

Education

M.S., Civil Engineering
University of Idaho

B.S., General Engineering
Idaho State University

Professional Certification

Professional Engineer
Idaho No. 7914, 1995

Oregon No. 84533PE, 2010

Certified Water Right Examiner

Idaho No. 133

Oregon No. 84533CWRE

Professional Affiliations

Member, ASCE

Member, AWRA

Areas of Expertise

- Water rights
 - investigations and analysis
 - permits and transfers
 - marketing and acquisitions
- Water resource investigations
- Water well design
- Surface water modeling
- Gravity irrigation systems
- Stream flow measurement
- Pipe flow measurement
- Pumping efficiency evaluations

Experience Summary

Mr. King has over 21 years of professional and academic experience in water resources engineering. He is currently a Supervising Engineer with SPF Water Engineering, LLC and specializes in water right issues, water flow measurement, open-channel flow, pumping system design, water well design, and geographic information systems (GIS). Prior work includes 14 years experience in a broad variety of Idaho Department of Water Resources' (IDWR) programs including water rights adjudication, water rights administration, safety of dams, and energy efficiency. He also has experience developing surface water models and providing consulting engineering services while employed at DHI, Inc, formerly known as the Danish Hydraulic Institute.

SPF Water Engineering, LLC – 2005 to present

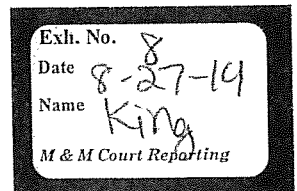
Mr. King is currently a Supervising Engineer with SPF Water Engineering, LLC. SPF was founded in March 2004 to provide hydrologic characterization, water resource development, and public water system design and regulatory compliance. Mr. King provides consulting services on water rights issues, pump design, irrigation system evaluation, surface water hydrology, surface water modeling, and river hydraulics. His recent project experience includes the following:

- Extensive water right experience including
 - permit and transfer applications
 - mitigation plans
 - investigations and analysis
 - acquisitions and sales
 - beneficial use field examinations
 - adjudication claim preparation and support
- Gravity irrigation system design and analysis
- Stream flow measurement and monitoring
- Conveyance capacity determinations for streams, culverts, and other open-channel systems
- Water well design including designs to municipal public drinking water supply standards
- Well capacity determination
- Pumping system design

DHI, INC – 2004 to 2005

Mr. King worked as a senior project engineer responsible for development of various surface water models. Project experience includes the following:

Modeling – MIKE 11. Developed hydrodynamic 1-D MIKE 11 model of the Little Claggett Creek storm water drainage system, a part of Marion County's East Salem Service District, Oregon. Produced flood maps for SCS Type 1A design storms and for the February 1996 flood event. This



model includes 8.5 km of streams in two branches, over 100 cross-sections extracted from a 2 ft vertical resolution DEM, and 23 culverts with corresponding broad-crested weirs representing roadways over culvert crossings. Inflow boundary conditions are represented by 21 catchments contributing point-source and distributed inflows simulated in MIKE 11's rainfall / runoff module.

Modeling – MIKE BASIN. Project lead on MIKE BASIN surface water distribution models developed for the Idaho Department of Water Resources. These models are used by IDWR for three primary purposes: flow enhancement tools to address flow-limited stream reaches; decision making tools to assist in selecting effective mitigation and restoration projects; and communication tools for educating decision makers and stimulating discussion among stakeholders. Developed systems include the Pahsimeroi River and East Fork Salmon River, and experiences with Lemhi River and Stanley Basin models. These models operate on a daily time step and represent the water distribution system within the basins including the stream networks, points of diversion, places of use, and locations of return flow. Time series information includes records of stream gaging, diversion measurements, precipitation, and evapotranspiration. Provided training to IDWR staff, contractors, and watermasters on the operation of MIKE BASIN through a series of hands-on sessions. Presented proposals to local waterusers and stakeholders for new model applications in Morgan Creek and Carmen Creek.

Modeling – Rainfall / Runoff. Developed lumped conceptual rain/snow/runoff models of the Stanley and East Fork Salmon River Basins for the Idaho Department of Water Resources using DHI's lumped conceptual rainfall/runoff module. The developed models are used to supply tributary inflow boundary conditions to the East Fork Salmon River and Stanley Basin MIKE BASIN models.

Developed rainfall/runoff models of 21 catchments supplying inflow boundary conditions for the Little Claggett Creek MIKE 11 model described above. Rainfall/runoff is simulated using DHI's URBAN module. Four storm events are modeled including the February 1996 observed event and SCS Type-1A 2-, 10-, and 50-year design storms.

Idaho Department of Water Resources – 1990 to 2004

During 14 years with the Idaho Department of Water Resources, Mr. King held four engineering positions and gained experience in a wide range of IDWR activities. These positions included Technical Engineer in the Adjudication Bureau, and Staff Engineer positions in the Water Distribution Section, in Western Region's Safety of Dams unit, and in the Energy Division. Relevant experience includes the following:

Program Management

Managed Western Region's Safety of Dams program. Inspected dams and made recommendations for maintenance and operation to improve safety and meet state standards. Issued storage certificates and authorizations to

fill.

Lead technical consultant in statewide water measurement program. Defined water measurement standards and implemented a program for measuring and reporting ground-water withdrawals. Coordinated field work performed by department staff and various measuring districts. Inspected contractor projects for adequacy and compliance with department standards. Designed and managed water measurement databases.

Water Rights

Reviewed complex water right claims and prepared water right recommendations for the Director's Report to the Snake River Basin Adjudication court. Provided technical analysis and recommendations for nonstandard water right claims, such as claims for diversion rates exceeding the standard allocation, and for claims to the use of water outside of the standard seasons of use.

Provided training and direction to new employees, water districts, water measurement districts, groundwater districts, and private consultants on water rights, water measurement programs, and adjudication procedures.

Worked with water users and their legal representatives on various water right enforcement issues, including excessive and illegal water diversions.

Experienced with all aspects of IDWR regional office operations including water rights, transfers, well drilling, adjudication, water district operation, violations, enforcement, and customer complaints.

Irrigation and Pumping Systems

Performed pumping system evaluations including determinations of municipal, industrial, and agricultural pumping plant efficiencies and recommended measures for improved efficiency and reduced operating costs. Provided recommendations and designs for conversions to low-pressure irrigation systems for reduced operating costs and improved yields.

Technical Expert to Snake River Basin Adjudication (SRBA) Court

Provided technical engineering support to department staff in the ongoing SRBA.

Designated as department expert to the SRBA court regarding irrigation requirements, evapotranspiration, and crop water requirements. and how this information is utilized for preparing recommendations.

Public Relations

Presentations at public meetings to explain laws and regulations relating to water measurement and water appropriation.

Provided conflict resolution support for several water related disputes.

Trained IDWR employees, state Watermasters and Hydrographers, contractors, and consultants on water measurement standards, equipment, practices, and procedures through regular training sessions and individual assistance.

Guest lecturer in 1996 and 1998 for College of Southern Idaho's Water Measurement course, and in 1998 for Boise State University's Water Measurement lab.

Presented *Selection and Installation of Pipe Flow Water Measurement Devices* at the 1997 Idaho Irrigation Equipment Show and Exhibition, Shilo Inn, Idaho Falls, January 8-9.

Technical

Developed and proposed to department administration and to the general public technically sound methods of using power records for estimation of pumped water diversions.

Determined acceptability and provided professional opinions for numerous non-standard water measurement methods and devices proposed to IDWR by engineering consultants and water users.

Determined conveyance capacity of pumps, diversions, pipelines, open channels, turbines, etc.

Led IDWR efforts to utilize global positioning systems (GPS). Developed standards for use, trained staff and consultants, and integrated GPS data collection into GIS work.

Report Development

Authored various reports including annual reports of ground water diversions, reports to individual water users, flowmeter accuracy reports, and various other reports relating to water measurement.

Co-author of *Eastern Snake Plain Aquifer Water Measurement Program, A Summary of Measurement Activity & Results from Basin 36 Project Area, 1995-1996 and a Review of Program Expansion in 1997*, IDWR, May 1998.

University of Idaho – 1999 to 2002

Masters of Science in Civil Engineering Thesis: The Effective Discharge Concept in Gravel Bed Stream Restoration: The Twelve Mile Reach of the Salmon River at Challis, Idaho.

Determined channel effective discharge based on sediment transport measurements and flow records. Compared effective discharge to bankfull discharge and stated implications of findings in regards to channel restoration. Completed hydraulic, hydrologic, and geomorphologic

characteristics of the study reach. Presented findings and recommendations to technical groups and local property owners.

Developed hydrodynamic pseudo 2-D MIKE 11 model of the Twelve Mile Reach, Salmon River, near Challis, ID. Produced animated flood maps of primary flooding events from 1974 (100-yr), 1996, and 1997. This model includes 27-km of mainstem river including braided sections and split flows. Over-bank discharge into Hannah Slough and across One-Mile Island is represented by link-channels. The model includes 68 surveyed cross-sections and utilizes a 2-ft interval contour map for flood mapping.