MEMORANDUM

TO: Thurston County Planning Commission
FROM: Jeremy Davis, Senior Planner
DATE: June 1, 2011
SUBJECT: Critical Areas Ordinance Update – Volcanic, Seismic, and Mine Hazards

Geologic hazards are divided into several categories, some related and some not related. The categories generally include:

- Landslide Hazard Areas
- Marine Bluff Hazard Areas
- Erosion Hazard Areas
- Volcanic Hazard Areas
- Seismic Hazard Areas
- Mine Hazard Areas

The 2005 draft Critical Areas Ordinance included all six in a geologic hazards chapter. In review of the six hazard area categories, staff found that three of the hazard areas are unique and would have different requirements than others, and that the three areas are treated separately in the existing critical areas ordinance, Chapter 17.15 TCC. As a result, staff has proposed three new chapters which include:

- Chapter 24.16 Seismic Hazard Area
- Chapter 24.17 Volcanic Hazard Area
- Chapter 24.18 Mine Hazard Area

Chapter 24.16 Seismic Hazard Areas:
The existing critical areas regulations in Section 17.15.605 were written in 1994, are brief, and only place an interim designation for seismic hazard areas. Although it is assumed, there is no direct link or reference between the hazard area designation and the building code (Title 14) and the road standards (Title 13). Each of these include engineering standards to address seismic
hazards. The building code is the primary set of regulations governing development in seismic hazard areas.

In addition, new studies have been done to map liquifaction areas in Thurston County by the Washington State Department of Natural Resources. These are in the 2004 report “Liquefaction Susceptibility and Site Class Maps of Washington State, By County” (DNR Open File Report 2004-20), as amended. Please see the attached Liquefaction Hazard Map.

“Seismic hazard area” means the following:

A. Those areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, surface faulting, settlement or soil liquefaction, such as artificial fill areas, and areas underlain by glaciolacustrine deposits and/or glacial outwash; or

B. Those areas mapped as having a liquefaction susceptibility of high, moderate to high, or low to moderate on the Liquefaction Susceptibility Map of Thurston County, Washington, published by Washington Department of Natural Resource (September 2004).

“Liquefaction” means a phenomenon in which strong earthquake shaking causes a soil to rapidly lose its strength and behave like quicksand. Areas of liquefaction typically occur in areas with artificial fills and in areas of loose sandy soils that are saturated with water, such as low-lying coastal areas, lakeshores, and river valleys. Hazard areas in Thurston County are mapped as having a liquefaction susceptibility of high, moderate to high or moderate on the Liquefaction Susceptibility Map of Thurston County, Washington, published by the Washington Department of Natural Resources (September 2004). Due to their size, smaller unmapped hazard areas of liquefaction may also be present.

More information will be included in the best available science summary being prepared by staff, and in the September 2009 Natural Hazards Mitigation Plan for the Thurston Region, which is available here:

http://www.trpc.org/regionalplanning/publications/Pages/NaturalHazardsMitigationPlan.aspx

Chapter 24.17 Volcanic Hazard Areas:
The existing critical areas regulations in Section 17.15.605 were also written in 1994, and are in need of updating due to increase knowledge and science about volcanoes in general, Mt. Rainier, and the Tacoma Power dams on the Nisqually River. Currently, the volcanic hazard area is limited to the lands within the five hundred year flood plain of the Nisqually River upstream of the Alder Dam. Because of newer information, we know that the volcanic hazard most likely to affect Thurston County, and which we should plan for, is a Case 1 Lahar. According to the September 2009 Natural Hazards Mitigation Plan for the Thurston Region as of 2009, this type of event poses a low probability, high consequence hazard for those that live in the Nisqually Valley. The Case 1 Lahar hazard area extends down the entire length of the Nisqually River channel as shown in the attached maps. There were approximately 1,100 existing homes with an approximate population of 2,900 in the hazard area The estimated 2030 build out is 1,600 homes, with an approximate population of 3,900.
It is possible that the Alder Dam and La Grande Dam would fail with a Case 1 lahar. If a Case 1 lahar from Mt. Rainier is heading down the Nisqually River valley, it is a possibility that water would have to be released from the Alder Dam at such a rate that may cause flooding and damage to roadways. Water would likely be released to prevent a catastrophic failure of the dam. In any event, a lahar would likely damage transportation routes across the Nisqually River.

The Case 1 Lahar pathway roughly coincides with other critical areas such as frequently flooded areas, seismic hazards, channel migration zones and riparian habitat areas. It is important that critical facilities such as fire stations, shelters and hospitals not be located in the estimated path of a Case 1 Lahar. Also, it is important to limit higher density development in this area. If a critical facility or place of assembly must be located in the hazard area, special reasonable use criteria are needed to ensure evacuation routes are present and that there would be enough time for evacuation without a vehicle.

“Critical facilities” means those facilities which would be particularly vulnerable to natural disasters and which pose a high risk to the public if damaged, or which is necessary for emergency (e.g., earthquake, flood, etc.) operations or are listed as category III or IV occupancy in the International Building Code. Refer to Table 24.15-2 for a current list of “Critical Facilities for Thurston County.” This table is included with the attached draft Chapter 24.17.

“Volcanic hazard area” means those areas subject to pyroclastic flows, lava flows and inundation by debris flows, mud flows or related flooding resulting from geologic or volcanic events of Mount Rainier, as mapped by United States Geological Survey Open File Report 98-428. The boundaries on these maps are approximately located, and areas outside of the boundaries should not be regarded as hazard-free.

More information will be included in the best available science summary being prepared by staff, and in the September 2009 Natural Hazards Mitigation Plan for the Thurston Region, which is available here:

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Chapter 24.18 Mine Hazard Areas
Coal mine hazards are primarily located in the southern portion of the county with the majority on the Transalta property south of Bucoda. There are a few known locations outside of the Transalta property on Weyerhauser and Port Blakely property to the east and west. The mine hazards for Thurston County are generally related to coal mines in Lewis County. A general map from the Washington State Department of Natural Resources Coal Mine Map Collection is attached. While this is a low probability hazard, Thurston County still needs to include regulations in the Critical Areas Ordinance.

Mine hazard areas include those areas directly underlain by, adjacent to, or directly affected by mine workings such as adits (mine entrances), gangways (tunnels), drafts or air shafts. Shallow hazards may include entry portals, shaft collars, ventilation shafts, prospects, and mine waste dumps. Any of these can cause sink holes, ground subsidence, ground tilting, and strains on structures.
The existing critical areas regulations in Section 17.15.605 were also written in 1994, and are in need of updating due to updated information and mapping. The current mine hazard area delineation dates to the Centraulia-Chehalis District Washington, U.S. Geological Survey Bulletin 1053 (1958).

Lewis County and other jurisdictions use the Washington State Department of Natural Resources, Division of Geology and Earth Resources, Open File Report 94-7 “The Washington State Coal Mine Map Collection: A Catalog, Index, and User’s Guide,” Open File Report 84-6 “Inventory of Abandoned Coal Mines in the State of Washington,” and specific maps and surveys of mine workings on file with the Department of Natural Resources. Mapping began around 1900. Mines existing prior to this may not be mapped unless they were active after 1900 and they reported their activities. There are unmapped and undocumented mines located in the County that may pose a hazard.

The proposed code is borrowed and adapted from the 2008 Lewis County Code for mine hazards. The Lewis County Code in turn is borrowed and adapted from the City of Bellevue Code for mine hazards. The Bellevue code appears to be well researched and is much more extensive. They have much more of an issue since their hazard areas are also in an urban environment.

The Washington State Coal Mine Map Collection is available at the Washington Department of Natural Resources interactive map portal at:

http://www.dnr.wa.gov/ResearchScience/Topics/GeosciencesData/Pages/geology_portal.aspx
Seismic hazard area

Chapter 24.16

Seismic Hazard Area

Sections:
24.16.010 Seismic Hazard Area – General Purposes.
24.16.020 Seismic Hazard Area - Applicability.
24.16.030 Seismic Hazard Area – Development Standards and review.

24.16.010 Seismic Hazard Area – General Purposes.
The purposes of this section are to:

A. Protect public health and safety;

B. Establish minimum requirements to address seismic hazards; and

C. Identify seismic hazard areas in Thurston County.

24.16.020 Seismic Hazard Area - Applicability.
This chapter applies to all properties in Thurston County. Seismic activity can be unpredictable and may exceed the scope of this title and other requirements of the Thurston County Code. Such events may cause serious personal or bodily injury, including death, and damage to or loss of property. Too many uncertainties exist about the source, size and mobility of future events. This chapter is not a guarantee against damage or injury due to seismic activity.

24.16.030 Seismic Hazard Area – Development Standards and review.
A. Buildings shall be subject to the design requirements and review process in Title 14 TCC, Buildings and Construction; and

B. Subdivision of property in an area that has a liquefaction susceptibility rating of high may occur provided that a geological report is provided that identifies sufficient buildable area outside of the area that has a liquefaction susceptibility rating of high. The boundary of the area that has a liquefaction susceptibility rating of high shall be clearly shown on the map; and
C. New Roads, bridges, utilities, and trails shall only be allowed in an area that has a liquefaction susceptibility rating of high when there is no feasible alternative location. Geotechnical analysis and design shall be provided to ensure the roadway, bridge and utility structures and facilities will not be susceptible to damage from seismic-induced ground deformation. These shall be designed consistent with other requirements in the Thurston County Code, including Title 13 TCC, Roads and Bridges, Title 14 TCC, Buildings and Construction, and other applicable regulations.

Here are the definitions from Chapter 24.03 Definitions that apply to this chapter:

“Liquefaction” means a phenomenon in which strong earthquake shaking causes a soil to rapidly lose its strength and behave like quicksand. Areas of liquefaction typically occur in areas with artificial fills and in areas of loose sandy soils that are saturated with water, such as low-lying coastal areas, lakeshores, and river valleys. Hazard areas in Thurston County are mapped as having a liquefaction susceptibility of high, moderate to high or moderate on the Liquefaction Susceptibility Map of Thurston County, Washington, published by the Washington Department of Natural Resources (September 2004). Due to their size, smaller unmapped hazard areas of liquefaction may also be present.

“Seismic hazard areas” means the following:

A. Those areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, surface faulting, settlement or soil liquefaction, such as artificial fill areas, and areas underlain by glaciolacustrine deposits and/or glacial outwash; or

B. Those areas mapped as having a liquefaction susceptibility of high, moderate to high, or low to moderate on the Liquefaction Susceptibility Map of Thurston County, Washington, published by Washington Department of Natural Resource (September 2004).
Volcanic hazard area

Chapter 24.17

Volcanic Hazard Area

Sections:
24.17.010 Volcanic Hazard Area – General Purposes.
24.17.040 Volcanic Hazard Area – Additional Reasonable Use Exception Criteria.

24.17.010 Volcanic Hazard Area – General Purposes.
The purposes of this section are to:

A. Protect public health and safety given current information on volcanic hazards;
B. Minimize damage to property due to volcanic events; and
C. Identify approximate locations of volcanic hazard areas.

This chapter applies to all properties in Thurston County meeting the definition for volcanic hazard area in Chapter 24.03 TCC. However, because volcanic activity can be unpredictable and may exceed the scope of this title, other areas of the county may be affected. Such low-probability, high-consequence events and other events documented by the United States Geological Survey, the State of Washington, or Thurston County may cause serious personal or bodily injury, including death, and damage to or loss of property. Too many uncertainties exist about the source, size and mobility of future events to locate hazard-free zones with absolute confidence. This chapter is not a guarantee against damage or injury due to volcanic activity.

A. No new critical facilities as defined in Chapter 24.03 TCC and listed in Table 24.15-2 TCC shall be constructed or located in Case 1 lahar volcanic hazard areas; and
B. Existing critical facilities may be expanded so long as the existing evacuation plan is amended to demonstrate that any additional people can be evacuated in an amount of time less than the anticipated time that it takes a lahar to reach the facility. The time that it takes a lahar to reach a given point is calculated from the source of the event to the given point; and

C. An evacuation plan shall be provided for all lodging and public assembly uses with posting of the plan in all occupied rooms; and

D. For all new permitted uses and structures approved under this title, recordation on the title with the Thurston County Auditor that:

1. Acknowledges that the development is within a Case 1 lahar volcanic hazard area for Mount Rainier, and is subject to debris flows and other hazards that potentially endangers property and life; and

2. The owner and all future owners take complete responsibility for development and occupation of the residence or structure and hold Thurston County and its employees harmless for any damage suffered because of volcanic hazards; and

3. Acknowledges that evacuation is the sole responsibility of the owner or occupant and that information on potential evacuation routes and holding areas is available from local emergency management agencies.

24.17.040 Volcanic Hazard Area – Additional Reasonable Use Exception Criteria.
In addition to the decision criteria in Chapter 24.45 TCC for granting reasonable use exceptions, reasonable use exceptions for the critical facilities listed in Table 24.15-2 proposed to be located in volcanic hazard areas shall also comply with the following conditions:

A. The applicant shall show through submittal of travel time data the amount of time that is anticipated for a Case 1 lahar to reach the proposed project and evacuation route.

B. The applicant has demonstrated that through submittal of a volcanic hazard emergency evacuation plan that:

1. The proposed project is located near a safety zone (area completely located outside the limits of a Case 1 lahar) that is within walking distance in an amount of time less than the anticipated time that it takes a lahar and/or flood waters from the release of water from the Tacoma Power Structures (dams) to reach a given point, whichever is less. The time that it takes a lahar and/or flood waters to reach a given point is calculated from the source of the event to the given point. The time of walking distance will be calculated based upon the amount of time necessary for physically or mentally challenged individuals to get from the proposed project to the safety zone Any lahars off of Mt. Rainier may be mitigated or enhanced by the Tacoma Power Structures (dams); and
2. The evacuation route is at a slope and surface to be considered handicapped accessible; and

3. The evacuation route has been determined not to contain any other potential natural hazards, such as landslide or flood hazards, to cause a blockage or destruction of the evacuation route during an event (i.e. seismic event causes the evacuation route to become impassible because of a landslide or soil liquefaction, or a release of water from the Tacoma Power Structures upstream that are likely to flood evacuation routes); and

4. The evacuation route is not located adjacent to any highways or arterial road networks that may cause a life safety threat to evacuating pedestrians; and

5. The safety zone is an area with adequate ingress/egress following an event, and that individuals have the ability to exit without going out of a safety zone.

C. Proposed critical facilities shall have an adequate contingency plan that identifies where occupants and emergency response equipment and vehicles will be relocated in the event that a lahar damages the facility to an uninhabitable condition.

Here are the definitions from Chapter 24.03 Definitions that apply to this chapter which will not be included in the final version:

“Volcanic hazard areas” means those areas subject to pyroclastic flows, lava flows and inundation by debris flows, mud flows or related flooding resulting from geologic or volcanic events of Mount Rainier, as mapped by United States Geological Survey Open File Report 98-428. The boundaries on these maps are approximately located, and areas outside of the boundaries should not be regarded as hazard-free.

“Critical facilities” means those facilities which would be particularly vulnerable to natural disasters and which pose a high risk to the public if damaged, or which is necessary for emergency (e.g., earthquake, flood, etc.) operations or are listed as category III or IV occupancy in the International Building Code. Refer to Table 24.15-2 for a current list of “Critical Facilities for Thurston County.”

Here is Table 24.15-2 from the deliberative draft of the geo hazards section:

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<td></td>
<td>Water treatment facilities required to maintain water pressure for fire suppression</td>
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<td></td>
<td>Designated earthquake, hurricane or other</td>
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### III. Hazardous

| Buildings and other structures where more than 300 people congregate in one area. |
| Buildings and other structures with elementary school, secondary school, or day care facilities with an occupant load > 250 |
| Buildings and other structures with an occupant load greater > 500 for colleges or adult education facilities |
| Health care facilities with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities |
| Jails and detention facilities |
| All structures with occupancy load > 5,000 |
| Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included as an Essential Facility, above |
| Buildings and other structures not included as an Essential Facility, above, containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released |
Thurston County makes every effort to ensure that this map is a true and accurate representation of the work of County Government. However, the county and all related personnel make no warranty, express or implied, including, but not limited to implied warranties of merchantability, data fitness for a particular purpose, and non-infringement of proprietary rights. Under no circumstances, including, but not limited to negligence, shall Thurston County be liable for any direct, indirect, incidental, special or consequential damages that result from the use of, or the inability to use, Thurston County materials.
Chapter 24.18

Mine Hazard Area

Sections:
24.18.010 Mine Hazard Area – General purposes.
24.18.020 Mine Hazard Area – Applicability – Permitted uses.
24.18.030 Mine Hazard Area – Maps.
24.18.050 Mine Hazard Area – Standards for mine hazards studies.

24.18.010 Mine Hazard Area – General Purposes.
The purposes of this chapter are to:

A. Protect public health and safety given current information on mine hazards;

B. Minimize damage to property due to mine hazards; and

C. Identify approximate locations of mine hazard areas.

24.18.020 Mine Hazard Area – Applicability – Permitted uses.
A. Mine hazard areas in Thurston County are generally limited to coal mines in south central Thurston County.

B. This chapter applies to areas in Thurston County that may be designated as a mine hazard area as defined in Chapter 24.03 TCC, which include those areas within 100 horizontal feet of a mine opening at the surface or which are underlain at a depth of 300 feet or less by mine workings.

C. Permitted uses in mine hazard areas shall be the same as the underlying zoning district except that critical facilities listed in Table 24.15-2 shall not be permitted.
Mine workings are identified in the Washington State Department of Natural Resources, Division of Geology and Earth Resources, Open File Report 94-7 “The Washington State Coal Mine Map Collection: A Catalog, Index, and User’s Guide,” Open File Report 84-6 “Inventory of Abandoned Coal Mines in the State of Washington,” and specific maps and surveys of mine workings on file with the Department of Natural Resources. General areas of coal mines have been delineated on maps provided by the Washington State Department of Natural Resources. These maps relied on annual reports submitted by mining companies since about 1900. Mines abandoned prior to 1900, and some small and unregistered mines are not documented in filed reports. Maps note broad areas suspected of posing coal-mine hazards and may not show individual mines. Because the lack of a full historic record for coal mines leaves uncertainties on the location of all coal mine hazards, Thurston County cannot guarantee that all coal mine hazard areas are noted on maps. This chapter is not a guarantee against damage or injury due to coal mine hazards.

A. Development on or near a mine hazard area requires the applicant to first demonstrate that no hazards to health or safety exist at the proposed site.

B. Development within mine hazard areas shall be accompanied by technical studies by qualified professionals that assess the potential risk from mine entries, shafts and ventilation facilities; investigate potential future trough subsidence or sinkhole development due to collapse of abandoned coal mines; and identify specific measures to mitigate the risk in accordance with the criteria below:

1. Mine entries and shafts shall be permanently sealed using controlled backfill and/or grouting, or an approved, engineered seal and shall include permanent diversion of surface drainage away from the shaft or mine entry; and

2. Existing sinkholes and shallow prospect excavations shall be backfilled to surface using controlled placement of suitable backfill and shall include permanent diversion of surface drainage away from existing sinkholes and prospect excavations; and

3. Potential sinkhole hazards shall be assessed by a qualified professional utilizing direct subsurface investigations that demonstrate coal mine workings either do not exist, or that the workings have fully collapsed so that there is no remaining potential for sinkhole development, or show that the hazards associated with any voids that are identified are fully mitigated by backfilling, grouting, or other approved means such that the potential for sinkhole development is eliminated; and

4. Any coal mine waste dump shall be demonstrated to be stable through analysis by a qualified professional. If the coal mine waste dump does not meet the stability criteria, it shall be regraded or otherwise mitigated to meet stability criteria. If
springs or seeps discharge from the coal mine waste dump, materials shall be removed or be covered with a minimum of two feet of clean soil and be revegetated with native vegetation. Development shall not be permitted within 100 feet of any coal mine waste dump that shows evidence of current or past combustion. Development may be permitted over coal mine waste material only if an investigation and analysis by a qualified professional identifies feasible construction criteria for foundation stability and performance; and

5. Mine gas hazards shall be mitigated by backfilling all mine entries, shafts and sinkholes and providing appropriate venting; and

6. Mine fire potential shall be assessed through analysis by a qualified professional. Development shall not be permitted within 100 feet of mine workings where investigations indicate the possible presence of combustion in the underlying seam or seams.

C. As a result of geotechnical investigations, the director may require special studies to ensure proposed buildings, utilities, and roads are constructed to adequate engineering specifications to address subsidence effects, strains, tilts and other issues associated with mine hazards areas.

24.18.050 Mine Hazard Area – Standards for mine hazard studies.
In addition to the geologic hazard study requirements in Chapter 24.35 TCC for special reports, the following are also required in mine hazard areas:

A. A mine hazard study shall contain all available documentary information about mine workings and the results of a surface reconnaissance that shall identify any public safety mine hazards, mine waste dumps, or evidence of mine subsidence or sinkholes and shall include:

1. Historical mining data, including available copies of original mine records for mine workings; and

2. A map showing property boundaries, mine hazard boundaries, and any potential hazards identified within 100 feet of the property.

B. Shallow hazards such as entry portals, shaft collars, ventilation shafts, prospects, and mine waste dumps may be investigated by test pits or trenching, providing the method enables an investigation to an adequate depth for the hazard being investigated.

C. Site-Specific Evaluation of Potential Trough Subsidence:

1. Review of available records of original mine workings that could potentially influence the site by trough subsidence shall include:

   a. Locations, depths and thicknesses of such seams and workings; and
b. Mine workings that could potentially influence the site shall be determined by projecting the downdip limit angle from the lowest limit of the documented workings to the ground surface. Mine workings are considered to potentially influence the property if the property lies within the line at which the limit angle intersects the ground surface.

2. Subsurface conditions may be evaluated by drilling. Drilling is the most acceptable method for providing information for reducing the remaining mine height value used in subsidence calculations to less than the height of the original workings. For these evaluations:

a. Drillholes shall be logged continuously from 100 feet above to 20 feet below mine working, including lithology at five-foot intervals, drill fluid circulation, penetration rate, and free fall of the drill string; and

b. Greater confidence will be placed in core drilling logs than rotary drilling logs; and

c. As a guidelines, a minimum of one drillhole penetrating each seam that could potentially cause trough subsidence at the site should be drilled for each 200-foot length of the adit; and

d. Surface geophysics, or other indirect means, may be used to assist in projecting information between and beyond drillholes, but shall not be accepted as the sole method for evaluating the condition of underground mine workings and calculating remaining mine height.

3. Calculation of trough subsidence magnitudes, tilt and strains shall be in accordance with the empirical function method of the British National Coal Board, as presented in their Subsidence Engineers Handbook, adjusted to reflect the effects of inclined seams and downdip limit angles encountered, and shall be based on a conservative evaluation of site conditions developed from the review of available records, site investigation, and subsurface exploration. Calculations shall consider the following:

a. Calculations shall calculate the subsidence factor, and the downdip limit angle with direct field evidence or a review of detailed mine records; and

b. Remaining mine height shall be presumed to be equal to the seam thickness for the subsidence calculations unless evidence from drilling justifies modification; and

c. The calculation of potential tilts and strains shall consider effects of individual panel widths and barrier pillar widths. If direct subsurface investigation indicates that the mine workings are fully collapsed, an
estimate of potential surface settlements due to consolidation of rubble and loose material shall be made for the cumulative effect of all seams that could induce trough subsidence at the site.

4. Site plans shall be prepared showing the proposed development and calculated magnitudes of potential subsidence, strains, and tilts at the property boundaries and at the location of any proposed structures. This also includes the following:
   a. A map showing contours of potential subsidence magnitudes, strains, and tilts throughout the property shall be submitted for use in design of roads and utilities; and
   b. Appropriate recommendations shall be provided for structural and civil design requirements.

D. Site-specific evaluation for potential sinkhole hazards:

1. Review of available records shall be as in subsection A (1) of this section.

2. Subsurface conditions for workings located within 200 feet of the ground surface shall be investigated by drilling. For this investigation:
   a. Drillhole sites shall be selected at representative locations and at representative working depths. A minimum of five drillholes shall be drilled along the alignment of any linear structure, such as roads or utility lines designed to cross a mine hazard area. No fewer than one drillhole per acre shall be provided for a site.
   b. Core drilling is preferred, but is not compulsory. Rotary drilling is an acceptable method, provided it is used in combination with downhole geophysical logging, including caliper logs. Drilling shall penetrate immediately above and through the predicted mine workings locations to facilitate interpretation of the conditions of the mine workings.
   c. Drillholes shall be logged continuously throughout their length, including lithology at five-foot intervals for rotary drillholes, drill fluid circulation, penetration rate, and free fall of the drill string.

E. The director may waive or reduce engineering study and design requirements for alterations in mine hazard areas for the following:

1. Additions or alterations to legally existing structures meeting the requirements in place at the time of construction that do not increase occupancy or significantly affect the risk of structural damage or injury; and

2. Buildings that are defined as agricultural buildings in Section 14.46.010 TCC.
Here are the definitions from Chapter 24.03 Definitions that apply to this chapter which will not be included in the final version:

“Mine hazard areas” means those areas directly underlain by, adjacent to, or directly affected by mine workings such as adits (mine entrances), gangways (tunnels), drafts or air shafts. In Thurston County, and “Coal Fields of Southwestern Washington” (Culver, Harold E, 1919, Washington Geological Bulletin 19).

“Critical facilities” means those facilities which would be particularly vulnerable to natural disasters and which pose a high risk to the public if damaged, or which is necessary for emergency (e.g., earthquake, flood, etc.) operations or are listed as category III or IV in the International building code. Refer to Table 24.15-2 for a current list of “Critical Facilities for Thurston County.”

Here is Table 24.15-2 from the deliberative draft of the geo hazards section:

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<td></td>
</tr>
<tr>
<td><strong>Buildings and other structures not included as an Essential Facility, above, containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released</strong></td>
<td></td>
</tr>
</tbody>
</table>