



Chuck Manning, PE, CFM

Project Engineer, Stormwater and Drainage

Areas of Expertise

Stormwater Management and Permitting
Surface Water Quality
Hydraulic/Hydrologic Engineering,
Stream Rehabilitation and Fish Passage

Years of Experience

18

Education

MS, Agricultural Engineering,
University of Arizona, 1993
BS, Agricultural Engineering,
University of Arizona, 1987
BA, Political Science, University of
Washington, 1980

Registration/Certification

Professional Engineer, 1995,
Washington #32663
Certified Floodplain Manager, 2006

Professional Societies/Affiliates

American Society of Agricultural
Engineers

Overview

Mr. Manning is an agricultural engineer with research and consulting experience in the fields of surface water quality, stormwater management, hydrologic and hydraulic engineering, and stream rehabilitation and fish passage engineering. Mr. Manning has extensive experience in stormwater management, including drainage design and erosion and sediment control. He has authored numerous stormwater pollution prevention plans, and stormwater monitoring plans. Mr. Manning has provided hydrologic and hydraulic engineering support for numerous stormwater management and drainage projects, and for several stream rehabilitation projects. He is experienced in surface water quality sampling methods.

Project Specific Experience

Storm Sewer Design Study, Exxon Chemical Company, Baton Rouge, Louisiana. Assistant project engineer for a study of a large chemical plant's storm drainage system. Ground-truthed the stormwater system maps, and performed rainfall-runoff analyses to evaluate the adequacy of the stormwater drainage system under changed conditions and new fire-flow standards. Recommended system modifications (pipe replacements, rerouting) to address potential problems revealed by the analyses.

Stormwater System Analysis, Shell Oil Company, Norco, Louisiana. Assistant project engineer for hydrologic analyses for large refinery that was experiencing drainage problems. Performed rainfall/runoff analyses and storm routing, and recommended system improvements including culvert upgrades and installation of a pump station and force main.

Stormwater Diversion Study, Gaylord Container Corporation, Bogalusa, Louisiana. Project engineer for hydrologic analysis at a pulp and paper mill to identify ways to minimize commingling of process wastewater and stormwater runoff, in order to reduce flows and bypasses of the facility's wastewater treatment plant. Performed hydrologic analyses and recommended engineering solutions.

Spent Bauxite Landfill Drainage Design, Kaiser Aluminum, Gramercy, Louisiana. Assistant project engineer for drainage design. Performed drainage calculations and sized and laid out the underdrain system for a spent bauxite landfill at the aluminum refinery.

Pacific Mountain Energy Center, Energy Northwest, Kalama, Washington. Author of the water resources section for the draft EIS. Managed the NPDES permit application which involved preparing an Engineering Study supporting the stormwater drainage and treatment systems and the industrial wastewater treatment system to be used. The



study include mixing zone modeling and AKART analyses of treatment options.

Deer Mountain Landfill NPDES Support, City of Ketchikan, Ketchikan, Alaska. Prepared Stormwater Pollution Prevention Plan and Stormwater Monitoring Plan for NPDES compliance for municipal solid waste landfill.

Stormwater Pollution Prevention Plan, U.S. Air Force, Mountain Home Air Force Base (AFB), Idaho. Project engineer and principal author for the preparation of the plan to comply with the NPDES Multi-Sector General Permit for Stormwater Discharges. Performed field evaluation of stormwater drainage and management practices at more than 50 industrial facilities on base. Evaluated potential new practices, and incorporated selected practices into plan.

Stormwater Pollution Prevention Plan and Stormwater Monitoring Plan, Fort Wainwright, Alaska. Project Engineer and principal author for the plan to comply with the NPDES General Permit for Stormwater Discharges Associated with Industrial Activities. Performed field evaluation of stormwater drainage and 40 industrial facilities on post. Evaluated potential new practices, and incorporated selected practices into plan. Conducted training of facility personnel required by the permit.

Stormwater Pollution Prevention Plan, U.S. Army Yakima Training Center, Yakima, Washington. Project engineer and principal author for the plan to comply with the NPDES General Permit for Stormwater Discharges Associated with Industrial activities. Performed field evaluation of stormwater drainage and management practices at more than 30 industrial facilities on post. Evaluated potential new practices and incorporated selected practices into plan.

Stormwater Pollution Control Plan, Department of Public Works, City and County of Honolulu, Hawaii. Assistant project engineer for the preparation of plans for several closed municipal landfills operated by the City and County of Honolulu. Reviewed drainage and hydrologic characteristics of the site and recommended erosion and sediment control measures.

Stormwater Pollution Prevention Plan, Ketchikan Pulp Company, Ward Cove, Alaska. Assistant project engineer for the plan for a landfill closure to comply with the NPDES General Permit for Stormwater Discharges from Construction Activities. The plan detailed erosion and sediment control measures and management of construction materials to prevent pollution of adjacent water bodies.

Stormwater Pollution Prevention Training, Tongass National Forest, United States Forest Service, Petersburg, Alaska. Conducted training for Forest Service personnel required by the Service's NPDES permit for discharge of stormwater from log transfer facilities (LTFs).



Puget Sound Naval Shipyard Stormwater Treatment Study, U.S. Navy, Bremerton, Washington. Managing study to select appropriate treatment system to remove high copper levels from dry dock stormwater runoff at Navy shipyard, for compliance with the shipyard's NPDES permit. Study includes hydrologic analysis, bench-scale filter media testing, treatment alternatives analysis, and development of design parameters for full-scale treatment system.

Naval Air Station Whidbey Island, U.S. Navy, Oak Harbor, Washington. Managing project to prepare NPDES wastewater permit renewal application and biosolids disposal permit application for Naval Air Stations wastewater treatment plant. Project involves wastewater and sludge sampling and analysis, negotiations with regulatory authority (EPA Region X) and preparation of application materials.

Stormwater Comprehensive Plan, City of Arlington Public Works Department, Arlington, Washington. Project engineer for update of Arlington's stormwater comprehensive plan, to comply with Growth Management Act and NPDES Phase II requirements.

Stormwater Pollution Prevention Plan and Engineering Study, Arlington Municipal Airport, Arlington, Washington. Managing project to develop SWPPP for compliance with airport's State Industrial Stormwater Discharge Permit, and to analyze hydrology of airport to determine appropriate fees to be charged by new city stormwater utility.

Newport Creek Stream Rehabilitation, City of Bellevue, Bellevue, Washington. Managing project to design stream improvements for salmon habitat and passage. Designing stream improvements and fish passage structures using hydraulic sediment management techniques that will result in a stable stream supportive of the full range of conditions needed to sustain salmon populations in the creek.

Sears Creek, City of Bellevue, Bellevue, Washington. Providing engineering support for design of stream improvements for a reach of a small urban stream, to enhance salmon habitat and improve salmon access to the reach. The design goal is to maximize benefits for spawning salmon. Hydraulic sediment management techniques will be used to maintain clean spawning gravel. Hydraulic design of a bypass intake will improve fish passage access into the reach.

Upper Richards Creek, City of Bellevue, Bellevue, Washington. Providing engineering support for design of fish habitat and passage improvements for an urban stream. The design includes hydraulic management of significant sediment loads, both to maintain stable habitat and to preserve hydraulic capacity in the stream and prevent flooding.

Saar Creek Sediment Trap and Fish Bypass Channel, Whatcom County, Washington. Design engineer for project to manage sediment in a naturally sediment-laden stream, in order to enhance salmon



spawning habitat and prevent flooding. Hydraulic sediment management techniques are being used to pass coarse-grained sediment into the sediment trap, while leaving the low-flow bypass channel relatively sediment free and suitable for salmon habitat.

Elwha River Municipal Water Supply Intake Diversion Fish Passage and Siting Study, United States Bureau of Reclamation, Port Angeles, Washington. Developed conceptual design for diversion structure for municipal/industrial water supply intake and associated fish bypass channel. Used hydraulic management techniques to design structures capable of preventing sedimentation of the intake during the period following dam removal when sediment loads are expected to be large, and later when sediment loads will have returned to lower levels. The siting study will determine the appropriate location for the intake, based on hydraulic management of the sediment and fish passage criteria.

Longfellow Creek Rehabilitation, City of Seattle, Seattle Public Utilities, Seattle, Washington. Provided engineering support for design of habitat and fish passage improvements for an urban stream in Seattle. Work included assessment of sediment sources, hydraulic management of sediments, and channel and culvert design for fish passage.

Tongue Point Landfill Remedial Design, U.S. Army Corps of Engineers, Tongue Point, Oregon. Preparing design documents and specifications for temporary erosion and sediment control and surface water control (drainage and culvert design) during remediation at an inactive Department of Defense landfill.

Erosion and Sediment Control Plan, Ketchikan Pulp Company, Thorne Bay, Alaska. Assistant project engineer for the capping of a landfill that had received municipal and industrial wastes. Prepared erosion and sediment control plan to protect adjacent wetlands and streams.

Landfill Closure Plan, City of Burlingame, California. Assistant project engineer for the landfill closure plan. Performed the rainfall runoff analysis and conceptual design of the surface drainage system. The design included surface swales, subsurface pipes, culverts and energy dissipation structures.

Falgout Canal Wetland Restoration, Terrebonne Parish, Houma, Louisiana. Assistant project engineer for coastal wetland restoration project. Prepared a conceptual design and engineering feasibility study. Designed a mobile, barge-based pump station and a slurry pipeline for the distribution of dredged Mississippi River sediments in a coastal marsh.

Judy Reservoir Expansion Temporary Erosion and Sediment Control. Skagit County PUD No. 1, Mt. Vernon, Washington. Prepared Temporary Erosion and Sediment Control Plan for project to increase capacity of the water supply reservoir. Protection of the water



supply during construction was critical. Project also included protection of water quality in Janicki Creek, which flows adjacent to the reservoir and through the borrow area for dam-building materials.

Clarks Creek Pollution Reduction Study, City of Puyallup, Puyallup, Washington. Managing project to identify sources of pollution and develop management alternatives for urban creek. Data may be used to develop Total Maximum Daily Load allocations for the creek.

Steilacoom Lake TMDL Study, Pierce County Surface Water Management Division, Tacoma, Washington. Analyzed Total Maximum Daily Load phosphorus allocations for Steilacoom Lake, as promulgated by EPA Region X. Developed basis for challenge of TMDL based on technical merits of EPA's estimation of natural phosphorus loading rates from the lake's watershed. Concluded that the natural phosphorus loading to the lake is probably a larger portion of the total load than is acknowledged in the TMDL.

Guidelines for Stormwater Management 1999 Update, Spokane County, Washington. Managing project to update Spokane County's stormwater management regulations. Project involves complex technical issues and a large public participation component.

Mill Creek Water Quality Plan, City of Kent, Washington. Prepared sampling and analysis plan for water quality data collection in lower Mill Creek. Collected streamflow, pH, DO, temperature and sediment oxygen demand data to be used to develop approaches to mitigating low dissolved oxygen and high temperatures in the creek.

Stormwater Management Manual for the Puget Sound Basin, Washington State Department of Ecology, Olympia, Washington. Served as assistant project engineer on the URS project team that reviewed the manual, evaluated the manual's best management practices, and recommended revisions to the manual.

Stormwater Quality Monitoring Guidance Manual, Washington State Department of Ecology, Olympia, Washington. Assistant project engineer for the development of this manual, which serves as a tool to aid in the development of realistic, cost-effective monitoring approaches to support stormwater quality management planning. Contributed to the stormwater sampling methods and sediment monitoring sections of the manual.

McNeil Island Boatyard Wastewater Treatment System Engineering Study, Washington State Department of Corrections, Washington. Project engineer for study of treatment/disposal of hull washwater at a small boatyard. Evaluated three options: (1) contracting work out to eliminate the generation of wastewater, (2) connection to a wastewater treatment plant, and (3) an evaporator system. Recommended the evaporator system, due to the small volume of wastewater generated.



Chronology

1988-1989: U.S.D.A. Water Conservation Laboratory, Tucson, Arizona,
Engineering Technician

1987-1988: University of Arizona, Tucson, Graduate Research Assistant

1983-1987: University of Arizona, Tucson, undergraduate degree

1980-1983: United States Peace Corps, Agriculture Science Teacher