



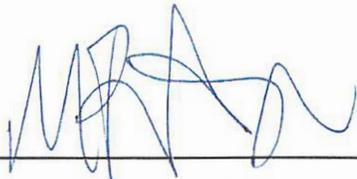
Appendix B  
City of Bend  
Bridge Creek Water Supply System  
Operation and Maintenance Plan  
Updated June 2024

HOLDER:

CITY OF BEND

US DEPARTMENT OF AGRICULTURE

DESCHUTES NATIONAL FOREST

By: 

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By: 

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Date: 6/24/2024

Date: 7/2/2024

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## INTRODUCTION

The Special Use Permit (SUP) BEN1158, granted by the U.S. Department of Agriculture Forest Service (USFS) authorizes a right-of-way (ROW) to the City of Bend (The holder) to operate and maintain a water system located on the Deschutes National Forest in the State of Oregon. The provisions of this Plan shall be incorporated by reference as terms and conditions of the special-use permit described above. Unlike the SUP however, this Operating Plan may be amended as conditions change. The permit area is located west of Bend, Oregon, and includes the Source Springs Diversion within the Bend Municipal Watershed and the Bridge Creek Water Intake and pipeline to the Outback Facility Site (BEN1158 and amendment 1). The pipeline ROW primarily follows Forest Service Roads 4601 (Skyliners Road) and 4603. The pipeline originates at the holder's intake facility located on Bridge Creek approximately thirteen miles west of the city of Bend, near the Tumalo Falls Overlook parking area and terminates at the holder's Outback Facility Site located approximately 3.5 miles west of Bend off Skyliners Road.

The permit area is in unincorporated Deschutes County in Township 17 South, Range 11 East, Section 34; Township 18 South, Range 10 East, Sections 1, 2, 7, 8, 9, 10, and 11; and Township 18 South, Range 11 East, Sections 3, 4, 5, 6, 7, and 8 on the Bend–Fort Rock Ranger District of the Deschutes National Forest. The project lies within the Upper and Lower Tumalo Creek 6<sup>th</sup> Field Sub-watersheds.

### **Language from BEN1158:**

This permit covers **approximately 10 miles/18.75 acres as described below** (“the permit area”) for **Operation and Maintenance of a Domestic Water System and Improvements:**

### **Bridge Creek Water System**

Township (T) 17S, Range(R) 11E, Section 34; T 18S, R 10E, Sections 1, 2, 7, 8, 9, 10, and 11; and T 18S, R 11E, Sections 3, 4, 5, 6, 7, and 8. One 30-inch diameter water pipeline of which 8.07 miles is located on National Forest System Lands including monitoring devices and the necessary appurtenances for transporting water between the Intake at Bridge Creek and the Outback Site. The total right-of-way width is 15 feet (approximately 16 acres).

### **Garage/Storage Shed**

- T 18 S., R. 10 E., SW1/4 NE1/4 Section 10 - Garage/storage building near Skyliner Lodge used to support the operation and maintenance of the water system (approximately 0.25 acres).

### **Bridge Creek Intake Facility, Caretaker Cabin and Diversion Weir**

- T. 18 S., R. 10 E., SE1/4 NE1/4 Section 7 - Intake Facility, caretaker cabin, and diversion weir located on Bridge Creek to divert water into city water distribution system via pipeline (approximately 0.5 acres).

### **Bridge Creek Water Diversion Wash Line near Tumalo Falls**

- T. 18 S., R. 10 E., S1/2 NE1/4 Section 7- Waterline less than 12 inches in diameter to provide water from Bridge Creek under gravity pressure for cleaning filters at the domestic water intake building. Right-of-way is approximately 10 feet by 900 feet in size (approximately 0.25 acres/0.17 miles).

### **Water System Access Gate**

- Gate across Forest Service Road 4603.

### **Language from BEN1158 Amendment 1:**

This permit covers 1.29 acres in Sections 3 and 10, T. 18 S., R. 9 E., Willamette Meridian ("the permit area") for **water diversion weir and culverts to divert spring water from Source Springs at the Middle Fork of Tumalo Creek via canal to Bridge Creek and then on to the City of Bend for use as domestic water supply. The canal from the diversion to Bridge Creek is approximately 20 feet wide and 700 feet in length.**

## PURPOSE AND NEED

This Operations and Maintenance Plan (O&M Plan) documents a mutual commitment between the holder and the United States Forest Service (individually referred to as "Party" and collectively the "Parties") concerning the operation and maintenance of the City of Bend water systems including the Intake Facility, pipeline, and Source Springs water diversion infrastructure.

Unless otherwise noted, any obligation or requirement in this O&M Plan applies to the contractors, agents, lessees, licensees and permittees of both Parties.

## COMMUNICATIONS PROTOCOL

Efficient and accurate communication during operations and maintenance of these permitted improvements is essential. A clear and consistent communication protocol will help to ensure that any issue is quickly and satisfactorily resolved.

The Bend-Fort Rock Lands Permit Administrator will be the Point-of-Contact (POC) for all activities and coordinating approvals by the responsible official (District Ranger) or the authorized officer (Forest Supervisor - Deschutes National Forest). Prior to any significant and/or non-routine operation and maintenance activity on any portion of NFS (ground disturbing activity), the holder will notify the POC.

The POC shall also be the contact in emergency maintenance situations during FS office hours. However, when the POC/District Permit Administrator cannot be reached, the holder will contact the District Ranger or the Forest Supervisor. When an emergency occurs, the POC will be notified within 48 hours unless the emergency occurs on the weekend then the POC will be notified the next workday.

### Contact Information

Forest Service, Deschutes National Forest Contact Information

#### Central Oregon Interagency Dispatch – 541-316-7700

Position	Name	Phone	Email
Bend-Fort Rock Lands Permit Administrator	Cynthia Anderson	458-218-5965	<a href="mailto:cynthia.anderson@usda.gov">cynthia.anderson@usda.gov</a>
Bend-Fort Rock Special Uses Lead	Brooke Andrew	541-208-2649	<a href="mailto:brooke.andrew@usda.gov">brooke.andrew@usda.gov</a>
Deschutes Forest Supervisor	Holley Jewkes	541-610-3402	<a href="mailto:holly.jewkes@usda.gov">holly.jewkes@usda.gov</a>
Bend-Fort Rock District Ranger	Kevin Stock	541-410-2415	<a href="mailto:kevin.stock@usda.gov">kevin.stock@usda.gov</a>
Bend-Fort Rock Deputy District Ranger	Michael Deal	541-213-5394	<a href="mailto:Michael.Deal@usda.gov">Michael.Deal@usda.gov</a>
Bend-Fort Rock Fire Management Officer	Robert Newey	435-640-8420	<a href="mailto:robert.newey@usda.gov">robert.newey@usda.gov</a>

Bend-Fort Rock Engineer	Kenda Caligure	541-383-4005	<a href="mailto:kenda.caligure@usda.gov">kenda.caligure@usda.gov</a>
Bend-Fort Rock Botanist	Marlo Fisher	541-383-4743	<a href="mailto:marlo.fisher@usda.gov">marlo.fisher@usda.gov</a>
Bend-Fort Rock Wildlife Biologist	Barbara Webb	541-383-4788	<a href="mailto:barbara.webb@usda.gov">barbara.webb@usda.gov</a>
Bend-Fort Rock Hydrologist	Kyle Wright	541-433-3263	<a href="mailto:kyle.wright2@usda.gov">kyle.wright2@usda.gov</a>
Deschutes Watershed Program Manager	Jason Gritzner	541-383-5537	<a href="mailto:jason.gritzner@usda.gov">jason.gritzner@usda.gov</a>

City of Bend Contact Information

In case of emergency – Bend Utility Water Operations On-Call 541-480-7419

Position	Name	Phone	Email
Utilities Director	Mike Buettner	(o) 541-388-5569 (c) 541-213-1911	<a href="mailto:mbuettner@bendoregon.gov">mbuettner@bendoregon.gov</a>
Water Operations Manager	Rod Mingus	(o) 541-693-2180 (c) 541-410-2366	<a href="mailto:rmingus@bendoregon.gov">rmingus@bendoregon.gov</a>
Environmental Resources Manager	Lori Faha	(o) 541-317-3025 (c) 503-422-9272	<a href="mailto:lfaha@bendoregon.gov">lfaha@bendoregon.gov</a>
Bend Water Operations 24-hour duty phone line		541-480-7419	
Director of Risk and Emergency Management	Carrie Karl	(o) 541-323-5969 (c) 541-797-3094	<a href="mailto:ckarl@bendoregon.gov">ckarl@bendoregon.gov</a>

If the holder facilities are involved in a catastrophic event such as a wildfire, washout or other detrimental occurrence notify Central Oregon Interagency Dispatch (541-316-7700).

**The holder will be responsible for notifying permittees and other regular users of NFS in advance of any maintenance activity that might affect their businesses or operations.** This will include, but not be limited to, posting signs for work on or adjacent to roadways, removal and/or cutting of fences, and disturbances to improvements or other land use related structures.

## COMPLIANCE WITH FEDERAL ACTS, REGULATIONS, EXECUTIVE ORDERS, ETC.

O&M Plan is executed under the Federal Land Policy and Management Act (FLPMA) including Title 5, section 507. The holder and the FS must both comply with the National Environmental Policy Act (NEPA) as well as the environmental laws cited in this permit under Section V. Resource Protection.

## RESOURCE PROTECTION MEASURES

### A. Non-Native Vegetation

All maintenance related equipment will be cleaned prior to entering National Forest System lands to remove mud, dirt, and plant parts.

### B. Water Quality, Aquatic Species, and Riparian Areas

1. **Fueling Equipment** - To the extent possible, the holder will service and refuel equipment on developed roads in areas that are at least 300 feet from streams. When equipment must be serviced in off-road areas or near surface waters, the holder will exercise best management practices to prevent pollutants from entering natural bodies of water.
2. **Fish Passage Mitigation Plan** - As stated in Clause I.F of Special Use Permit BEN1158, the holder shall comply with all present and future federal laws and regulations and all present and future state laws and regulations regarding fish passage requirements. The Forest Service will work with the holder to implement any required modifications to activities or improvements to be in legal compliance.

## RESOURCE PROTECTION MONITORING

### A. Monitoring Committee

The monitoring committee is comprised of the holder, the USFS, and any other parties agreed to by the committee.

For the duration of the SUP, the committee will hold an annual meeting to review monitoring results, identify trends and concerns, and possibly refine the monitoring program. If applicable water quality values are found that prevent attainment of state or federal water quality standards applicable to Tumalo

Creek, and can be determined to be the result of holder's activities authorized by the SUP, USFS, after consulting with the holder, and potentially with ODFW and OWRD, may amend the terms and conditions of the SUP to ensure flows that do not "retard attainment of water quality standards".

The committee will convene each winter for the duration of this permit, hosted by the holder. The committee will determine what changes, if any, need to occur within the monitoring program.

## **B. Water Diversion Rate Monitoring**

The City of Bend will monitor water diversion rates (in pipe water flow) at both the Intake Facility and the Outback site. The holder shall be limited by municipal demand, up to a maximum hourly average diversion rate of 18.2 cfs.

### **DATA REPORTING**

Data reporting on water diversion rate monitoring will be posted on City of Bend website readily available to the public. An annual report will be provided by the holder at the year-end monitoring meeting.

## **C. Specific Stream Flow and Temperature Monitoring Actions**

### **1. OWRD Flow and Temperature Monitoring (OWRD SUP BEN582)**

The City of Bend contracted with OWRD to provide year-round flow and temperature monitoring services to City of Bend at approximately the following locations:

#### **Location A (See Figure 1):**

Upper OWRD Location Station ID #14070920  
LAT 44° 01' 47.8" N, LONG 121° 33' 46.5" W (44.02994, -121.56292)

#### **Location B (See Figure 1):**

Lower OWRD Location Station ID # 14070980  
LAT 44° 01' 54.7" N, LONG 121° 31' 15.3" W (44.03187, -121.52093)

### **DATA REPORTING**

*Web link: [http://apps.wrd.state.or.us/apps/sw/hydro\\_near\\_real\\_time/](http://apps.wrd.state.or.us/apps/sw/hydro_near_real_time/)*

### **2. City of Bend Temperature Monitoring**

One Additional temperature monitoring location will be performed by the holder's monitoring staff using submersible temperature data loggers and secure, non-obtrusive instream equipment.

The holder will provide temperature monitoring at:

**Location C (See Figure 1):**

Note: This site is at the existing bridge and culvert under the existing crossing of Shevlin Park road and Tumalo Creek.

LAT 44° 04' 58.3" N, LONG 121° 22' 34.8" W (44.08286, -121.37632)

Temperature loggers and temperature data will be audited and graded based on the City of Bend's Water Quality Monitoring Program's quality assurance and quality control procedures.

**3. USGS Flow and Temperature Monitoring**

During the life of the permit, the City will contract with USGS to provide monitoring at 5 sites described in USGS special use permit BEN1322.

Site locations are as follows:

**Location A (See Figure 2):**

14070615: Middle Fork of Tumalo Creek above Source Springs

LAT 44° 02' 13.62" N, LONG 121° 37' 57.968" W (44.03711, -121.632777)

**Location B (See Figure 2):**

14070620: Source Springs Diversion Pool

LAT 44° 02' 13.97" N, LONG 121° 37' 58.75" W (44.037217, -121.632986)

**Location C (See Figure 2):**

14070621: Diversion Canal to Bridge Creek

LAT 44° 02' 13.454" N, LONG 121° 37' 57.326" W (44.037067, -121.632589)

**Location D (See Figure 2):**

14070624: Middle Fork of Tumalo Creek below Source Springs

LAT 44° 02' 13.995" N, LONG 121° 37' 57.003" W (44.037221, -121.6325)

**Location E (See Figure 3):**

14070900: Bridge Creek below Intake

LAT 44° 01' 51.64" N, LONG 121° 34' 4.101" W (44.031083, -121.567778)

## DATA REPORTING

Data will be made available monthly, or as requested by USFS for use in the monitoring program.

Figure 1 – Water Monitoring Map

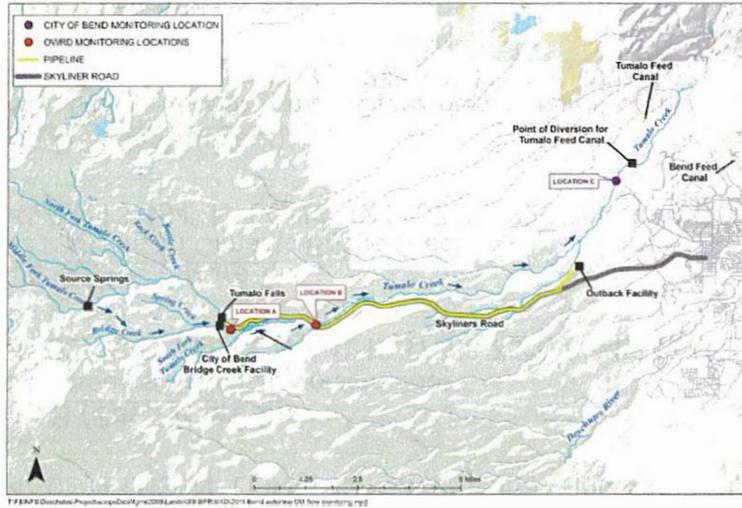


Figure 2 – USGS Monitoring Map

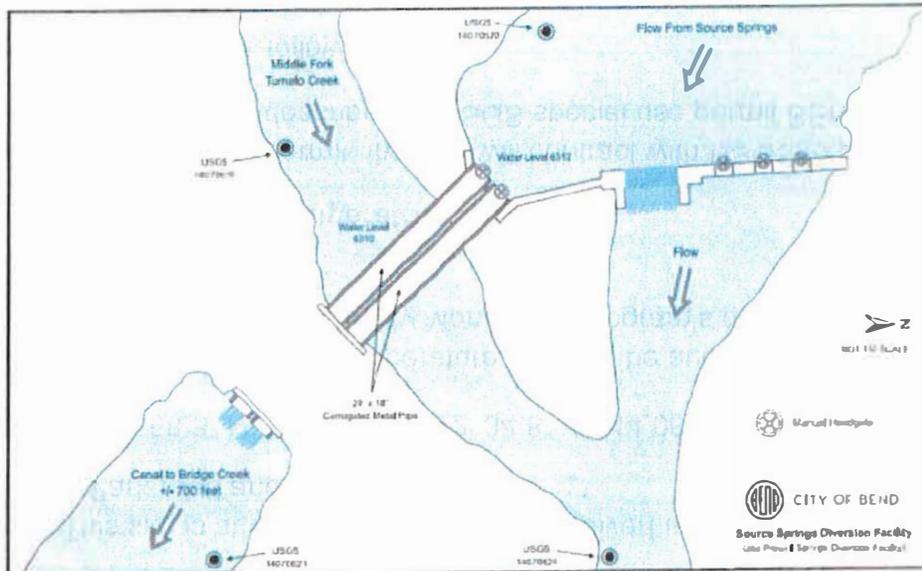
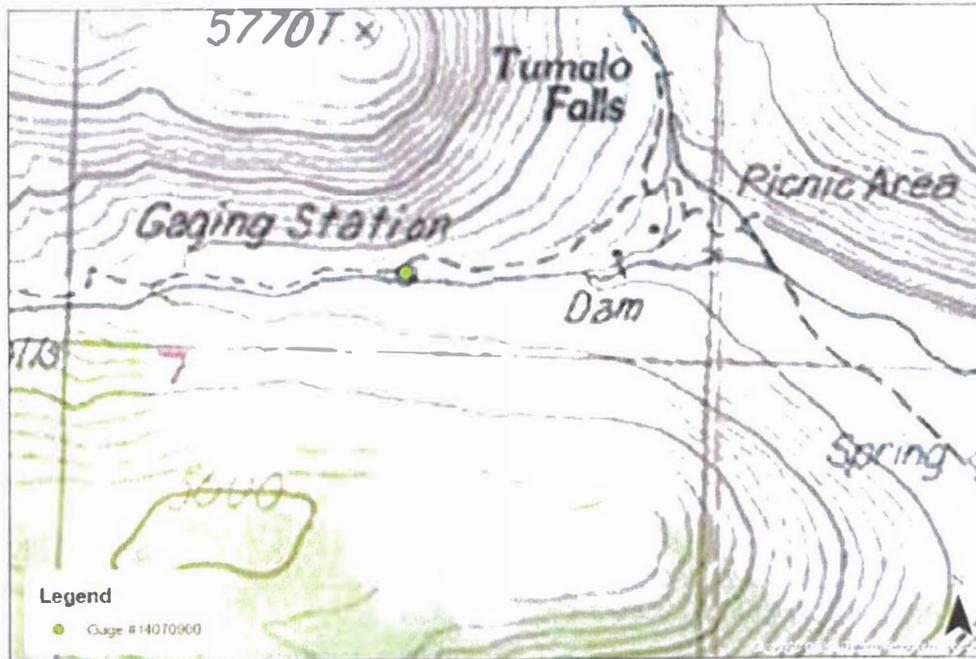


Figure 3 – USGS Monitoring Map



#### D. Fish Monitoring

Redband trout populations are to be monitored in Tumalo Creek to determine trends in population size and age class structure. The methodology will be snorkeling in late summer in sub-reach A1 and an area above the confluence with Bridge Creek using stations that were established during a 2011 fisheries survey conducted by the Forest Service. This data will supplement the fisheries data collected during the 2011 survey.

The fish snorkeling and related report will be completed by USFS Fish biologists and paid for by the City of Bend. The costs for monitoring during the years it is required will be assessed and collected pursuant to cost recovery regulations in 36 CFR 251.58.

Fish monitoring will include a total of five sites to be surveyed annually in late summer for three years, (2016, 2017, and 2018), then biennially over the next six years (2020, 2022, and 2024). This schedule is subject to change based on an annual evaluation of the monitoring program. One monitoring site will be above the City of Bend intake facility (between the junction with Bridge Creek and Tumalo Falls) and the four remaining sites will be within the affected area of Tumalo Creek which fall within sub-reach A1. These monitoring sites will include two sites within sub-reach A1-RR and two sites within sub-reach A1-B. (See Tumalo Creek stream

reach map in **EXHIBIT B**). The four sites within the affected area will be those previously surveyed in the 2011 fisheries survey of Tumalo Creek. The one site above the holder's intake facility will be a new survey and control site. Each site will be 200 meters in length.

The holder has entered into a multi-year cost recovery agreement (17MJ-11060101001) with the Forest Service to recover monitoring costs. This agreement expires on 12/31/2024. The holder may be responsible for any unforeseen additional monitoring costs and an amendment to the cost recovery agreement will be issued.

### **DATA REPORTING**

Fish monitoring information will be reported by the USFS at the annual monitoring meeting with the holder. The Forest Service may require adjustments in flow or ramping rates when necessary.

### **E. Wildlife**

Disturbing activities (such as tree removal, noise generating activities, etc.) shall not be conducted within ¼ mile and/or line of sight from any active nest of the following species during the listed periods. Distance increases to 1 mile for blasting.

Northern goshawk	March 1 – August 31
Cooper's hawk	April 15 – August 31
Sharp-shinned hawk	April 15 – August 31

### **RAMPING RATES**

The holder will continue to work with the USFS to develop and modify the following ramping rate procedures to ensure that they are operationally sound and reasonably protective of fish. USFS guidance for ramping rate procedures is provided in **EXHIBIT C**.

#### **A. Water Diversion Rates - City of Bend Surface Water Supply**

The holder's surface water filtration facility began operating in spring of 2016. Operational protocols will continue to be developed to guide operations as experience builds and staff gain experience running under different seasonal conditions. These protocols will balance protections for stream, as well as for the

operational constraints from equipment and water demand changes that occur during normal operations.

### B. Stream Flow Conditions

Flows in Bridge and Tumalo Creeks vary dramatically by season. Daily flow changes during spring runoff season can differ by 60-100 cfs in some conditions for Tumalo Creek, and less so, but similarly in Bridge Creek. Storm events at any time of year can increase flows dramatically as well (see flow graph from USFS 2013 Environmental Assessment, and instantaneous “native flow” record from OWRD).

Figure 4. Maximum, Minimum, and mean flow values for Tumalo Creek

Flow includes a compilation of in-stream flow and flow from the Columbia Southern canal. Data do not include water use by the City of Bend

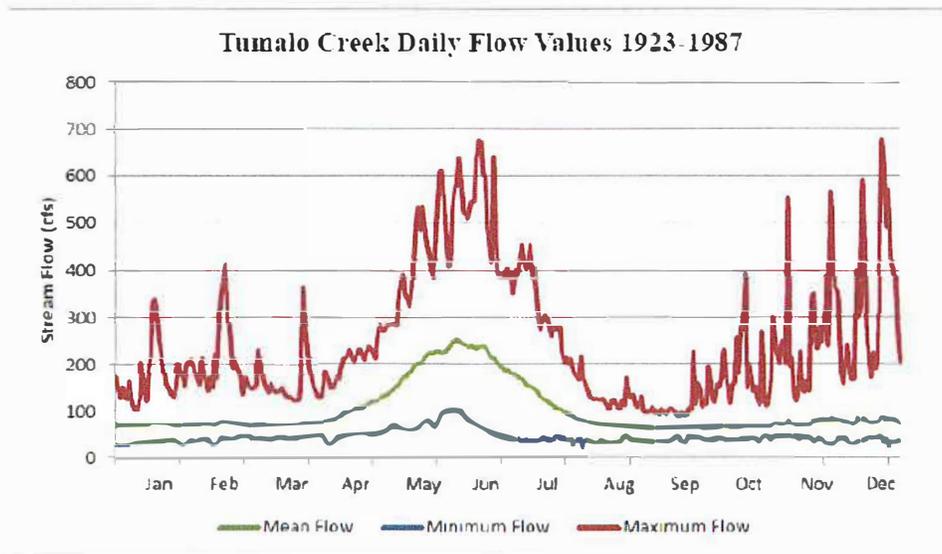
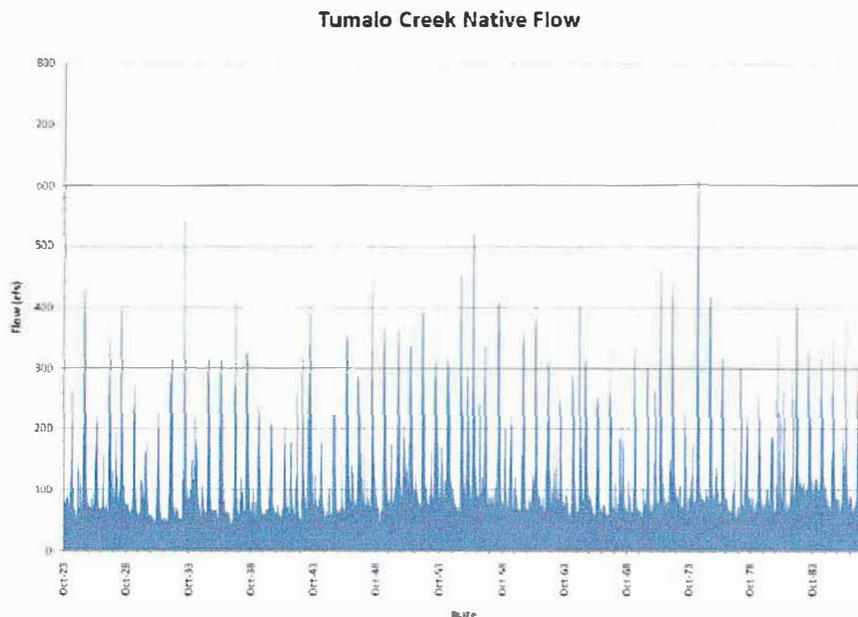


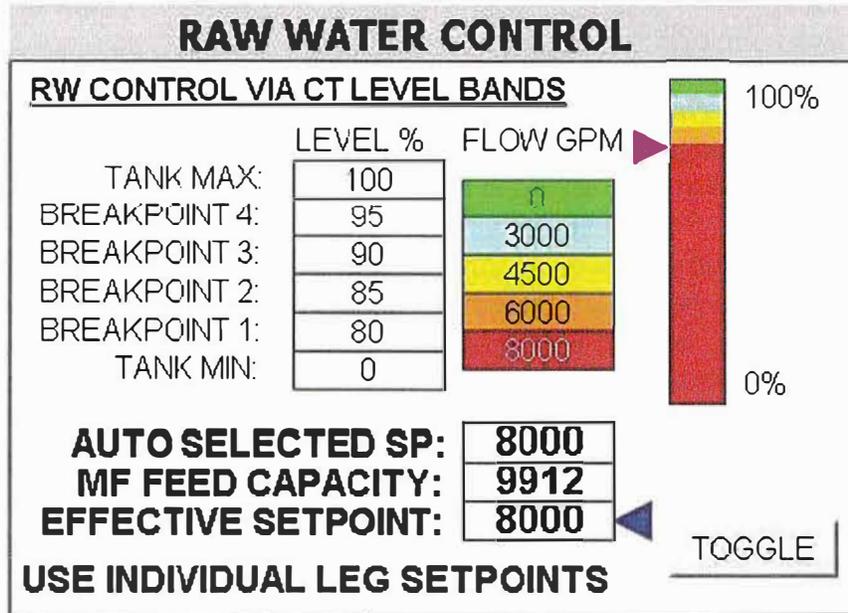
Figure 5. Tumalo Creek native flow (cfs)



### C. Operational Details

A key operational goal is to minimize energy use by maximizing the use of surface water which is delivered to holder's water system by gravity. A sophisticated control system is in place and programmed to look at the reservoir levels (See **Figure 6**). This system allows holder to stay at or under the maximum diversion rate is 18.2 cfs.

**Figure 6: Raw Water Reservoir Control Operating Settings**



A guiding principle of plant operations is to run the plant *consistently* and *continuously*. The goal is for the water system to never shut down and the design has included redundant equipment to support continuous operation. However, periodic equipment maintenance or failures may require a shut down and re-start under abnormal conditions.

Raw water is controlled through the flow control valves located ahead of the water system at the Outback facility. The flow control valves are designed and controlled to be slow acting. The need for slow acting valves is to prevent hydraulic surges in the raw water pipeline.

Water flows through the intake on Bridge Creek, where it is screened and flows into the pipeline. It then enters the flow control valve structure, then through the treatment process within the plant and into water storage reservoirs (above ground steel tanks) at the Outback site. Water flows out of the reservoirs and to the city to supply water demands that vary up and down during the day. An operation goal of this water system is to run a uniform rate (consistent and continuous), despite the variance in demand for water use in the city. This is accomplished by allowing the Outback storage tanks to be depleted when demand in the city is high, and then to refill when demand in the city is low, all

while water is being processed to the Outback Reservoirs at a relatively uniform rate. This will enable holder's staff to keep the withdrawal from Bridge Creek as consistent and continuous as possible.

If the Outback tanks were to become full, then the water supply would have to be stopped to prevent the tanks from spilling. The flow control system has been designed to try and avoid this situation to try and keep the diversion from Bridge Creek as consistent and continuous as possible. The control of flow has been automated and is based on the water level in the Outback tanks. As the level in the Outback tanks increases, the diversion rate decreases, all to avoid the need to shut down and then re-start the water supply system.

Overall, holder's staff are focused on maintaining a consistent and continuous flow diversion from Bridge Creek because they understand this is preferential for aquatic habitat. The supply system has been designed for this and is currently being operated in this manner. It is the opinion of consulting engineers and holder's staff that the plant is currently being operated as consistent and continuous as possible, given the limitations of equipment, instrumentation, and controls.

### **DATA REPORTING**

Ramping rate monitoring will be done by holder. Information will be reported to the USFS and discussed at the annual monitoring meeting with the City of Bend, and USFS may require adjustments in ramping rates when necessary.

### **PROJECT NOTIFICATION AND PROCEDURE**

Environmental analysis for proposed projects will vary in size depending on complexity and size and the potential for impacts. All proposals should be submitted to the SUPA as early as possible to allow time for authorized officer review and the appropriate level of environmental analysis to be completed by the Forest Service. Minor maintenance activities may take as little as a few months to approve while major maintenance or new construction activities may require several months to more than one year.

All proposals should include enough description to determine the scope of the project and the level of environmental analysis needed. Major construction projects may be delayed dependent upon the required depth and/or results of the environmental analysis

as well as the outcome of consultation with the State Historical Preservation Office (SHPO) and the Tribes.

## ROADS

Access on USFS roads and/or within restricted or closed areas will be in accordance with the current Deschutes National Forest Guidelines. Locks of the appropriate agencies/cooperators/permittees will be used at each applicable closure to facilitate entry for administrative use. During the closure, access will be by written authorization. Contact the District Road Manager for procedures. Emergency access is allowed without a written authorization to avoid or reduce damages to the line or for extended outages. The holder is responsible for notifying the District Road Manager at the earliest convenience and is fully responsible for any damage or area rehab associated with the emergency entry. Refer to current motor vehicle use map (MVUM) open roads and seasonal open roads.

Written approval must be obtained prior to commencement of road maintenance activities. Requests to perform any and all road related maintenance must be submitted in writing to the SUPA & District Road Manager, allowing for a reasonable time period for review.

Wet weather access provisions – The holder will take precautions to avoid rutting damage to unsurfaced roads by rerouting travel routes whenever possible.

Forest Service regulations prohibit the operation of any vehicles or equipment having cleats or other tracks on USFS roads which will injure the surface of the roadway.

### **Traffic Control**

All maintenance work where members of the public may be recreating shall be signed according to the *Manual on Uniform Traffic Control Devices for Streets and Highways* (U.S Department of Transportation, Federal Highway Administration) and applicable Department of Transportation (DOT) standards.

## HEALTH AND SAFETY

### **A. Safety Plan**

The holder is responsible for the safety of all personnel employed by itself or others in the performance of operation and maintenance activities. The holder recognizes the importance of providing employees with a safe and healthy work environment, free from recognized hazards, and conducting business in the safest manner possible. Safety is taken very seriously by the City and employees are to actively promote safety and accident prevention on a daily basis. Additional information can be provided at the USFS request.

### **B. Accident Reports**

During normal business hours, the holder shall notify the USFS, as soon as practicable, that an accident occurred during the performance of operation and maintenance, to either the holder's employees, a member of the public, or to the environment. After hours, and on weekends, the appropriate sheriff's office will be notified and the USFS will be notified the next normal workday. The holder will provide a copy of the accident report to the USFS.

### **C. Waste Disposal**

All forms of refuse and waste produced along the ROW will be disposed of in a designated landfill or appropriate waste disposal site. Disposal sites on the NFS will only be used with prior designation and approval of the USFS. Refuse and waste is defined as any discarded material, trash, garbage, packing material, containers, waste petroleum products, broken equipment (poles, cross arms, wire, other hardware), used parts, excess construction materials including waste rock and excess excavation, or human waste.

### **D. Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.269**

OSHA standard 1910.269 applies to line clearance and tree trimming operations performed by qualified employees (those who have knowledge of the construction and operation of electric power generation, transmission, and distribution equipment and their associated hazards). These employees typically perform tree-trimming as an incidental part of their work.

## HAZARDOUS AND TOXIC SUBSTANCES

### **A. Fuels and Lubricants**

No equipment will be re-fueled within 300 feet of any wetland or waterway without prior approval of the USFS.

All equipment will be regularly inspected for leaks. Any significant leaks detected will be promptly corrected. During fueling operations, personnel will prevent overfill of equipment. Absorbent materials will be kept at the work site to clean up and contain spills. Vehicles and equipment with leaks will have drip pans, heavy plastic sheeting or other containment devices placed on the ground beneath them and the vehicle or equipment will not be used until the leak is corrected.

### **B. Prevention of Oil Spills and Contamination**

The holder shall not dispose of any oil, oil products or petroleum containers on NFS lands. Appropriate preventive measures shall be taken to insure that any such spill of oil or oil products does not enter any stream or other waters of the United States. The holder shall notify the USFS when a spill does occur and cleanup will be in accordance with the Code of Federal Regulations and all applicable state environmental laws. When applicable, the holder shall prepare a Spill Prevention Control and Counter Measure Plan and provide a copy to the USFS prior to work commencement.

### **C. Hazardous Materials**

The holder will be responsible for any hazmat associated with their facilities and as stated in the SUP.

## FIRE PROTECTION PLAN

**All projects and activities are subject to Industrial Fire Precaution Level regulations which may cause delays in project implementation.** The holder will take appropriate fire prevention and suppression measures in conjunction with its operations and maintenance on the ROW. The holder will comply with the following Industrial Fire Precaution Levels and call the fire information line at [\*\*1-800-523-4737\*\*](tel:1-800-523-4737) prior to implementing a project during fire season (usually May through October depending upon fire indicators). The USFS may make periodic inspections. Failure to comply shall result in a temporary shutdown of all non-compliant maintenance activities

until compliance is met. If necessary, the holder may contact the Permit Administrator to obtain a fire waiver, an example of which is attached as **EXHIBIT D**.

**The USFS may require additional resource protection measures to be consistent with Industrial Fire Precaution Regulations which may be listed in the fire waiver.**

## ENVIRONMENTAL RESOURCE PROTECTION

The holder shall take all reasonable measures to protect environmental resources. If emergency maintenance jeopardizes the continued existence of endangered species or results in the destruction of designated critical habitat and requires immediate corrective action, the holder shall:

- I. Notify the applicable federal regulatory agencies (e.g., United States Fish and Wildlife Service, United States Army Corps of Engineers, National Oceanic and Atmospheric Administration) with jurisdiction over the resource(s) potentially affected by the emergency and plan for corrective actions/mitigation measures as soon as possible.
- II. Notify the USFS of the emergency immediately following notification to federal regulatory agencies. The holder shall also follow any USFS recommended mitigation measures.
- III. Take all necessary corrective actions.

## INSPECTIONS

The holder will inspect every structure at a minimum of five year intervals and periodically as necessary for regular operations. Needed repairs and maintenance will be based on the results of these inspections and operations. These inspections review the structures for hazards or safety concerns to ensure the continued safe, reliable operation of the system. The Forest Service may inspect improvements at any time and may ask for inspection documents from the holder.

## NOTIFICATIONS

- A. NEPA notices shall follow the process designated by law.
- B. Notifications shall provide sufficient time to ensure cooperation and to proactively respond to any potential conflicts with the Parties management activities. Notices should contain an adequate description of the area impacted to allow the receiving Party the ability to locate the area without additional information.
- C. The holder shall notify the USFS prior to conducting planned, non-emergency, ground disturbing or vegetation management activities.
- D. The USFS shall notify the holder prior to conducting any operational, maintenance or land management activities that have the potential to impact the holder's utility water lines, facilities, access roads such as:
  1. timber sales,
  2. major road maintenance,
  3. road closures,
  4. changes to the forest plan,
  5. land sales or land exchanges.
- E. The Parties will work together to improve notification processes when problems are identified.

## COOPERATION AND COORDINATION

The Forest Service and the holder shall meet annually to discuss operations, and any proposed projects in the spring and fall. Meetings may be held separately or be combined with the water monitoring committee meeting held annually.

Discussion topics may include but are not limited to:

- Planned projects for the upcoming year
- Review of External Access Road Work Requests
- Proposed roads to be abandoned
- Authorized public use concerns
- Unauthorized use concerns

- Vegetation Management concerns
- Safety concerns

## RELATED ENVIRONMENTAL DOCUMENTATION

Future maintenance, construction projects, or any changes in operations or environmental conditions applicable to permitted activities or improvements under SUP BEN1158 may necessitate further NEPA analysis. In this instance, final documentation developed pursuant to NEPA, such as mitigation provisions, shall be attached to and made part of this O&M Plan.

## COST RECOVERY (36 CFR 251.58)

Under the Forest Service's cost recovery regulations and directives (36 CFR 251.58 and FSH 2709.11, Ch. 20), applicants for a special use authorization for a ROW are subject to fees for costs incurred by the USFS that are necessary for processing the special use application, including USFS costs incurred in approving an operating plan and resource surveys, associated environmental analysis conducted, and ESA consultation needed to process an application. Holders of a special use authorization for a ROW are also subject to fees for costs incurred by the USFS in monitoring compliance with the terms and conditions of their special use authorization. A Category 5 Master Agreement or Category 6 Agreement may be appropriate for cost recovery associated with anticipated expansion, monitoring, or maintenance of a water line ROW, particularly where compliance with NEPA, ESA, NHPA, or other environmental laws is required. If the environmental analysis of a project requires less than 50 hours of review, the holder will pay a non-refundable fee based on the annual cost recovery fee schedule and the number of hours USFS personnel spend processing the application. Routine and emergency maintenance will be exempt from this requirement.

## OPERATION AND MAINTENANCE PLAN UPDATES

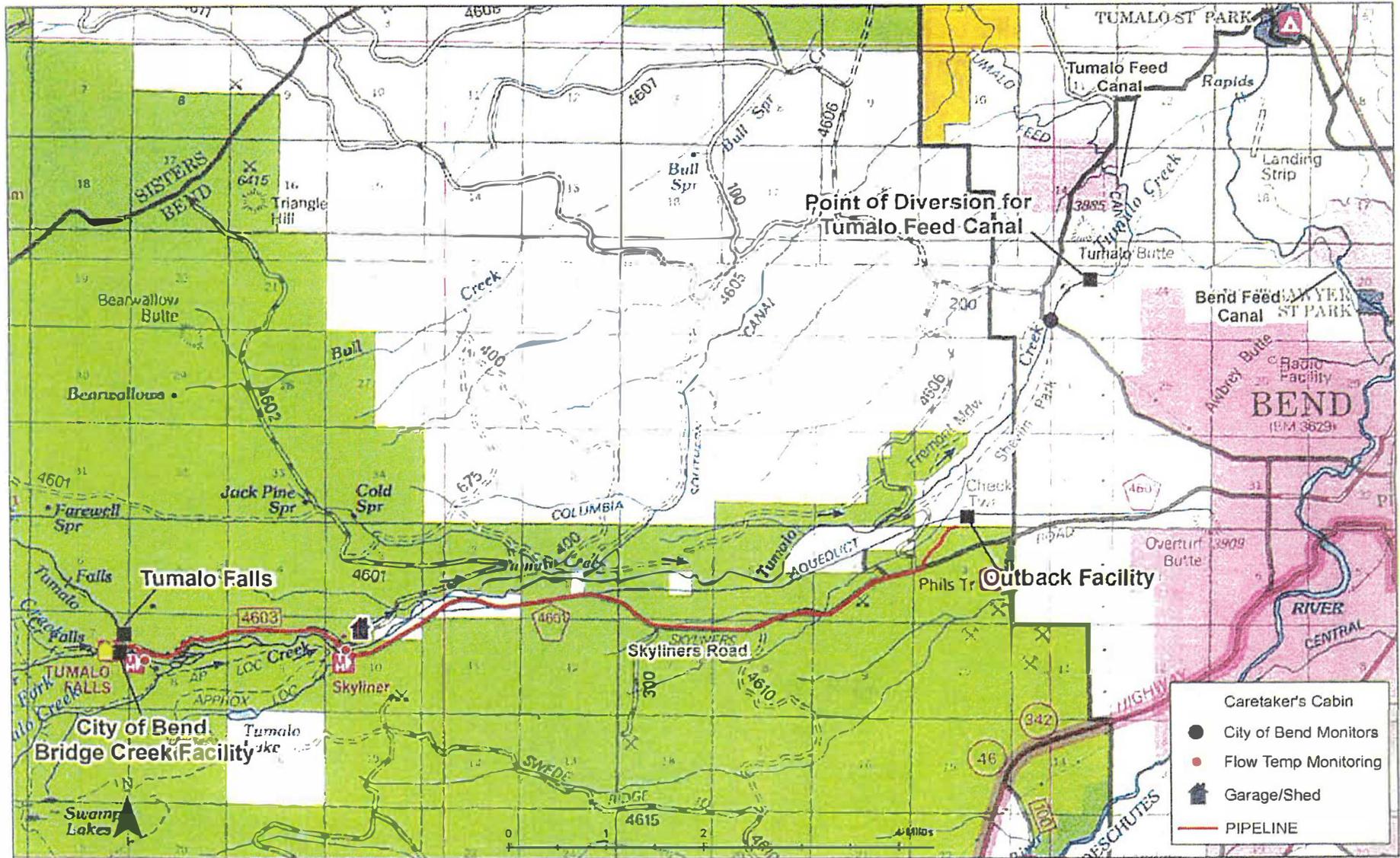
As per section II. C (OPERATING PLAN) in BEN1158:

The holder shall prepare and annually revise an operating plan, which will occur as necessary after each annual monitoring committee meeting, for the life of this

permit. The operating plan shall be prepared in consultation with the authorized officer or the authorized officer's designated representative and shall cover all operations authorized by this permit.

# EXHIBIT A - Maps

## BEN1158 - Special Use Permit Map



T:\FS\WFS\Deschutes\Project\soaps\Data\Map\2009\Lands\GIS\BFRM\XD\2015 Bend waterline OM flow monitoring.mxd

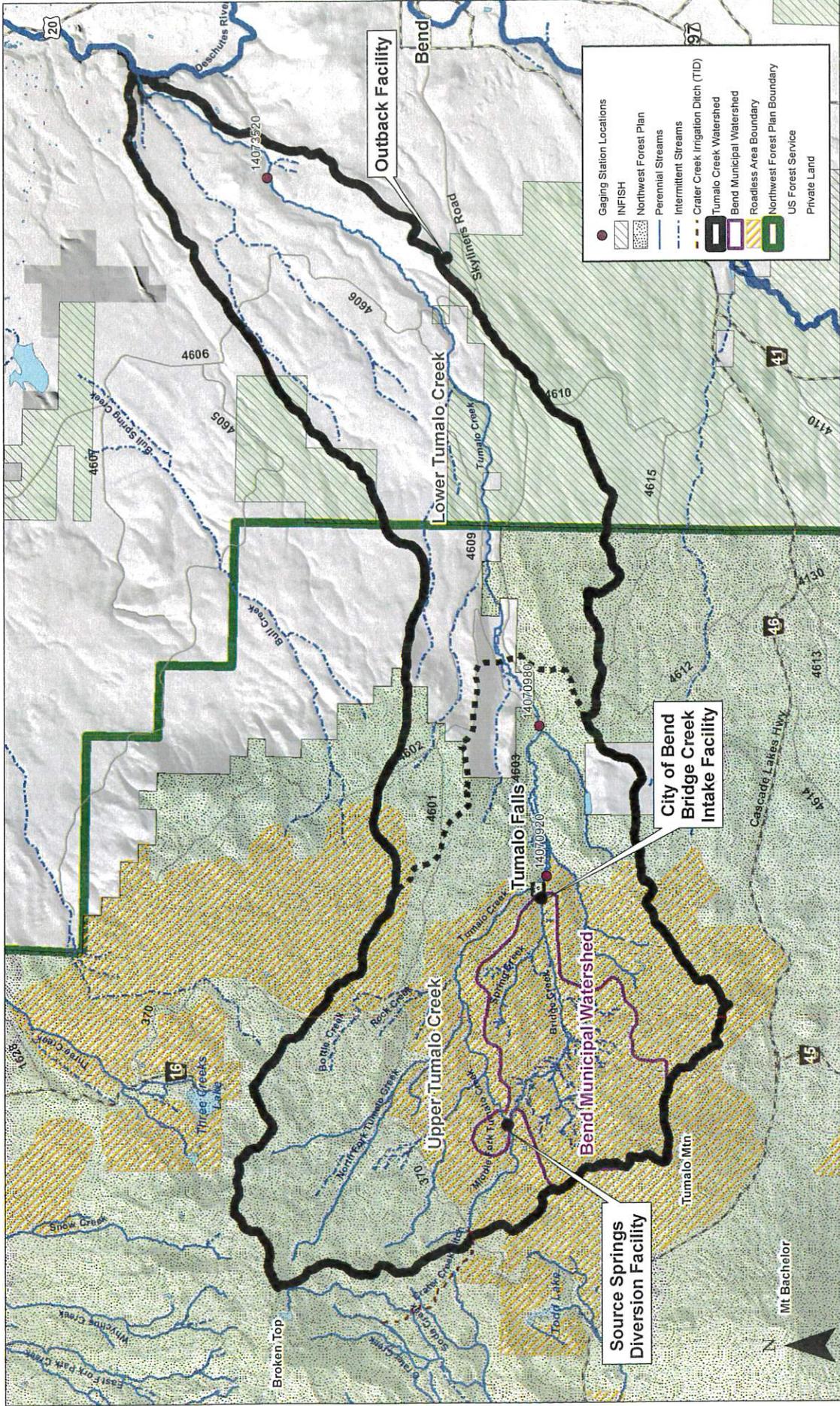
# BEN1158 Amendment 1 Map



H. Jackson 12-17-2019

# Bend Municipal Watershed - Administrative Boundaries

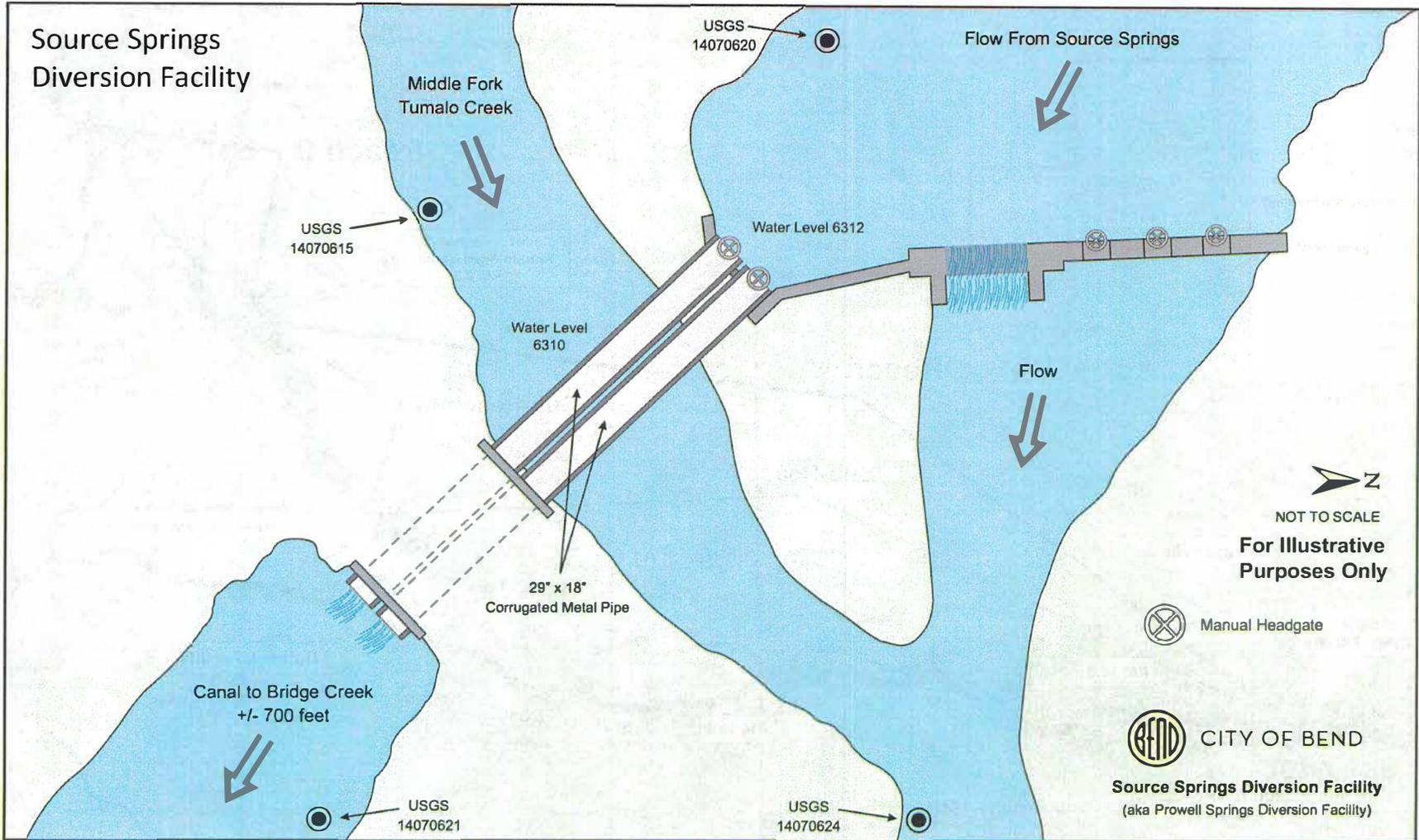
Version 3/7/2018



This product is reproduced from geospatial information prepared by the U.S. Forest Service. The reliability or suitability of this information is for a purpose other than which it was created. Original data elements were compiled from various sources and may be updated, corrected, or otherwise modified without notification. For additional information about this data, contact the Data User Support Office at (509) 546-2100. Map Created 11/2017 mdrumhart



# Source Springs Diversion Facility



NOT TO SCALE

For Illustrative  
Purposes Only



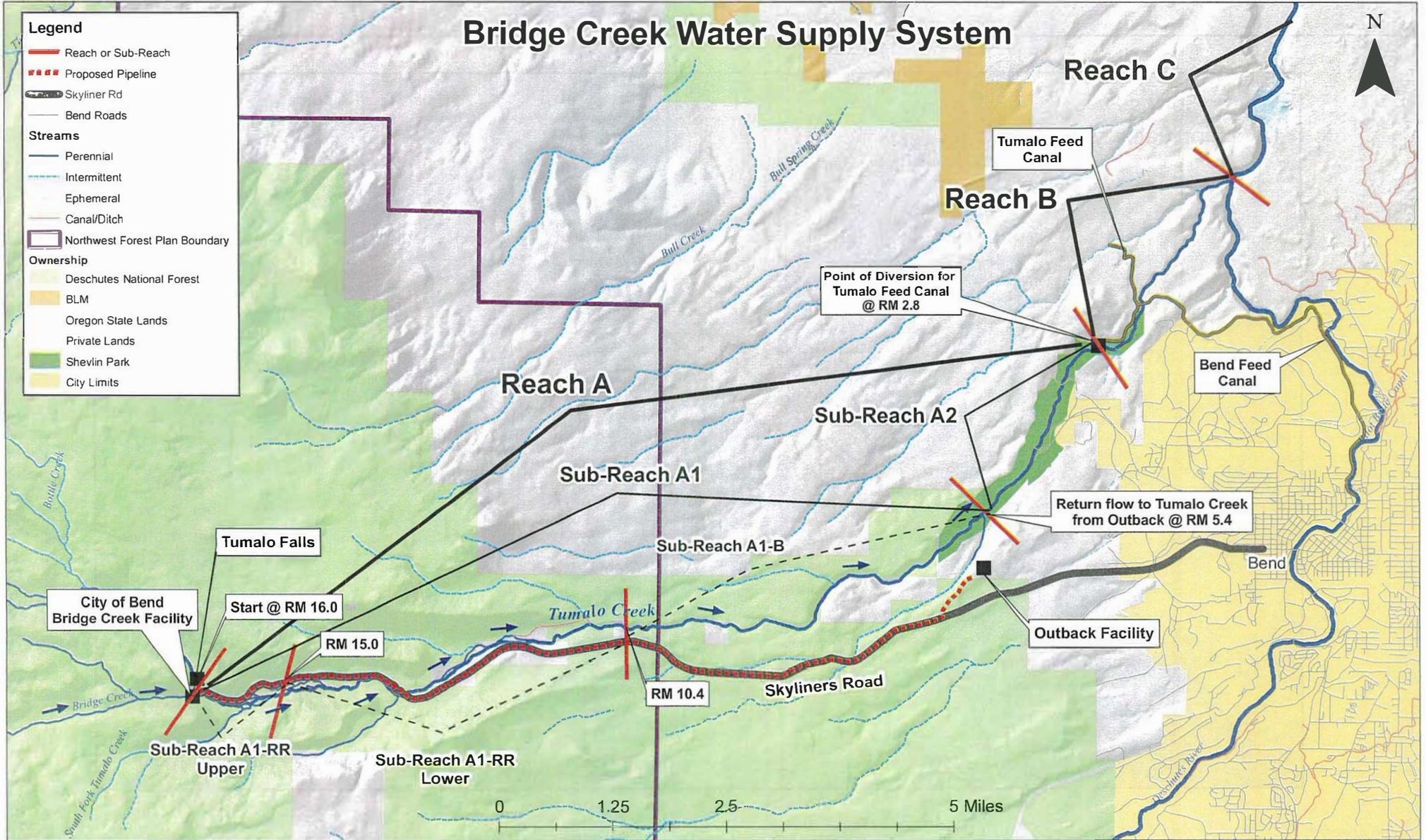
Manual Headgate



CITY OF BEND

Source Springs Diversion Facility  
(aka Prowell Springs Diversion Facility)

# EXHIBIT B - Reach Map



## **EXHIBIT C –**

### **Ramping Rates Determination for the City of Bend Bridge Creek Water System**

7/28/17

Tom Walker, Deschutes National Forest

#### **I. Introduction**

Operation of the City of Bend Surface Water System now allows flow control at the Bridge Creek intake diversion to meet municipal demand (new system began operations in April of 2016). Previously, 18.2 cfs was continually diverted with no capacity for adjustment, other than to infrequently close off the system for maintenance. The maximum diversion with the new system under Special Use permit from the Deschutes National Forest is limited to 18.2 cfs. The City will often operate the system at less than 18.2 cfs, resulting in more instream flow within Bridge Creek and Tumalo Creek below the junction of the two streams. The City would typically operate the system with little fluctuation in intake diversion rates. A guiding principle is to run the plant consistently and continuously, with a goal to never shut down. An operating goal is to run the Bridge Creek system much more uniform than the fluctuating rate of water use in the city, utilizing storage in tanks at the Outback site (City of Bend, 2016).

Periodic equipment maintenance or failures may require a shut down and restart of the intake under abnormal conditions. Complete shutdown would result in 0 cfs diversion and more discharge into Bridge Creek and Tumalo Creek below the diversion, and the re-start of the system would decrease discharge in Bridge Creek and Tumalo Creek. The maximum change in discharge in Bridge Creek and Tumalo Creek below the diversion intake would either be an increase or decrease of 18.2 cfs. Rapid decreases in discharge are of the most concern for adverse effects to fish. The Forest Service has been tasked with working with the City on developing ramping rates for operations of the Bridge Creek system. The redband trout population, a Region 6 Forest Service and State of Oregon sensitive species, is the species of concern when considering ramping rates. Redband trout in Bridge Creek are more vulnerable than in Tumalo Creek, considering it is a much smaller stream with more pronounced habitat changes expected with any rapid changes in discharge.

Long term habitat quality is not of concern with the determined ramping rates with this system, as more discharge into Bridge Creek would likely benefit redband trout habitat. An instream flow analysis using the Physical Habitat Simulation Model (PHABSIM) with Habitat Duration Analysis (HAD) determined redband trout habitat would be improved with more flow within Tumalo Creek. Similar results would likely be found within Bridge Creek.

#### **II. Ramping Rate Determination for Operations**

The conditions set forth below address the 4 primary factors for effects to trout from flow fluctuations: ramping rate, timing (seasonal and diurnal), frequency (unknown but abnormal), and amplitude (maximum of 18.2 cfs down-ramping or up-ramping).

The largest concern to fisheries from operation of the Bridge Creek system is the potential to strand redband trout juvenile fish, especially newly emerged fry, within the 0.22-mile reach of

Bridge Creek below the intake diversion when diversion rates are increased significantly and at a rapid rate. The greatest potential for stranding would occur when the system has been turned off, then turned back on to maximum capacity, reducing the discharge below the diversion by 18.2 cfs. This would typically under infrequent, abnormal conditions, such as for maintenance, as it is the intent of the city to operate a reasonably stable intake diversion rate. Stranding of redband trout in Tumalo Creek is of less concern with sudden increases in diversion based on the small change in stage exhibited during a field study conducted on Bridge and Tumalo creeks. Accretion of flows from tributary streams and springs continues to temper stranding potential in a downstream direction in Tumalo Creek.

The Forest Service will work with the City on ramping rates to protect redband trout under an Adaptive Management approach. Future cooperative research will likely include additional field study of changes in stage in Bridge and Tumalo Creeks with changing diversion rates at the intake facility and monitoring of redband trout populations in Bridge Creek and Tumalo Creek. As the City becomes more experienced and knowledgeable on system operations and capabilities, the ability to adjust ramping rates to accommodate redband trout will become improved.

A literature review on effects to trout from ramping discharge was conducted by the Forest Service. Findings from the literature review were used to develop ramping rate objectives listed below. These objectives may not be achievable initially but may become attainable as experience is gained in operating the new operating system. The objectives may be adjusted over time under the adaptive management approach. These objectives pertain only to abnormal conditions when the intake at Bridge Creek is shut down for maintenance, and not daily operations under normal operating conditions.

#### *Down-Ramping Diversion Rate Under Abnormal Conditions*

Down-ramping occurs when the diversion rate at the intake is increased and discharge in Bridge Creek and Tumalo Creek below the intake is decreased, with the potential to strand redband trout along the margins. Abnormal conditions would occur when the system is completely shut down (maintenance, emergencies) with a subsequent restart. The ability to store water at the Outback site and the flexibility of using groundwater wells alleviates some of the concern for the City of Bend in continuing to deliver water during temporary shutdowns or reduced intake diversion capacity. The field study demonstrated that there is approximately 4 inches (0.33 feet) difference in elevation between no diversion and maximum diversion within Bridge Creek below the intake facility. To mimic ramping rates for redband trout determined from the literature review, strive to meet the following objectives:

(A) November 1 through June 30th

- During this period there will be none or very few newly emergent redband trout fry present. Juvenile redband trout will be greater than 40 mm and have increased swimming ability and are less susceptible to stranding.
- Attempt to increase diversion rates at the intake that result in a stage change in Bridge Creek of 2 inches or less/hour. Under a scenario of no diversion, then re-starting the system to maximum capacity of 18.2 cfs (8167 gpm) would therefore be conducted at

a reasonably consistent rate over a two hour period, recognizing that a minimum amount of approximately 3000 gpm diversion is needed initially to charge the system and treatment facility. Avoid turning system back on after shutdown (down-ramping) during the *day* if feasible between November 1<sup>st</sup> and April 15<sup>th</sup>, as juvenile trout may seek concealment under the substrate along stream margins in the day during winter months.

(B) July 1 through October 31

- During this period newly emergent fry (<40 mm length) will be present. Due to poor swimming ability, this life stage is susceptible to stranding along stream margins during down-ramping.
- Attempt to increase diversion rates at the intake that result in a stage change in Bridge Creek of 1 inches or less/hour. Under a scenario of no diversion, then re-starting the system to maximum capacity of 18.2 cfs (8167 gpm) would therefore be conducted at a reasonably consistent rate over a four hour period, recognizing that a minimum amount of diversion of approximately 3000 gpm is needed initially to charge the system and treatment facility.

*Up-Ramping Diversion Rate During Abnormal Conditions*

Up-ramping occurs when the diversion at the intake is shutdown, resulting in an increase in discharge in Bridge Creek and Tumalo Creek below the intake.

(C) During High Stream Flow Events

- Avoid planned maintenance if feasible during high stream flow events to avoid potential adverse effects to channel conditions, or trout spawning and fry emergence from up-ramping when intake is shut down.

(D) All Year

- Although stranding is not an issue during up-ramping, strive to meet the same ramping rate as described in A above (shut down intake over two-hour period) during up-ramping, unless an emergency requires immediate shutdown. This rate is likely within the natural rates of diurnal fluctuation that redband trout are adapted to.

## EXHIBIT D

### Industrial Fire Precaution Levels

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Industrial Fire Precaution Levels (IFPLs) pertain to permitted activities such as timber sales, service contracts and firewood cutting. Please refer to your permit or firewood synopsis for more information.

There are four fire precaution levels that begin with **Level I** at the start of the “closed season” and can go as high as **Level IV** if conditions warrant. The fire precaution levels restrict certain operations as the fire danger increases. There are no precautions prior to the closed fire season. Each fire precaution level adds to the precaution measures applicable to all lower levels.

**Industrial Fire Precaution Levels** are stages that apply to work activities, including personal use firewood cutting, on Forest Service or BLM lands in order to reduce the risk of a wildfire starting from the operation.

**It is the responsibility of the individual operating on public land to know the precaution level for the day and to take the correct fire precautionary measures.**

Where hauling involves transit through more than one shutdown/regulated use area, the precaution level at the woods loading site shall govern the level of haul restriction, unless otherwise prohibited by other than the industrial precaution level system.

The IFPL system does not apply on lands protected by ODF east of the summit of the Cascades. The following definitions shall apply to these industrial fire precaution levels:

- Loading sites: A place where any product or material (including, but not limited to logs, firewood, slash, soil, rock, poles, etc.) is placed in or upon a truck or other vehicle.
- Cable yarding systems: A yarding system employing cables, and winches in a fixed position.
- Low hazard area: Any area where the responsible agency representative (BIA, BLM, FWS, NPS, ODF, USFS, WDNR) determines the combination of elements reduces the probability of fire starting and/or spreading.
- Closed season (Fire precautionary period): That season of the year when a fire hazard exists as declared by the responsible agency official.

**Waivers, written in advance, may be used for any and all activities. Activities for which waivers may be issued include, but are not limited to:**

- Mechanized loading and hauling.
  - Road maintenance such as sprinkling, graveling, grading and paving.
  - Cable yarding using gravity systems or suspended lines and blocks, or other yarding systems where extra prevention measures will significantly reduce the risk of fire.
  - Power saws at loading sites or in felling and bucking where extra prevention measures will significantly reduce the risk of fire.
  - Maintenance of equipment (other than metal cutting and welding) or improvements such as structures, fences, and power lines.
-

The **Closed Season (IFPL I)** means that fire season requirements are in effect. **During the Closed Season, the following requirements must be met:**

- Fire tools must be on site
- Fire extinguisher and shovel must be with each chainsaw
- Fire extinguishers must be in all vehicles
- Chainsaws must have a .023-inch mesh screen installed in the exhaust
- Approved spark arresters must be on all internal combustion engines
- Watchmen service must be provided for 1 hour after shutdown of power equipment for the day unless otherwise specified
- No smoking is permitted while working or traveling through any operations area on public land except while in enclosed vehicles
- Permits to burn are required unless waived in advance

**When a Fire Watch is required, the Watchman must be:**

- Physically capable and experienced in operating any firefighting equipment on site
- On duty for 1 hour after the shutdown of the last power-driven equipment for the day unless otherwise specified
- Furnished with adequate facilities for transportation and communications in order to summon if needed
- Patrolling and visually inspecting all sites where work was done during the day

**Attack a fire start:**

- Oregon State Law requires that any operator on forest or range land take immediate action to control and extinguish a fire.
- The contractor shall take this action and notify the BLM or Forest Service and the nearest State District Office immediately. Please call Central Oregon Interagency Dispatch Center (COIDC) at 541-316-7700.

**ALL OPERATIONS ARE PROHIBITED (IFPL IV):**

- No waivers will be issued
- Landowners are permitted entry into their lands

**For Current IFPL and other information, call the toll-free, 24-hour recorded message line at 1-(800)-523-4737.**

The Industrial Fire Precaution Level can be seen in the Table below.

IFPL Level	Industrial Fire Precaution Levels Definition
<p><b>Level One</b></p> <p><b>I</b></p>	<p><b>Closed Season</b> - Fire precaution requirements are in effect. A Fire Watch/Security is required at this and all higher levels unless otherwise waived.</p>
<p><b>Level Two ***</b></p> <p><b>II</b></p>	<p><b>Partial Hootowl</b> - The following may operate only between the hours of 8 p.m. and 1 p.m. local time:</p> <ul style="list-style-type: none"> <li>• power saws except at loading sites;</li> <li>• cable yarding;</li> <li>• blasting;</li> <li>• welding or cutting of metal.</li> </ul>
<p><b>Level Three ***</b></p> <p><b>III</b></p>	<p><b>Partial Shutdown</b> - the following are prohibited except as indicated:</p> <ul style="list-style-type: none"> <li>• cable yarding - except that gravity operated logging systems employing nonmotorized carriages may operate between 8 p.m. and 1 p.m. when all blocks and moving lines are suspended 10 feet above the ground except the line between the carriage and the chokers.</li> <li>• power saws - except power saws may be used at loading sites and on tractor/skidder operations between the hours of 8 p.m. and 1 p.m. local time.</li> </ul> <p><b>In addition</b>, the following are permitted to operate between the hours of 8 p.m. and 1 p.m. local time:</p> <p>Tractor, skidder, feller-buncher, forwarder, or shovel logging operations where tractors, skidders, or other equipment with a blade capable of constructing fireline are immediately available to quickly reach and effectively attack a fire start;</p> <ul style="list-style-type: none"> <li>• mechanized loading or hauling of any product or material; blasting;</li> <li>• welding or cutting of metal</li> <li>• any other spark emitting operation not specifically mentioned.</li> </ul>
<p><b>Level Four</b></p> <p><b>IV</b></p>	<p><b>General Shutdown - All operations are prohibited.</b></p>

**\*\*\*IFPL LEVELS, II, III REQUIRE A WAIVER IF OPERATING BETWEEN THE HOURS OF 1 PM AND 8 PM. CONTACT THE BEND-FORT ROCK RANGER DISTRICT OFFICE AT (541) 383-5300 FOR MITIGATION MEASURES**