

Peter Willing, Ph.D.

Water Resources Consulting, L.L.C.

1903 Broadway Y Bellingham, Washington Y 98225 Y 360-734-1445 Y 360-676-1040 (fax) Y pwilling@telcomplus.net

EDUCATION

B.A., University of Washington, Seattle, Washington
M.S., Ph.D., Cornell University, Ithaca, N.Y.

PROFESSIONAL AFFILIATIONS

American Water Resources Association
American Geophysical Union

SELECTED SPECIALIZED TRAINING

Applied Fluvial Geomorphology: Wildland Hydrology Center, Pagosa Springs, Colorado
Stormwater Treatment: Biological, Chemical, and Engineering Principles. Professional Engineering Practice Program, University of Washington

SUMMARY

Dr. Willing is Principal in the Bellingham firm of Water Resources Consulting, L.L.C. Since founding the firm in 1989, he has carried out a wide variety of assignments for public and private clients seeking to solve water-related technical questions. Examples are: hydroelectric system design, flood frequency analysis on Northwest rivers, wellhead protection, surface water - ground water interactions, storm water management strategy, and hydrologic basis of water rights. In public sector positions, he has served as general manager of a medium sized public water system. He also served as chief environmental officer of a large municipal electric utility. Dr. Willing holds Adjunct Faculty appointments in Geology and Huxley College at Western Washington University, Bellingham.

SELECTED PROJECT EXPERIENCE

Review of surface and ground water hydrology associated with the possible construction of a third runway at Sea-Tac Airport. Questions under investigation include permeability and water storage characteristics of imported fill materials, effectiveness of stormwater management measures, compliance with water quality provisions of the King County Surface Water Design Manual, effect of fill on wetlands and stream flows, and project effects on anadromous fish. November 1999 - February 2001.

Water supply source investigation for determination whether the source is under the influence of surface water. Project includes multi-site water quality monitoring, source intake design, microscopic particulate analysis, and a geohydrologic investigation of a complex of juxtaposed unconsolidated glacial, metamorphic, and volcanic geological systems. Client: Puget Sound Energy

Design and implementation of geohydrologic investigation for new ground water supply, with special emphasis on hydraulic continuity between ground and surface waters. Project includes securing drill and test permit, engaging driller, logging the well, overseeing a pump test, high resolution surface water flow measurements, collecting and analyzing the data, geologic mapping, and writing completion report. 1997.
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Exhibit	345
Date	2/15/02
Witness	Willing
Diane Mills, Court Reporter	

AR 021136

Geohydrologic evaluation of Lummi Island public water supply wells in support of water rights application, including 24-hour pump test, monitoring observation wells, analysis of data, and project report. 1997.

Reconnaissance investigation of surface water storage potential of the Nooksack Basin, Washington. Project included a review of prior studies, hydrology, current water demands, and project costs. 1997.

Preparation and compliance monitoring of NPDES permits for industrial gas manufacturing facility. Responsibilities included both process wastewater and storm water permits, analysis and recommendations on process flow control, best management practices from regional surface water design manuals, and waste stream management. 1992-1997.

Alluvial fan and debris flow hazard element of Comprehensive Flood Hazard Management Plan, Lower Nooksack River, Whatcom County, Washington. This element consisted of field investigation in support of hydrologic and geomorphologic analysis of two high-gradient streams. 1995-6. Client: Whatcom County Flood Control Zone District

Assessment and expert testimony on hydrologic basis and technical adequacy of contested water rights application, San Juan Island, Washington. Case was heard by Washington Pollution Control Hearings Board as Fleming et al. v. Department of Ecology, 1994. Client: private party appellants.

Miscellaneous water rights investigations involving adequacy of water supplies, well interference, salt water intrusion potential, and hydraulic continuity between surface and ground waters. 1997. Clients: individual parties.

Hydrologic and geohydrologic data needs assessment in support of potential basinwide water rights adjudication. The preparatory work on this project is designed to support development of a hydrologic and water rights accounting model. Client: Nooksack Basin Water Users Steering Committee

Preparation of Wellhead Protection Programs for small cities and public water supplies. Components include assessment and compilation of existing data, aquifer delineation, contaminant source inventory, storm water management design, and provision of alternative water supply. Clients: City of Everson, City of Sumas, Pole Road Water Association.

Hydrology element of Comprehensive Flood Hazard Management Plan, Lower Nooksack River, Whatcom County, Washington. This element consisted of a review of the adequacy of the stream flow record, previous flood frequency analyses, and potential error and uncertainty in flood frequency estimates. Client: Whatcom County Flood Control Zone District

Water rights review for industrial facility in Whatcom County. This assignment involved documentation of historical water use and claim to water that go back to before the turn of the century. The purpose of the effort was to position the client to advantage in the current climate of water rights regulation by the State of Washington.

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Snoqualmie River Shallow Aquifer Evaluation. This project consists of a two-year investigation of hydraulic continuity between the pool behind Snoqualmie Falls and the local shallow aquifer. Key questions are effect of river stage on sewer inflow, wetlands, building foundations, and construction conditions. Client: Puget Sound Power & Light.

Primary technical witness in siting of industrial landfill in Whatcom County. This project consisted of an independent review of the geohydrology report submitted by the landfill applicant in support of the application for the landfill, and expert testimony on that review. Client: Private landowner.

Hydrogeologic evaluations of sand and gravel mining and landfill proposals in glacial outwash deposits on the margins of the Nooksack River in Whatcom County, Washington. These investigations have established local gradients and flow directions in the vicinity of gravel mining operations. Different projects have been completed, both for gravel mining clients and others who perceived themselves to be affected.

Review of rainfall and runoff hydrology in support of design of small hydroelectric installation on Baranof Island, Alaska. Project involved use of HEC-1, HEC-2, WaterWorks, and other hydrologic models. Client: City and Borough of Sitka.

Principal investigator for low flow frequency and water supply risk study on the Nooksack River, Whatcom County, Washington. Client: Whatcom County Public Utility District #1.

Consultant for aquifer recharge area delineation, Whatcom County, Washington. Project undertaken in support of Critical Areas Ordinance to be adopted pursuant to the Washington State Growth Management Act.

Project manager and surface water hydrology investigator for groundwater resource evaluation, for Lummi Indian Business Council, Whatcom County, Washington.

Project manager for review of power operations plan and fish and wildlife mitigation plan for Kerr Dam, Flathead River, Montana. Client: Bureau of Indian Affairs.

Preparation of Initiating Memorandum and preliminary scope of work for US \$3M investigation of Southern African river basins. The project is designed to provide water resources focus to major World Bank grant-in-aid program.

Project manager and client liaison for runoff forecast model development project, for the Cedar and South Fork Tolt Rivers, King County, Washington. Work carried out for the Seattle Water Department.

Project manager for hydroelectric power plant efficiency improvements for Puget Sound Power and Light Company's White River plant. Project consists of application of linear and dynamic programming and optimization techniques to interactions between hydraulics, energy value, and hardware.

Analyst for hydrologic and environmental screening of 1,200 potential small-scale hydroelectric sites in British Columbia, on behalf of independent power producer with interests in B C Hydro's resource acquisition program.

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System planning, operations efficiency, and source evaluation for water supply and hydroelectric facilities.

Contributor to Coordinated Water Supply System Plan for six-utility area with 250,000 population. Project elements consisted of demand projections, evaluation of existing and planned capacity expansion, and evaluation of alternatives for meeting projected demand.

Researcher for assessment of U.S. groundwater management strategies and their suitability for the Puget Sound lowland.

Participant in oversight of lake restoration program for Lake Whatcom, Whatcom County, Washington. Reviewed water quality sampling regime, interim findings, and final analysis and interpretation. Participated in steering committee deliberations, final drafting of Watershed Management Plan, and presentation to local government.

Chief administrative officer for water and sewer utility, which included responsibility for raw surface water source monitoring and protection. Devised watershed management policies and documented land use - water quality interactions.

Expert witness in litigation concerning adequacy of Environmental Impact Statements prepared under Washington State Environmental Policy Act. Witness before the Pacific Northwest Power Planning Council on fish and wildlife aspects of implementing the Pacific Northwest Electric Power Planning and Conservation Act.

Visiting Lecturer, upper division courses in surface water hydrology and water resources policy; Department of Geology and Huxley College, Western Washington University.

Investigator for design and implementation of an analysis of the interactions between watershed land use and receiving lake water quality for a 205-square-mile lake basin in Cayuga County, New York. Participated in water quality sampling and analysis program. The lake in question is the water source for the City of Auburn.

Principal researcher for report on costs of fish and wildlife mitigation and enhancement measures in the Columbia River Basin.

Team participant in multi-national effort to research and recommend coal transportation environmental standards for Pacific Rim developing countries.

Responsible official for preparation of Environmental Impact Statement on Copper Creek Dam, Skagit County, Washington. Important issues included anadromous fisheries, riparian habitat, power generation, hydrologic effects, and water rights.

Team manager for preparation of environmental documents in support of FERC application for a hydroelectric installation on the South Fork Tolt River, King County, Washington.

Supervisor of analysis of environmental aspects of rehabilitating the Cedar Falls hydroelectric project, King County, Washington.

Consulting analyst on water resources and environmental consequences of Seattle's participation in construction of proposed coal-fired generating station in Spokane County, Washington.

Project investigator on effects of state electric rate regulation on coal-fired power plant emissions in Wyoming.