

BEFORE THE STATE OF WASHINGTON  
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 96-1

Olympic Pipe Line Company

Cross Cascade Pipeline Project

**PRE-FILED TESTIMONY OF  
PETER H. MORRISON**

ISSUE:  
GIS MAPS

SPONSOR:

City of North Bend, Washington  
City of Snoqualmie, Washington  
Cascade Columbia Alliance

**BRICKLIN &  
GENDLER, LLP**

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

**Could you please identify yourself?**

My name is Peter Morrison. I am Executive Director of Pacific Biodiversity Institute where I am responsible for organization management, program development, and supervision of lead staff.

**Would you please summarize your experience and education relevant to your work?**

I received a Masters of Science in forest ecology and a Bachelor of Arts in biology, geology, and geography. While I have considerable experience in conservation biology, ecology, and botany; my primary expertise utilized for this matter is my expertise in geographic information systems (GIS).

I have been Executive Director of the Pacific Biodiversity Institute since 1993. The Pacific Biodiversity Institute conducts scientific research in the fields of ecology, conservation biology, and natural resource management. We are one of the leading organizations in the nation in the use of GIS to study environmental issues. I have worked with GIS technology for 13 years and have become one of the leading experts in that computer mapping and analysis technology in the United States. I have conducted GIS mapping projects that have dealt with complex environmental issues covering large geographical extents (including all of the Pacific Northwest and major parts of California). I have also employed GIS in projects in other parts of the United States, Canada, Mexico and Chile. My work has been presented to the US Congress and has received considerable international recognition. I have used GIS to aid in the analysis of the environmental impact of numerous projects and development proposals. I have recently conducted an accuracy assessment of GIS data developed by federal agencies for use in ecosystem planning projects. I have used GIS in an analysis of the I-90/Plum Creek Timber Company land exchange, in an analysis of a proposed electrical transmission line in Okanogan County, in an analysis of the environmental impact of large proposed developments in Okanogan County, WA and San Diego County, CA. I have used GIS in modeling and mapping forest productivity and commercial forestland suitability, in forest growth simulations in the coastal redwood zone in California, and in scientific review and ecological modeling of marbled murrelet populations in California. I have used GIS to analyze factors contributing to biodiversity in the North Cascade ecosystem and in numerous vegetation and forest condition mapping projects. I am a nationally recognized expert on definition, inventory, and mapping of late successional forests. As an ecologist and project director for the Wilderness Society in 1989 to

**BRICKLIN &  
GENDLER, LLP**

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

1993, I developed state-of-the-art GIS and remote sensing lab and performed extensive GIS-based analysis on forest issues. I received the 1992 *ComputerWorld Magazine-Smithsonian Institution Environmental Award* for innovation in information technology related to environmental research as a result of my work with GIS.

I have also been called as an expert witness to testify in numerous legal proceedings and have presented expert testimony based on GIS analysis and mapping in these proceedings. In one of these cases *Marbled Murrelet v. Pacific Lumber Company*, 880 F. Supp. 1343 (N.D. Cal. 1995), aff'd, 83 F.3d 1060 (9<sup>th</sup> Cir. 1996), cert. denied, 117 S. Ct. 942 (1997), I did a lengthy GIS presentation for the Judge.

**Are you familiar with the Cross Cascade Pipeline proposal submitted to the Energy Facility Site Evaluation Council by Olympic Pipe Line Company?**

Yes. I have coordinated the compilation, analysis and mapping of a considerable amount of data using GIS computer mapping and analysis technology, including the pipeline route itself, geohazards along the route; surface water and groundwater; animals; fish and their habitat, including threatened and endangered species; land uses; and other environmental factors raised by the proposal.

**Could you describe what you have produced for the Council utilizing this information and technology?**

I with the help of other experts in my office, have prepared a number of maps that depict different aspects of the proposal. We were provided with data from Olympic showing the location of the pipeline as proposed. We incorporated pipeline revisions that were recently digitized by King County for the portion of the pipeline crossing King County. We overlaid that data with data obtained from many federal, state and county agencies and departments to produce maps of portions of the pipeline route. GIS technology allows for a combination of high mapping accuracy and flexibility in looking at different aspects of the oil pipeline proposal. In some cases, the data available for computer mapping is not comprehensive and therefore some maps may not include some faults, aquifers, streams, or other details of existing environs. We were able to compile extensive amounts of data along the proposed pipeline route and this data accurately reflects the environmental conditions encountered on the route.

**BRICKLIN &  
GENDLER, LLP**

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

We have collected the maps on the attached CD ROM disk for duplication. The CD ROM itself is Exhibit PHM-1, while each map therein is identified by a map title printed on each map as described in the following list. Each map is reproduced as a JPEG image, which is viewable with web browsers, word processors and many other types of common computer software. The JPEG image filenames contained on the CD that correspond with each map title are listed after the map title in the following list:

#### **LIST OF GIS MAPS**

- a) Areas Susceptible to Erosion, King County, Washington
  - i) king-erosion-2-tn.jpg
  - ii) king-erosion-2.jpg
- b) Areas Within Floodplains, King County, Washington
  - i) king-floodplain-2-tn.jpg
  - ii) king-floodplain-2.jpg
- c) Areas Susceptible to Landslides, King County, Washington
  - i) king-landslide-2-tn.jpg
  - ii) king-landslide-2.jpg
- d) Areas Seismically Unstable Areas, King County, Washington
  - i) king-seismic-unstable-2-tn.jpg
  - ii) king-seismic-unstable-2.jpg
- e) Proposed Pipeline Route through King County Showing locations of Streams, Wetlands and Sensitive Plants and Animals
  - i) king-co-2-tn.jpg
  - ii) king-co-2.jpg
- f) Proposed Pipeline Route through Kittitas County Showing locations of Streams, Wetlands and Sensitive Plants and Animals
  - i) kittitas-co-2.jpg
  - ii) kittitas2-tn.jpg
- g) Proposed Pipeline Route through Grant, Franklin and Adams Counties Showing locations of Streams, Wetlands and Sensitive Plants and Animals
  - i) gfa-co-2-tn.jpg
  - ii) gfa-co-2.jpg
- h) Chum Salmon Presence along Proposed Pipeline Route
  - i) chum3-tn.JPG
  - ii) chum3.jpg
- i) Coho Salmon Presence along Proposed Pipeline Route
  - i) coho2-thumb.jpg

- ii) coho2.jpg
- j) Fall Chinook Runs along Proposed Pipeline Route
  - i) fall-chinook-tn.jpg
  - ii) fall-chinook1.jpg
- k) Spring and Summer Chinook Runs along Proposed Pipeline Route
  - i) spg-sum-chinook-2-tn.jpg
  - ii) spg-sum-chinook-2.jpg
- l) Steelhead Presence along Proposed Pipeline Route
  - i) steelhead-2.jpg
  - ii) steelhead-tn.jpg
- m) Bulltrout Presence along Proposed Pipeline Route
  - i) bulltrout1-tn.jpg
  - ii) bulltrout1.jpg
- n) Major Geologic Structures: Eastern Washington
  - i) faults-e1-tn.jpg
  - ii) faults-e1.jpg
- o) Major Geologic Structures: Western Washington
  - i) faults-w1-tn.jpg
  - ii) faults-w1.jpg
- p) Aquifers and Groundwater Management Areas Along Proposed Pipeline Route:
  - i) aquifers-thumb.jpg
  - ii) aquifers.jpg
- q) Tolt River Crossing Vicinity Map
  - i) tolt-2-tn.jpg
  - ii) tolt-2.jpg
- r) Map of City of North Bend
  - i) northbend-2-tn.jpg
  - ii) northbend-2.jpg
- s) Snoqualmie Tunnel Vicinity Map
  - i) snoq-tunnel-2-tn.jpg
  - ii) snoq-tunnel-2.jpg
- t) Swauk Creek Crossing (topographic map)
  - i) swauk-tn.jpg
  - ii) swauk.jpg
- u) Swauk Creek Crossing (aerial photo view)
  - i) swauk-ortho-thumb.jpg
  - ii) swauk-ortho.jpg
- v) Columbia River Crossing Spill Scenario
  - i) columbia-2-tn.jpg

**BRICKLIN &  
GENDLER, LLP**

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

- ii) columbia-2.jpg
- w) Slope Steepness along Proposed Pipeline Route: Snohomish and King Counties
  - i) slope-king&snoh2-tn.jpg
  - ii) slope-king&snoh2.jpg
- x) Slope Steepness along Proposed Pipeline Route: Kittitas County
  - i) kittitas-slope1-tn.jpg
  - ii) kittitas-slope1.jpg
- y) Slope Steepness along Proposed Pipeline Route: Grant, Frankin and Adams Counties
  - i) gfa-slope-2-tn.jpg
  - ii) gfa-slope-2.jpg
- z) Land Use and Potential for Hillslope Instability Above Oil Pipeline Near Keechelus Lake
  - i) KeechelusStability1-tn.jpg
  - ii) KeechelusStability1.jpg
- aa) Land Use and Potential for Hillslope Instability Above Oil Pipeline in South Fork Snoqualmie River Valley
  - i) snoqualmie-stability1-tn.jpg
  - ii) snoqualmie-stability1.jpg
- bb) Wetlands near Ellensburg
  - i) wetlands-ellensburg-1.jpg
  - ii) wetlands-ellensburg-2-tn.JPG
- cc) Wetlands near Saddle Mountains
  - i) wetlands-saddle-2-tn.JPG
  - ii) wetlands-saddle-2.jpg
- dd) Wetlands near Crab Creek
  - i) wetlands-crab-1.jpg
  - ii) wetlands-crab-2-tn.JPG
- ee) Unmapped riparian areas along Keechelus Lake
  - i) unmapped-riparian-on-lake-2-tn.jpg
  - ii) unmapped-riparian-on-lake-2.jpg
- ff) Ollalie Creek Crossing
  - i) olallie-2-tn.jpg
  - ii) olallie-3.jpg
- gg) Wetland Complex 1 mile west of Spex Arth Creek
  - i) spexarth-2-tn.jpg
  - ii) spexarth-3.jpg

The following above maps are also attached to Henry Landau's testimony:

**BRICKLIN &  
GENDLER, LLP**

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

Tolt River Crossing Vicinity Map  
Map of City of North Bend  
Snoqualmie Tunnel Vicinity Map  
Swauk Creek Crossing (topographic map)  
Swauk Creek Crossing (aerial photo view)  
Columbia River Crossing Spill Scenario

The following above maps are also attached to George Wooten's testimony:

Unmapped riparian areas along Keechelus Lake  
Ollalie Creek Crossing  
Wetland Complex 1 mile west of Spex Arth Creek

Also, I found in the past that the most effective way for a decision maker to rely upon this GIS technology is to actually view this information on a large screen connected to a computer as that allows focus on specific detailed aspects of the maps. Accordingly, as part of my opening testimony, I intend to present this data in that manner for reference and questions.

END OF DIRECT TESTIMONY OF WITNESS

cca\experts\morrison.pft

ATTORNEYS-AT-LAW  
SUITE 1015 FOURTH AND PIKE BUILDING  
1424 FOURTH AVENUE  
SEATTLE, WA 98101  
(206) 621-8868

**BRICKLIN &  
GENDLER, LLP**