
Richard Holub
dick@dlhinc.com

**Subject: Geologic Hazards Assessment, Preliminary Soil Design Information,
and Conceptual Drainage Plan Review**
Holub Property, Parcel #3125079010, Redmond, Washington

Mr. Holub:

The purpose of this letter is to provide some preliminary soils information about the subject property, our opinion on the conceptual drainage plan, and some general commentary on the geologic hazard area on the subject property. Based on the recent design team correspondence, clarification with respect to some of the mapped geologic hazard areas (critical areas) is needed from King County staff. Our intention is to provide some preliminary soil design information and our assessment of the design approach in consideration of the soil and geologic conditions.

Proposed Project

Based on our correspondence and review of the referenced plan (Encompass Engineering, DATE), it is our understanding that you intend to build a barn and a detached accessory dwelling unit (DADU) on the subject property.

Site Conditions

The subject property (Parcel #3125079010) was located at 27933 East Main Street in Redmond, Washington. The subject property was irregularly shaped but was generally rectangular with the property lines in north-south/east-west orientation. The King County Department of Assessments information indicated that the property was 12.50 acres (544,500 square feet) in size. The bulk of the property gently sloping from the west down to the east, at slopes ranging from approximately 6 to 20 percent. There is an isolated steeper slope near the northeast corner of the property that is on the order of 40 percent. This slope is not near the areas associated with the planned development. Based on the grading plan, the total relief on the subject property is on the order of 160 feet. A gravel road from East Main Street serves the property, entering near the northeast property corner, running along the east edge of the property and then to the west along and near the south property line. This gravel road also services adjacent properties to the south and west. The subject property is bordered on all sides by other residential properties.

There is an existing home on the property that is in disrepair and is to be demolished as a part of this development. There were also a shed and a pumphouse associated with the existing home. The middle of the property had been cleared and consisted of grass yard/pasture-type area. There had also been some drainage improvements associated with the driveway and other site features.

We did not observe any evidence of soil movement or significant erosion features during our site reconnaissance. There were some wetland areas near the southern portion of the



property. The wetland area (Category III) is delineated and will have a 60-foot buffer. It is our opinion that this wetland will not adversely affect, or be adversely affected by, the proposed development.

Geologic Mapping

Our review of the referenced geologic map (Dragovich et al, 2007) indicates that the subject property is underlain by Vashon stade recessional deposits consisting of outwash gravels and glaciolacustrine deposits. Based on our observations of minor existing excavations, road cut slopes, and the ground surface, it is our opinion that the geologic mapping is correct.

These type of Vashon recessional deposits were deposited in fluvial and lacustrine environments as the Vashon glacial ice sheet receded. As such, these sediments were not overconsolidated by the glacial ice. While not as dense as lodgement till or advance outwash sediments, recessional outwash deposits have been normally consolidated since their deposition and are generally suitable for support of lighter structural loads typical of residential construction.

Geologic Hazards Assessment

The following discussion of potential geologic hazards is based on the visual reconnaissance of the site, reviews of aerial photographs and regional topographic and geologic maps of the area, and review of the information available on the King County Interactive Mapping Tool (iMap). The iMap information indicates the following geologic hazards: Erosion Hazard Area, Potential Steep Slope Hazard Area, Critical Aquifer Recharge Area (Category 2), Seismic Hazard Area and a Landslide Hazard Area that was within the “Stormwater Services” map layer tree, which is not a typical GIS layer for determining geologic hazards. We will address these items in the following subsections:

Erosion Hazard Area (21A.24.220) Temporary Erosion and Sediment Control (TESC)

A significant portion of the subject property and the area to be developed is mapped as an erosion hazard area. However, erosion hazard areas are not buffered geologic hazards and it is our opinion that erosion and runoff can be controlled during construction by implementing TESC measures consistent with the standard of practice for the Puget Sound region. The following is a partial list of best management practices (BMPs) that should be implemented:

- Prevention and maintenance of vehicle sediment track-out
- Temporary soil cover, as appropriate
- Perimeter controls, as appropriate
- Establish permanent vegetation soon after grading is complete

Implementation of TESC measures will likely be a requirement of the clearing and grading permit or the building permit. South Fork Geosciences is available to assist in the design of the TESC plan and to provide any required inspections during construction.

Potential Steep Slope Hazard Area

There are some potential steep slope areas upslope of the gravel road in the northeast portion



of the property. Though on the order of 40 percent in places, we did not observe any signs of recent slope movement or accelerated erosion. These slopes are not near the proposed development and it is our opinion that any slope related hazard areas are mitigated through avoidance.

Critical Aquifer Recharge Area (Category 2) (21A.24.316)

Portions of the subject property are mapped as Category II Critical Aquifer Recharge Areas. However, due to the size of the property, there are no restrictions with respect to CARAs for the proposed development.

Seismic Hazard Area (21A.24.290)

The eastern portion of the property is mapped as a seismic hazard area. This is due to the presence of Quaternary peat deposits in the bog to the east of the property. These soils do not underlie the area to be developed and as such the proposed development should not be encumbered by seismic hazard areas. Liquefaction is a condition where loose, saturated, fine sands lose their shear strength due to rapid pore pressure build-up when subjected to high intensity cyclic loads that can occur during earthquakes. Based on the native, moderately to well-graded sediments underlying the area to be developed and the lack of adverse groundwater conditions (minor perched water rather than a static groundwater table), it is our opinion the liquefaction potential of this site is low, and no mitigations are necessary.

Landslide Hazard Area (Stormwater Services mapping layer)

Based upon our site reconnaissance, the topographic and geologic conditions present, and the lack of geomorphic evidence of past landslide activity, it is our opinion that the site conditions do not fulfill the codified definition/criteria of a landslide hazard area (KCC 21A.06.680). However, King County staff brought the Stormwater Services landslide hazard area mapping layer to Mr. Holub's attention. It appears that this mapping layer was designed to flag sensitive drainage basins and natural slopes with respect to stormwater drainage design, but we could not determine from the iMap layer source information what data or interpretation this mapping was based on. We have attached images of the landslide hazard area related iMap layers, the typical layer from the "Environmentally Critical Areas" map tree, which does not indicate the presence of landslide hazard areas, and the "Stormwater Services" map tree mapping layer that shows landslide hazard areas. South Fork Geosciences has reached out to King County staff for clarification with respect to this mapping layer discrepancy, but we have not received a response at the time this letter was prepared.

We presume that the code definition/criteria for a landslide hazard area would dictate the development standards for the property, and the property clearly does not constitute a landslide hazard area per KCC 21A.06.680. Upon clarification of the implications of this "Stormwater Services" mapping layer by King County staff, South Fork Geosciences will provide additional assessment or supplemental information, as required.



Preliminary Soil Design Information

Full architectural and civil engineering plans were not available for review at the time this report was prepared. The design recommendations in this report should be considered preliminary, and upon completion of additional site work, South Fork Geosciences will provide additional information with respect to soils design elements. We anticipate working with the architect and civil engineer to ensure that our recommendations will be properly incorporated into the design of the structures and site work.

Feasibility of General Site Development

Based on our site reconnaissance and geologic research, the subject property is suitable for the proposed development, provided there are not additional requirements from the mapped landslide hazard areas that are not based on the codified landslide hazard area definition. As evidenced by our observations of the soil and nearby homes, structures may be designed to bear on conventional spread footing foundations on the native soils or structural fill placed upon native soils. South Fork Geosciences will provide soil design values and additional design recommendations upon completion of subsurface exploration within or near future building pads.

Stormwater Infiltration Feasibility

Based on the surface exposures of relatively fine-grained recessional glaciolacustrine deposits, and the presence of wetlands and surface water on portions of the property, it is our opinion that stormwater infiltration is not feasible for the proposed development. However, due to the gently sloping site conditions, the weathered soil horizon, and the native vegetation, the site conditions are well suited for stormwater dispersion.

Conceptual Drainage Plan Review

We have reviewed the referenced drainage plan (Encompass Engineering, provided January 12, 2021) and agree that full dispersion of stormwater is the best design approach for the proposed development. It is our opinion that the placement of the dispersion flow paths in native vegetated areas is consistent with the natural site drainage patterns. Due to the soil and vegetation conditions present, it is our opinion that stormwater dispersion flow paths on slopes up to 20 percent are allowable.



Closure

We have enjoyed working with you on this project and are confident that the information provided in this letter will aid in the design of your project. If there are any questions about this letter, please feel free to contact us.

Sincerely,



Andrew L. Glandon

Andrew L. Glandon, LEG
Engineering Geologist / Owner
South Fork Geosciences, PLLC

Attachments: Typical Mapped Geologic Hazard Layers
Surface Water Design Manual Mapped Landslide Hazard Layers

References:

King County Department of Assessments,
<https://blue.kingcounty.com/Assessor/eRealProperty/Detail.aspx?ParcelNbr=3125079010>

"Grading and Drainage Plan, Holub Residence, Project#20637", Encompass Engineering and Surveying, provided via e-mail on January 12, 2021

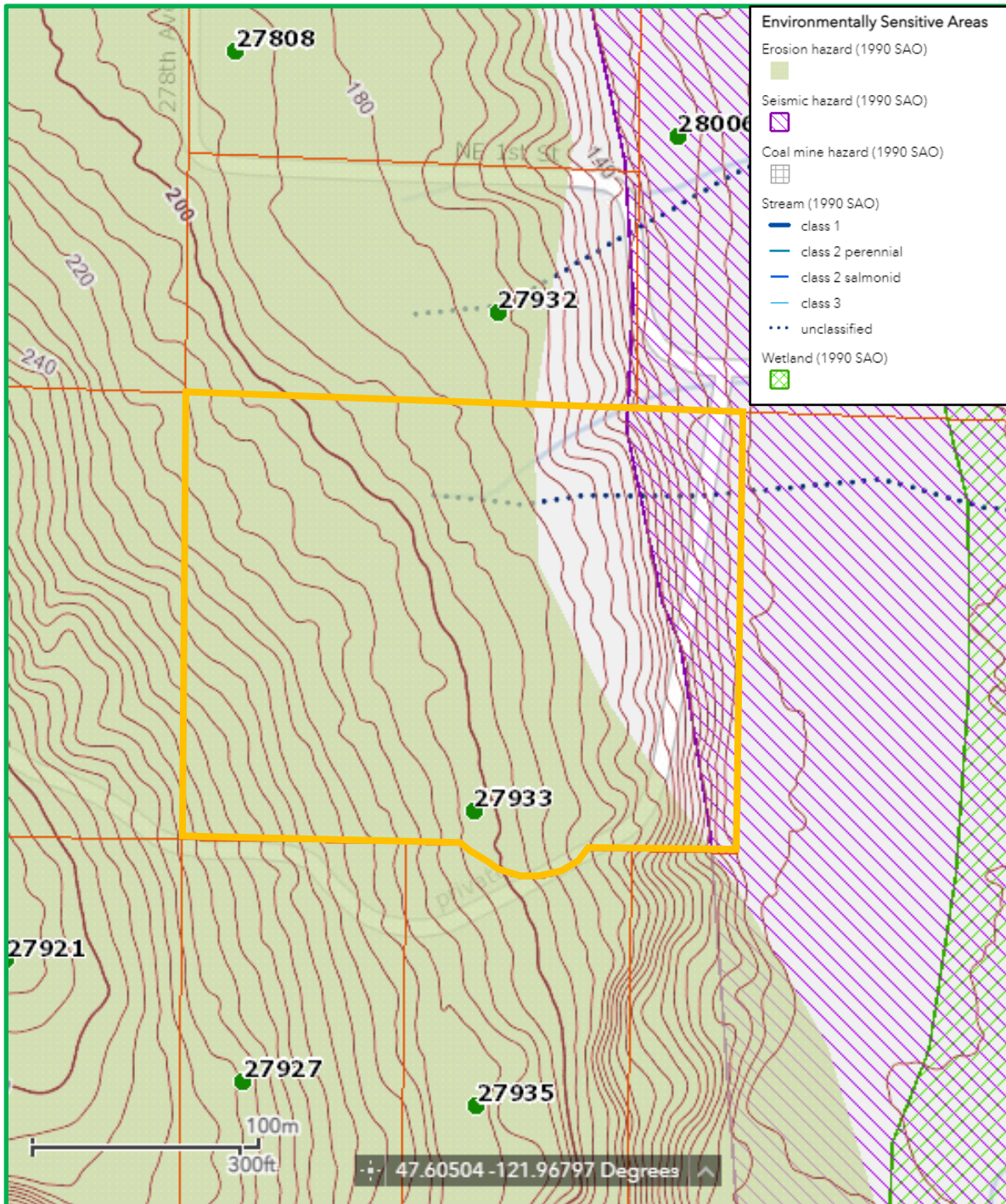
"Geologic Map of the Fall City 7.5-minute Quadrangle, King County, Washington" by Joe D. Dragovich, Megan L. Anderson, Timothy J. Walsh, Brendon L. Johnson, and Tamara L. Adams, WA Division of Geology and Earth Resources, Geologic Map GM-67, November 2007

Washington State Geologic Information Portal, <https://geologyportal.dnr.wa.gov/>

King County Code, http://www.kingcounty.gov/council/legislation/kc_code.aspx

King County Interactive Mapping Tool (iMap), <https://gismaps.kingcounty.gov/iMap/>

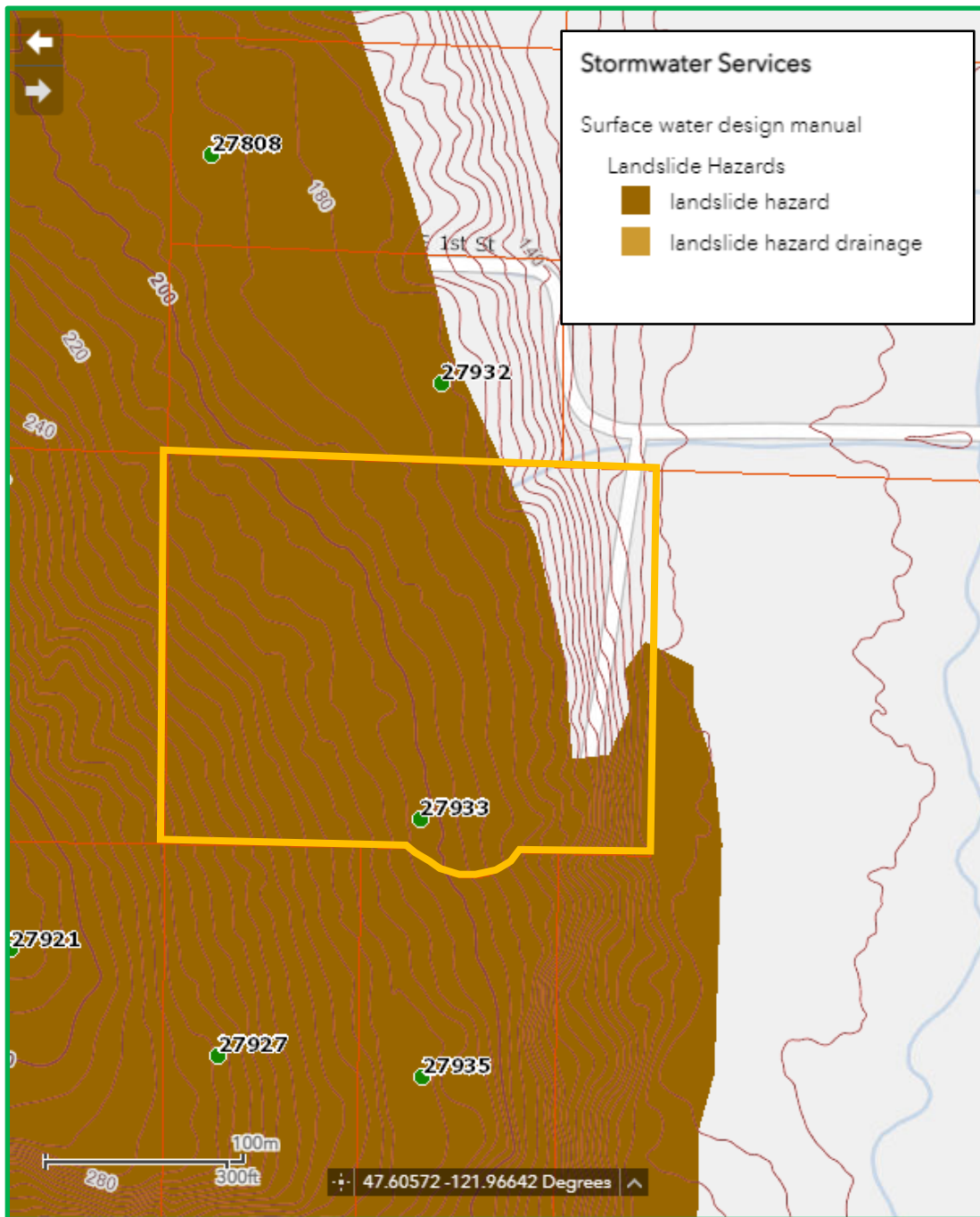




Source: King County iMap

Typical Mapped Geologic Hazard Layers





Source: King County iMap

Surface Water Design Manual Mapped Landslide Hazard Layers

