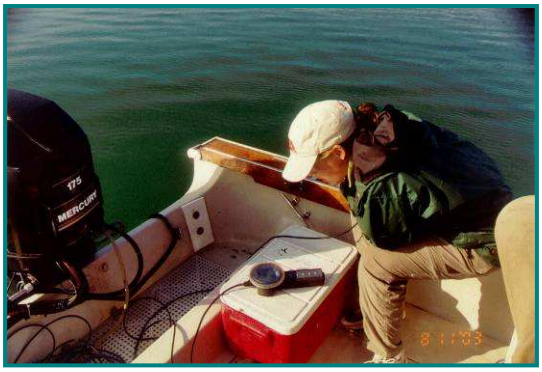
Lake Tapps Water Quality Modeling and Monitoring

Lake Tapps, Pierce County, Washington



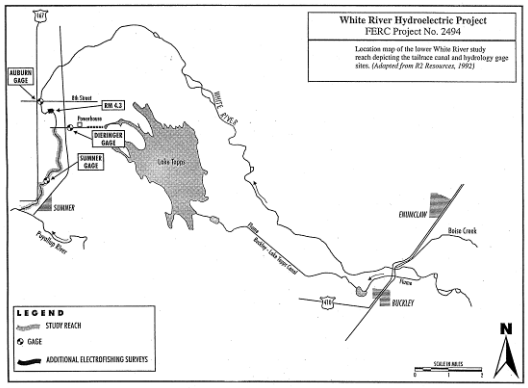
Historically, Puget Sound Energy, Inc. (PSE) diverted up to 2,000 cfs from the White River for its White River Hydropower project. This water flows into Lake Tapps Reservoir before being returned to the White River through the powerhouse and tailrace canal. Currently, PSE is in the process of converting this resource into a source for municipal water supply. The municipal water right will utilize the existing White River diversion facility used by PSE for the White River Hydropower Project and will also utilize PSE's existing hydropower water storage capacity in Lake Tapps Reservoir. Services included environmental analysis, water quality analysis, river basin modeling, and reservoir operations modeling.

As part of the project, R2 maintained and operated the 2-dimensional hydrodynamic and water quality model developed for the lower White and Puyallup rivers. The model was developed using CE-QUAL-W2 to determine impacts of the proposed water right on water quality constituents such as temperature, dissolved oxygen, pH, salinity, nutrients, and fecal coliform.

Project Elements:

- Water Supply
- Hydropower
- Water Quality Monitoring
- Water Quality Modeling
- Recreation

As part of the work for PSE, in addition to water quality modeling work, R2 provided water quality monitoring services. Future operations without hydropower present a series of challenges of how best to operate the reservoir to maintain water quality for both recreation and water supply. R2 provided technical support regarding the design and implementation of the Lake Tapps and White River water quality monitoring program. R2 conducted in situ field sampling of water quality parameters and collected samples for laboratory analysis. Water quality data including temperature, dissolved



oxygen, pH, conductivity, fecal coliform, nutrients, and metals were collected for several months in 2003 to 2005 at up to nine locations in the reservoir and seven locations in the White and Puyallup rivers. This data along with data collected by other sources was compiled and used in statistical modeling to predict and evaluate limnological processes and mechanisms occurring in the Lake Tapps Reservoir and their dependence on the quantity and quality of water diverted from the White River.