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BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

5 In the Matter of)
6 Application No. 96-1)

) TESTIMONY OF TERRY BUTLER

7 OLYMPIC PIPE LINE COMPANY)

) • Stream Crossings

8 CROSS CASCADE PIPELINE PROJECT)
9 _____)

10 1. I, Terry Butler, am an Earth Scientist in the Rivers Section of the King County
11 Department of Natural Resources, where I staff the County's flood hazard reduction efforts and its
12 river facility maintenance program. I am familiar with sediment transport and deposition in the Tolt
13 and South Fork Snoqualmie Rivers, and with channel migration hazard along sections of the Tolt,
14 Raging, and forks of the Snoqualmie River. I make this affidavit of my own personal knowledge in
15 support of the County's position that the proposed pipeline would be subject to high hazard from
16 natural processes at the currently proposed river crossings.
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18 2. These are comments with regard to Olympic Pipe Line Company's proposed river
19 channel crossings, as identified in the Draft Environmental Impact Statement (DEIS), Cross
20 Cascade Pipeline, dated September 1998.
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22 a. All viable alternatives to sub-surface (i.e., either trenching or horizontal
directional drilling) channel crossings should be pursued and selected as the preferred
approach for pipeline installation. In particular, the project should be configured to use
existing bridges, rerouted to avoid all sub-surface channel crossings, or constructed in
aboveground bridges to cross all channels. The statement on page 3-37 of the DEIS should

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be heeded: “Because of limitations in the current understanding of stream and hillslope processes, it is not feasible to completely eliminate the potential for such impacts [breakage of the pipeline as a result of stream scour].” Breakage of the proposed pipeline as a result of stream scour or lateral migration is not acceptable and should not be allowed under any approved project alternative.

b. If and only if it is not technically feasible to use an alternative to placing the pipeline under an existing channel, the following comments apply and should be required of every proposed stream crossing:

- The statements on page 3-34 of the DEIS regarding specific studies needed to determine depth of scour and the appropriate depth of pipeline installation should be required, especially the four bullet list of measures shown on that page.
- Site specific scour analysis should be performed for all stream crossings that are not proposed to be bridged or placed under or over existing culverts. The scour evaluation should consider current site conditions as well as the effects of rapid gully advancement in steep disturbed channels, flow constrictions, log jams, debris flows, and headward migration resulting from stream degradation. The analysis should extend over the full width of the stream channel including its floodplain and areas subject to lateral migration. The analysis should extend a sufficient distance upstream and downstream of the proposed channel crossing to consider all future potential changes in channel bottom elevation that could affect an installed pipeline. The pipeline should be buried a minimum of four feet below the maximum scour depth based upon a 100 year flood event.
- Calculation of depth of scour should reflect site specific conditions and make use of monitoring of actual channel conditions at each proposed channel crossing.
- Detailed analyses of geomorphologic, hydrologic, hydraulic, sediment transport, and lateral migration characteristics at each site should consider not only the present day hydrologic regime but also the projected future peak flow regime.
- Horizontal directional drilling should be required at all channel crossings.

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- Flexible couplings and block valves should be required on either side of every channel crossing (or channel migration hazard area) as further safeguard against damage or rupture during seismic activity.
- The pipeline should be an additional thickness (or double hulled) and lined with concrete in all channel crossings.
- There should be a system of monitoring devices installed at all channel crossings to monitor in-channel scour conditions and the ongoing status of the pipeline under the channel.

c) Most, if not all, of the over 80 proposed stream crossings in King County would cross channels that provide habitat critical to salmonid species that are proposed for listing under the Endangered Species Act. If the specific studies recommended on page 3-34 of the DEIS indicate that natural levels of sediment transport, scour, bank erosion, or flow regime would be altered or adversely affected by construction of a proposed crossing, or its long-term maintenance, such a crossing should not be permitted. Noteworthy examples where the currently proposed project would cause disruptive, sub-surface trenching through valuable habitat in erodible and/or unstable channel conditions include the Tolt River, Griffin Creek, and multiple tributaries of the South Fork Snoqualmie River.

3. Stream Crossing #26 and #27– Tolt River. Olympic Pipe Line Company’s proposed Tolt River crossings pose a serious risk of potential hazard. The Tolt River, a Class 1 water, is a gravel bed, fast flowing river that is subject to high risk of rapid stream incision, bank erosion and shifts in the location of the main channel. The channel migration hazards of the Tolt River in general, and especially the recent avulsions at the site of proposed channel crossings, are described in Exhibit 1 (Excerpts from the Tolt and Raging River Channel Migration Study, 1991). It should be noted that the proposed Tolt River crossings are located in "Reach C" described in Exhibit 1. The

1 proposed crossing is located in a mapped channel migration hazard area (see Exhibit 2, the Tolt
2 River channel migration hazard map) and an area that is known to have avulsed repeatedly over the
3 past 20 years and as recently as 1990 (see "Figure 11" of Exhibit 1). The Tolt River splits into two
4 channels approximately 2100 feet upstream of the proposed crossing location. The two channels
5 recombine approximately 1000 feet downstream of the proposed crossing location. The two
6 channels are approximately 1200 feet apart which represents the approximate width of the
7 floodplain and the approximate extent of the channel migration hazard area at the proposed
8 crossing. The main river channel is identified as Stream Crossing #26. Stream Crossing #27 is a
9 major side channel. It should be noted that prior to 1990, the main Tolt River channel was in the
10 location of the present day side channel. The 1990 floods caused a major realignment of the Tolt
11 River channel. The 1995/1996 floods caused major damage to a King County revetment that the
12 proposed pipeline is intended to cross. Changes in the location of the main channel at the site of the
13 proposed Tolt River channel crossings can be seen in sequential aerial photographs of this area
14 shown in Exhibit 3. In summary, the Tolt River channel is prone to rapid shifting, outright
15 relocation, bank erosion, and channel scour in the area of this proposed channel crossing. The risks
16 associated with such a crossing are of such significance that an entirely different route should be
17 used, such as the Trail Bridge about a mile to the west.

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21 4. Cedar Falls Trail near town of Snoqualmie. The pipeline is proposed for installation
22 under the Cedar Falls Trail in the three forks area of the Snoqualmie River near the town of
Snoqualmie. Here also, the proposed route runs along a mapped channel migration hazard area (see
Exhibit 4, Summary of the Three Forks Channel Migration Study, 1996, and Exhibit 5, the Channel
Migration Map for the Three Forks Area of the Snoqualmie River). Although the trail prism forms

1 the boundary of a channel migration hazard area, a pipeline buried in the trail prism would still abut
2 that channel migration hazard area and should therefore be installed deep enough avoid scour from a
3 river that may migrate laterally to impinge upon the trail prism. Additional armoring should be
4 placed on the east side of the trail prism to prevent erosion from anticipated lateral migration of
5 either the South Fork Snoqualmie or the Middle Fork Snoqualmie River.
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7 5. King County strongly recommends that any site certification decision by the Council
8 include, at a minimum, conditions set forth above. Such conditions would be imposed by King
9 County under its applicable sensitive area zoning ordinances if such a proposal were subject to the
10 County's permit review. Absent compliance with these recommended conditions the project would
11 not be consistent with King County land use plans and zoning ordinances. See KCC 21A.24.275;
12 KCC 21A.24.360 through .380.
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14 DATED this _____ day of _____, 1999
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20 TERRY BUTLER
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