



Fish Creek Canal Shutoff and Drain North Umpqua Hydroelectric Project

Roseburg, Oregon



Fish Creek is a high mountain stream, located in the North Umpqua National Forest east of Roseburg, Oregon, with flows ranging from a low of about 100 cfs to over 6,000 cfs. PacifiCorp owns and operates a 150 cfs hydropower diversion on the creek, which is part of their 185-MW North Umpqua Hydroelectric Development. Upon receipt of their new Federal Energy Regulatory Commission (FERC) license to operate the hydro-development, PacifiCorp has agreed to automate the shutoff and drainage of the 5 mile long diversion canal from Fish Creek to mitigate potential problems that can occur when the canal is blocked or damaged by land slides.

R2 was retained by PacifiCorp to provide all engineering, surveying, and environmental services associated with the canal shutoff and drainage system design. Key tasks include

Project Elements:

- Fish Passage and Protection
- Hydrologic Analyses
- Hydraulic Engineering
- Conceptual and Final Design
- Cost Estimating
- Agency Consultation
- Permitting

development of conceptual design alternatives and a recommendation of a preferred shutoff and drain solution, agency consultation as required by the FERC license, final design and permitting, cost estimating, and providing engineering services during the construction.



The remote site provided many challenges to the design, including automating the closure of the headgates and opening the new canal drains when a canal problem is identified, developing the

control logic to automatically detect a canal blockage or rupture, automation of the diversion to insure instream flow compliance while maximizing the diversion rate, and communications.

A variety of canal drain mechanisms, control, and communication configurations were evaluated. The recommended design utilizes a pneumatic system

at the headgates, unique weight actuated – exploding bolt released butterfly valves for the drains, and programmable logic controllers with radio communications for control.

