have been incorporated into its recommendations;
- b. A letter from the applicant, or the owner of the property if not the applicant, stating an understanding and acceptance of any risk of injury or damage associated with development of the site and agreeing to notify any future purchasers of the site, portions of the site, or structures located on the site of the geologic hazard;
- c. A legally enforceable hold harmless agreement, which shall be recorded as a covenant and noted on the face of the deed or plat, and executed in a form satisfactory to the City, acknowledging that the site is located in a geologic hazard area; the risks associated with development of such site; and a waiver and release of any and all claims of the owner(s), their directors, employees, successors or assigns against the City of Mountlake Terrace for any loss, damage or injury, whether direct or indirect, arising out of issuance of development permits for the proposal; and
- d. Posting of a bond, guarantee or other assurance device approved by the City, to cover the cost of monitoring, maintenance and any necessary corrective actions.

#### E. Aquifer Recharge Areas.

1. The following land uses and activities shall be avoided in critical (high significance) aquifer recharge areas:

- a. Land uses and activities that involve the use, storage, transport or disposal of regulated quantities of chemicals, substances or materials that are toxic, dangerous or hazardous, as those terms are defined by state regulations (per WAC [173-303-070](#) through [173-303-100](#), and Chapter [173-342](#) WAC);
- b. On-site sewage disposal systems;
- c. Underground or outdoor storage of chemicals;
- d. Petroleum pipelines; and
- e. Solid waste landfills.

2. Medium or Low Significance Recharge Areas. Development within "medium or low significance aquifer recharge areas," as those terms are defined in these regulations, shall implement the mitigation standards contained in MTMC [16.15.110](#) and [16.15.120](#).

#### F. Flood Hazard Areas – Development Standards.

1. Flood Hazard Areas Generally. Any development in flood hazard areas is subject to the provisions of Chapters [15.05](#) and [16.20](#) MTMC. (Ord. 2370 § 12, 2004).

**16.15.110 Mitigation standards, criteria and plan requirements.****A. Mitigation Standards.**

1. Adverse impacts to critical area functions and values shall be mitigated. Mitigation actions shall be implemented in the preferred sequence identified in this chapter. Proposals which include less preferred and/or compensatory mitigation shall demonstrate that:
  - a. All feasible and reasonable measures have been taken to reduce impacts and losses to the critical area, or to avoid impacts where avoidance is required by these regulations;
  - b. The restored, created or enhanced critical area or buffer will be as viable and enduring as the critical area or buffer area it replaces; and
  - c. In the case of wetlands and streams, no overall net loss will occur in wetland or stream functions and values. The mitigation shall be functionally equivalent to the altered wetland or stream in terms of hydrological, biological, physical and chemical functions.

**B. Location and Timing of Mitigation.**

1. Mitigation shall be provided on-site. Mitigation may be allowed off-site only when it is determined by the Department that on-site mitigation is not scientifically feasible or practical due to physical features of the property, or where the affected site is identified as appropriate for off-site mitigation pursuant to an off-site mitigation program. The burden of proof, based on a preponderance of the evidence, shall be on the applicant to demonstrate that mitigation cannot be provided on-site.
2. When mitigation cannot be provided on-site, mitigation shall be provided in the same drainage basin as the permitted activity on property owned, secured or controlled by the applicant where such mitigation is practical and beneficial to the critical area and associated resources. Mitigation sites shall be located within the City.
3. In-kind mitigation shall be provided except when the applicant demonstrates, based on a preponderance of the evidence, and the Department concurs, that greater functional and habitat value can be achieved through out-of-kind mitigation.
4. When wetland, stream or habitat mitigation is permitted by these regulations on-site or off-site, the mitigation project shall occur near an adequate water supply (river, stream, ground water) with a hydrologic connection to the critical area to ensure a successful mitigation or restoration. A natural hydrologic connection is preferential as compared to one which relies upon manmade features requiring routine maintenance.
5. Any agreed-upon mitigation plan shall be completed before initiation of other permitted activities, unless a phased or concurrent schedule that assures completion prior to occupancy has been approved by the Department.

**C. Wetland Replacement Ratios.**

1. Where wetland alterations are permitted by the Department, the applicant shall enhance or create areas of wetlands in order to compensate for wetland losses. The compensation shall be determined according to acreage, function, type, location, timing factors, and projected success of enhancement or creation.

2. The following acreage replacement and enhancement ratios shall be implemented. The Department may vary these standards only if the applicant can demonstrate, and the Department agrees, that the variation will be compensated by mitigation that will replace the lost functions of the wetland. In no case shall the amount of mitigation be less than the area of affected wetland. The Department may at its discretion increase these standards where mitigation is to occur off-site or in other appropriate circumstances.

<b>Wetland Category</b>	<b>Wetland Creation Replacement Ratio</b>	<b>Wetland Enhancement Ratio (Acres)</b>
	(Acres Created or Enhanced: Acres Impacted)	
Category I	6:1	12:1
Category II	Forested 3:1	6:1
	Scrub/Shrub 2:1	4:1
	Emergent 2:1	4:1
Category III	Forested 3:1	6:1
	Scrub/Shrub 2:1	4:1
	Emergent 2:1	4:1
Category IV	1.25:1	2.5:1

Source: Wetland Mitigation Replacement Ratios: Defining Equivalency, Department of Ecology, 1992

(Ord. 2370 § 13, 2004).

#### **16.15.120 Performance standards for mitigation planning.**

The performance standards in this section and the standards in MTMC [16.15.110](#) shall be incorporated into mitigation plans submitted to the Department to address impacts to critical areas. Mitigation plans shall contain detailed critical area information as required by the Department to analyze impacts and alternatives.

##### **A. Wetlands and Streams.**

1. Use plants native to the Puget Lowlands; nonnative, introduced plants or plants listed by the Washington State Department of Agriculture as noxious weeds (Chapter [16-750 WAC](#)) shall not be used;
2. Use plants adapted to and appropriate for the proposed habitats and consider the ecological conditions known or expected to be present on the site. For example, plants assigned a facultative wetland (FACW) wetland indicator status should be used for sites with soils that are inundated or saturated for long periods during the growing season. Use nearby reference wetlands or aerial photos to identify plants suitable to the site conditions and hydrologic regimes planned for the mitigation site;
3. Avoid planting significant areas of the site with species that have questionable potential for successful establishment, such as species with a narrow range of habitat tolerances;

4. Specify plants that are commercially available from native-plant nurseries or available from local sources; if collecting some or all native plants from donor sites, collect in accordance with ecologically accepted methods, such as those described in the Washington Native Plant Society's Policy on Collection and Sale of Native Plants, that do not jeopardize the survival or integrity of donor plant populations;
5. Use perennial plants in preference to annual species;
6. Use plant species high in food and cover value for native fish and wildlife species that are known or likely to use the mitigation site (according to reference wetlands, published information, and professional judgment);
7. Install a temporary irrigation system and specify an irrigation schedule unless a sufficient naturally occurring source of water is demonstrated;
8. For stream substrate or wetland soils, at least one foot of clean inorganic and/or organic materials, such as cobble, gravel, sand, silt, clay, muck, or peat as appropriate shall be ensured. The stream substrate or wetland soils shall be free from solid, dangerous, or hazardous substances as defined by Chapter [70.105](#) RCW and implementing rules;
9. Confine temporary stockpiling of soils to upland areas. Unless otherwise approved by the Department, comply with all applicable best management practices for clearing, grading, and erosion control to protect any nearby surface waters from sediment and turbidity;
10. Show densities and placement of plants; these should be based on the ecological tolerances of species proposed for planting, as determined by a qualified consultant;
11. Provide sufficient specifications and instructions to ensure proper placement diversity and spacing of seeds, tubers, bulbs, rhizomes, springs, plugs, and transplanted stock and other habitat features, to provide a high probability of success, and to reduce the likelihood of prolonged losses of wetland functions from proposed development. Prepare contingency plans for all mitigation proposals;
12. Do not rely on fertilizers and herbicides to promote establishment of plantings; if fertilizers are used, they must be applied per manufacturer specifications to planting holes in organic or time-release forms, such as Osmocote® or comparable formulations, and never broadcast on the ground surface; if herbicides are used to control invasive species or noxious weeds and to help achieve performance standards, only those approved for use in aquatic ecosystems by the Washington Department of Ecology shall be used; herbicides shall only be used in conformance with all applicable laws and regulations and be applied per manufacturer specifications by an applicator licensed in the state of Washington;
13. Include the applicant's mitigation plan consultant in the construction process to ensure the approved mitigation plan is completed as designed. At a minimum, the consultant's participation will include site visits to inspect completed rough and final grading, installation of in-water or other habitat structures, and to verify the quality and quantity of native plant materials before and after installation; and
14. During construction, place temporary markers, signs and/or fencing around the perimeter of the critical area, where practical and applicable to particular critical areas.

## B. Wetlands.



1. Do not exceed a maximum water depth of 6.6 feet (two meters) at mean low water unless approved as part of a planned interspersion of wetland vegetation classes and deep-water habitats;
2. Do not exceed a slope of 25 percent (4H:1V) in the wetland unless it can be clearly demonstrated by supporting documentation that wetland hydrology and hydric soils capable of supporting hydrophytic (wetland) vegetation will be created on steeper slopes;
3. Do not exceed a slope of 25 percent (4H:1V) in the wetland buffer.

#### C. Wildlife Habitat.

1. Incorporate relevant performance standards from subsections A and B of this section, as determined by the Department;
2. Include the following additional mitigation measures in mitigation planning:
  - a. Locate buildings and structures in a manner that minimizes adverse impacts on critical habitats used by priority or threatened or endangered species and identified by the Washington State Department of Fish and Wildlife, National Marine Fisheries Services, and U.S. Fish and Wildlife Services. Priority habitats include, but are not limited to, riparian areas, streams, wetlands, caves, snags and logs, talus, and urban natural open space;
  - b. Integrate retained habitat into open space and landscaping;
  - c. Wherever possible, consolidate critical habitats into larger, unfragmented, contiguous blocks;
  - d. Use native plant species for landscaping of disturbed or undeveloped areas and in any habitat enhancement or restoration activities;
  - e. Create habitat heterogeneity and structural diversity that emulates native plant communities described in *Natural Vegetation of Oregon and Washington* (Franklin, J.F. and C.T. Dyrness 1988) or other regionally recognized publications on native landscapes;
  - f. Remove and/or control any noxious weeds or exotic animals which are problematic to the critical habitat area as determined by the Department or consultant hired by the City to review the mitigation plan; and
  - g. Preserve significant or existing native trees, preferably in stands or groups, consistent with achieving the goals and standards of this chapter; the plan shall reflect the report prepared pursuant to MTMC [16.15.070](#).

#### D. Geologic Hazard Areas.

1. Relevant performance standards, as determined by the Department, shall be incorporated into mitigation plans.
2. The following additional performance standards shall be reflected in proposals within geologic hazard areas:
  - a. A geotechnical study shall be prepared to identify and evaluate potential hazards and to formulate mitigation measures;

- b. Construction methods will reduce or not adversely affect geologic hazards;
- c. Site planning shall minimize disruption of existing topography and natural vegetation;
- d. Impervious surface coverage shall be minimized;
- e. Disturbed areas shall be replanted as soon as feasible pursuant to an approved landscape plan;
- f. Clearing and grading shall be limited to the period of May 1st to October 1st unless the geotechnical report specifically addresses measures necessary to perform clearing and grading during other portions of the year;
- g. Use of retaining walls that allow maintenance of existing natural slope areas are preferred over graded slopes;
- h. Temporary erosion and sedimentation controls, pursuant to an approved plan, shall be implemented during construction;
- i. A master drainage plan shall be prepared for large projects as required by the City Engineer;
- j. Development shall not increase instability or create a hazard to the site or adjacent properties, or result in a significant increase in sedimentation or erosion.

#### E. Aquifer Recharge Areas.

1. Development within "high and medium significance aquifer recharge areas," as those terms are defined in these regulations, shall implement the following measures:
  - a. Underground storage of chemicals, substances or materials that are toxic, hazardous or dangerous is prohibited;
  - b. Any chemicals, substances or materials that are toxic, hazardous or dangerous as defined by state law (per WAC [173-303-070](#) through [173-303-100](#) and Chapter [173-342](#) WAC) should be segregated and stored in receptacles or containers that meet state and federal standards;
  - c. Storage containers should be located in a designated, secured area that is paved and able to contain leaks and spills, and surrounded by a dike;
  - d. Secondary containment devices should be constructed around storage areas to retard the spread of any spills and a monitoring system should be implemented;
  - e. A written operations plan should be developed, including procedures for loading/unloading liquids and for training of employees in proper materials handling;
  - f. An emergency response/spill clean-up plan shall be prepared and employees properly trained in reacting to accidental spills;
  - g. The tanks should include overflow protection systems and positive controls on outlets to prevent uncontrolled discharges;
  - h. Development should be clustered and impervious surfaces limited where possible;

- i. No waste liquids or chemicals of any kind shall be discharged to storm sewers; and
- j. All development shall implement best management practices (BMPs) for water quality, as approved by the Department, such as biofiltration swales and use of oil-water separators, and BMPs appropriate to the particular use proposed.

2. Development within low significance aquifer recharge areas shall implement best management practices (BMPs) for water quality as approved by the City.

On completion of construction, any approved mitigation project must be signed off by the applicant's qualified consultant and approved by the Department. Signature will indicate that the construction has been completed as approved. (Ord. 2370 § 14, 2004).

#### **16.15.130 Monitoring program and contingency plan.**

A. For all actions requiring a mitigation plan, a monitoring program shall be prepared and implemented by the applicant to evaluate the success of the mitigation project and to determine necessary corrective actions. This program shall determine if the original goals and objectives are being met. The monitoring program shall be reviewed and approved by the Department prior to implementation.

B. The monitoring program shall include a contingency plan in the event that implementation of the mitigation plan is inadequate or fails. A performance and maintenance bond or other acceptable security device is required to ensure the applicant's compliance with the terms of the approved mitigation plan. The amount of the performance and maintenance bond shall equal 125 percent of the cost of the mitigation project for the length of the monitoring period; the Department may agree to reduce the bond in proportion to work successfully completed over the period of the bond.

C. Incorporate the following into monitoring programs prepared to comply with this chapter:

1. Appropriate, accepted, and unbiased qualitative or precise and accurate quantitative sampling methods to evaluate the success or failure of the project compared to performance standards approved by the City;
2. Quantitative sampling methods that include permanent photopoints installed at the completion of construction and maintained throughout the monitoring period and shall also include permanent transects, sampling points (e.g., plots or quadrants or water quality or quantity monitoring stations), and wildlife monitoring stations;
3. Clearly stipulated qualitative and quantitative sampling methods that are approved by the City or the consultant selected by the City to review the monitoring plan before implementation by the project proponent;
4. Appropriate qualitative and/or quantitative performance standards that will be used to measure the success or failure of the mitigation. These will include, at a minimum, standards for plant survival and diversity, including structural diversity, the extent of wetland hydrology, hydric soils, and habitat types and requirements as appropriate; all proposed standards are subject to review and approval by the City or the consultant selected by the City to review the monitoring plan;
5. Monitoring programs for an appropriate period of time, usually three to five years, that include, at a minimum: preparation of an as-built plan; biannual monitoring and preparation of annual monitoring reports following implementation; and a maintenance plan. More stringent

monitoring requirements may be required on a case-by-case basis for more complex mitigation plans;

6. Monitoring reports shall be submitted to the Department by December 1st of the year in which monitoring is conducted. The reports are to be prepared by a qualified consultant and must contain all qualitative and quantitative monitoring data, photographs, and an evaluation of each of the applicable performance standards. If performance standards are not being met, appropriate corrective or contingency measures must be identified and implemented to ensure that performance standards will be met;

7. Provision for extension of the monitoring period beyond the minimum timeframe if performance standards are not being met at the end of the initial three- or five-year period; and provision for additional financial securities or bonding to ensure that any additional monitoring and contingencies are completed to ensure the success of the mitigation. (Ord. 2370 § 15, 2004).

#### **16.15.140 Procedural provisions.**

A. Interpretation and Conflicts. The Director shall have the authority to administer the provisions of this chapter, to make determinations with regard to the applicability of the regulations, to interpret the intent of unclear provisions, to require additional information, to determine the level of detail and appropriate methodologies for critical area reports and studies, to prepare application and informational materials as required, to promulgate procedures and rules for unique circumstances not anticipated with the standards and procedures contained within this section.

#### B. Enforcement.

1. Voluntary Correction. When it has been determined that a violation has occurred or is occurring, the City of Mountlake Terrace may enter into a voluntary correction agreement, which is a contract between the City and the responsible person, under which such person agrees to abate the violation within a specified time and according to specified conditions. The voluntary correction agreement shall include the following:

- a. The name and address of the person responsible for the violation; and
- b. The street address or other description sufficient for identification of the building, structure, premises, or land upon or within which the violation has occurred or is occurring; and
- c. A description of the violation and a reference to the regulation which has been violated; and
- d. The necessary corrective action to be taken, and a date or time by which the correction must be completed; and
- e. An agreement by the person responsible for the violation that the City may inspect the premises as necessary to determine compliance with the voluntary correction agreement; and
- f. A statement of understanding that if the terms of the voluntary correction agreement are not satisfied, that the City may abate the violation and recover its costs and expenses (including attorney fees, expert witness fees, and court costs) from the person responsible for the violation, and/or they may be subject to a monetary penalty; and



g. A statement of understanding that by entering into the voluntary correction agreement, the person responsible for the violation waives the right to a hearing as to the existence of the violation and stipulates to the same. A statement of understanding that an extension of the time limit for correction or a modification of the required corrective action may be granted if the person responsible for the violation has shown due diligence and/or substantial progress in correcting the violation, but unforeseen circumstances delay correction under the original conditions.

2. Notice of Civil Violation. When it is determined that a violation has occurred or is occurring, and the City is unable to secure voluntary correction or a voluntary agreement is not applicable, the City may issue a notice of civil violation, or a "notice and order" to the person responsible for the violation. A "notice and order" shall include the following:

- a. The name and address of the person responsible for that violation; and
- b. The street address or description sufficient for identification of the building, structure, premises, or land upon or within which the violation has occurred or is occurring; and
- c. A description of the violation and a reference to the provision(s) of the City regulation(s) which has been violated; and
- d. The required corrective action and a date and time by which the correction must be completed, after which the City may abate the unlawful condition using all legal means; and
- e. A statement that the order may be appealed to the Hearing Examiner upon filing a written request for hearing with the City Manager or designee within 15 days of issuance of the order. Failure to timely file a notice of appeal shall constitute a waiver of the right to appeal the determination of the order. An appeal hearing, timely requested, shall be set before the Hearing Examiner no less than 20 days but no more than 60 days from the date the notice of civil violation is issued, unless such date is continued by the Hearing Examiner for good cause or by agreement of the parties; and
- f. A statement indicating that the hearing will be canceled and no monetary penalty will be assessed, other than City costs and expenses, if the required corrective action is completed and approved by the City prior to the hearing; and
- g. A statement that the costs and expenses of abatement incurred by the City and a monetary penalty in an amount per day or week for each violation may be assessed against the person to whom the notice of civil violation is directed as specified and ordered by the court.

Service of the notice to the person responsible for the violation may be done either personally or by mailing a copy of the notice of civil violation by certified or registered mail, return receipt requested, to such person at their last known address. If the person responsible for the violation cannot be personally served within Snohomish County and if an address for mailed service cannot be ascertained, notice shall be served by posting a copy of the notice of civil violation conspicuously on the affected property or structure. Proof of service shall be made by a written declaration under penalty of perjury executed by the person effecting the service, declaring the time and date of service, the manner by which the service was made and, if by posting, the facts showing the attempts to serve the person personally or by mail.

### 3. Abatement.

a. Urgent Abatement. Whenever a condition, the continued existence of which constitutes an immediate threat to the public health, safety or welfare or to the environment, is found to exist, the City may summarily and without prior notice abate the condition. Notice of such abatement, including the reason for it, shall be given to the person responsible for the violation as soon as reasonably possible after the abatement.

b. Judicial Abatement. The City may seek judicial process, as it deems necessary to abate a condition which was caused by or continues to be a violation of this chapter and other methods of remedial action failed to produce compliance. An order of abatement is issued through the appropriate court of jurisdiction.

### C. Penalties.

1. Violation of, or failure to comply with, any provision of this chapter is a civil offense except as otherwise provided, and subject to a fine as established by resolution. If the violation has not been corrected pursuant to a notice and order, or the fine is not paid within 15 days of issuance of the notice and order and the notice and order has not been appealed, the violation shall constitute a continued offense subject to the penalties in subsection (C)(3) of this section.

2. Any person or entity cited for violation under subsection B of this section may request an administrative hearing by notifying the Department in writing within 15 days of the issuance of the citation. The requested hearing shall be brought before the Hearing Examiner in accordance with and pursuant to Chapter [2.120](#) MTMC.

3. A continued offense or subsequent violation of the same or like provision committed within a 24-month period shall constitute a misdemeanor crime and shall be punishable by a fine not to exceed \$1,000 or 90 days in jail, or both such fine and jail time, and shall be in addition to any civil remedy for abatement and collection for the cost and expense thereof.

D. Appeals of Critical Area Review Decisions. Critical area review decisions may be appealed to the Hearing Examiner pursuant to Chapter [2.120](#) MTMC by a party with standing and shall be governed by the following procedures and standards:

1. Written Appeal. Appeals shall be written and shall state the following:

- a. The decision being appealed, the name of the project applicant and the date of the decision.
- b. The name and address of the person appealing, and his or her interest in the matter.
- c. The reasons why the person appealing believes the decision to be in error under the provisions of this chapter.

2. Filing the Appeal. The person appealing shall file the appeal and applicable fee with the Director of Community Services within 14 calendar days after the date of the decision being appealed.

3. Standards. In deciding the appeal, the Hearing Examiner shall determine whether the critical area decision, pursuant to the appeal, was in error pursuant to the provisions of this chapter. (Ord. 2370 § 16, 2004).

**16.15.150 Reasonable use provision.**

A. The standards and requirements of these regulations are not intended, and shall not be construed or applied in a manner, to deny all reasonable use of private property. If an applicant demonstrates to the satisfaction of the Hearing Examiner that strict application of these standards would deny all reasonable use of a property, development may be permitted subject to appropriate conditions.

B. Applications for a reasonable use exception shall be processed for consideration by the Hearing Examiner, pursuant to Chapter [2.120](#) MTMC.

C. An applicant for relief from strict application of these standards shall demonstrate that all of the following criteria are met:

1. No reasonable use with less impact on the critical area and its buffer is possible; and
2. No feasible and reasonable on-site alternative is possible to the activities proposed, considering possible changes in site layout, reductions in density and similar factors, that would allow a reasonable economic use with fewer adverse impacts; and
3. The proposed activities, as conditioned, will result in the minimum possible impacts to affected critical areas; and
4. All reasonable mitigation measures have been implemented or assured; and
5. The inability to derive reasonable economic use is not the result of the applicant's actions or that of a previous property owner, such as by segregating or dividing the property and creating an undevelopable condition; and
6. Any alteration of a critical area approved under this section shall be subject to appropriate conditions and will require mitigation under an approved mitigation plan.

D. Approval of a reasonable use exception shall not eliminate the need for any other permit or approval otherwise required by applicable City codes. (Ord. 2370 § 17, 2004).

The Mountlake Terrace Municipal Code is current through Ordinance 2686, passed June 20, 2016.

Disclaimer: The City Clerk's Office has the official version of the Mountlake Terrace Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

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