

**FERC Notice Requesting Applications for Panel Member List for
Hydropower Licensing Study Dispute Resolution. Docket No. AD04-4-000.**

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Ms. Larson has over 10 years of experience in water resources including hydroelectric, fish passage, flood control, municipal, river engineering, and hydrology projects. She has managed numerous large water resources projects including municipal projects for the Los Angeles Department of Water and Power and major fish passage projects for the U.S. Army Corps of Engineers. She is currently a member of the Technical Committee for HydroVision 2004 and is a session chair.

Her hydroelectric experience includes fish passage, gas abatement, turbine, erosion, spillway, and hydrology studies. She has extensive background in fisheries engineering issues including adult and juvenile fish bypass systems at hydroelectric projects and river restoration projects. She worked as an independent consultant for the NOAA Fisheries (formerly National Marine Fisheries Service) and provided technical support to the Snake River Salmon Recovery Team on upstream and downstream fish passage issues at the Lower Snake and Lower Columbia River projects.

1. Technical Expertise:

Education:

M.S. Civil Engineering, Oregon State University, 1994. Water Resources Engineering and Construction Engineering Management.

B.S. Civil Engineering, Oregon State University, 1993. Cum Laude.

A.A. Pre-Architecture. Centralia College, 1989. Highest Honors.

License and Professional Affiliations:

P.E., Registered Professional Engineer, 1998. WA.
Member, Northwest Hydroelectric Association (NWhA)
Member, American Society of Civil Engineers (ASCE)
Member, American Fisheries Society (AFS)
AFS Environmental Concerns Committee
HydroVision 2004 Technical Committee

Experience in Technical Areas:

Aquatic Resources:

Water Quality – Dissolved Gas Issues

- Gas Abatement Feasibility Design for all eight Corps of Engineers Lower Columbia and Snake River Dams: Involved in the feasibility level design of auxiliary spillway, sluice, and turbine modifications for each of the eight Corps dams on the Columbia and Snake River Dams. Spillway structures included stepped, baffled, and conventional deflected spillway types. Modifications evaluated included submerged sluices through existing spillway structures, additional spillway bays, and turbine and/or powerhouse modification. U.S. Army Corps of Engineers, Portland District.
- Independent contractor for the NOAA Fisheries (formerly National Marine Fisheries Service) 1995. Provided assistance to the Snake River Salmon Recovery Team. Processed and analyzed dissolved gas data from fixed stations operated by the U.S. Army Corps of Engineers.
- Boundary Dam Dissolved Gas Measurements. Involved in the 2004 dissolved gas data collection and analysis for Boundary Dam. Will analyze previous data collected and compare to 2004 results.

Fish Passage – Ms. Larson has been involved in the management, design, and evaluation of numerous fish passage structures and restoration projects in the Pacific Northwest. Ms. Larson is a partner at Northwest Hydraulic Consultants, an international water resources engineering firm. The firm operates two hydraulic laboratories that are used to build physical models of water resources projects. She has been involved in the development of physical models to test both adult fish ladders and juvenile bypass systems. She has experience with physical and numerical modeling as well as the hydraulic design of fish passage structures. She has published several papers on the topic of adult fish ladders and surface collection concepts.

- Lower Snake River Adult Fishway Studies: Project manager for the hydraulic analysis of the fishways at Lower Granite, Little Goose, and Lower Monumental Dams. Numerical Models were developed that included both open channel and pressurized pipe computer simulations. Project included an extensive field program to collect velocities. Velocity measurements were taken using Acoustic Scintillation Flow Meters (ASFM). U.S. Army Corps of Engineers, Walla Walla District.
- Columbia and Snake River Fish Passage Issues: Wrote several technical reports for the Snake River Salmon Recovery Team. Topics included: drawdown, juvenile fish bypass screens, and adult fish passage. Provided preparation material for Snake River Salmon Recovery Team Surface Collection/Bypass Workshop and helped facilitate the workshop. National Marine Fisheries Service.
- Bonneville Second Powerhouse Auxiliary Water Supply Study: Project manager for the hydraulic analysis of an Emergency Auxiliary Water Supply for the Bonneville Second Powerhouse Fishway. Presented results at meetings with Corps of Engineers, National Marine Fisheries Service, ODFW, and WDFW. Used computer model of the fishway to study emergency auxiliary water supply sources. Managed field data collection program to verify model (including velocity measurements). Developed operational guidelines for the fishway. U.S. Army Corps of Engineers, Portland District.
- Dalles Combined System (Juvenile Fish Bypass Facility): Project engineer involved in the hydraulic design and physical model testing of a juvenile bypass dewatering structure for The Dalles Dam (2,500 cfs dewatered through screens). The structure was designed to meet fish screening criteria for juvenile salmonids. Project included the hydraulic design and physical modeling of an outfall structure that met juvenile salmonid outfall criteria. U.S. Army Corps of Engineers, Portland District.
- Priest Rapids FERC Relicensing Project – PacifiCorp/Yakama Nation Competing License: Project manager of a literature review and analysis of biological and fisheries engineering issues at two hydroelectric facilities. Developed a briefing for relicensing team members and presented results of study at a team meeting. PacifiCorp.
- Lower Columbia River Adult Fishway Facilities: Project engineer involved in the hydraulic analysis of fishways and the development of fishway numerical computer models for Bonneville Dam, John Day Dam, and The Dalles Dam. Models used to predict the operating conditions of fish ladders. Collected field data to verify model. U.S. Army Corps of Engineers, Portland District.
- Juvenile Fish Attraction-Flow System: Developed conceptual designs and preliminary hydraulic calculations for a juvenile fish attraction-flow system

- for Wanapum Dam. Researched and wrote material on de-watering screens. Grant County PUD.
- John Day Fish Ladder Modifications: Project engineer for the hydraulic analysis of potential modifications to the control section of John Day Fish Ladders. Developed conceptual level designs of several alternative configurations. U.S. Army Corps of Engineers, Portland District.
 - Skook Creek Channel Restoration: Project manager of a restoration project for a reach of Skook Creek (tributary to the Cowlitz River). Project included hydraulic analysis and restoration of 400-foot reach of channel. Rock weirs, preformed scour holes, woody debris, and plantings were included in the design. Involved in coordinating hydraulic design, civil design, and permitting. Sargaent Engineers/Lewis County.
 - Middle Fork Nooksack River Fish Ladder Project: Fisheries engineer involved in the development of fish ladder design alternatives for a water diversion dam on the Middle Fork Nooksack River. City of Bellingham.
 - Lewis River FERC Relicensing - Swift Habitat Channel: Involved in a reconnaissance study to determine the feasibility of constructing a habitat channel downstream of the Swift 1 hydroelectric facility. PacifiCorp.
 - Skookum Hatchery Intake Design: Responsible for the design of a screened hatchery intake meeting WDFW fisheries criteria. Managed the design of abutments to protect the intake, the fish screen design, the development of a HEC-RAS model, the design of a pump station, and the water supply line.

Engineering:

Hydraulic and Civil Engineering - Ms. Larson is a licensed professional civil engineer and has a master's degree in Civil Engineering. She specializes in hydraulic design with an emphasis on fish passage and hydroelectric studies. She is currently an assistant project manager for NHC's on-call hydraulic services contract with the Los Angeles Department of Water and Power. She has been involved in a wide range of hydraulic studies including turbine, reservoir, pipeline, spillway, conveyance channels, flood control structures, and complex energy dissipation structures.

- Corps of Engineers Turbine Study: Involved in the collection and analysis of physical, biological, and operational characteristic data of turbines at seven hydroelectric projects. Developed matrix of turbine characteristics and physical conditions. U.S. Army Corps of Engineers, Portland District.
- Los Angeles Reservoir Overflow Replacement Project: Project manager for the development of alternatives to replace a baffled chute spillway inlet to the Los Angeles Reservoir. The reservoir will be covered in the future

- which requires alternatives that eliminate any potential air entrainment. Options included: six foot diameter valves, orifice plates, and drop shaft structures. Currently testing a physical model of the drop shaft alternative. LADWP.
- River Supply Conduit: Project Manager for the hydraulic analysis of the existing River Supply Conduit and the design of a new conduit. This conduit is a major water supply connection owned and operated by LADWP. Involved in field investigations to collect data for the calibration of a numerical model. Managed the computer modeling of over 12 miles of pipeline using a complex numerical model, WANDA. LADWP.
 - Lower Monumental Stilling Basin Erosion: Involved in the assessment of erosion in the Lower Monumental stilling basin. Reviewed flow data to develop relationships between flow and stilling basin erosion. Predicted future erosion potential in the basin. U.S. Army Corps of Engineers, Walla Walla District.
 - Los Angeles Reservoir West Stormwater Channel: Senior project engineer responsible for designing a new stormwater channel diversion and energy dissipation structure. Discharges are approximately 10,000 cfs with 2,000 cfs bypassed downstream and 8,000 cfs discharged through the new energy dissipation structure. Energy dissipation structure options include baffled chute spillways, stepped spillways, and flip-bucket alternatives. LADWP.
 - Guadalupe River Downtown San Jose Reach: Hydraulic design of large bypass conduits designed to convey Guadalupe River flood flows through downtown San Jose, California. Capacity of the bypass was about 75% of the total river design flow of up to 20,000 cfs. Bypassed reach included very sensitive riparian and anadromous fish habitat features that required preservation. Santa Clara Valley Water District.

2. Knowledge of the effects of construction and operation of hydroelectric projects.

Ms. Larson has a solid understanding of operations at hydroelectric facilities. During her career, she has worked on all eight of the Lower Columbia and Lower Snake River projects. She has worked on flood, drawdown, turbine, and fish bypass studies. This experience has been valuable to her knowledge of the effects of operational changes at hydroelectric projects. She has managed several field data collection programs at hydroelectric projects to study operational changes of fish facilities.

Although she has not been involved in the construction of new hydroelectric facilities, she has been involved in the design of proposed structures for existing facilities. She also has a minor in Construction Engineering Management.

- Lower Snake River Adult Fishway Pump Performance Tests: Project Manager for pump performance tests at Lower Granite, Little Goose, and Lower Monumental Dams. The pump performance test included taking measurements to determine the pump and turbine flows at various pump heads and rpm's. U.S. Army Corps of Engineers, Walla Walla District.
- 1996 Portland District Corps of Engineers, Post Flood Report: Responsible for the data management and analysis for the Portland District U.S. Army Corps of Engineers 1996 Post Flood Report. Data management required extensive use of HEC-DSS. U.S. Army Corps of Engineers, Portland District.
- John Day Drawdown Study: Project engineer for the numerical modeling aspects of the John Day Drawdown Study. Modified and calibrated an existing numerical model. Used the model to determine the hydraulic conditions associated with multiple drawdown alternatives. U.S. Army Corps of Engineers, Portland District.

3. Working knowledge of laws relevant to expertise.

Ms. Larson's background is hydraulic engineering; however, her work requires knowledge of the policy and regulations aspects hydroelectric studies. Her experience as an assistant to the Snake River Salmon Recovery Team provided her with working knowledge of the Endangered Species Act. The Snake River Salmon Recovery Team was appointed to independently develop recovery plan recommendations for endangered and threatened species on the Snake River. She is familiar with fish passage criteria developed by NOAA Fisheries, WDFW, and ODFW.

In addition, she has worked on several dissolved gas abatement studies that required working knowledge of the Clean Water Act and state water quality requirements. She also worked on a project in the Wild and Scenic designated area of the Rogue River in Oregon that involved water quality/erosion concerns of land owners.

Ms. Larson has worked on engineering studies that are associated with projects undergoing the FERC relicensing process. She is a member of the Northwest Hydroelectric Association and stays current on changes in FERC relicensing and other issues relevant to hydroelectric facilities. She recently attended one of FERC's seminars on the Integrated Licensing Process.

4. Ability to promote constructive communication about a disputed study.

Ms. Larson has extensive experience working on projects that include many stakeholders. Several of the fish passage projects that she has worked on have included agency representatives as well as the Columbia River Inter-Tribal Fish Commission. These projects required coordinating with agencies to develop concepts that meet multiple purposes. The ability to communicate complex technical issues is essential in her daily work. She has a significant amount of experience in working on large engineering projects that involve multiple consultants and agency representatives. On several occasions, she has used physical models to demonstrate the operation of proposed structures such as fish bypass systems and gas abatement measures.

In addition, her experience providing technical assistance to the Snake River Salmon Recovery Team (the Team) required a non-biased approach to presenting complex technical information. As a part of her assistance to the Team, she also coordinated a regional workshop on surface collection to provide a forum for developing this juvenile bypass concept. She presented material on a surface collector concept (a relatively new application for Columbia and Snake River projects at the time) and published two papers on the topic. Ms. Larson has presented several papers at national conferences and has a significant amount of public speaking experience.

Relevant Publications:

Wieland Larson, L.M., K.J. Christison, E.T. Zapel, K. McCune, and D.Schwartz, 2003. "Application of Numerical Models, Prototype Tests, and Physical Models to Study Adult Fish Passage at Lower Columbia and Lower Snake River Projects". Written for HydroVision 2003, Buffalo.

Wieland Larson, L.M., E.T. Zapel, S.J. Schlenker, R.T. Lee, and S.C. Milligan, 2001. "Predictive Computer Models of Adult Fishways and Application at U.S. Army Corps of Engineers Dams. Written for American Fisheries Society 2002 Conference, Baltimore.

Klingeman, P., Wieland, L.M., Elbert, K.R., Lorz, T.K., 1996. "Surface Bypass Collector Concepts and Performance." Written for the North American Water and Environment Congress held June 1996.

Wieland, L.M. and Klingeman, P., 1995. "Surface-Oriented Bypassing of Juvenile salmonids at main-Stem Columbia Snake Dams." Written for the First Annual Pacific Northwest Water Issues and 1995 Pacific Northwest/Oceania Conferences. February 1995.

References:

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