

# BAKER RIVER HYDROELECTRIC PROJECT

Providing power, protecting natural resources

PSE

PUGET SOUND ENERGY

The Energy To Do Great Things

The Baker River Hydroelectric Project in the north Cascade Mountains of Washington is the largest of Puget Sound Energy's three hydropower facilities.\* The Baker River project consists of two dams: Upper Baker Dam and Lower Baker Dam, each with its own powerhouse. The project also contains extensive facilities to move salmon and other fish around the dams and increase spawning. In addition, the project provides public access for boating and fishing, camping, hiking, and other recreational opportunities. Under federal authorization, PSE's two Baker River reservoirs also provide significant flood-control storage for people and property in the Skagit Valley.



Lower Baker Dam

## Power Output

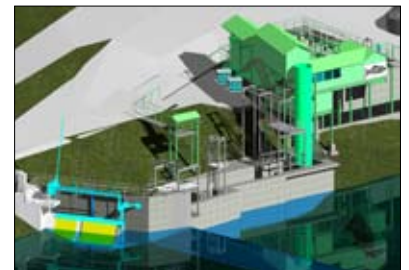
Lower Baker Dam can generate up to 79 megawatts of power, while Upper Baker Dam can produce 91 MW at maximum capacity. Together, the dams can serve the peak power demand of about 130,000 households. Over a year's time, the project's output serves the total power needs of 60,000 households.



Baker Lake Floating Surface Collector

## Fish-Enhancement Facilities

PSE's construction of Lower Baker Dam in the 1920s included specialized facilities for helping salmon and steelhead migrate around the new structure. Over the years, PSE has periodically upgraded the project's fish-enhancement facilities or replaced them altogether with more scientifically advanced equipment. These upgrades included construction of specially designed salmon-spawning beaches to boost the river basin's propagation of young salmon and trout. The latest advancement came in 2008 with the completion of a \$50 million "floating surface collector" for attracting and safely capturing juvenile salmon in Baker Lake for downstream transport around both Baker dams. Fisheries agencies have praised the collector as a global model for successful movement of fish around high-reservoir dams. Future additions will include a modern, updated fish hatchery near Upper Baker Dam capable of quadrupling the number of small fish spawned in the Baker



Artist rendering of new Baker River fish trap, now under construction

River. The new hatchery is scheduled for completion in 2010, as is a new, more advanced trap-and-haul facility PSE is constructing to better manage the upstream transport of adult salmon around both dams.

## Location

The hydroelectric project, approximately 100 miles north of Seattle, is located on the Baker River, a tributary of the Skagit River. The dams' two reservoirs – Lake Shannon (behind Lower Baker Dam, in Skagit County) and Baker Lake (behind Upper Baker Dam, in Whatcom County) – are fed primarily by melting snow from the slopes of nearby Mount Baker and Mount Shuksan. Lower Baker Dam lies about one mile upstream from the Baker River's confluence with the Skagit River – inside the Town of Concrete. Upper Baker Dam is about nine miles upstream from Lower Baker Dam.

### **Lower Baker Dam**

Completed in 1925 by a construction crew of 1,300, Lower Baker Dam is a 285-foot-high, 550-foot-long concrete gravity-arch structure. The dam's downstream powerhouse, which initially housed three turbines, was destroyed in 1965 by a major earth slide. PSE rebuilt the powerhouse and brought it back into service in 1968. The rebuilt powerhouse is equipped with a single, large turbine.



Upper Baker Dam

### **Upper Baker Dam**

Upper Baker Dam, completed in 1959, is a concrete gravity dam measuring 312 feet in height and 1,200 feet in length. A public road across the dam's top provides access to popular North Cascades hiking trails. The powerhouse at the base of the dam contains two generating units.

### **Project Licensing**

PSE received a new, 50-year operating license for the Baker River Hydroelectric Project in October 2008 from the Federal Energy Regulatory Commission (FERC). Four years earlier, PSE and 23 other parties (federal, state and local government organizations, Native American tribes, environmental groups, and others) submitted a comprehensive, 162-page settlement agreement to FERC that contained the parties' recommended provisions for what later became the updated project license. PSE estimates a 30-year cost of \$360 million to implement the settlement agreement's provisions and operate the Baker hydropower facility.

#### **Major elements of Baker River Project's new 50-year license:**

- Improved fish-passage systems (including a new floating surface collector on Lake Shannon and new fish trap below Lower Baker Dam) for moving salmon, upstream and downstream, around the dams.
- Construction of a new fish hatchery and improved spawning beaches aimed at quadrupling (to 14 million) the number of juvenile sockeye released annually to the lakes.
- Closer regulation of water flows through Lower Baker Dam to better accommodate the needs of fish (the planned addition of one or two new powerhouse generators will moderate the dam's outflows).
- Enhanced camping, hiking, and boating access for the public within the project boundaries.
- A commitment to seek authorization from the U.S. Army Corps of Engineers for additional flood-control storage behind the dams.

### **Personnel**

Twenty-eight full time PSE employees work at the Baker River Hydroelectric Project.

### **Tax Benefits to Public**

Property taxes levied on PSE's facilities in Skagit and Whatcom counties, including the Baker River Hydroelectric Project, provide significant revenue for local schools, county roads, and other public services. PSE property taxes in Skagit and Whatcom counties totaled more than \$5.2 million in 2008.

*\* PSE's other two hydroelectric projects are Snoqualmie Falls (44 MW) and Electron (22 MW), both located in the central Cascades.*