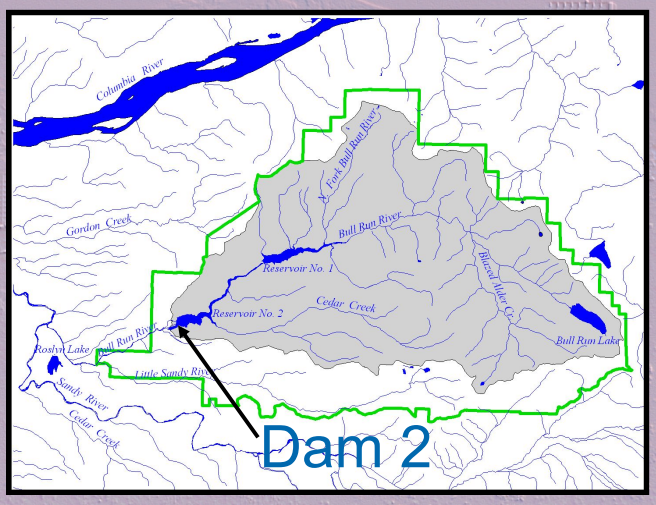
# Bull Run Dam 2
# Tower Improvements

## Contract Manager/General Contractor (CM/GC) Guaranteed Maximum Price (GMP)

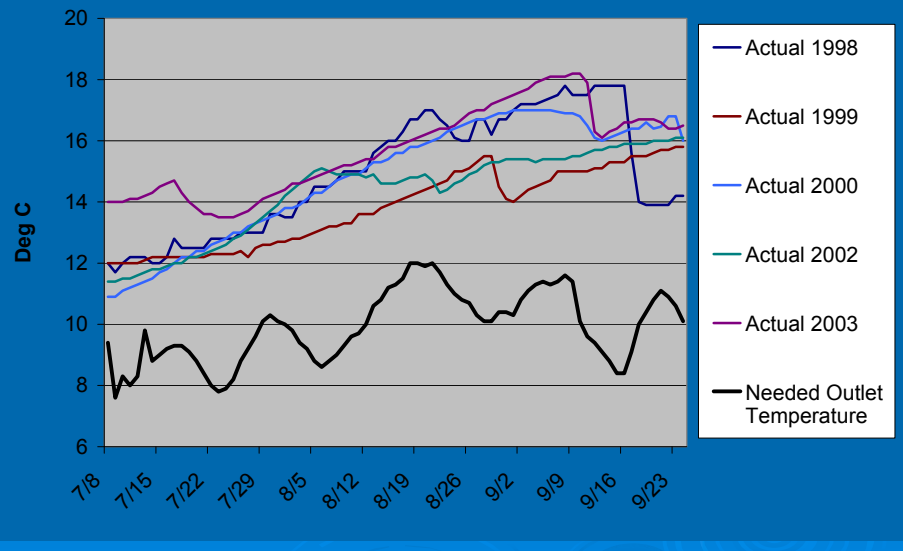
December 14, 2011

## The Bull Run Management Unit



# Habitat Conservation Plan (HCP)

- Adopted by PWB April 2009.
- Outlined tasks to mitigate impacts of the dams.
- HCP prescribes water temperatures for the Bull Run River.
- Modifying intake towers is necessary to achieve prescribed river temperatures.
- Only HCP in the nation allowed off-site mitigation measures in lieu of providing fish passage.

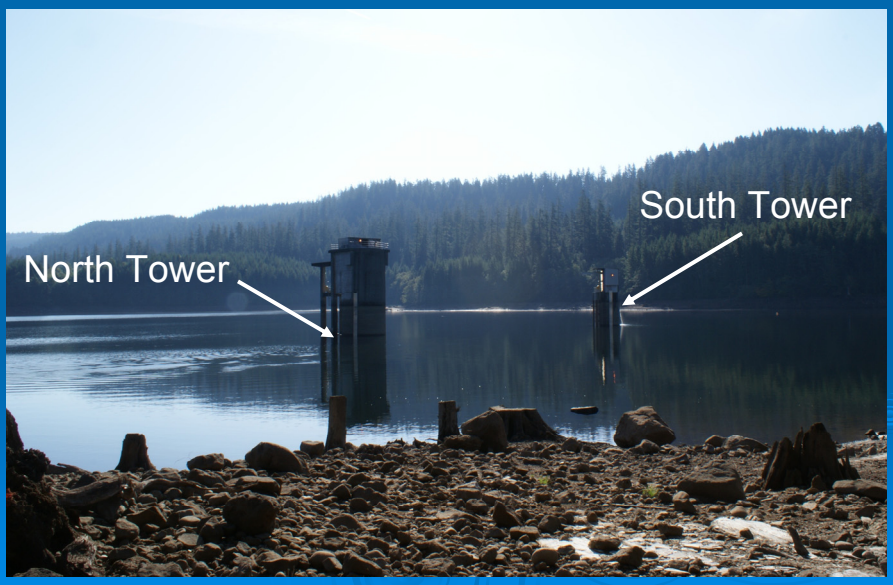


## Dam 2 Current Conditions

- Completed in 1962.
- 145’ Tall Earthen Fill Dam.
- Two intake towers , 150’ upstream of the dam.
- North Tower is higher capacity.
- South Tower largely used as backup.
- Each tower intake is located the bottom of the reservoir.

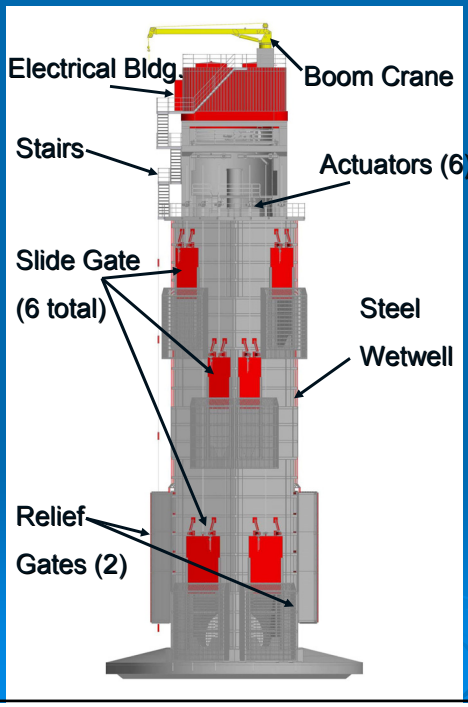
## Dam 2 Towers - 1959

## Dam 2 Towers - 2011




## Project Team

- Owner, Portland Water Bureau (PWB)
- Procurement Services
- Design Consultant, Black and Veatch (B&V)
- CM/GC Contractor, Advanced American Construction (AAC)




**North Tower Project Elements**

- Boom Crane
- New electrical and instrumentation building.
- Access improvements (new floating dock, stairways, walkways)
- Actuators and instrumentation
- Slide gates at three different elevations (6 total).
- 150' tall steel frame wet well
- Relief gates

## South Tower Project Elements

- Install access and safety improvements South Towers.
- Fish Flow piping at the Headworks facility.

## CM/GC Contract Strategy

- Shall not exceed GMP.
- Time and Material - Only pay what is actually invoiced.
- Savings clause. All funds less than GMP will be divided by PWB and AAC.
- Savings allocation; 75% PWB – 25% AAC

## Main Cost Drivers

- Site is in the Bull Run Watershed and remote.
- Project is one of a kind.
- 15 story, steel structure with unique gates and controls.
- Wetwell installation requires diving to 100 foot depth. This depth of dive is challenging and expensive.
- Work on going while the other tower is providing water to town, can not drain the reservoir.
- Water quality requirements for both people and fish.

# Project Cost Estimate History

## Two Tower Option

- October 2008 – HCP Estimate
  - $10 Million + $4.5 Million = $14.5 Million

(Original (10% Design) estimate + Fish Flow Piping)

## One Tower Option*

- August 2011 – 90% Design
- $27 Million + $4.5 Million = $31.5 Million

(90% Design estimate + Fish Flow Piping)

*Includes access improvement to South Tower and Fish Flow Piping.

## Comparison of Selective Withdrawal System on Local Dams

| | Shasta Dam – | Cougar Dam | Round Butte Dam |
|---|---|---|---|
| **Owner** | US Bureau of Reclamation | Portland District, USACE | Portland General Electric |
| **Cost** | $80M | $55M | $110M |
| **Construction Period** | 2 Years | 3 Years | 3 Years |
| **Year Completed** | 1997 | 2005 | 2010 |
| **Type** | Selective withdrawal structure attached over intake gates of the powerhouse. | Selective withdrawal structure attached over existing intake structure. | Selective withdrawal structure over existing intake structure with floating fish capture and re-direction facility. |
| **Configuration** | Shutter Structure – (5) Units totaling 250' long, 50' wide, and 300' high.<br><br>Lower Level Intake Structure – (3) Units totaling 125' long, 50' wide, and 170' high. | Concrete wet well 50' wide, 50' long, and 300' high attached to upstream face of existing intake structure. | Selective Withdrawal Bottom Structure at 68' long, 57' wide, 67' high.<br><br>40' diameter Steel Conduit.<br><br>Selective Withdrawal Top Structure at 150' long, 90' wide, and 50' high.<br><br>287' access bridge. |
| **Construction Type** | Work performed at full reservoir with diver | Work performed in an empty reservoir. Seasonal | Work performed at full reservoir with diver |

## Budget Constraints

- Program Budget for FY 11-12, 12-13, 13-14; $33.1 Million
- Actions taken to keep the project within budget.
  - Modify Headworks piping to provide Fish Flow.
  - Eliminate wetwell installation from the South Tower.

## Project Phasing

- Broke project into parts due to uncertainty with UV Variance.
- **Part 1:** North Tower, South Tower work ($27 Million).
- **Part 2:** Fish Flow Piping at Headworks ($4.5 Million).

# Potential Costs

Maximum cost (GMP) - $31.5M
Towers (Part 1) + Fish Flow Piping (Part 2)
$27M + $4.5M

Most probable cost - $29.5M
$25M + $4.5M

Lowest probable cost - $27.5M
$23M + $4.5M

Anticipated Notice to Proceed 1/15/12
Anticipated Construction Completion 12/31/13

# Environmental Controls

- Erosion Control installed around the impacted site (silt fence, wattles, hay, gravel pads)
- All equipment entering the watershed will be cleaned prior to entering the watershed. Cleaning station will be located just outside of the watershed.
- Specifications comply with the Water Bureau's **Aquatic Invasive and Nuisance Species Standard Operating Procedure**.
- Silt Curtain will surround the North Tower Work. No sediment will leave the work zone. We have groundwater as a back-up.
  - Excavation will take 4–6 weeks.
  - Armor Flex will take 2-3 weeks.

## Temporary Work Dock Installation
## Lake Pend Oreille, Idaho

## 550,000 LB Gate Lift (Section 1 of 4)
## John Day Dam Gate Replacement Project

## Typical Dive Barge & Crane Barge Setup
## Gig Harbor Project

## Dive Crew – Gig Harbor Project

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(Decompression Chamber in Connex)

## Diver – Lake Oswego Interceptor Sewer Project

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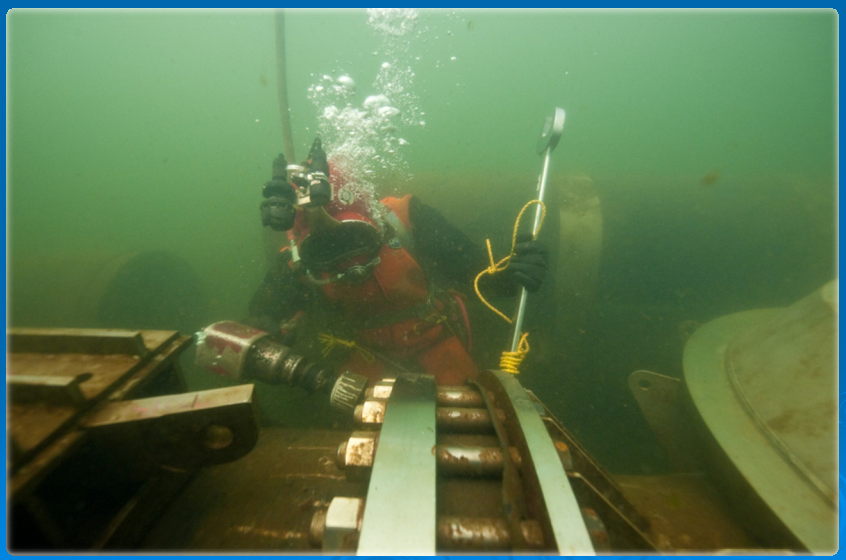
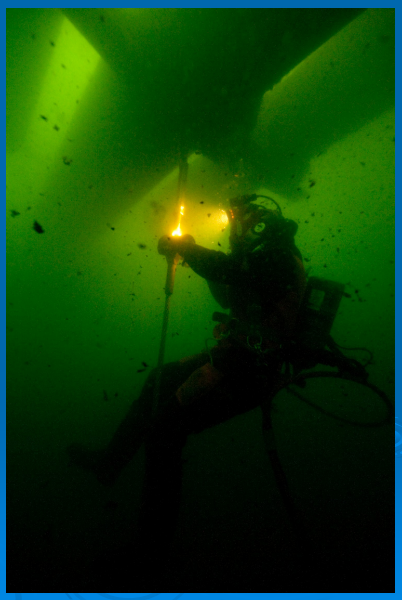
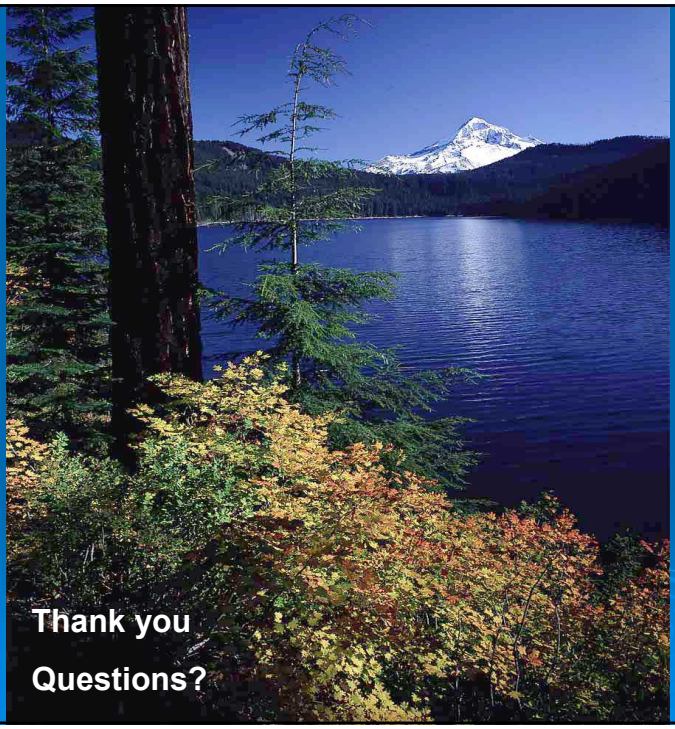


## Diver – Lake Oswego Interceptor Sewer Project





Thank you

Questions?