

**Revised Targeted Critical Areas
Geologic Hazard Evaluation**

Energize Eastside Project
Newcastle, Washington

for
Puget Sound Energy

July 24, 2017



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File No. 0186-871-06

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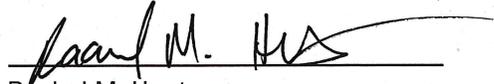
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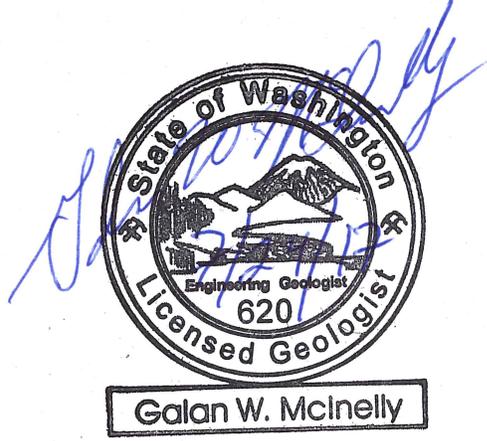
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INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to present this revised report with the results for targeted critical areas evaluation of specific geologic hazards identified by Puget Sound Energy (PSE) for the Energize Eastside Project. Our services have been provided in general accordance with the proposal between GeoEngineers and PSE dated June 21, 2017. These services were authorized by Kelly Purnell with PSE on June 15, 2017, and formal authorization was received on June 26, 2017.

The project area is located along existing PSE rights-of-way and includes areas within the City of Newcastle, Washington. We previously provided a geologic hazard evaluation for various routes under consideration, including the route evaluated within this document, in a separate report submitted to PSE on December 19, 2014. Since no grade changes or buildings are proposed as part of this project, the geologic hazards evaluation included in this report focuses on a desktop review and a site-specific evaluation for steep slope, erosion and landslide hazard areas, as assigned by PSE, relative to proposed tree-removal activities required for construction access and pole replacement (herein referenced as pole replacement activities), as well as vegetation management in the wire zone. Additionally, this report contains information summarized from the previous reports regarding pole stability in geologic hazard areas. PSE has provided specific locations for evaluation and also provided a proposed tree removal map developed by others.

LOCAL REGULATIONS

GeoEngineers assessed local regulations in the Newcastle Municipal Code, Critical Areas, Chapter 18.24 for geologic hazard areas.

General Geologic Hazard Area and Buffers

The City of Newcastle criteria for defining geologic hazards and geologic hazard buffers is described below:

- *Erosion Hazard Areas: The process by which soil particles are mobilized and transported by natural agents such as wind, rain splash, frost action, or surface water flow (Newcastle Municipal Code 18.06.213).*

According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.210, there are no buffer requirements for erosion; however, the code states that clearing vegetation in an erosion hazard area shall be allowed only from May 1 to September 30.

- *Landslide Hazards: Episodic downslope movement of a mass including, but not limited to, soil, rock, or snow. This can include an area with a combination of slopes steeper than 15 percent, impermeable soils, such as silt and clay, frequently interbedded with granular soils, such as sand and gravel, and springs or groundwater seepage; any area which has shown movement from 9,700 BC, or which is underlain by mass wastage debris from that epoch, any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action; any area which shows evidence of or is at risk from snow avalanches; any area located on an alluvial fan, or in or below a ravine or canyon presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments; or areas of historic failures, such as areas designated as earthflows, mudflow, or landslides on maps published by the U.S. Geological*

Survey, Washington State Department of Natural Resources, and/or other research meeting the best available science criteria in WAC 365-195-915 (Newcastle Municipal Code 18.06-350).

According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.270, the established critical area minimum buffer for landslide hazards is 50 feet from the top of the slope.

- *Steep Slopes: Those areas on slopes 40 percent or steeper within a vertical elevation change of at least 10 feet. A slope is delineated by establishing its toe and top and is measured by averaging the inclination over 10 feet of vertical relief. For this definition, the toe of the slope is a distinct topographic break in slope which separates slopes inclined at less than 40 percent from slopes 40 percent or steeper. 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 a horizontal distance of 25 feet and the top of a slope is a distinct, topographic break in slope which separates slopes inclines at less than 40 percent from slopes 40 percent or steeper. Where no break exists, the top of a steep slope is the uppermost limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet.*

According to the Newcastle Municipal Code, Critical Areas, Chapter 18.24.300, the established critical area minimum buffer for steep slope hazards is 50 feet from the top of the slope.

EXISTING CONDITIONS

GeoEngineers used King County iMap and a previous report, titled Geologic Hazards Evaluation and Preliminary Geotechnical Engineering Services report, submitted to PSE in December 2014 (GeoEngineers 2014), to assess existing conditions in the project area within the City of Newcastle. Existing geology in this area mainly consists of glacial drift, recessional outwash, glacially consolidated till and advance outwash deposits, with the exception of alluvium and volcanic deposits or rocks. Based on a review of the previous report and existing documentation, soil types in the project area predominantly include silty gravel and silty sand, with the exception of fine sand and silt.

There is only one landslide hazard and steep slope area within the project limits that will experience disturbance as a result of the proposed project activities. This area of steep slopes is within the May Creek drainage south of SE 89th Place and north of SE 95th Way, where slopes greater than 40 percent and with a 10-foot vertical elevation rise are present locally. The May Creek drainage area also includes localized mapped landslide and erosion hazards. No tree removal is planned on any mapped steep slope area, but limited tree removal is planned within steep slope buffers and mapped landslide hazard areas, as well as the overlaying erosion hazard area.

Erosion hazard areas in the project area are mapped within the right-of-way just west of Lake Boren, south to SE 95th Way. The majority of these erosion hazard areas are within residential developed areas; best management practices (BMPs) and restoration recommendations are provided in this report. This report will address erosion hazard areas within the May Creek area using the same BMPs recommended for the steep slope and landslide hazard areas.

A field investigation was performed on June 28, 2017 to evaluate the landslide, steep slope and erosion hazard areas along the slopes of May Creek within the project area. We observed no active slope movement or instability on the southern, north-facing slope of the May Creek drainage area, which includes a regularly mowed pipeline right-of-way with no tree cover. The terrain on the south bank of

May Creek was uneven with hydrophilic plants; however, no active slope movement or instability was observed. It appears that the pipeline company had installed rockeries and silt fences on the slope for mitigation of slope stability within the pipeline right-of-way; these features are still performing as intended.

IMPACT ASSESSMENT

Tree Removal

There are two primary ways in which the tree removal activities (associated with pole replacement activities and vegetation management) may impact erosion or slope stability on steep slopes or landslide hazard areas. After tree removal, root decay causes both the numbers of roots and the tensile strength of the remaining individual roots to decrease with time (Burroughs and Thomas 1977). Studies show that the period of minimum root strength is typically from 3 to 5 years after harvest (Ziemer 1981a; 1981b), but can extend up to 10 to 20 years depending on the tree species. For example, minimum root strength in evergreens is typically 10 years after harvest, alders have a minimum root strength of 5 to 10 years after harvest, and maples typically maintain full root strength after harvest (because they regrow from the existing stump). The reductions in root strength result in a net decrease in the cohesive strength of the near-surface soil mass.

Tree removal also may modify surface and subsurface hydrology. Tree removal may increase soil moisture by reducing canopy interception and evapotranspiration. Ground-based yarding equipment can compact soil, which may alter hydrologic processes in certain soil types.

Elevated groundwater levels decrease the stability of slopes by reducing the shear strength of the soil and by adding additional weight. The probability of erosion and landsliding from increased groundwater levels depends on the magnitude of the increase and the existing stability of the slope. The magnitude of potential changes in groundwater levels from tree removal is highly variable and depends on several factors, including the tree size, silviculture, subsurface conditions and topography.

In general, tree removal will increase the impact of erosion and slope stability for steep slopes or landslide hazard areas. However, fewer impacts are expected in areas where tree removal is isolated to one or two trees and the erosion, steep slope or landslide hazard area is otherwise stable and well vegetated. Additionally, fewer impacts are expected at the toe of the slope, compared to tree removal within the body or at the top of the slope.

Access Construction

Temporary access routes will generally follow previously established access trails and routes and, in some cases, will cross existing developed landscape. Therefore, little cutting or filling will be required. Small amounts of quarry spalls might be necessary to stabilize portions of existing routes. Many of the existing routes are overgrown with vegetation and, thus, will need to be cleared of vegetation. Standard erosion control BMPs should be following during clearing and use of the temporary access routes. Following completion of construction activities, restoration BMPs, such as mulching and/or placing jute matting, should be implemented.

Pole Installation

Where new poles are located in steep slope or landslide hazard areas, a temporary working bench might be necessary to install the pole. These benches may vary from about 10 by 10 feet to 30 by 30 feet in dimension. The same considerations discussed above for access routes also apply to benches needed for pole installation. We recommend that clearing activities be restricted to that necessary to auger the hole for the pole.

Recommendations for the design and construction of poles are presented in our Geotechnical Engineering Services report dated June 8, 2016. In general, most of the site soils along the proposed route consist of recessional deposits or glacially consolidated deposits and, in some limited locations, bedrock. These soils should provide adequate support for the new poles, and it is our opinion that once the pole is installed, the pole will not adversely impact slope stability; the pole should actually provide additional resisting force against slope failure, provided the pole is embedded to a sufficient depth.

CONCEPTUAL IMPACT MITIGATION STRATEGY

Conclusions

The only mapped steep slopes in Newcastle area that will experience disturbance associated with the proposed project activities are located in the May Creek drainage. Proposed tree removal activities generally avoid slopes greater than 40 percent within the May Creek corridor but are proposed within the buffer areas. The project area is within an existing right-of-way that is maintained for vegetation by PSE and includes a narrower right-of-way managed by a private petroleum pipeline company. The right-of-way for the buried petroleum pipeline includes areas with no trees and grass that is mowed regularly for vegetation management. We observed no indication of slope movement in the pipeline right-of-way that is included within the PSE right-of-way. The proposed removal of about 60 selected trees in this area is less intrusive when compared with the management activities of the existing pipeline right-of-way and is not anticipated to impact the mapped geologic hazard areas within the May Creek drainage, provided that no tracked or rubber-tired equipment is used to remove the trees.

Conceptual Impact Mitigation Strategy

Vegetation Management and Tree Removal

For vegetation management and tree removal (associated with the pole replacement activities) in the City of Newcastle within the mapped geohazard areas outlined in the proposed PSE project segment, GeoEngineers suggests the following options for mitigating impacts after tree removal.

In general, to limit impacts on erosion and slope stability from vegetation management and tree removal within erosion, steep slope and landslide hazard areas, the sites should be accessed by foot to reduce equipment impacts. Hand cutting with chainsaws should be implemented to trim branches and remove trees. Stumps should remain in place, but can be cut to ground level. Branches, limbs, trunks and other tree debris should be chipped and scattered around the removal site within the right-of-way. Where chipping is not feasible, unchipped tree debris can be scattered.

In areas where houses are located within 25 to 50 feet of vegetation management and tree removal, all tree debris should be removed from the owner's property and communication with the property owner is

suggested to identify possible reseeding, replacement tree or shrub, or landscaping options. If agreeable to the property owner, it is possible that the tree trunk can be cut and left below ground surface to maintain root strength (up to 5 to 10 years, depending on tree type), and a replacement tree or shrub may be planted near the trimmed trunk.

Within the May Creek drainage area, where erosion, landslide and steep slope hazard areas are mapped, it is recommended that tree removal be done by hand cutting with chainsaws, stumps left in place and tree debris scattered. We recommend that trees are felled across the fall line and are left perpendicular to slope. All tree debris should be scattered upslope of the riparian buffer zone to reduce erosion along May Creek. Erosion controls, such as placement of stream wattles or jute mat, should be used to reduce erosion of material from the slope into May Creek.

Reestablish Access Routes

Where vegetation clearing is required to reestablish the access on existing trails and access routes, BMPs should be implemented; these BMPs can include, but are not limited to: outsloping road surfaces, crowning road surfaces (where appropriate, such as at ridge tops and where roads climb gently inclined surfaces) and installing water bars or rolling dips at regularly spaced intervals to avoid concentrating surface water flow along the road surface. The spacing depends on the grade of the route, the soil type present, proximity to streams and the intended use of the road (i.e., temporary or permanent).

Most, if not all, access routes will be temporary and will be abandoned following construction of the transmission line. No temporary access roads will cross any drainages situated in geologic hazard areas.

It is the contractor's responsibility to complete construction work safely and in accordance with applicable local, state and federal laws. After access use is complete, where it is deemed necessary, limited regrading of the access route is recommended to avoid concentrating surface runoff along tracks, ruts or other potential flowpaths. Following completion of construction activities, the construction access routes will be graded to a stable free-draining configuration, treated with appropriate erosion control measures, such as mulching and/or placing jute matting and installation of water bars as needed to control runoff, and seeded. If jute mat is determined a necessary BMP, the jute mat should be anchored at the upslope and downslope ends and secured with staples per the manufacturer's recommendations.

Pole Installation

Where a bench is required to install a pole on a steep slope or landslide hazard area, the recommendations presented above for temporary access roads also apply for pole installation. Appropriate erosion control BMPs should be implemented during construction, and the disturbed area should be restored after pole installation by seeding or revegetating and covering the disturbed area with appropriate BMPs. Soil removed from the new pole excavations should be scattered into vegetation away from any landscaped areas. Any areas of exposed soil must be seeded and mulched (or covered with hog fuel) to prevent transport of sediment down the steep slopes or into the seepage area during rain events. If the work area is wet or has standing water, driving mats should be used under all equipment and all soils should be removed from the site for off-site disposal.

For poles located in geologic hazard areas, where feasible, old poles should be cut off approximately 1 to 2 feet below the ground surface and the remaining portion of each pole left in place. If poles are installed on slopes steeper than 2H:1V (horizontal to vertical), they should be embedded at least 3 feet deeper than the typical design embedment.

CODE COMPLIANCE

18.24.210 Erosion Hazard Areas – Development Standards

Development proposals and other alterations on sites containing erosion hazard areas shall be allowed, pursuant to applicable permits or approvals, only if they or any other alteration complies with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:

- A. Clearing in an erosion hazard area shall be allowed only from May 1 to September 30, except that timber harvest may be allowed pursuant to an approved forest practice permit issued by the Washington Department of Natural Resources.

Response to Code Requirement: Site activities include vegetation management and tree removal (associated with the pole replacement activities), which will be completed between May 1 and September 30.

- B. All subdivisions, short subdivisions, binding site plans, site plan review and planned unit developments on sites with erosion hazard areas shall retain existing vegetation in all erosion hazard areas until a building permit is approved for development on the lots, except that:
- Vegetation may be removed as necessary for construction of related infrastructure;
 - Noxious weeds may be removed; and
 - Timber may be harvested as allowed in subsection (A) of this section. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5; Ord. 2005-311 § 1; Ord. 2001-247 § 6; Ord. 2000-224 § 1).

Response to Code Requirement: No subdivision or unit developments on sites are proposed relative to the proposed vegetation management and tree removal activities (associated with the pole replacement activities) within mapped geologic hazard areas and buffers. Trees removed are not proposed for timber harvest and typically will be left on site as described above unless agreed otherwise with individual property owners. Per WAC 222 and RCW 76.09, a Forest Practice Application to Washington Department of Natural Resources for limited tree removal will not be required.

18.24.215 Erosion Hazard Areas – Specific Mitigation Requirements

In addition to general mitigation requirements contained in NMC 18.24.170, the following shall apply to mitigation of adverse impacts associated with erosion hazard areas:

- A. For any development proposal on a site containing an erosion hazard area, an erosion and sediment control plan shall be required and included as part of the mitigation plan. The erosion and sediment control plan shall be prepared in compliance with requirements set forth in the erosion and sediment control standards and the Surface Water Design Manual.

Response to Code Requirement: The proposed development includes vegetation management and tree removal (associated with pole replacement activities) that will be followed by mitigation measures to reduce potential impacts to geologic hazards that include erosion, landslide and steep slope hazards. Mitigation measures include a variety of BMPs to reduce potential impacts to geologic hazards in the vicinity of neighboring properties. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential

impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific Temporary Erosion and Sediment Control (TESC) Plan and Construction Stormwater Pollution Prevention Plan (CSWPPP).

- B. Damage to or removal of vegetation on lots in a subdivision, short subdivision or binding site plan during construction of related infrastructure shall be mitigated by stabilizing the lots in compliance with the provisions of the erosion and sediment control standards.

Response to Code Requirement: No subdivisions, short subdivisions, or binding site plan properties are located within the May Creek drainage (primarily open space associated with the surrounding riparian area), which is the only location in the existing utility corridor where tree removal activities associated with right-of-way vegetation management will result in disturbances to steep slope and landslide hazard areas. No poles will be replaced, nor will any access routes be re-established, in the designated steep slope and landslide hazard areas of the May Creek drainage.

Erosion hazard areas are mapped north of the May Creek drainage area in the existing utility corridor, crossing through multiple subdivisions. Right-of-way vegetation management and pole replacement activities throughout the mapped erosion hazard area will require disturbance of the residential lots located in these subdivisions. During and after construction, the disturbed area will be stabilized using the BMPs that reduce potential impacts to erosion and other geologic hazards. BMPs include, but are not limited to: plant replacement, scattering trimmed or removing tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. The requirements of a Sediment and Erosion Control Plan will be addressed in the project-specific TESC Plan and CSWPPP.

- C. If a city determines that erosion from a development proposal site poses a significant risk of damage to downstream receiving waters based on the size of the project, the proximity to the receiving waters or the sensitivity of the receiving waters, the applicant shall monitor the surface water discharge from the site and submit monitoring reports as set forth in an approved mitigation plan. If the project does not meet appropriate water quality standards established by law or administrative rules, the city may suspend further development work on the site until such standards are met. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5, Formerly 18.24.374).

Response to Code Requirement: The proposed vegetation management and tree removal activities (associated with the pole replacement activities) will use mitigation measures to include BMPs to reduce potential of damage to downstream receiving waters. Mitigation measures include, but are not limited to: plant replacement, scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

18.24.270 Landslide Hazard Areas – Development Standards and Permitted Alterations

- A. Development proposals and other alterations on sites containing landslide hazard areas or buffers shall comply with all applicable requirements set forth in this chapter, including, but not limited to, mitigation requirements and the following standards:
 - 1. A buffer shall be established from all edges of the landslide hazard area. The size of the buffer shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from landslides caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet.

2. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a landslide hazard area or buffer shall be prohibited.
3. All alterations shall be undertaken in a manner to minimize disturbance to the landslide hazard area, slope and vegetation unless necessary for slope stabilization.

Response to Code Requirement: PSE's existing public utility corridor, which is routinely maintained, crosses the wooded May Creek drainage. This drainage is mapped as a landslide hazard. The proposed removal of about 40 to 50 selected trees (and retention of at least 30 trees) in the May Creek drainage for vegetation management is consistent with the management activities of the existing power line right-of-way and is not anticipated to impact the mapped landslide hazard areas within this drainage area, provided that removal of vegetation and trees is completed by hand and/or using limited access machinery to reduce potential impacts to landslide hazard areas. Three trees (Douglas firs, ranging in diameter-breast-height from 4.2 to 5.3 inches) will be removed and pole replacement activities will occur in the landslide hazard buffer zone. Possible mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas, including plant replacement (where located near existing residential properties), scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

- B. Alterations to landslide hazard areas and buffers may be allowed, pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:
 1. Surface water conveyances if the department finds that:
 - a. Discharging the surface water at the base of the landslide hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the landslide hazard area; and
 - b. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.
 2. Public and private utilities and utility corridors if the applicant shows that:
 - a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and
 - b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.
 3. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:
 - a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and
 - b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.
 4. Vegetation removal activities, as follows:
 - a. The removal of noxious weeds
 - b. The removal of vegetation, only as necessary for surveying purposes
 - c. The removal of hazard trees, as determined by the department

5. Stabilization of sites where erosion or landsliding threatens public or private structures, utilities, roadways, driveways or publicly maintained trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.
6. Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.
7. The application of herbicides or other hazardous substances, if necessary, as approved by the department.
8. Any alterations in a landslide hazard area located in an area that does not meet the criteria as a steep slope as defined under NMC 18.06.628 only if:
 - a. The development proposal will not decrease slope stability on contiguous properties; and
 - b. Mitigation based on the best available engineering and geological practices is implemented which either eliminates or minimizes the risk of property damage, death or injury resulting from landsliding. (Ord. 2016-538 § 2 (Exh. 3); Ord. 2005-325 § 5; Ord. 2005-311 § 1; Ord. 2000-224 § 1).

Response to Code Requirement: The proposed development includes limited vegetation management and tree removal for the purpose of existing utility right-of-way within mapped landslide hazard areas. Tree removal in the mapped landslide hazard area will be associated with vegetation management in the wire zone and limited to selective tree removal necessary to provide system reliability and meet the federal requirements. Tree removal will be followed by mitigation measures to reduce potential impacts to landslide hazard areas. Mitigation measures include a variety of BMPs to reduce potential impacts to landslide hazard areas and slope stability on contiguous properties. BMPs include minimum removal necessary to maintain utility's function, tree/vegetation replacement, scattering trimmed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate. In our opinion, the proposed vegetation management will not decrease slope stability on contiguous properties; and mitigation based on the best available engineering and geological practices will be implemented to either eliminate or minimize the risk of property damage, death or injury resulting from landsliding.

18.24.300 Steep slope hazard areas – Development standards and permitted alterations.

- A. Development proposals and other alterations on sites containing steep slope hazard areas or buffers shall comply with all applicable requirements set forth in this chapter including, but not limited to, mitigation requirements and the following standards:
 1. A buffer shall be established from all edges of the steep slope hazard area. The size of the buffer or setback shall be determined by the department to eliminate or minimize the risk of property damage, death or injury resulting from slope instability, landsliding or erosion caused in whole or part by the development, based upon the department's review of and concurrence with a critical area report prepared by a geotechnical engineer or geologist. In no instance shall the minimum buffer be less than 10 feet. If no critical area report is submitted to the department, the minimum buffer shall be 50 feet;
 2. Buffers for steep slope hazard areas shall not be subject to provisions for buffer averaging; and

3. Unless otherwise provided or as a necessary part of an approved alteration, removal of any vegetation from a steep slope hazard area or buffer shall be prohibited.

Response to Code Requirement: For this review, steep slopes were assigned a 50-foot-wide buffer. No pole replacement activities will occur in the steep slopes mapped within the existing utility corridor. The proposed project includes limited vegetation management and tree removal (associated with the pole replacement activities) within steep slope buffer areas (which is an allowed alteration for public utility corridors with the approval of permits). Even with the proposed vegetation management, the existing utility corridor still provides a substantial tree cover when compared to the mowed pipeline right-of-way that, based on our observations, has not impacted steep slope hazards or buffers. Mitigation measures will be used to reduce potential impacts to steep slope hazard area buffers.

- B. Alterations to steep slope hazard areas and buffers may be allowed pursuant to applicable permits or approvals and subject to mitigation requirements set forth in this chapter, only as follows:
 1. Surface water conveyances if the department finds that:
 - a. The conveyance is installed in a manner to minimize disturbance to the slope and vegetation;
 - b. Discharging the surface water at the base of the steep slope hazard area has less adverse impact upon the critical area than if the surface water were dispersed at the top of the slope; and
 - c. Adverse impacts to fish are minimized, to the maximum extent possible, by maintaining the prealteration groundwater volume to support fish habitat in receiving water bodies.
 2. Public and private trails as long as no trails are constructed of impervious surfaces which will contribute to surface water runoff, unless such construction is necessary for soil stabilization or soil erosion prevention or unless the trail system is specifically designed and intended to be accessible to handicapped persons. Trail construction shall be in compliance with adopted trail standards.
 3. Public and private utilities and utility corridors if the applicant shows that:
 - a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and
 - b. Vegetation removal is limited to the minimum necessary to locate the utility or construct the corridor.
 4. Normal and routine maintenance of existing public and private utility facilities and utility corridors if the applicant shows that:
 - a. The alterations involved will not subject the critical area to an increased risk of landslide or erosion; and
 - b. Vegetation removal for the purpose of utility and corridor maintenance is the minimum necessary to maintain the utility's function.
 5. Vegetation removal activities, as follows:
 - a. The removal of noxious weeds;
 - b. The removal of vegetation, only as necessary for surveying purposes; and
 - c. The removal of hazard trees, as determined by the city.

6. Stabilization of sites where erosion or landsliding threatens preexisting public or private structures, utilities, roadways, driveways or trails or where erosion or landsliding threatens any lake, stream, wetland or shoreline. Stabilization work shall be performed in a manner which causes the least possible disturbance to the slope and its vegetative cover.
7. Point discharges from surface water facilities onto or upstream from steep slope hazard areas that are also erosion hazard areas shall be prohibited except as follows:
 - a. Conveyed via continuous storm pipe downslope to a point where there are no erosion hazard areas downstream from the discharge;
 - b. Discharged at flow durations matching predeveloped conditions, with adequate energy dissipation, into existing channels that previously conveyed stormwater runoff in the predeveloped state; and
 - c. Dispersed discharge upslope of the steep slope onto a low-gradient undisturbed buffer demonstrated to be adequate to infiltrate all surface and stormwater runoff.
8. Exploratory drilling and testing, involving only necessary and limited clearing and grading, for the purpose of preparing critical area reports.
9. The application of herbicides or other hazardous substances, if necessary, as approved by the department.

Response to Code Requirement: The proposed development includes vegetation management and tree removal (associated with the pole replacement activities) within an existing utility right-of-way. No alterations to steep slopes are proposed. In our opinion, the proposed alterations to steep slope hazard buffers will not subject the critical area to an increased risk of landslide or erosion, and vegetation removal is limited to the minimum necessary to maintain the utility corridor. Tree removal will be followed by mitigation measures to reduce potential impacts to slope stability in steep slope areas and steep slope buffer zones. Mitigation measures include a variety of BMPs to reduce potential impacts steep slope areas and slope stability on contiguous properties. BMPs include, but are not limited to: minimum removal necessary to maintain utility corridor's function, tree/vegetation replacement, scattering trimmed or removed tree debris, and chipping wood to reduce potential impacts to work areas as appropriate.

LIMITATIONS

We have prepared this report for the exclusive use of PSE and their authorized agents for the Energize Eastside project located in Newcastle, Washington.

The purpose of our services was to review slope stability and landslide hazard impacts in relation to vegetation management and tree removal and temporary access routes (associated with the proposed pole replacement activities) in steep slope and landslide critical hazard areas along the transmission line corridor within the City of Newcastle. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

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