CASE STUDY

Crater Lake and Cordel Pumping Plants
Oroville - Tonasket irrigation district

INDAR SP UGP

Figure 1. Pumping Station - Slant Intake

The Challenge

For lake water abstraction, different intake arrangements can be considered for the varying demands of surface water intake at the lakeshore or riverbank, at the lake or reservoir, and at the intake basin.

These arrangements will define the pump type to be installed.

The Original Project

Located in Washington State and operated by Oroville-Tonasket Irrigation District, **the Crater Lake** and **Cordell Pumping Stations** were projected in early 70's to provide irrigation water to customers throughout Okanagan Highlands to over 10,000 acres of farm land.

These two (2) Pumping Stations are included, along with other four (4) plants, in the Chief Joseph Dam project - Okanogan-Similkameen Division - Oroville-Tonasket Unit Extension:

> Crater Lakes, Cordell, Osoyoos, Ellisford, Tonasket and Bonaparte Creek.

These plants were projected to supply water to eight independent irrigation service areas.

Crater lake Pumping Station (4 wells) is located in the Crater Lake National Park, takes water from the Okanagan River East Bank and also supplies water to campers on the rim grounds.

Cordell Pumping Station (6 wells) takes water from the Okanagan River West Bank.

Figure 2. The Okanogan Highlands

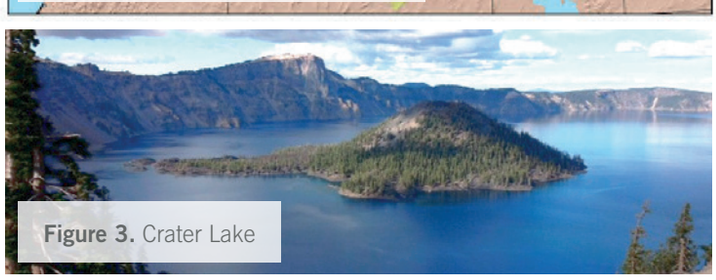

Figure 3. Crater Lake

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With a cost of 97M $, and 230 miles of pipeline (4" and 54") the projects were completed in two (2) phases.

For the two (2) Pumping Stations the intakes were projected in slant intake configuration.

The inclined solution configuration was the most efficient (cost) compared with other pumping station arrangements as open tank intakes (sump) or lagoon style system.

These were considered the first pumping station of this slant-type in all the northwestern area of the United States.

Indar-Gicon Installed eight (8) submersible Pumps – PS Retrofit

After many years, In 2011 Indar, together with our Partner GICON, worked with the Oroville-Tonasket Irrigation District in the retrofit of 8 of the 10 slant wells.

Flow (USgpm)	Head (feet)	Motor Output (HP)	Voltage (V)	Diameter (in)
2400	400	300	2300	14

The eight (8) submersible pumps in standard configuration, due to the slim design, was the ideal solution for installation onto the narrow casings (36 in).

Submersible motorpump sets were made of a multistage (5 stages) centrifugal pump directly coupled a submersible type electric Motor.

The submersible sets for the slant wells were the best technical and environmentally friendly alternative due to the efficient use of water.

Compact Solution
- Less Space
- Less Cost of Installation
- Easy Alignment

Direct Transmision of Power & Efficiency Improvement vs. Vertical Turbine Pumps

Easy maintenance

Very Low Noise Levels
- Perfect Solution Inside Cities

Avoids Flooding Risks

Figure 4. Submersible Pump. Installing Maneuver

Figure 5. Submersible Pump. Installing Maneuvers

Figure 6. Submersible Pump. Installing Maneuvers

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