CONSTRUCTION

Pipeline
Pipe Diameter - 30 inch
Pipe Length - approximately 10 miles total

Water Filtration Facility
Plant Capacity - 11.8 MGD

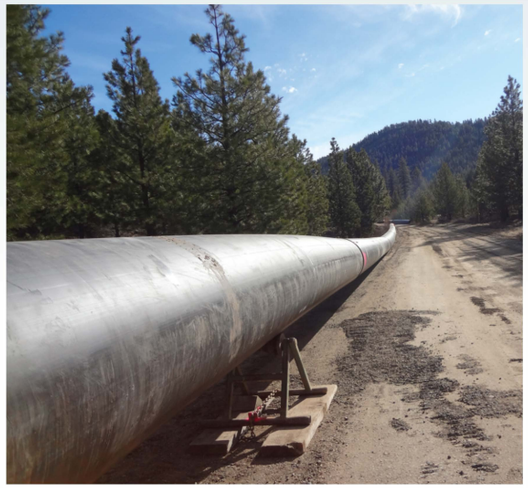
Intake Facility
- Self-cleaning rotating drum screens
- Automated monitoring and control of valves and instruments
- Security equipment and monitoring

Completion Date - April, 2016

Project Construction Cost
$56 M (Entire Bridge Creek Project)

Engineer of Record
HDR

Construction Company
Mortenson Construction



Bridge Creek watershed is the City of Bend's primary drinking water source. This surface water comes from a protected and isolated watershed deep in the Deschutes National Forest. Water is brought into the system at the Intake Facility and piped through a ten mile pipeline to the Outback site for treatment. Our ground water supply is from the Deschutes regional aquifer. Pumps pull ground water from the deep aquifer at nine well fields. The well fields have 22 available wells that provide a supplemental water source used to meet peak summer demand and are also a back-up water source when and if a shutdown of surface water treatment is ever required.

Bend is fortunate to have well protected water supplies. Both our surface and groundwater sources are managed in accordance with Oregon State Health Authority requirements, Federal Environmental Protection Agency (EPA) regulations, and best management practices for water supply systems.

For more information, our annual water quality report can be found at **bendoregon.gov/waterquality**.

CITY OF BEND

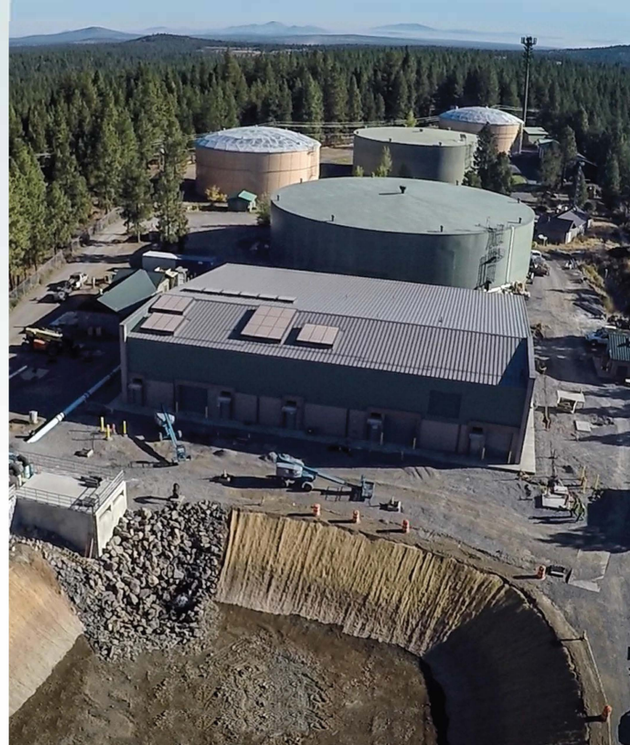
UTILITY DEPARTMENT
62975 Boyd Acres Road
Bend, Oregon 97701
541-317-3000 ext 2
bendoregon.gov

Cover Photo:
Richard Scott Nelson Photography 2015

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic format and audio cassette tape please contact Karin Morris at 541-693-2141 or email kmorris@bendoregon.gov.

CITY OF BEND

WATER FILTRATION FACILITY



CITY OF BEND | Water Filtration Facility Process Flow

1 Raw Water Structure and Overflow Swale - This structure brings untreated water from the Bridge Creek pipeline to the Water Filtration Facility. The structure has energy dissipating valves, which reduce the high pressure of the water that comes into the facility. The overflow swale is available if the Bridge Creek pipe needs to be drained or flushed, if there is a disruption at the plant where water needs to bypass to the swale for a short time. Water is held in the swale and infiltrates back into the groundwater.

2 Feed Pumps - Water is pumped from the Raw Water Structure through the strainers and membrane racks. The feed pumps provide raw water to the Water Filtration Facility at a constant specific pressure, protecting equipment from pressure variations and allowing the process to run efficiently.

3 Strainers - Raw water is pumped through strainers which remove particulates ahead of membrane filtration, allowing for greater lifetime and optimized efficiency of membrane filters. The strainers are woven wire mesh screens made of stainless steel that remove particles greater than 300 microns. For reference, a human hair is about 75 microns across. The strainers automatically self-clean on a regular basis.

4 Membrane Filter Racks - Hollow-fiber membranes remove very fine particulates, viruses, bacteria and pathogens. Membrane filters are particularly good at removing Cryptosporidium and Giardia that can contaminate drinking water and adversely affect public health. The filters work by moving water through a membrane. The membrane allows water to pass through, but not small particulates, bacteria and pathogens. The membrane filters utilized at this facility are made of synthetic materials (polymers) and remove particles of 0.1 microns size and greater. There are 6,350 fibers per membrane module and 132 modules tubes per membrane rack. Each rack is capable of producing 3,300 gallons of water per minute. With proper treatment we would expect the membranes to perform for ten years without replacement.

5 Backwash and Membrane Cleaning System - This system uses chemicals and water and air to keep the membrane filters working efficiently. When the membrane filters begin to become plugged with materials removed from the raw water, the backwash and cleaning cycle begins. Process water from this cleaning cycle is discharged to a process waste line.

6 Control Room - Operators monitor and control the treatment process from the Control Room. They use a computerized SCADA system to optimize the water treatment process, monitor water quality, and respond to alarms from system set points 24 hours a day.

7 Disinfection - Chlorine is added in the form of Sodium Hypochlorite to ensure all bacteria and viruses are removed by the treatment process. This chlorine is available to ensure that drinking water remains bacteria free throughout the City piping distribution system. High quality treated water is conveyed to a chlorine contact basin then conveyed to town for the use of City of Bend customers.