Q. *State your name and business address.*

A. Thomas F. Mumford, Jr.

Division of Aquatic Resources

Washington State Department of Natural Resources

PO Box 47027

1111 Washington St. SE

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Q. *Where are you employed and what is your job title?*

A. Division of Aquatic Resources

Washington Department of Natural Resources

Natural Resource Scientist 3

Q. *What is your educational background?*

A. I received my BA in botany and chemistry from Wabash College in 1966, and my Ph.D. from the Botany Department at the University of Washington in 1972 in the subject area of seaweed taxonomy and ecology. I spent three years at the University of British Columbia on a postdoctoral fellowship in marine botany before joining the Washington Department of Natural Resources in 1976.

Q. *Summarize your professional experience.*

A. I have worked for the Department of Natural Resources since 1976 in what is now called

the Division of Aquatic Resources.

I supervise the Stewardship Section of the Division of Aquatic Lands, Department of Natural Resources. This section performs environmental review, prepares guidance, and represents the department in CERCLA and Coastal Protection Fund (oil spill) trustee councils and steering committees. I supervise six people. I supervise the department's natural resource trustee for assessing natural resource damages under CERCLA. I perform environmental review for proposed use authorizations, and design and negotiate proposed mitigation and restoration projects. I have served as department representative on the Coastal Protection Fund, and the Commencement Bay Trustee Council. I manage and act as principal investigator in the nearshore habitat component of the Puget Sound Ambient Monitoring program, and as the department's representative on the Georgia Basin/ Puget Sound International Task Force.

I advise on the management of aquatic plant resources of the state of Washington. I advise on guidance for marine plant harvest and give advice on lease/harvest permits. I advise and consult with government officials and interested private individuals on questions and problems involving marine plants and marine plant management.

I currently supervise a project to inventory marine and estuarine nearshore habitats in Puget Sound. This study uses remote sensing methods of aerial photography and multi spectral scanning imagery to gather data, and a computer geographical information system to store, analyze and display data. The results are used for regional planning and long term monitoring in the Puget Sound Ambient Monitoring Program.

I was the project leader for the development of a commercial seaweed aquaculture industry for the State of Washington. I integrated various factors to develop the culture of

seaweeds used for food, chemicals, pharmaceuticals, fertilizers, and energy bioconversion. I performed economic and market analyses, researched biological factors that must be known in order to grow plants selected for development, devised and constructed structures for their growth, investigated the biological, social and legal problems of site selection, obtained the necessary permits for aquaculture structures, and researched the various factors involved in optimizing production. A pilot-scale seaweed aquaculture demonstration farm was built and operated for three years.

I have increased my teaching proficiency and expertise by teaching courses at the University of Washington and The Evergreen State College, as well as having interns and individual contracts with students from The Evergreen State College, and the University of Puget Sound. I have also served on the Ph.D. Dissertation reading committee of a student at the University of Washington.

I worked daily for seven months with a Japanese aquaculturalist in transfer of Japanese technology. I worked for five months on a technology transfer project in Thailand. I learned to work through a language barrier and broad cultural differences. I have negotiated a contract with the Squaxin Tribal Council to use marine waters near their reservation with several tribes in the herring-roe-on-kelp harvest management.

I have worked as a consultant with teams of biologists, engineers, and economists in reviewing assessments of biological and economic concepts for the large scale production of energy from macro and microalgal biomass. I have headed a team of biologists, economists, and production specialists for a project to determine the feasibility of developing an agar industry in Thailand.

Q. *What is the subject matter of your testimony?*

A. I will testify about the process and methods I use to respond to requests from a land manager to ensure consideration of environmental protection in balancing public benefit per WAC 332-30-107 in response to an application for use of state-owned aquatic lands.

Q. *What is your role in processing easement applications?*

A. I respond to requests from the land manager and management. I may be asked to assess the application to identify environmental risks and impacts, deficiencies in the environmental information supplied by the applicant, propose environmental mitigation, or be involved in negotiations to mitigate, and may make a recommendation for the application to be approved or not, based on environmental concerns.

Q. *In what manner do you normally work with the land manager?*

A. The department prefers, through early interaction with applicant, permitting agencies, and tribes, to assure that the Department of Natural Resources (DNR) concerns are met through permit conditions. This is often an iterative process involving applicant, permitting agency, the DNR land manager and division staff, and feedback from DNR decision makers: see Aquatic Resource Management Reference Manual 20.1- Sensitive Habitat. I may also be asked to develop further specific conditions to incorporate into requirements of a use authorization for an applicant's specific operations occurring on state owned aquatic lands (SOAL).

Largely because of environmental concerns, focused by the proposed Endangered

Species Act (ESA) listings of salmon, the department is emphasizing environmental protection in its decision making, and is in the process of developing further guidance to assure RCW 79.90.455, RCW 79.90.460(3), and other laws (including the Public Trust Doctrine) are fully complied with.

Q *What guidance do you use in making a recommendation to the land manager?*

A

1. Assure that requirements for sequential mitigation are met, WAC 332-30-107(6), i.e., first avoid, then minimize, impacts and risks, then allow replacement (compensatory mitigation) and then only then, payment. Through a risk analysis to resources, be able to compare alternatives (including take no action) to be able to select the one that either reduces or does not increase risk (avoidance), or minimizes risk.
2. Assure that environmental assessment is done on an appropriate ecosystem scale. In complying with its mandate, the department is moving toward considering the ecological connectedness of projects in a region with consideration of existing or desired future environmental conditions.
3. Assure that cumulative impacts are addressed at the correct geographical and ecological scale. For example, are there other similar types of impacts/risks already in area (other pipelines), or are there other types of stressors impacting resources of concern, e.g., forest practices already causing high silt load- any more, even small amounts might be highly and disproportionately harmful, or is a resource (e.g., salmon) already highly stressed (listed), and this proposal will cause impacts or a "bottleneck" at a critical part of its life history such as salmon

spawning areas?

4. Design environmental monitoring to be carried out over the length on the contract to assure risk does not change over time because of poor maintenance, spills, or unanticipated changes or impacts (river bed shifts, etc.).

5. Use best available science to be able to reduce impacts or risk. As better technology becomes available to reduce impacts or risk of impact, be able to incorporate it quickly and effectively.

6. Utilize adaptive management. Realizing that our ability to predict environmental impacts and risks is limited, it is prudent to design any project as an experiment, by using an information feedback loop to assure that the applicant be able and willing to make changes to reduce or improve risks. The project should: 1) have clear goals/criteria for level of risk or impacts, and resource production, 2) monitor for the full term of the contract, 3) through the contract be able to utilize best available science in responding to change in risk discovered through monitoring; and 4) either have re-openers or make the term of easement be appropriate to the time scale of ecological processes.

7. Applicants will provide evidence that there is no known impacts or "takes" known to have occurred or will occur from this activity. (See letters from US Fish and Wildlife Service, January 1998, and National Marine Fisheries Service, August 8, 1995, in App. No. 96-1, Appendix B-3, Plants and Animals)

8. Any compensatory mitigation will:

    a. Use proven technology, or

    b. Be performed prior to construction, and be shown to perform to replace

ecological functions though monitoring with clear criteria to assess success.

C. If on state-owned aquatic lands, that it will be for impacts on SOAL. Any mitigation area on SOAL will be under use authorization.

9. The burden of proof lies with the applicant. Based on the precautionary principle, my recommendation is to move forward on applications only when the applicant provides information needed. All costs for mitigation, maintenance and monitoring must be borne by applicant. All monitoring reports are submitted in a timely manner to the department for review as possible corrective actions.

Q. *Have you read the Olympic Pipeline Company's Cross Cascade pipeline project Application Number 96-1 for Site Certification, dated May 11, 1998. (App. No. 96-1) ?*

A. I have read the following parts of sections of Olympic Pipeline Company's Cross Cascade pipeline project Application Number 96-1 for Site Certification, dated May 11, 1998:

Section 1.1 Description of Applicant

Section 1.4 Mitigation Measures

Section 2.9 Spill prevention and Control

Section 3.4 Plants and Animals

Part 9- Analysis of Alternatives

Appendix B-2 - Product Spill Analysis

Appendix B-3 - Plants and Animals - Plants and Animals Correspondence

Q. *Does App. No. 96-1 meet the guidelines mentioned above?*

A. No, in many cases. In particular, I have examined App. No. 96-1 and did not find adequate analysis of impacts and comparisons of risks to salmon, other biological resources and sediments in freshwater and marine environments from spills in freshwater, barge traffic, tanker truck traffic, and changes in marine tanker traffic which would allow an analysis for mitigation avoidance and minimization.

Q. *Have you read the Draft Environmental Impact Statement (DEIS) - Cross Cascade Pipeline, September, 1998?*

A. Yes.

Q. *Are DNR comments provided to EFSEC regarding the DEIS complete and accurate to the best of your knowledge?*

A. Yes, in particular I would draw your attention to issues stated in the cover letter dated December 17, 1998 regarding "Need for Supplemental Analysis," "Analysis of need for a Cross Cascade Pipeline," "Analysis of Impacts," "risk of spills," and "Impacts of spills and leaks," and in the Specific Comments, Attachment #1, issues under the heading Aquatic Resources (35 through 46), Spill Scenarios (Issues 93, 94), and Alternative Routes (95) are pertinent to this testimony.

Q *What other documents have you read pertaining to this application?*

A. Application for easements to Washington Department of Natural Resources, August 10, 1998, numbered 51-07801.

Q. *Are you able to make a recommendation to the land manager?*

A. At this time, based on the information contained in App. No. 96-1 and in the application to the department which mainly refers to App. No. 96-1, I would recommend that until the appropriate information is provided, the department cannot forward on approving the application, based on the principles mentioned above.

Q. *What further analysis do you recommend?*

A. I would recommend that an ecological risk assessment model be used. One approach currently used by DNR has been put forth in the document *EPA Guidelines for Ecological Risk Assessment,* EPA/630/R-95/002F, February, 1998. (Available as Acrobat® .pdf document at http://www.epa.gov/ncea/ecorsk.htm)

Q. *What is an ecological risk assessment?*

A. Ecological risk assessment is a defined process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors. The EPA has recently published the guidelines mentioned above.

Regional ecological risk assessment can accomplish four goals toward the purpose of analyzing decisions:

1. It involves risk managers, risk assessors, and stakeholders,
2. It creates an agreed-upon set of endpoints, management goals, and understanding of the ecosystem and its interactions,
3. It addresses concerns about cumulative impacts, and
4. Risk to resources can be communicated to the risk managers for decisions.

The risk assessment process does not evaluate business risks needed to make land management decisions. Rather, the process will allow identification of high risk activities and then devise appropriate adaptive management to minimize risk. It will also allow for examining various "what if" tradeoff scenarios between different activities.

Q. *What mitigation requirements will you recommend?*

A. The first step in mitigation is avoiding impacts and risks to aquatic resources. I would recommend that the applicant perform an alternative analysis that will address risks and impacts to fresh water and marine biological resources, habitats, and sediments through an ecological risk assessment process. It is inappropriate to decide what compensatory mitigation may or may not be needed until this process is completed.

Q. *Does that conclude your testimony, Dr. Mumford?*

A. Yes, it does.

I certify and declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct to the best of my knowledge and belief.

SIGNED AT Olympia, Washington on this _____ day of February, 1999.

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Thomas F. Mumford, Jr. H:\KSMM490\KIM\SEPA\opl finaltest2 mumford.wpd