Karl J. Dreher

Idaho Department of Water Resources
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EDUCATION

B. S. in Civil Engineering – 1971, Colorado State University
M. S. in Civil Engineering – 1973, Colorado State University

LICENSES AND REGISTRATIONS

Professional Engineer – Colorado and Idaho

SUMMARY OF EXPERIENCE

1995 – Present Time ***State of Idaho***

Title / Accomplishments ***Director, Idaho Department of Water Resources***

- Resolved issues and conflicts that had stymied the Snake River Basin Adjudication
- Brought science-based view to debate concerning flow augmentation for Snake River salmon
- Established policies for conjunctive management of ground and surface water supplies
- Initiated studies for principal groundwater systems using public/private partnerships
- Negotiated rules implementing provisions of interstate compact on water deliveries
- Drafted and implemented legislation providing for future municipal water supplies
- Drafted other legislation and issued rules and orders improving water management
- Established framework and funding for updating Department's computer systems
- Provided leadership in improving efficiency in the Department's functions
- Current Chairman of Western States Water Council

1986 – 1995 ***Northern Colorado Water Conservancy District***

Title / Accomplishments ***Head, Engineering Services Branch***

- Engineering Manager – Operations/Maintenance, water rights, irrigation management
- Program/Project Manager – Cooperative 110-mile pipeline water supply project
- Project Manager – Regional water supply study (integration of existing supplies)
- Construction Manager – Modifications to dams
- Case Manager – Water rights litigation
- Project Manager – Feasibility of water storage/hydroelectric power project

1982 – 1986 ***Stone & Webster Engineering Corporation***

Title / Accomplishments ***Consultant (1984 – 1986)***
Senior Structural Engineer (1982 – 1984)

- Panel Member – National Research Council Panel on Earthquake Engineering
- Project Manager – Stability analyses of White Mountain Dam, China
- Consultant – Power plant modifications at Theodore Roosevelt Dam, Arizona
- Project Engineer – Seismic Stability of Baker River Project dams, Washington
- Consultant – Finite element analysis techniques for concrete dams

for California Division of Dam Safety
Southern Company Services – Birmingham, Alabama
United Nations Research Station – Pune, India

1975 – 1982 ***U. S. Bureau of Reclamation – Concrete Dams Section***

Title / Accomplishments ***Head, Analytical Design Group (1978 – 1982)***
Civil & Structural Engineer (1975 – 1978)

- Tech. Manager – Seismic stability analyses of Stony Gorge Dam, California
- Tech. Manager – Stability analyses for Theodore Roosevelt Dam, Arizona
- Tech. Manager – Feasibility & final designs for Upper Stillwater RCC Dam, Utah
- Tech. Manager – Construction analyses of post-stressed arch dam, New Mexico
- Tech. Manager – Stability of Stewart Mtn. Dam (alkali-aggregate reaction), Arizona
- Tech. Manager/Project Engineer – Seismic stability of Auburn Dam, California

1973 – 1975 ***Denver Water Department***

Title / Accomplishments ***Senior Assistant Design Engineer (1974 – 1975)***
Water Resources Engineer (1973)

- Design Engineer – Harriman Lake hydraulic control structure
- Design Engineer – Moffat Water Treatment Plant hydraulic control structure
- Design Engineer – 10-mile long, 72-inch diameter pipeline project
- Planning Engineer – Extension of raw water supply system

DESCRIPTION OF EXPERIENCE

Mr. Dreher is the current chairman of the Western States Water Council and has more than 30 years of experience in developing and managing water resources covering a broad spectrum of disciplines. His experience includes interstate negotiations, developing legislation, water rights, water law, water policy, water treatment, environmental issues, planning, program/project management, construction management, personnel management, contract negotiations, hydraulic analysis and design, structural analysis and design, and permitting for projects. Mr. Dreher has been involved with water resource projects in various countries throughout the world and has served as a consultant to a number of public as well as private organizations involved in the development and management of water resources.

Currently, Mr. Dreher is in his third term as the Director of the Idaho Department of Water Resources. Appointed by the Governor of Idaho, Mr. Dreher is the senior executive responsible for all aspects of the Department's multi-office based services to the people of Idaho. With a $20 million annual budget, the Department of Water Resources has about 200 employees organized into four divisions: Water Management; Planning and Technical Services; Energy Resources; and Support Services.

The Water Management Division administers appropriations of water and water right transfers and serves as the technical expert to district courts adjudicating water rights decrees. The Division also supervises the diversion and use of water under established water rights, licenses well drillers and regulates the drilling and use of wells, regulates the modification of natural stream channels (in corroboration with the U. S. Army Corps of Engineers), and administers Idaho's participation in the National Flood Insurance Program. Additionally, the Water Management Division is responsible for ensuring that dams constructed for water storage or impoundment of mine tailings are properly designed, constructed, operated, and maintained.

The Planning and Technical Services Division provides staff support for the Idaho Water Resource Board, the members of which are also appointed by the Governor of Idaho. The IdahoWater Resource Board formulates, implements, and maintains the State Water Plan; underwrites revenue bonds and provides loans and grants for water development and conservation projects; appropriates water for minimum stream flows; and represents Idaho in negotiations with Indian tribes and the federal government regarding water rights. The Planning and Technical Services Division also collects and maintains hydrologic data from throughout Idaho, performs hydrologic and hydrogeologic assessments and modeling studies, monitors the quality of groundwater statewide, monitors development and changes to the state's geothermal aquifers, and provides assistance to public organizations throughout Idaho in developing and implementing geographic information systems and remote sensing technology.

The Energy Resources Division implements energy conservation programs and promotes the utilization of cost-effective renewable energy resources with funding from the U. S. Department of Energy and the Northwest Energy Efficiency Alliance. The Energy Division provides energy efficiency training and technical assistance throughout Idaho and, in some instances, throughout the Pacific Northwest; assists local governments, school districts, and public institutions in obtaining funds to improve energy management; provides low-interest loans from court-awarded damages for petroleum pricing violations to individuals and institutions desiring to

implement energy efficient technologies and practices; assists farmers in implementing advanced water management and other practices; develops residential and commercial energy codes and standards; and conducts cooperative research programs in the development of alternative fuels such as diesel blends using rapeseed and used vegetable oils.

Prior to his appointment as the Director of the Idaho Department of Water Resources, Mr. Dreher was the Head of Engineering Services (Engineering Manager) for the Northern Colorado Water Conservancy District. The tasks performed under Mr. Dreher's leadership included water resource planning and feasibility studies (including studies for dams and reservoirs and including economic and financial analyses), water rights evaluations, water rights litigation, expert testimony, operations planning, negotiation and management of design and construction contracts, and agricultural engineering assistance to area farmers.

Mr. Dreher also served as the District's Program/Project Manager for the design and construction of the Southern Water Supply Project. This project consists of approximately 110 miles of buried pipelines ranging in diameter from 60 inches to 18 inches. The project enhances the conveyance capacity and integration of raw water supplies for municipalities and industries in the southern and eastern portions of the District's service area.

The Southern Water Supply Project was the result of a planning study directed by Mr. Dreher to develop alternatives for providing future water supplies to municipalities and industries in a multi-county region along the front range of the Rocky Mountains in northeastern Colorado. The plan focused on maximizing the use of existing resources and includes water supply, water treatment, and distribution components, as well as facilitating cooperative consensus among some 60 existing municipal and industrial water supply entities.

Before joining the Northern Colorado Water Conservancy District, Mr. Dreher was employed by Stone & Webster Engineering Corporation. During his association with Stone & Webster, Mr. Dreher directed the analysis and evaluation of the structural stability and performance of a 500-ft high concrete arch dam in the Peoples Republic of China. He also directed seismic stability analyses for a 285-ft high concrete arch dam, a 300-ft high concrete gravity dam, and a 285-ft high rockfill dam all located in northern Washington. Additionally, Mr. Dreher served as a consultant to the California Department of Water Resources Division of Dam Safety; the United Nations at the Central Water and Power Research Station in Pune, India; and the Southern Company Services in Birmingham, Alabama.

Prior to Stone & Webster Engineering, Mr. Dreher worked for the Bureau of Reclamation where he headed the Analytical Design Group in the Concrete Dams Section. During his tenure with the Bureau, Mr. Dreher performed or directed various levels of design, analysis, and evaluation for 7 major concrete dams and their foundations. These dams ranged in height from 140 ft to 690 ft and included arch, gravity-arch, gravity, roller-compacted gravity, and buttress type dams.

Mr. Dreher has also supervised rock mechanics studies to assess the effects of seepage and abutment deformation and to determine the stability of foundations for concrete dams. In addition, Mr. Dreher has been responsible for formulating design criteria for concrete dams and other structures and served on the National Research Council Panel on Earthquake Engineering for Concrete Dams.

SELECTED PUBLICATIONS

"Review of Survival, Flow, Temperature, and Migration Data for Hatchery-Raised, Subyearling Fall Chinook Salmon Above Lower Granite Dam, 1995-1998" Idaho Department of Water Resources, Idaho Water Resources Research Institute, and Idaho Department of Fish and Game; Boise, Idaho; September 2000 (principal author).

"A View on Idaho's Experience with Flow Augmentation" *Competing for the Mighty Columbia River – Past, Present and Future: The Role of Interstate Allocation*; American Bar Association Section of Natural Resources, Energy, and Environmental Law; Boise, Idaho; April 30 and May 1, 1998.

"Regional Water Supply Study" Northern Colorado Water Conservancy District; Loveland, Colorado; May 1991 (co-author and editor).

"Earthquake Engineering for Concrete Dams: Design, Performance, and Research Needs" Panel on Earthquake Engineering for Concrete Dams, Committee on Earthquake Engineering, National Research Council; Washington, D. C.; 1990 (co-author).

"Recognizing Institutional Barriers in Regionalizing Water Supply Infrastructure" Proceedings of an ASCE Symposium on Water Resources Infrastructure – Needs, Economics, and Financing; Fort Worth, Texas; 1990.

"Criteria for Evaluating Seismic Performance of Concrete Arch Dams" Proceedings of China – U. S. Workshop on Earthquake Behavior of Arch Dams; Beijing, China; 1987.

"As-Constructed Analyses of White Mountain Dam" Prepared for the China National Technical Import Corporation and Ministry of Water Resources & Electric Power, Beijing, China; Stone & Webster Engineering Corporation, Denver, Colorado; 1984 (primary author).

"Seismic Analyses of Baker River Dams" Prepared for Puget Sound Power and Light Company, Bellevue, Washington; Stone & Webster Engineering Corporation, Denver, Colorado; 1984 (primary author).

"Dynamic Stability of Concrete Dam Foundations" Proceedings for 5th International Congress on Rock Mechanics; Melbourne, Australia; 1983 (co-author).

"Preliminary Foundation Studies for Raising a Gravity-Arch Dam" Proceedings for 23rd U. S. Symposium on Rock Mechanics; Berkeley, California; 1982 (co-author).

"Seismic Analysis and Design Considerations for Concrete Dams" Proceedings of Conference at the Institution of Civil Engineers, Dams and Earthquakes; London, England; 1980.

Seismic Analysis of Concrete Dams" Proceedings of 13th International Congress on Large Dams, Volume 2, Q. 51, R. 11; New Delhi, India; 1979 (co-author).

"Design and Analysis of Auburn Dam" U. S. Department of the Interior, Bureau of Reclamation; Denver, Colorado; 1977 and 1978 (co-author).

"Procedures for Defining Earthquake Ground Motion" Presented at 1st Interagency Workshop Group Meeting for Earthquake Engineering Research Coordination, Denver Colorado; 1978.