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RECLAMATION

# Leavenworth National Fish Hatchery Surface Water Intake Fish Screens and Fish Passage Project Environmental Impact Statement

**Transportation and Traffic Resource Report**



**U.S. Department of the Interior  
Bureau of Reclamation  
Columbia-Pacific Northwest Regional Office  
1150 N. Curtis Road  
Boise, ID 83706**

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## **Mission Statements**

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

# Executive Summary

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) has prepared an Environmental Impact Statement (EIS) for the Leavenworth National Fish Hatchery (hereafter, LNFH or Hatchery) Surface Water Intake Fish Screens and Fish Passage (SWISP) Project (**Map A-1** in **Appendix A**). The purpose of this specialist report is to provide a comprehensive environmental baseline and analysis of the potential impacts of the SWISP Project under four separate alternatives, including Alternative A, No Action.

The Analysis Area for transportation and traffic includes East Leavenworth Road and Icicle Road from their intersections with United States (U.S.) Highway 2 to the intersection of these two roads north of the LNFH, where Icicle Road turns into Icicle Creek Road; and Icicle Creek Road to the US Department of Agriculture Forest Service (Forest Service) kiosk and construction vehicle turnaround area (**Map A-9** in **Appendix A**). The kiosk is approximately 1.25 mile southwest of the intake facilities. The primary Analysis Area is Icicle Creek Road between the intersection with East Leavenworth Road and the Forest Service kiosk, and Fish Hatchery Road. Icicle Creek Road is accessed by either East Leavenworth Road or Icicle Road.

## ***Affected Environment***

Icicle Road is the proposed haul route for the Project. It is used for access to recreation areas, private residences, inns and hotels, and the LNFH. Icicle Creek Road is the main access road to recreation opportunities on the Okanogan-Wenatchee National Forest, including the Snow Lakes Trail, a popular hiking trail (Forest Service 2020a). Fish Hatchery Road intersects Icicle Creek Road south of the Icicle Road and East Leavenworth Road intersection and is the main access road to the LNFH facilities.

Seasonal tourism directly influences traffic volume on roads in and near the Analysis Area. In general, traffic is lighter during the recreation off-season, between November and early May. Visitor use and associated traffic volume generally increases during the peak recreation season between mid-May and September. Snow Lakes Trailhead overnight reservation permits are required from May 15 to October 31 due to the heavy use of the Snow Lakes Trail and surrounding wilderness (Forest Service 2020a).

Level of Service (LOS) is used in traffic analysis to rate roadway segment operations using a traffic volume to road capacity ratio (TRPC 2016). It is also used to determine how well a transportation facility is operating from a traveler's perspective (TRPC 2016). LOS ratings for the State of Washington range from A to F, with A being the most free-flowing and F the least. (WSDOT 2020). The LOS rating decreases as a result of higher traffic volumes, decreased road capacity, or both. All roads within the Analysis Area are in Chelan County. The Chelan County LOS policy for rural roads is C or better (Chelan County 2015), and the City of Leavenworth strives for an LOS of C or better<sup>1</sup>.

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<sup>1</sup> Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on May 20, 2020, regarding "L-SWISP: Transportation—Level of Service (LOS) Data Request."

The typical LOS is C or better on northbound Icicle Road. The intersection of Icicle Road and U.S. Highway 2 is the only road segment or intersection near the Project Area for which LOS has been officially calculated (RBT Consultants 2018). Since average daily traffic counts on Icicle Road are less than the lowest average daily traffic counts for the U.S. Highway 2 and Icicle Road intersection for both Saturdays and weekdays, and roadway capacity is the same, it can be inferred that Icicle Road has a baseline LOS of C or better. While traffic volume at this intersection is not necessarily representative of the Analysis Area, it suggests that Icicle Road has an LOS C or better and provides context for possible daily, weekly, and seasonal traffic conditions on roads in the Analysis Area. For example, the available LOS data indicate that Icicle Road and Icicle Creek Road experience an increase in traffic during the peak recreation season and on weekends (RBT Consultants 2018).

Traffic congestion typically occurs near the Snow Lakes Trailhead area due to parking overflow along both sides of the road. During the peak recreation season, especially on weekends when visitor use is highest, traffic conditions on Icicle Creek Road within 0.25 miles of the Snow Lakes Trailhead is more representative of a LOS D.

### ***Environmental Consequences***

Indicators for impacts on transportation and traffic are changes in the LOS on roads and changes in access on roads to points of interest.

#### *Alternative A – No Action Alternative*

Under the No Action Alternative, there would be no change in the LOS on roads and drivers would not experience any increase or decrease in delays or frustrations while accessing or leaving the Alpine Lakes Wilderness. No planned construction activities would occur; however, the existing intake facilities would continue to operate and require routine maintenance. Operation and maintenance activities would involve one to two pickup trucks entering and leaving the Analysis Area on the days when maintenance occurs. Extraordinary maintenance would occur every couple of years and would be expected to continue into the future, which would require the use of one to three heavy construction vehicles. The LNFH's primary point of diversion and water delivery system on Icicle Creek is nearly 80 years old and is reaching or exceeding its operational life. Failure of the diversion or water delivery system would be an emergency situation. Hatchery staff responding to the situation would have an immediate and potentially sustained impact on traffic both during the emergency and until repairs are made. The timing and extent of potential impacts on transportation and traffic from extraordinary maintenance or emergency repairs would depend on the nature, extent, and timing of the necessary repairs. For the purposes of this analysis, it is assumed the No Action Alternative would result in no changes to the baseline LOS or access in the Analysis Area.

#### *Alternative B – Proposed Action*

Compared with Alternative A, there would be an increase in heavy vehicle traffic using Icicle Road and Icicle Creek Road under Alternative B. The requirement to turn around at the Forest Service and Alpine Lakes Wilderness kiosk and the need to back in against traffic onto the intake access road would result in temporary, localized reductions in LOS. The changes would be largely confined to the Wenatchee Bridge and the 1.25-mile segment of Icicle Creek Road between the intake construction area and Snow Lakes Trailhead. Reduced parking at the Forest Service and Alpine Lakes Wilderness Area kiosk to accommodate the construction vehicle turnaround area would

change the level of access to the area compared with Alternative A because there would be fewer places for visitors to park. The greatest potential for impacts would be during daylight hours, on weekends, during the summer when traffic volumes and demands for access to nearby recreation opportunities are highest. Distributing certain types of construction traffic across a 24-hour period would result in the potential for impacts occurring 24-hours per day.

Under Alternative B, Phase I construction activities would occur up to 24 hours a day, 7 days per week. During Phase I of construction, temporary reductions in LOS below C would be expected between the intake construction area and the Forest Service and Alpine Lakes Wilderness kiosk as heavy construction vehicles would utilize the turnaround and back in onto the intake access road. There would continue to be open access to the Snow Lakes Trailhead and businesses along Icicle Creek Road. A LOS below C would also occur on Icicle Road at Wenatchee Bridge when construction vehicles with oversized loads access the bridge. This is because the road would be reduced to one lane and would temporarily stop northbound or southbound traffic, depending on the vehicles' direction of travel. Vehicles in the Analysis Area would be delayed at most 10 minutes (see the SWISP Project EIS **Recreation Resource Report**), accessing Icicle Road and Icicle Creek Road due to temporary and intermittent lane closures at the Wenatchee Bridge, intake access road, and the Forest Service and Alpine Lakes Wilderness kiosk at the turnaround. The lane closure would be considered a delay rather than a change in the level of access because the lane would immediately reopen. Impacts to traffic and transportation within the Analysis Area would be reduced during nighttime construction activities because baseline LOS is typically higher at night due to fewer vehicles on the roads.

Traffic control Best Management Practices (BMPs) such as flagging, cones, delineators, safety barriers, flasher lights, danger signals, and signs would help maintain a LOS of C and maintain vehicle access by maintaining traffic flow, minimizing obstruction, and ensuring public safety (see **Appendix B**). These measures would meet the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, Part 6 (Temporary traffic control; <https://mutcd.fhwa.dot.gov/>) and WAC 296-155-305 (Signaling and flaggers).

During Phase II of construction, use of contractor use areas (CUAs) would temporarily delay access to the Icicle River RV Resort, Icicle Creek Center for the Arts, and Sleeping Lady Mountain Resort from mid-April to mid-May. Cyo Road (accessed from Icicle Creek Road) would be used to access CUA 5, which may delay access, intermittently, to the Mid-Columbia Fish and Wildlife Conservation Office. Impacts on access would be minimized by maintaining convenient access to driveways and buildings along the line of work, as listed in **Appendix B**.

Construction vehicles would make two to three trips daily, per worker, with a maximum of 15 workers per shift during Phase I construction, and 7-10 workers per shift during Phase II construction. While roadways would be maintained to ensure smooth condition (see **Appendix B**), this level of high use may result in any combination of ruts, broken pavement, potholes, or low areas with standing water on Icicle Creek Road. These would be minimized to the extent possible during Phase I and Phase II construction through the applicable BMPs listed in **Appendix B**. The construction contractor would also comply with the permitting requirements for Chelan County

ROW use and repairs and Forest Service road repairs at both jurisdictional boundaries on Icicle Creek Road.

*Alternative C*

Alternative C would temporarily reduce LOS compared with Alternative A, but to a lesser extent than Alternative B. This is because Alternative C would require fewer heavy equipment vehicle trips accessing the intake construction area. The locations where there would be temporary LOS reductions would be the same as discussed under Alternative B. Impacts on access would be the same as described under Alternative B.

*Alternative D*

Alternative D would temporarily reduce LOS and vehicle access compared with Alternative A. Alternative D would have a similar LOS as Alternative B with respect to impacts from construction vehicle trips along the construction vehicle route. Impacts on access would be the same as described under Alternative B. However, under Alternative D, Phase I construction would be limited to the workday hours of 7:00 a.m. to 10:00 p.m., 5 days per week, and up to 6 days per week under pre-approved circumstances. This construction time window limit creates two additional years of Phase I construction activities under Alternative D than proposed under Alternative B. As such, impacts to traffic and vehicle access during Phase I construction would last for a total of four years, or two more years than under Alternative B. Impacts from Phase II construction on transportation and traffic would be the same as described under Alternative B. Traffic conditions and vehicle access would return to baseline conditions in four years, after construction is completed.

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# Acronyms and Abbreviations

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Full Phrase

BMP	Best Management Practice
cfs	cubic feet per second
CIPP	cure-in-place pipe
COIC	Cascade Orchard Irrigation District
CUA	contractor use area
Ecology	Washington Department of Ecology
ESA	Endangered Species Act
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
Forest Service	U.S. Department of Agriculture, Forest Service
IO&MA	Intake Operations and Maintenance Area
LNFH	Leavenworth National Fish Hatchery
LOS	level of service
mph	miles per hour
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
O&M	operations and maintenance
PISMA	pipeline intake and sediment management area
RCW	Revised Code of Washington
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROW	right-of-way
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

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# Chapter 1. General Project Information

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) has prepared an Environmental Impact Statement (EIS) for the Leavenworth National Fish Hatchery (hereafter, LNFH or Hatchery) Surface Water Intake Fish Screens and Fish Passage (SWISP) Project (**Map A-1** in **Appendix A**). The purpose of this specialist report is to provide a comprehensive environmental baseline and analysis of the potential impacts of the SWISP Project under four separate alternatives, including Alternative A, No Action.

## 1.1 Project Area

The Project Area is on and near the LNFH, near the City of Leavenworth in Chelan County, Washington. The Project Area includes the LNFH's surface water intake and primary point of diversion on Icicle Creek, and conveyance pipeline to the Hatchery. The surface water intake is on U.S. Fish and Wildlife Service (USFWS) property, while the conveyance pipeline crosses several private parcels before re-entering USFWS property. Access to private parcels is via existing easement agreements between the landowner and federal government. The Project Area also includes approximately 1.25 miles of Icicle Creek Road, from the surface water intake to a U.S. Department of Agriculture Forest Service (Forest Service) kiosk to the west, as well as access roads and staging areas on the USFWS property. The Project Area is depicted on **Map A-1** in **Appendix A**.

## 1.2 Alternatives

Reclamation identified a reasonable range of alternatives for analysis in the EIS through the development of screening criteria, the assessment of Project *components* and *elements* against these criteria, and the consideration of scoping comments received. The major Project components are Intake, Fish Passage, Sediment Management, Conveyance Pipeline, Temporary Hatchery Water Supply, and Access and Staging. Each *component* has technical and operational requirements; generally, there are different techniques to meet these requirements. These different techniques are termed *elements*.

**Chapter 2** of the EIS describes the No Action Alternative and three action alternatives in detail, along with a summary comparison of the differences and common impacts between the alternatives. A summary of the alternatives and component elements considered but eliminated from detailed study is also provided. **Map A-2** through **Map A-8** in **Appendix A** depict the alternatives in detail.

### 1.2.1 Alternative A – No Action

The No Action Alternative represents continuation of current operation and maintenance (O&M) of the LNFH surface water intake and delivery system on Icicle Creek and provides a basis for comparison to the action alternatives. The existing intake and delivery system, constructed in 1939 and 1940, would remain in its current degraded condition and likely continue to deteriorate. All existing features listed and summarized below and depicted in **Map A-2** and **Map A-3** in

**Appendix A**, would remain in place and would not be modified, improved, or rehabilitated under this alternative.

- Low-head diversion dam
- Intake channel
- Intake trashrack structure
- Access road
- Fish ladder/Sediment sluice
- Gatehouse
- Outlet channel
- Conveyance pipeline
- Sand settling basin
- Inside and outside screen chambers

The diversion dam would continue to divert water from Icicle Creek to the intake channel, through an unscreened diversion. The start of the intake system would remain at the intake trashrack structure. The excavated intake channel above the intake trashrack structure and concrete intake channel below would continue to convey water through gravity flow to the gatehouse. The channel would remain unscreened. The intake trashrack structure at the entrance to the concrete intake channel would remain in operation. The trashrack's 6-inch bar spacing would continue to prevent large debris from entering the concrete intake channel. The road would not be modified or extended and would continue to provide access to the stairs leading to the intake trashrack structure. The existing fish ladder would not be modified to alter flow or enhance fish passage.

The existing gatehouse serves to transition surface water from the open intake channel to the enclosed conveyance pipeline. It houses a fine rack with 1.5-inch bar spacing and an overflow spill and sediment sluicing sections separated by a bulkhead. The fine rack limits the size of objects that enter the pipeline. A gate valve can be opened to flush sediment; however, it does not function reliably. The gatehouse would remain in place, and the outlet channel would continue to direct bypassed water and sluice material (sediment) from the gatehouse back to Icicle Creek.

The aging 31- to 33-inch diameter buried concrete pipeline would continue to convey water up to 42 cubic feet per second (cfs) from the gatehouse to the Hatchery. No sections would be lined or replaced and introduced sediment would continue to be transported to the Hatchery. Transported sediments would continue to degrade the existing pipeline. Before water enters the Hatchery's rearing units it is either routed into the sand settling basin (normal operation) or directly to the inside or outside screen chamber. The sand settling basin would continue to trap sediment and minimize the amount of remaining sediment from entering fish production facilities. Sediment and entrained fish would continue to be periodically removed from the sand settling basin in accordance with existing biological opinions (USFWS 2011; NMFS 2017). From the sand settling basin, water can be directed to either the inside or outside screen chamber before entering the Hatchery's rearing units. The screens in the inside and outside screen chambers are composed of vertical static screen panels that filter fish and debris from the Hatchery's water supply. The screen chambers do not

meet National Marine Fisheries Service (NMFS) current screening criteria (NMFS 2011)<sup>1</sup>. Screens must be manually cleaned, and entrained fish must be captured, removed, counted, and returned to Icicle Creek. LNFH reports the number and species of Endangered Species Act (ESA)-listed fish entrained in the intake and delivery system in their annual take report to NMFS and the USFWS.

Hatchery O&M is subject to both the National Pollution Discharge Elimination System (NPDES) permit from the Environmental Protection Agency (EPA) and O&M consultations under the ESA Section 7 with NMFS and USFWS (USFWS 2011; NMFS 2017). Extraordinary maintenance would continue to be handled on a case-by-case basis as determined to be necessary by the Hatchery. ESA Section 7 consultation has been reinitiated with the USFWS for O&M of the Hatchery.

The Cascade Orchard Irrigation Company (COIC) is expected to relocate its point of diversion on Icicle Creek downstream of the Hatchery. Once the new point of diversion is constructed, COIC would no longer divert water at the current intake location.

### 1.2.2 Alternative B – Proposed Action

Reclamation proposes to rehabilitate the LNFH surface water intake and delivery system on Icicle Creek by constructing new headworks<sup>2</sup> and a creek-width roughened channel and replacing and lining the surface water conveyance pipeline to the Hatchery. In addition, the current access road would be modified and extended to provide better entry to an expanded Intake Operations and Maintenance Area (IO&MA). A conceptual drawing of the proposed intake facilities is included as **Map A-4** in **Appendix A**. See **Map A-5** and **Map A-6** in **Appendix A** showing activities proposed under Alternative B.

#### ***Intake and Fish Passage***

Construction of the headworks and roughened channel would incorporate the existing low-head diversion dam and intake channel. The roughened channel would incorporate a portion of the fish ladder/sediment sluice; the unincorporated portion would be removed. Two self-cleaning, cylindrical, screens would be installed at the diversion headworks to comply with NMFS fish screening criteria, provide redundancy in case of screen maintenance, and to facilitate the Hatchery's ability to meet future water conservation goals. A low-flow boulder weir fishway would be integrated into the roughened channel to provide NMFS-compliant fish passage during typical low flows, and a portion of the roughened channel would be extended upstream of the diversion dam to facilitate fish passage overall and at higher flows in particular. The intake trashrack structure would be removed, and a new pipeline would be placed in the intake channel to connect the headworks to the conveyance pipeline. The intake channel would be filled to cover the pipeline and create the IO&MA to enable Hatchery personnel to safely and efficiently access, operate, and maintain the intake facilities. The existing stairway from the access road to the intake channel would be removed

<sup>1</sup> The existing inside and outside screen chambers meet NMFS standards for fish screening (NMFS 1997), but not current criteria (NMFS 2011). Even if the screen chambers were upgraded to NMFS current criteria, take would still occur. This is because take occurs at the point of entrainment, at the existing intake facilities on Icicle Creek. The screen chambers are at the distal end of the conveyance pipeline, approximately 6,300 feet from the existing intake facilities on Icicle Creek.

<sup>2</sup> Headworks means any dam, weir, barrage, or reservoir and all works appurtenant thereto, used for or in connection with the storage, control, conveyance, or distribution of water. For the SWISP Project, the headworks includes the combined intake structure elements, such as the intake structure, gates, and retaining walls.

as this area would become part of the IO&MA. See **Map A-4** in **Appendix A** for a conceptual drawing of the proposed intake facilities.

### ***Sediment Management***

Elements to manage sediment accumulated at the intake include a ramp on the upstream side of the roughened channel to help mobilize sediment over the feature, a vertical access pipe incorporated into the IO&MA behind the screens to enable a submersible pump to draw in screened water and force it through a hose and nozzle to mobilize sediment through propulsion, and a series of pipes, valves, and outlet channel at the pipeline intake and sediment management area (PISMA) to flush sediment through the intake pipeline back to Icicle Creek (as needed). Components of the PISMA would be placed at the former gatehouse location. See **Map A-4** in **Appendix A** for a conceptual drawing of the proposed intake facilities.

### ***Conveyance Pipeline***

Under Alternative B, approximately 2,180 feet of the conveyance pipeline would be replaced using cut and cover trenching on USFWS property and approximately 4,000 feet of conveyance pipeline would be lined with cure-in-place pipe (CIPP) on private parcels (**Map A-5** in **Appendix A**). Construction of several temporary access points (contractor use areas [CUAs]) along the existing conveyance pipeline alignment would be installed to provide ingress and egress for pipe lining on private lands. These areas would be restored to pre-construction conditions following lining activities.

The uppermost segment of the existing concrete cylinder pipeline on USFWS property would be removed and replaced with 520 feet of new 42-inch high-density polyethylene pipe in the same location. The 1,660 feet of the lower segment of pipeline on USFWS property would be constructed parallel to the existing concrete cylinder pipeline. The current control valve system at the sand settling basin on USFWS property would be replaced with a new control valve vault to allow safe pipe filling operations. After control valve connections are made, this segment of the existing pipeline would be decommissioned and abandoned-in-place. All rehabilitation, replacement, and modernization of the LNFH intake and delivery facilities would conclude at the control valve system; the sand settling basin and inside and outside screen chambers would remain unaltered.

### ***Temporary Hatchery Water Supply***

Temporary Hatchery water would primarily be supplied by a gravity-fed diversion. A 40 cfs water supply to LNFH would be maintained during Phase I construction<sup>3</sup>. Temporary pumping from the spillway pool would supply water while the gravity-fed bypass pipeline and outlet are installed and connected to the existing conveyance pipeline approximately 200-300 feet below the intake construction area. This would occur over an approximately 1-week period. It is likely that multiple pumps would be needed to supply this water.

A 20 cfs water supply to LNFH would be maintained during Phase II construction between April 17 to May 20. This would be needed when pipeline replacement, lining with CIPP, and pipeline

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<sup>3</sup> During Phase I construction, the LNFH has agreed to a 40 cfs temporary Hatchery water supply, which is different than the LNFH's full surface water right of 42 cfs.

interconnections were underway, and would occur through pumping from the spillway pool adjacent to LNFH (Map A-5 in Appendix A).

### **Access and Staging**

Staging and storage sites for construction equipment and materials, and construction staff administration and vehicle parking would be located at various places on LNFH grounds (see Map A-5 and Map A-6 in Appendix A). Trucks hauling construction equipment and containing construction materials would be required to turn around approximately 1.25 miles southwest of the intake access road, at the Forest Service and Alpine Lakes Wilderness Area kiosk on Icicle Creek Road. Construction access to the conveyance pipeline would use existing roads, temporary access routes, and the pipeline right-of-way (ROW).

### **Construction**

Construction of the SWISP Project would occur in three phases. Phase I would include construction of the intake access road and rehabilitation of the intake structures and facilities (e.g., fish screens, fish passage). Phase II would include replacement and lining of the conveyance pipeline. There would likely be temporal overlap between parts of Phase I and Phase II construction. For instance, in July 2022, it is likely that construction of the proposed intake facilities may overlap with pipeline replacement on the Hatchery grounds (see Appendix C in the SWISP Project EIS for additional assumptions). Phase III would include revegetation of upland and riparian areas that are proposed to be disturbed.

Phase I construction activities would occur up to 24 hours per day, 6 days per week, and up to 7 days per week. In addition, the in-water work window would be from July 1 to November 15 each year. Phase II construction activities and Phase III revegetation activities would not include any in-water work and would be limited to workday hours of 7:00 a.m. to 10:00 p.m., 5 days per week, and up to 6 days per week.

Phase I includes:

- Construction activities occurring up to 24 hours a day, up to 7 days a week.
- Construction occurring over two seasons primarily within the in-water work window of July 1 to November 15.
- Construction of intake access road (2022).
- Installation of temporary cofferdams<sup>4</sup> (2022 and 2023).
- Demolition of existing intake trashrack structure (complete), existing gatehouse (complete) and fish ladder/sediment sluice (partial) (2022).
- Construction of headworks, including the intake structure, retaining walls, and vertical access pipe for sediment management tools (2022).
- Placement of new intake pipeline (2022).

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<sup>4</sup> Temporary cofferdams would likely consist of geo-bags, or non-woven geotextile bags. These are large bags made of synthetic materials, such as polyester, polypropylene, or polyethylene, which are filled with sand, rock, or other material, fastened shut, and used to protect structures or riverbanks from erosion or scour.

- Construction of IO&MA over the headworks, retaining walls, and intake pipeline (2022).
- Placement of guiderails, hydraulic equipment, NMFS-compliant fish screens, slide gates, covered control panel, and safety guardrails around the IO&MA (2022).
- Construction of the PISMA at former gatehouse location (2022).
- Rehabilitation of the outlet channel (2022).
- Construction of roughened channel, including upstream sediment ramp and low-flow boulder weir fishway (2023).
- Supplying LNFH with a temporary water supply of 40 cfs using a temporary above-ground, gravity-fed bypass pipeline connected to the conveyance pipeline or pumping from the spillway pool when necessary (2022).
- Post-construction seeding of disturbed areas that do not have a surface treatment (e.g., gravel) with an upland or riparian seed mix, as appropriate (2023).

Phase II includes:

- Construction activities occurring during workday hours of 7:00 a.m. to 10:00 p.m., 5 days per week, and up to 6 days per week.
- The majority of pipeline lining construction occurring over three seasons during a 4- to 5-week period between April and May.
- Pipeline replacement construction occurring year-round where practicable.
- Replacing conveyance pipeline segments on USFWS property (2022, 2023, and 2024).
- Utilizing existing roads and temporary access routes to gain access to CUAs, as coordinated with private landowners. No improvements are needed to existing roads and access routes.
- CIPP lining of the conveyance pipeline on private parcels from CUAs.
- Temporarily pumping Hatchery water out of the spillway pool during pipeline replacement, lining with CIPP, and pipeline interconnections. Pumping would take place between April 17 and May 20 during the Phase II construction period (2022, 2023, and 2024).
- Constructing new control valve vault and system on USFWS property (2022 and 2023).
- Post-construction seeding of disturbed upland areas (2022, 2023, and 2024).

Phase III includes:

- Planting of riparian tree cuttings in the riparian zone within the Phase I construction area (2024).
- Planting of containerized upland shrubs and trees in uplands within the Phase I construction area (2024).

### **Best Management Practices**

Reclamation would implement practices to protect water quality and other resources and promote soil conservation during Project construction and O&M activities. While these measures are often called Best Management Practices (BMPs), they are conservation measures used to reduce Project impacts on resources and resource uses, including, but not limited to, fisheries and aquatic resources,



Tribal interests, public health and safety, and recreation. BMPs can be a ‘thing’ installed on-the-ground (e.g., silt fence, ground cover vegetation) or a ‘process’ used to plan and conduct an activity (e.g., marking stream buffers). The comprehensive list of BMPs is included in this report as **Appendix B**.

### **Permitting**

Because Alternative B would include work within Icicle Creek, several federal and state regulatory permit approvals would be required before construction begins. Reclamation would obtain all required regulatory permits prior to construction implementation. Reclamation would use the Washington State Joint Aquatic Resources Permit Application form to apply for applicable permits. Permits that would be obtained include:

- U.S. Army Corps of Engineers (USACE) Section 404 Nationwide Permits
- Washington Department of Ecology (Ecology) Section 401 Water Quality Certification
- Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval

Alternative B would also include the use of Icicle Creek Road on National Forest System lands, between the Snow Lakes Trailhead and the Forest Service and Alpine Lakes Wilderness Area kiosk. As a result, Reclamation would secure the required road use approval from the Forest Service, most likely under a special use permit. The kiosk is approximately 1.25 miles southwest of the intake facilities.

### **Operations and Maintenance**

O&M activities would periodically occur on an as-needed basis as determined by Hatchery staff, including daily visual inspections of the proposed intake facilities. Periodic maintenance of the fish screens would be facilitated by construction of the proposed IO&MA, while O&M of the conveyance pipeline would be facilitated by the PISMA and the new control valve system at the sand settling basin.

Hatchery O&M is subject to both the NPDES permit from the EPA and O&M consultations under the ESA Section 7 with NMFS and USFWS (USFWS 2011; NMFS 2017). Extraordinary maintenance is handled on a case-by-case basis as determined to be necessary by the Hatchery.

#### **1.2.3 Alternative C**

Under Alternative C, Reclamation would rehabilitate the LNFH surface water intake and delivery system on Icicle Creek as described under Alternative B. However, under Alternative C, Reclamation would line the entire upper segment (520 feet) of the conveyance pipeline on USFWS property with CIPP instead of replacing it, as described under Alternative B (**Map A-7** and **Map A-8** in **Appendix A**). As a result, the mature trees in the Icicle Creek riparian zone found in this conveyance pipeline segment would not be removed. Under Alternative C, the length of the conveyance pipeline, from the PISMA to CUA 5 (4,520 feet), would be lined with CIPP. The remaining segments lined with CIPP on private parcels and replaced on the Hatchery grounds proper would be the same as described under Alternative B (see **Map A-7** in **Appendix A**). A conceptual drawing of the proposed intake facilities is included as **Map A-4** in **Appendix A**.

A 20 cfs water supply to LNFH would be maintained during Phase II construction between April 17 and May 20, as described under Alternative B. No temporary pumping would be necessary for pipeline replacement during Phase II construction because the upper segment of the conveyance pipeline on USFWS property would be lined with CIPP instead. As discussed under Alternative B, temporary pumping would be needed while the conveyance pipeline is lined with CIPP, and when pipeline interconnections were underway.

Hatchery O&M is subject to both the NPDES permit from the EPA and O&M consultations under the ESA Section 7 with NMFS and USFWS (USFWS 2011; NMFS 2017). Extraordinary maintenance is handled on a case-by-case basis as determined to be necessary by the Hatchery.

#### 1.2.4 Alternative D

Under Alternative D, Reclamation would rehabilitate the LNFH surface water intake and delivery system on Icicle Creek as described under Alternative B but with the following differences. Phase I construction activities would be same as Alternative B but would be limited to workday hours of 7:00 a.m. to 10:00 p.m., 5 days per week, and up to 6 days per week. In addition, the in-water work window would be limited to July 1 to October 31 each year. Alternative D was developed to minimize the effects of 24 hours a day construction and reduce the overlap of cofferdam use with a period of greater high-flow risk. Phase II construction activities and schedule would be the same as described under Alternative B. Phase III revegetation efforts would be the same as described under Alternative B except would occur a year later (2025).

The components and elements of the surface water intake facilities and construction activities would be the same as described for Alternative B during Phase I; however, because construction would be limited to workday hours of 7:00 a.m. to 10:00 p.m. and the in-water work window would be two weeks shorter than under Alternative B, construction of Phase I under Alternative D would require four years (i.e., four in-water work windows from 2022 to 2025) to complete. The sequence of Phase I construction activities would be very similar to those listed for Alternative B but would extend through two additional in-water work windows during two additional years (2024 and 2025). Initial mobilization, construction of the intake access road, temporary Hatchery water supply during the in-water work window, access and staging, BMPs, permitting, and O&M would be unchanged from Alternative B. Details of the Phase I construction schedule for intake and fish passage and temporary Hatchery water supply components for Alternative D are provided below.

During the first in-water work window in 2022, preparation for and installation of cofferdams and the gravity bypass pipeline and gravity bypass outlet, demolition of the intake trashrack structure, gatehouse, fish ladder/sediment sluice (partial), and construction of the PISMA and outlet channel, would be the same as Alternative B (**Map A-6** in **Appendix A**). However, because of the shorter workdays and shorter in-water work window, construction of the intake structure would be limited to excavation, preparation and construction of the concrete slab foundation, and partial construction of the intake headworks. At the end of the 2022 in-water work window, the intake structure would be approximately 35 percent completed. Although the full extent of the intake headworks foundation would be in place, the area of the partially constructed intake headworks would be inundated between the 2022 and 2023 in-water work windows after cofferdam removal.

Demobilization of construction equipment in 2022 would leave the constructed elements of the intake structure in this condition until July 2023 when re-mobilization occurs.

From November 1, 2022 to June 30, 2023, the Hatchery's surface water would be supplied by pumping from the spillway pool on Icicle Creek adjacent to LNFH (**Map A-5 in Appendix A**). Two high capacity pumps<sup>5</sup> would provide 40 cfs of water to the Hatchery during this period. An operational third pump would be on site as a backup. The pumps would operate 24 hours per day for the 8-month period; as a result, they would require 24 hour per day, 7 day per week monitoring by the construction contractor.

During the second in-water work window in 2023, preparation for and installation of cofferdams and the gravity bypass pipeline and gravity bypass outlet again would occur as described under Alternative B. The remaining 65 percent of construction of the intake structure components and elements would be completed before cofferdam removal. By the end of the 2023 in-water work window, fish screens would be in place and fully operational, and the temporary gravity bypass pipeline and gravity bypass outlet would be removed. In addition, the transition to the new intake structure would be completed by connecting intake facilities to the conveyance pipeline to deliver the LNFH surface water supply by October 31, 2023. Because the intake structure would be fully operational at the end of this in-water work window, there would be no need to supply temporary water to the Hatchery during the remainder of Phase I construction.

During the third in-water work window in 2024, mobilization similar to previous Phase I in-water work window construction seasons would be required before construction of the low-flow boulder weir fishway and the left bank portion of the roughened channel could occur. Construction of the low-flow boulder weir fishway and the left bank portion of the roughened channel would include placement of cofferdams, dewatering of the construction area, regrading of the stream channel bottom, construction of the low-flow boulder weir fishway and the left bank portion of the roughened channel and finally, removal of the cofferdam.

During the fourth in-water work window in 2025, mobilization similar to previous Phase I in-water work window construction seasons would be required before construction on the remaining portion (right bank) of the roughened channel could occur. Construction of the remaining portion of the roughened channel would include placement of cofferdams, dewatering of the construction area, regrading of the stream channel bottom, construction of the roughened channel and finally, removal of the cofferdam. Once the entire roughened channel is complete and all cofferdams have been removed, the intake facilities would undergo final testing and commissioning to ensure proper operation and compliance with NMFS current screening and fish passage criteria for anadromous fish passage facilities (NMFS 2011), which would occur by October 31, 2025.

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<sup>5</sup> Pumps are assumed to be high-lift, 16-inch, trailer-mounted with 150 horsepower diesel engines.

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# Chapter 2. Relevant Laws, Regulations, and Policy

## 2.1 Federal Laws, Regulations, Statutes, and Orders

**Columbia Basin Project Act of March 1943**—reauthorized the Columbia Basin Project, bringing it under the provisions of the Reclamation Project Act of 1939.

**Moving Ahead for Progress in the 21st Century Act (MAP-21 Act)**—This act provides guidance for traffic and motor vehicle safety on highways and highway arterials.

## 2.2 State and Local Laws

**Revised Code of Washington (RCW) Title 46.44, Size, Weight, Load**—This law includes standards for size, weight, and load of motor vehicles and the use of special permits for oversized vehicles.

**RCW Title 47.52, Limited Access Facilities**—This law includes standards for restricting or closing access on highways or streets designated for through traffic.

**Chelan County Code Title 15.30, Article VII, Construction Control and Inspection**—This provides guidance for site maintenance, inspection, and traffic control for work performed in the construction or improvement of roads, whether by or for a private developer, by county forces, by county contractor, or by private contractor.

**Chelan County 2017–2037 Comprehensive Plan**—This plan is a guide for future land uses throughout the county. It provides a foundation for the creation of regulatory codes, such as zoning and development regulations, and includes a list of goals and a set of policies for transportation.

**City of Leavenworth Comprehensive Plan 2017**—This plan directs regulations and policy, implementation actions, and services that support the community’s vision for the future and physical development of the City of Leavenworth. It demonstrates how land use, housing, transportation, capital facilities, and services align to complement the desired vision.

## 2.3 Other

**Forest Service Handbook 7709.59 – Road System Operations and Maintenance Handbook**—This handbook provides guidance for conducting planning, traffic management, investment sharing (cost share), highway safety, traffic studies, road maintenance, and other road system operations and maintenance activities.

**Washington Transportation Plan**—This plan establishes a 20-year vision for the development of the statewide transportation system. The Washington Transportation Plan is based on the six

transportation system policy goals established by the state legislature: preservation, safety, mobility, environment, stewardship, and economic vitality (RCW 47.04.280).

**Transportation 2040 – The Regional Transportation Plan for Chelan and Douglas**

**Counties**—This plan addresses the federal metropolitan planning requirements in 23 United States Code (USC) 134 and 49 USC 5303; the Washington state regional transportation planning requirements in 47.80 RCW; all urban, rural, and small city areas in Chelan and Douglas Counties; and regionally significant transportation deficiencies and opportunities. It recommends transportation system improvements in urban, rural, and small city areas throughout Chelan and Douglas counties.

# Chapter 3. Affected Environment

## 3.1 Analysis Area

The Analysis Area for transportation and traffic includes East Leavenworth Road and Icicle Road from their intersections with United States (U.S.) Highway 2 to the intersection of these two roads north of the LNFH, where Icicle Road turns into Icicle Creek Road; and Icicle Creek Road to the Forest Service kiosk and construction vehicle turnaround area. The kiosk is approximately 1.25 mile southwest of the intake facilities (**Map A-9** in **Appendix A**). The primary Analysis Area is Icicle Creek Road between the intersection with East Leavenworth Road and the Forest Service kiosk, and Fish Hatchery Road. Icicle Creek Road is accessed by either East Leavenworth Road or Icicle Road (**Map A-9** in **Appendix A**).

## 3.2 Transportation

U.S. Highway 2 runs through the City of Leavenworth. Icicle Road and East Leavenworth Road connect with U.S. Highway 2 approximately 2.5 miles north of the LNFH; the two roads intersect directly north of the Project Area at which point Icicle Road turns into Icicle Creek Road (**Map A-9** in **Appendix A**). The *City of Leavenworth Comprehensive Plan* identifies these roads as rural major collector roadways, meaning they provide access at a regional level (City of Leavenworth 2017).

East Leavenworth Road is approximately 3.3 miles long with a speed limit of 35 miles per hour (mph) and is used for residential, commercial, and recreation access to the Wenatchee River and Icicle Creek. Icicle Road is a 2-mile long road that crosses the Wenatchee River and narrows, briefly, at the Wenatchee River Bridge, located approximately 1 mile north of the Project Area (**Map A-9** in **Appendix A**). The bridge span is approximately 250 feet. The travel lanes are the same width over the bridge but without shoulders. Icicle Road, which turns into Icicle Creek Road, has an 80,000-pound gross vehicle weight capacity<sup>6</sup> and is used for access to recreation areas, private residences, inns and hotels, and the LNFH. Icicle Creek Road is the main access road to recreation opportunities on the Okanogan-Wenatchee National Forest, including the Snow Lakes Trail, a popular hiking trail (Forest Service 2020a). Fish Hatchery Road intersects Icicle Creek Road south of the Icicle Road and East Leavenworth Road intersection and is the main access road to the LNFH facilities and a few Hatchery staff residences. Vehicles entering Icicle Creek Road from Fish Hatchery Road must yield to traffic on Icicle Creek Road. Vehicles turning onto Fish Hatchery Road from Icicle Creek Road must do so from the travel lanes; there are no separate turn lanes.

The Forest Service and Alpine Lakes Wilderness Area kiosk is located approximately 0.25 miles west of the parking area for the Snow Lakes Trailhead and is proposed as the construction vehicle turnaround area on Icicle Creek Road. To the west of a double-iron gate west of the Snow Lakes Trailhead parking lot, jurisdiction for the road ROW and associated maintenance responsibility transitions from Chelan County to the Forest Service. The Forest Service initiated hot patch repairs

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<sup>6</sup> David Child, Bureau of Reclamation, email to Paula Cox, Chelan County, on June 30, 2020, regarding “L-SWISP: Transportation—Road Load Ratings, Leavenworth Roads.”

to Icicle Creek Road, starting at the boundary, in June 2020, to address deteriorated road surface conditions (see **Figure 1**).



**Figure 1. Existing Road Conditions on Icicle Creek Road, West of Snow Lakes Trailhead Parking Area**

Icicle Road has approximately 6-foot wide shoulders, except at the bridge over the Wenatchee River, where the shoulder narrows to approximately 1 foot wide. West of the bridge, the shoulders begin to narrow at the intersection of Icicle Creek Road and Cyo Road, where they become approximately 4 feet wide. On-street parking, as overflow parking, is common near the Snow Lakes Trailhead. On-street parking does not occur on Icicle Road or East Leavenworth Road. However, on either side of the bridge on Icicle Road, shoulder parking is common during the summer months as recreationists access the Wenatchee River below the bridge.

### 3.3 Traffic

Level of service (LOS) is used in traffic analysis to rate roadway segment operations using a traffic volume to road capacity ratio (TRPC 2016). It is also used to determine how well a transportation facility is operating from a traveler's perspective (TRPC 2016). LOS ratings for the State of Washington range from A to F, with A being the most free-flowing and F the least. (WSDOT 2020). As shown in **Table 1**, the LOS rating decreases as a result of higher traffic volumes, decreased road capacity, or both.



All roads within the Analysis Area are in Chelan County. The Chelan County LOS policy for rural roads is C or better (Chelan County 2015), and the City of Leavenworth strives for an LOS of C or better<sup>7</sup>.

**Table 1**  
**Level of Service Descriptions**

<b>LOS</b>	<b>Description</b>
A	Free-flowing conditions.
B	Reasonably unimpeded operation.
C	Stable operating conditions, but individual motorists are affected by the interaction with other motorists.
D	Less stable operating conditions where a small increase in flow may cause substantial increases in delay and decreases in traffic speed.
E	Unstable operation and significant delay.
F	Over capacity, with delays.

Source: Chelan County Transportation Element (Draft) 2017

Seasonal tourism directly influences traffic volume in and near the Analysis Area. Traffic is generally lighter from November to May. Visitor use and associated traffic volume generally increases during the peak recreation season between mid-May and September. Traffic is heaviest during this period, especially on the weekends when visitors may park on either side of Icicle Creek Road to access the Snow Lakes Trail (**Map A-9** in **Appendix A**). Snow Lakes Trailhead overnight reservation permits are required from May 15 to October 31 due to the heavy use of the Snow Lakes Trail and surrounding wilderness (Forest Service 2020a).

During a Forest Service traffic count study, the average daily traffic on Icicle Creek Road near the LNFH was 600 vehicles<sup>8</sup>. However, there have been no traffic impact analyses and associated site-specific LOS determinations completed for intersections or roadway segments near the Hatchery. The nearest analysis is for the intersection of U.S. Highway 2 and Icicle Road (**Map A-9** in **Appendix A**), which found the average daily traffic in 2017 to be highest during the peak recreation season, and on Saturdays (RBT Consultants 2018). Traffic peaked on Saturdays from 1:45 p.m. to 2:45 p.m. and on weekdays from 4:45 p.m. to 5:45 p.m. (RBT Consultants 2018). The most traffic occurred during July, which had an average daily traffic count of 8,164 vehicles on Saturdays and 5,104 vehicles on weekdays (RBT Consultants 2018). Average daily traffic in the Project Area is lower because it is a more rural setting, but experiences similar daily, weekly, and seasonal traffic patterns.

<sup>7</sup> Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on May 20, 2020, regarding “L-SWISP: Transportation—Level of Service (LOS) Data Request.”

<sup>8</sup> Leslie Moscoso, Wenatchee River Ranger District Forest Service, email to Elizabeth Heether, Bureau of Reclamation, on June 24, 2020, regarding “L-SWISP: Transportation—Level of Service (LOS) data request.”

For the approximately 2-mile segment of Icicle Road south of U.S. Highway 2, observed average daily traffic during the non-peak recreation season is 1,979 to 3,498 (see **Table 2**) with the highest count nearest the U.S. Highway 2 and Icicle Road intersection at mile post 0.10<sup>9</sup>. This complements the data collected by RBT Consultants (2018). Since average daily traffic counts on Icicle Road are less than the lowest average daily traffic counts for the U.S. Highway 2 and Icicle Road intersection for both Saturdays and weekdays, and roadway capacity is the same, it can be inferred that Icicle Road has a baseline LOS of C or better. There is no corresponding traffic count data for Icicle Road for peak recreation season; however, data from RBT Consultants (2018) would suggest that volumes would be higher and LOS would be lower compared with the off-peak season data.

**Table 2**  
**Average Daily Traffic Counts on Icicle Road**

<b>Mile Post</b>	<b>Average Daily Traffic</b>	<b>Date Measured</b>
0.10	3,498	5/1/2017
0.72	1,994	4/9/2018
0.92	2,635	5/1/2017
1.44	2,175	5/1/2017
2.01	1,979	5/1/2017

Source: Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on May 20, 2020, regarding "L-SWISP: Transportation—Level of Service (LOS) Data Request."

To measure traffic during the peak recreation season, the Forest Service had a traffic counter on Icicle Creek Road east of the Snow Lakes Trailhead entrance. The traffic counts include data for 11.4 active days in May (starting on May 20, 2020), 30.0 active days in June, and 30.6 active days in July (see **Table 3**) for 2020 (Forest Service 2020b). Active days represent the amount of time each month that the traffic counter was on and recording data. The days with the highest traffic counts occurred between June 6, 2020 and July 25, 2020 from 12:00 p.m. to 4:00 p.m. (Forest Service 2020b). As shown in **Table 3**, average weekday counts are higher than average weekend counts. This reversal in weekday and weekend traffic volume levels compared with the observed trend further north on Icicle Road (RBT Consultants 2018) is likely due to the Coronavirus pandemic that resulted in business closures and social distancing restrictions beginning in late March of 2020. During this time, there was a greater demand for outdoor recreation opportunities.

<sup>9</sup> Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on May 20, 2020, regarding "L-SWISP: Transportation—Level of Service (LOS) Data Request."

**Table 3**  
**2020 Traffic Counts on Icicle Creek Road before the Snow Lakes Trailhead Entrance**

Month	Active Days	Total Count	Average Day <sup>1</sup>	Average Weekdays <sup>1</sup>	Average Weekends <sup>1</sup>
May	11.4	12,277	1,073.4	4,233.3	2,990.0
June	30.0	48,533	1,617.8	5,868.4	5,678.0
July	30.6	59,692	1,952	6,654.8	5,646.5

Source: Forest Service 2020b.

<sup>1</sup>Average day is the average daily traffic count for the period of active days; average weekdays is the average daily traffic count on weekdays for the period of active days; and average weekends is the average daily traffic count on weekends for the period of active days.

Icicle Road and Icicle Creek Road experience an increase in traffic during the peak recreation season, as mentioned above, but traffic congestion is most likely to occur near the Snow Lakes Trailhead. Congestion near the Snow Lakes Trailhead area is due to parking overflow for the Snow Lakes Trailhead (see **Figure 2**) along both sides of the road. During the peak recreation season, especially on weekends when visitor use is highest, traffic conditions on Icicle Creek Road within 0.25 miles of the Snow Lakes Trailhead is more representative of a LOS D rating.



**Figure 2. Snow Lakes Trailhead Parking Lot Entrance Looking East on Icicle Creek Road**

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# Chapter 4. Environmental Consequences

## 4.1 Methods

### 4.1.1 Analysis Indicators

- Changes in the LOS on roads
- Change in access to points of interest within the analysis area

### 4.1.2 Issue Statements

Reclamation received two comments during the public scoping process related to transportation which were summarized in the following issue statement:

- Commenters noted concerns related to additional transportation improvements. If additional transportation improvements are needed for the Project over an identified Water of the U.S., then those projects would need to be identified and brought forward (e.g., a bridge update to allow construction vehicles to get to the project area). Moreover, a Hydraulic Project Approval could be needed from the State if there are additional transportation improvements needed.

Transportation improvements related to the proposed project will include road repairs; however, none of the proposed transportation activities during the project construction will cross a Water of the U.S.

### 4.1.3 Assumptions

The following assumptions are used for the transportation and traffic analysis:

- Traffic volume in the Analysis Area is greatest during peak recreation season (from mid-May to September), and is typically greater on weekends than weekdays. On a daily basis, typical traffic volumes are greatest during daylight hours.
- Icicle Road and Icicle Creek Road have an LOS of C or better under baseline conditions.
- All impacts on transportation and traffic, including road repairs after Phase I and Phase II construction, would be temporary.

## 4.2 Alternative A – No Action Alternative

Under the No Action Alternative, there would be no change in the LOS on roads and drivers would not experience delays or frustrations while accessing or leaving the Alpine Lakes Wilderness. No planned construction activities would occur; however the existing intake facilities would continue to operate and require routine maintenance. Operation and maintenance activities would involve one to two pickup trucks entering and leaving the project area on the days when maintenance occurs. Extraordinary maintenance would occur every couple of years and would be expected to continue into the future, which would require the use of one to three heavy construction vehicles. The LNFH's primary point of diversion and water delivery system on Icicle Creek is nearly 80 years old

and is reaching or exceeding its operational life. Failure of the diversion or water delivery system would be an emergency situation. Hatchery staff responding to the situation would have an immediate and potentially sustained impact on traffic both during the emergency and until repairs are made. The timing and extent of potential impacts on transportation and traffic from extraordinary maintenance or emergency repairs would depend on the nature, extent, and timing of the necessary repairs. For the purposes of this analysis, it is assumed the No Action Alternative would result in no changes to the baseline LOS or access in the Analysis Area.

### 4.3 Alternative B – Proposed Action

During daytime construction hours, the LOS would temporarily decrease below C on portions of Icicle Road and Icicle Creek Road. Reduced LOS can lead to delays and driver frustration. Access to businesses along Icicle Creek Road would not be restricted during Phase I construction, only delayed. Access would be more limited to businesses during Phase II construction, but there would be no closures that would restrict or eliminate access. There would continue to be access to the Snow Lakes Trailhead; however, heavy vehicles using the parking areas as a turnaround could temporarily block the entrance or open parking spaces (see SWISP Project EIS **Recreation Resource Report**). During nighttime construction hours, when non-construction traffic is lightest, there would be no measurable change in the LOS. Access to businesses would not be impacted because night construction would not occur during business hours. Although the Snow Lakes Trailhead is open at night for overnight camping, it is unlikely that campers would drive to the trailhead at night; accordingly, there would be no impacts on LOS or access at the trailhead from nighttime construction.

Construction activities proposed under Alternative B during Phase I construction would occur up to 24 hours a day, 6 days a week, and up to 7 days a week, including activities that require construction vehicles to deliver or remove material at the Project site. During Phase II construction, activities would occur up to 6 days a week, limited to a standard workday of 7:00 a.m. to 10:00 p.m. Construction vehicles would make two to three trips daily, per worker, with a maximum of 15 construction workers per shift during Phase I construction, and 7-10 workers per shift during Phase II construction. During Phase I construction activities, there would be up to three shifts daily. The potential for changes in LOS would be greatest during Phase I construction activities and Project mobilization for Phase I and Phase II construction, which would include transport of large equipment.

**Sections 4.3.1** through **4.3.4**, below discuss locations within the Analysis Area that would have the greatest potential for changes in LOS and access due to the proposed construction activities under Alternative B.

Construction vehicles travelling south from U.S. Highway 2 to the Hatchery would use either Icicle Road or East Leavenworth Road to access the Project site (**Map A-9** in **Appendix A**). Use of existing public roads are subject to applicable local regulations. Icicle Road has been approved as the main haul road during the proposed Phase I and Phase II construction. Heavy construction vehicles would not use East Leavenworth Road. Gross weights for truck axles and tires must be consistent with the dispositions under RCW Title 46.44. Lightweight construction vehicles, mainly pick-up

trucks, would use East Leavenworth Road to access the temporary construction parking area at the dirt lot northeast of the Hatchery. All construction vehicles would access the intake construction area (**Map A-9 in Appendix A**) via Icicle Creek Road (from Icicle Road) to the intake access road. Trucks travelling southbound hauling construction equipment and containing construction materials for the intake construction area would turn around approximately 1.25 miles beyond the intake facilities at the Forest Service and Alpine Lakes Wilderness Area kiosk on Icicle Creek Road (**Map A-9 in Appendix A**). At the intake construction area, these trucks would back in onto the intake access road from the northbound lane of Icicle Creek Road. Lightweight vehicles would not be required to turn around and would access the intake access road using a left turn movement from southbound Icicle Creek Road. Vehicles in the Analysis Area would be delayed at most by 10 minutes (see the SWISP Project EIS **Recreation Resource Report**), accessing Icicle Road and Icicle Creek Road due to lane closures at the Wenatchee Bridge, the intake access road, and the Forest Service and Alpine Lakes Wilderness Area kiosk at the turnaround.

Fish Hatchery Road would be used for light and heavy construction vehicle access; vehicles would either use a left turn movement from the southbound travel lane of Icicle Creek Road to enter the Hatchery, or a right turn movement onto the northbound travel lane of Icicle Creek Road to leave the Hatchery. During construction, Fish Hatchery Road traffic will increase on the southern spur, which passes by some Hatchery staff residences. The increase in traffic will be more noticeable during Phase II than Phase I of construction. During Phase I, traffic may increase when temporary staging areas are being used to store construction equipment and materials. During Phase II of construction, traffic will be heavier on Fish Hatchery Road because of pipe deliveries to the staging areas and control valve vault component deliveries to the construction site.

Before construction begins, Reclamation would ensure that traffic control devices for warning, channeling, and protecting motorists are in place, in accordance with the approved traffic control plan, implemented by the contractor (see **Appendix B**). Traffic control devices would be removed when no longer needed (see **Appendix B**). Except at times when vehicles would be turning around at the Forest Service kiosk or backing onto the intake access road, Reclamation would provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations (see **Appendix B**). This would maintain baseline LOS and access.

### 4.3.1 Wenatchee Bridge

Under Alternative B, travel across the Wenatchee Bridge would be temporarily reduced to one lane during construction to accommodate construction vehicles with oversized loads. This would temporarily stop northbound traffic on Icicle Road when these vehicles head south to the Project Area, and southbound traffic on Icicle Road when these vehicles leave the Project Area. The duration of the lane closures would be the time it takes for the construction vehicle to cross the 250-foot long bridge, which in most cases would be 2 minutes or less, resulting in a temporary, localized reduction in LOS compared with Alternative A. The greatest potential for reduced LOS would be during daylight hours, on weekends, during peak recreation season. The lane closure would be considered a delay rather than a change in the level of access because the lane would immediately reopen. Impacts to traffic and transportation within the Analysis Area would be less during nighttime construction activities because baseline LOS is higher at night due to fewer vehicles on the

roads. BMPs would maintain traffic flow to minimize obstruction and inconvenience to public traffic and would provide flaggers and guards for safety of the public (**Appendix B**).

### 4.3.2 Snow Lakes Trailhead Access

Compared with Alternative A, there would be an increase in heavy vehicle traffic using the Forest Service and Alpine Lakes Wilderness kiosk as a turnaround under Alternative B. To facilitate a safe turnaround of heavy loads, over-flow parking will be prohibited along both sides of Icicle Creek Road between the Snow Lakes Trailhead to above the Forest Service and Alpine Lakes Wilderness kiosk; this would temporarily preclude other vehicles from entering or leaving the Snow Lakes Trailhead parking area. The construction vehicle turnaround area would require flaggers, guards, signs, and other traffic control BMPs (see **Appendix B**) to stop public vehicle traffic on both sides of Icicle Creek Road as the heavy construction vehicles complete their turns. As a result, traffic would stop in both directions and stack behind the Forest Service kiosk (as drivers travel northbound on Icicle Creek Road) and behind the Snow Lakes Trailhead entrance until the construction vehicle has completed its turnaround. Northbound traffic may experience further delays until the construction vehicle has accessed the intake construction area. Traffic speeds would decrease when approaching stopped traffic, resulting in a localized, temporary reduction in LOS compared with Alternative A. Distributing construction vehicle traffic throughout a 24-hour period would avoid multiple construction vehicles stacking on Icicle Creek Road and queuing to use the turnaround. Changes in LOS during the nighttime hours would be minimal because there would be little traffic leaving or entering the wilderness area with which the vehicles would obstruct or delay. During daytime construction activities driver frustration could increase, compared with Alternative A, due to temporary delays around access to the Snow Lakes Trailhead entrance or drivers' ability to enter or leave parking spots in the trailhead parking area while trucks are turning around. In addition, vehicles leaving the wilderness area (northbound on Icicle Creek Road) would be delayed as construction vehicles pull out of the turnaround area and back onto the intake access road. This would temporarily reduce LOS and increase driver frustration compared with Alternative A. Prohibiting parking at or adjacent to the Forest Service and Alpine Lakes Wilderness Area kiosk for the turnaround staging area would change the level of access to the area because there would be fewer places for visitors to park.

Traffic control BMPs such as flagging, cones, delineators, safety barriers, flasher lights, danger signals, and signs would help maintain a LOS of C and maintain vehicle access by maintaining traffic flow, minimizing obstruction, and ensuring public safety (see **Appendix B**). These measures would meet the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, Part 6 (Temporary traffic control; <https://mutcd.fhwa.dot.gov/>) and WAC 296-155-305 (Signaling and flaggers).

### 4.3.3 Intake Construction Area

The intake construction area would be the primary construction area used during Phase I; however, the intake construction area would also be used for a portion of Phase II work. When a heavy construction vehicle arrives at the intake access road, the LOS on northbound Icicle Creek Road would likely be below C due to delays caused by its turning around movement and slow speed. Construction vehicles carrying heavy loads would have to back in onto the intake access road, which would require flaggers to stop traffic in both directions on Icicle Creek Road until the construction



vehicle has fully accessed the intake construction area. As most of the construction activities under Alternative B are planned to take place during peak recreation season (between mid-May and September), stopping traffic would temporarily decrease LOS compared with Alternative A. Stopping traffic to allow construction vehicles to re-enter the northbound lane of Icicle Creek Road from the intake construction area would delay vehicles going northbound on Icicle Creek Road. There would be a temporary decline in LOS until the construction vehicle reaches cruising speed. Traffic control BMPs would be used as described under **Section 4.3.2**, Snow Lakes Trailhead Access.

#### 4.3.4 Business Access

During Phase II of construction, there would be construction vehicles accessing CUAs from mid-April to mid-May. For example, Cyo Road (accessed from Icicle Creek Road) would be used to access CUA 5. Maintaining convenient access to driveways and buildings along the line of work, as noted in **Appendix B**, would result in the same level of access to the Icicle River RV Resort, Icicle Creek Center for the Arts, and Sleeping Lady Mountain Resort as Alternative A. The mid-April to mid-May timing is preferred by the local businesses because construction would take place before peak visitation season (see the SWISP Project EIS **Socioeconomics and Environmental Justice Resource Report**). Access to the Hatchery and USFWS Mid-Columbia Fish & Wildlife Conservation Office, off Cyo Road, would be maintained during Phase II construction activities.

#### 4.3.5 Road Repairs

Under Alternative B, construction vehicles would make two to three trips daily, per worker, with a maximum of 15 workers per shift during Phase I construction (between January 2022 and November 2023), and 7-10 workers per shift during Phase II construction between March 2022 and June 2024. While roadways would be maintained to ensure smooth condition to the extent possible (see **Appendix B**), this level of high use could result in any combination of ruts, broken pavement, potholes, or low areas with standing water on Icicle Creek Road.

Use of Icicle Road and Icicle Creek Road for heavy load hauling would require a Chelan County ROW permit. If the work being done has potential to damage either County roadway due to heavy load hauling, a Road Haul permit may also be required<sup>10</sup>. Chelan County would video the surface of the haul route before work begins and would inspect the roads after the work is complete to determine if damage occurred to the County ROW or roadway<sup>11</sup>. The contractor would be responsible for repairing any damage and complying with the terms of the permit, consistent with the applicable BMPs in **Appendix B**. The contractor would also use guidance under Chelan County Code Title 15.30, Article VII for site maintenance, inspection, and traffic control for work involving improvement of roads.

<sup>10</sup> Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on July 15, 2020, regarding “L-SWISP: Transportation—Road Repairs.”

<sup>11</sup> Andrew Brunner, Chelan County Public Works Department, email to Elizabeth Heether, Bureau of Reclamation, on July 15, 2020, regarding “L-SWISP: Transportation—Road Repairs.”

Road repairs would maintain optimal roadway capacity; however, there would be temporary reductions in LOS, compared with Alternative A, during the road repair work. In the long-term, impacts associated with road repairs under Alternative B would be the same as Alternative A.

Reclamation would apply for a Forest Service road use permit for the section of Icicle Creek Road from the iron gate above Snow Lakes Trailhead entrance to the Forest Service kiosk (approximately 0.25 miles). The Forest Service would conduct a pre- and post-construction survey of their road and the contractor would be responsible for repairing the road to existing or better condition<sup>12</sup>. The contractor would also use Forest Service Handbook 7709.59, which provides guidance for road maintenance, road use permits, and inspections.

#### **4.4 Alternative C**

Alternative C would temporarily reduce LOS compared with Alternative A, but to a lesser extent than Alternative B. This is because Alternative C would require fewer heavy equipment vehicle trips accessing the intake construction area, which would reduce the overall number of trips required for construction vehicles to access the intake construction area. The locations where there would be temporary LOS reductions would be the same as discussed under Alternative B. Prohibiting parking at the Forest Service and Alpine Lakes Wilderness Area kiosk would result in the same impacts on access as described under Alternative B.

#### **4.5 Alternative D**

Alternative D would temporarily reduce LOS and vehicle access compared with Alternative A. Alternative D would have a similar LOS as Alternative B with respect to impacts from construction vehicle trips along the construction vehicle route. Impacts on access would be the same as described under Alternative B. However, under Alternative D, Phase I construction would be limited to the standard workday hours of 7:00 a.m. to 10:00 p.m., 5 days per week, and up to 6 days per week under pre-approved circumstances. Even though traffic is usually heavier during daytime hours, overall daily impacts to traffic and transportation within the Analysis Area would be reduced under Alternative D as compared with Alternative B, as construction activities between 10 p.m. and 7 a.m. would not occur. The LOS and vehicle access would be maintained during inactive construction hours, as described under Alternative A.

By limiting the construction time window to standard workday hours, and 5 days per week instead of up to 24 hours per day, and up to 7 days per week as proposed under Alternative B, two additional years of Phase I construction activities would be required under Alternative D, including two more full equipment and crew mobilizations than would occur under Alternative B. No additional heavy equipment would be required under this alternative. As such, impacts to traffic and vehicle access during Phase I construction would last for a total of four years, or two more years than under Alternative B. Impacts from Phase II construction on transportation and traffic would

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<sup>12</sup> Elizabeth Heether, Bureau of Reclamation, email to Michael Von Buhr, Bureau of Reclamation, on July 15, 2020, regarding "L-SWISP: Transportation—Road Repairs."

be the same as described under Alternative B. Traffic conditions and vehicle access would return to baseline conditions in four years, after construction is completed.

#### **4.6 Short-Term Uses and Long-Term Productivity**

Construction activities under the action alternatives would result in the short-term use of the transportation network by construction vehicles. These vehicles would result in localized effects on LOS and accessibility in the short-term, which is the duration of construction. BMPs would require road repairs on Icicle Road and Icicle Creek Road to offset any road surface damage caused by the construction traffic. These BMPs would minimize the potential for effects on long-term productivity for transportation.

#### **4.7 Unavoidable Adverse Impacts**

The action alternatives would result in unavoidable adverse impacts on traffic and transportation and an increase in delays and frustration of drivers. An increase in vehicle traffic is evidence of changes in the LOS on roads, which was chosen as an indicator of construction impacts. Likewise, delays associated with vehicles crossing the Wenatchee Bridge, turning around at the Forest Service and Alpine Lakes Wilderness Area kiosk, and backing into the intake construction area would result in a change of LOS on the roads. These changes would also delay access on roads by inhibiting access to points of interest within the Analysis Area, which was identified as an indicator of construction impacts. Implementation of the BMPs listed in **Appendix B**, along with adhering to current laws and regulations for traffic control, would minimize these impacts.

#### **4.8 Irreversible and Irretrievable Commitment of Resources**

There are no irreversible or irretrievable commitment of resources for transportation and traffic; all potential impacts described above would be temporary in duration.

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## Chapter 5. Glossary

**Access** – the ability of a particular transportation mode, such as a vehicle, bicycle, or pedestrian, to enter or use a portion of the transportation network.

**Average daily traffic**—The number of vehicles that pass a point on a given road in a determined number of days, divided by the number of days.

**Level of service**—A metric that describes the operating conditions of a roadway based on factors such as physical roadway capacity, speed, maneuverability, safety, and traffic volume.

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## Chapter 6. References Cited

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# **Appendix A**

Maps

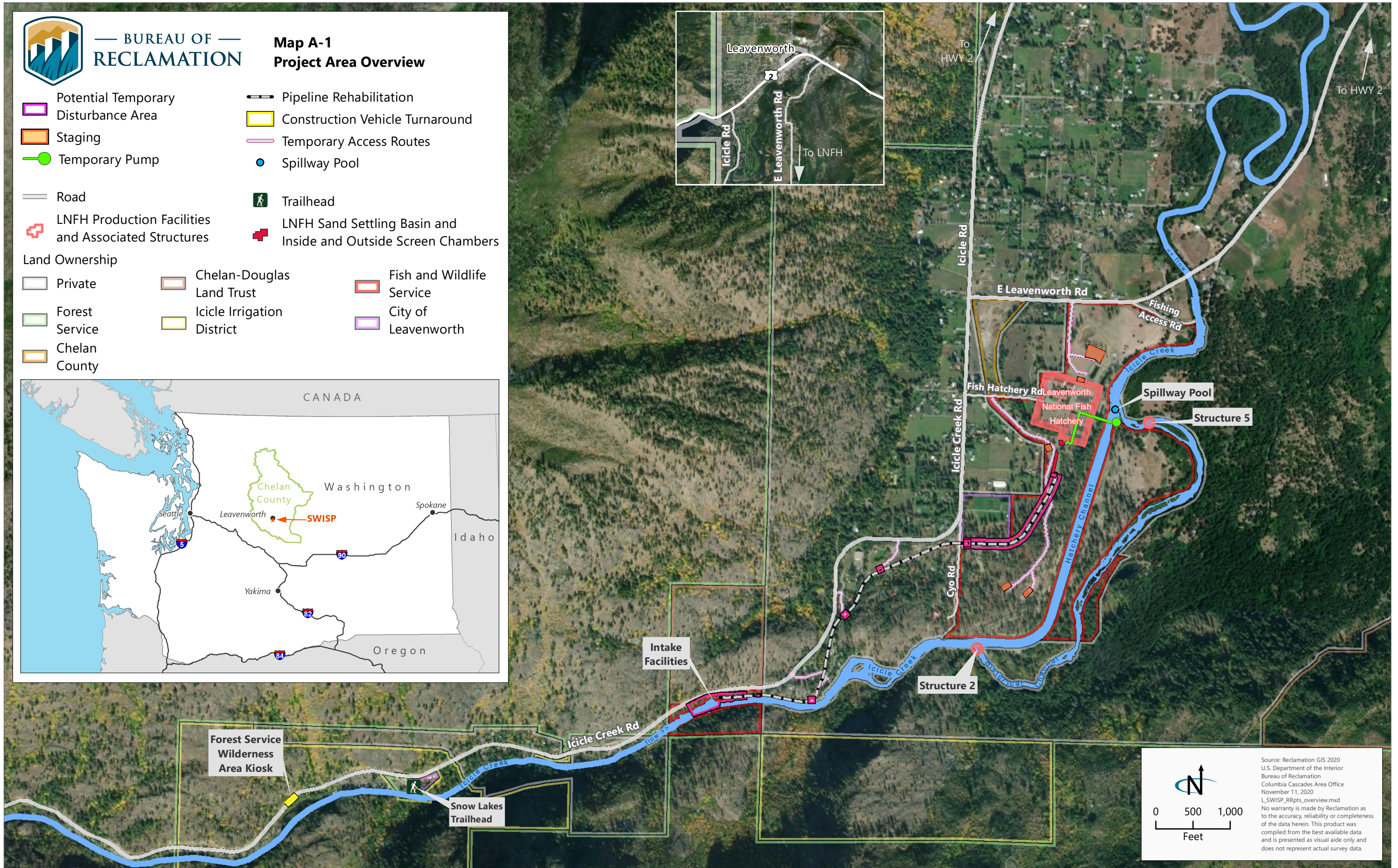
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BUREAU OF RECLAMATION

Map A-1 Project Area Overview

- Potential Temporary Disturbance Area
- Staging
- Temporary Pump
- Road
- LNFH Production Facilities and Associated Structures
- Land Ownership: Private, Forest Service, Chelan County, Chelan-Douglas Land Trust, Icicle Irrigation District, Fish and Wildlife Service, City of Leavenworth
- Pipeline Rehabilitation
- Construction Vehicle Turnaround
- Temporary Access Routes
- Spillway Pool
- Trailhead
- LNFH Sand Settling Basin and Inside and Outside Screen Chambers











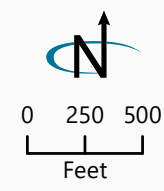
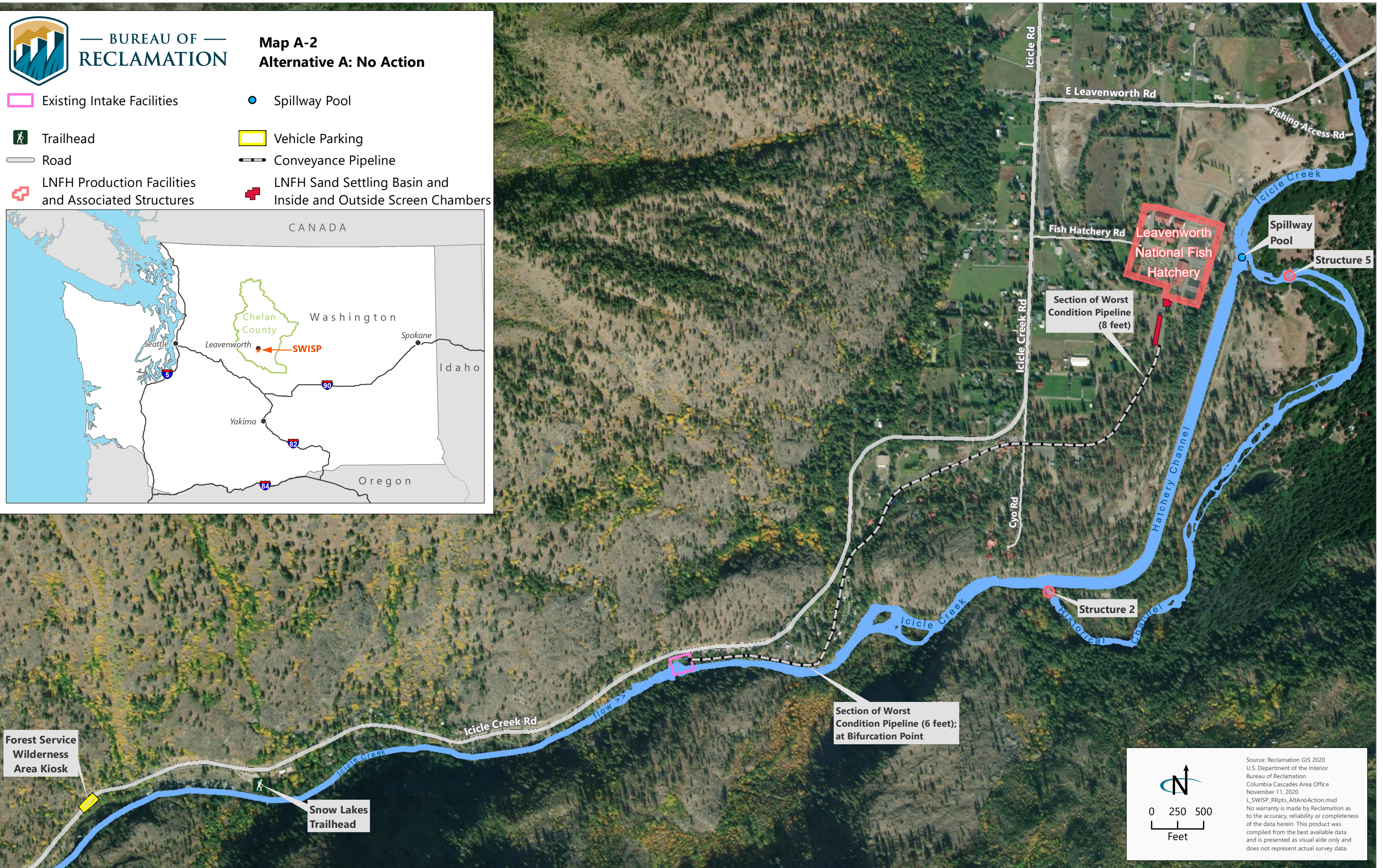
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 November 11, 2020  
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BUREAU OF RECLAMATION

Map A-2  
Alternative A: No Action

-  Existing Intake Facilities
-  Trailhead
-  Road
-  LNFH Production Facilities and Associated Structures
-  Spillway Pool
-  Vehicle Parking
-  Conveyance Pipeline
-  LNFH Sand Settling Basin and Inside and Outside Screen Chambers



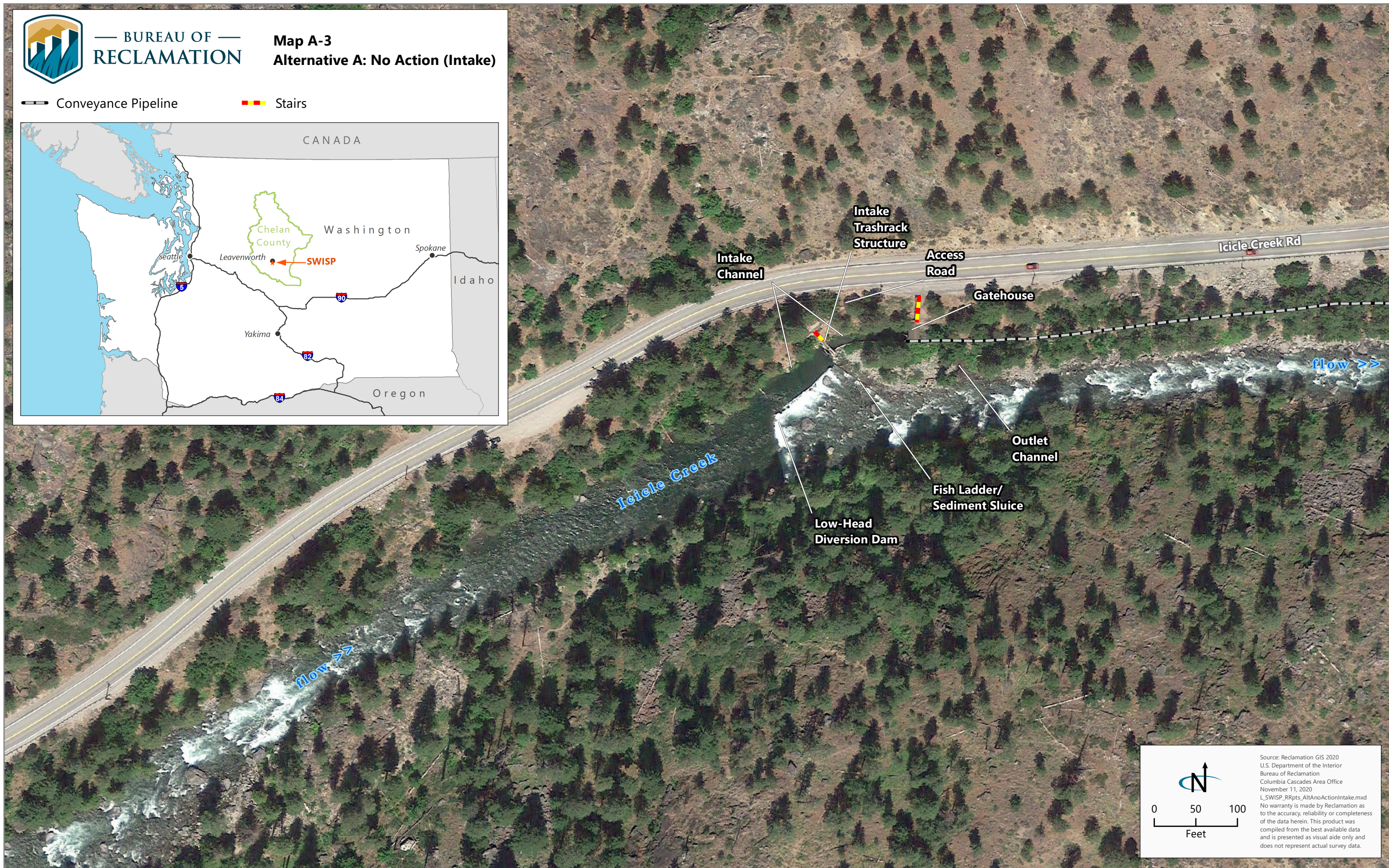
Source: Reclamation GIS 2020  
 U.S. Department of the Interior  
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Map A-3  
Alternative A: No Action (Intake)

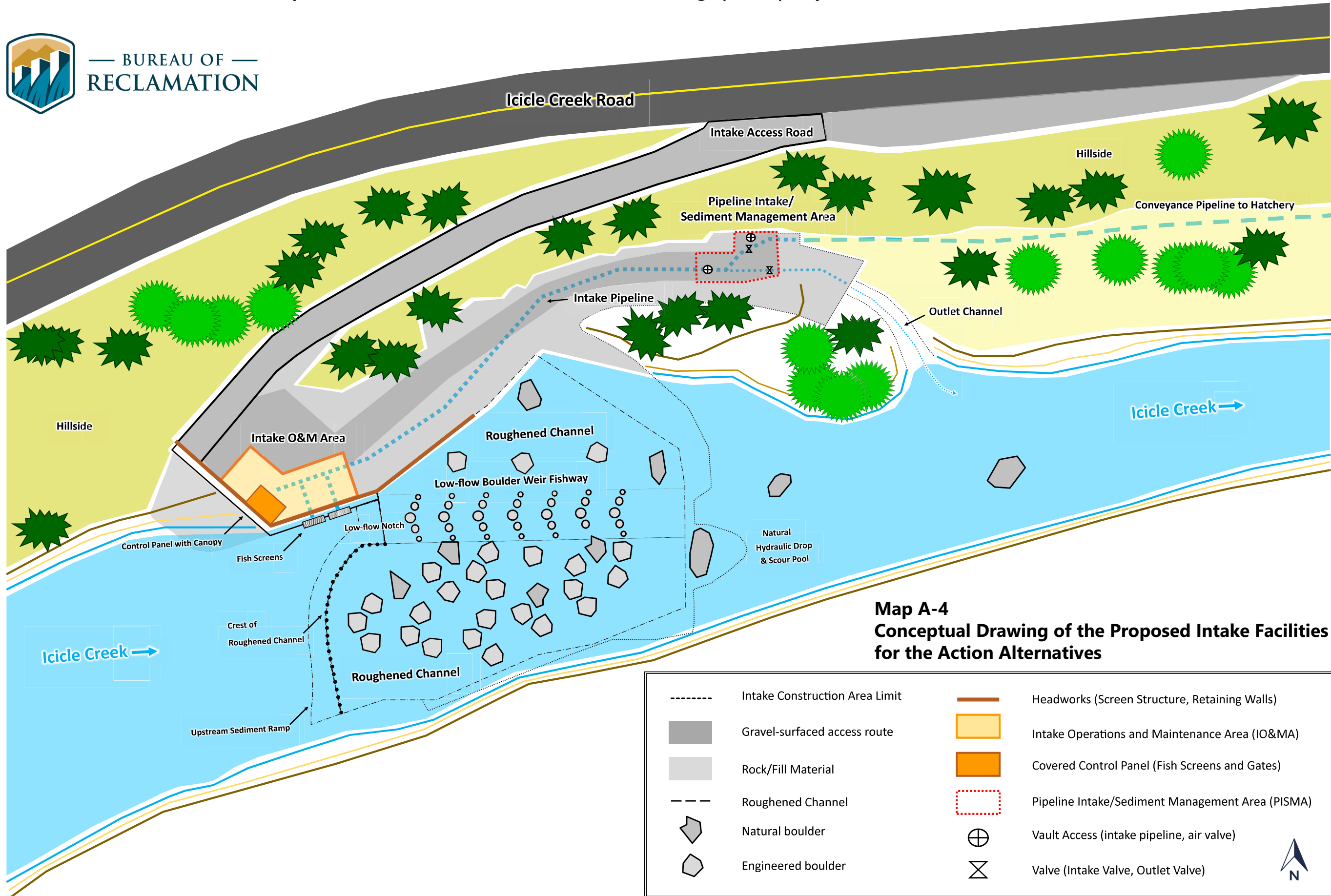
Conveyance Pipeline      Stairs



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Feet

Source: Reclamation GIS 2020  
U.S. Department of the Interior  
Bureau of Reclamation  
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Leavenworth National Fish Hatchery Surface Water Intake Fish Screens and Fish Passage (SWISP) Project



**Map A-4**  
**Conceptual Drawing of the Proposed Intake Facilities**  
**for the Action Alternatives**

-----	Intake Construction Area Limit	—	Headworks (Screen Structure, Retaining Walls)
■	Gravel-surfaced access route	■	Intake Operations and Maintenance Area (IO&MA)
■	Rock/Fill Material	■	Covered Control Panel (Fish Screens and Gates)
- - -	Roughened Channel	□	Pipeline Intake/Sediment Management Area (PISMA)
⬠	Natural boulder	⊕	Vault Access (intake pipeline, air valve)
⬠	Engineered boulder	⊗	Valve (Intake Valve, Outlet Valve)





BUREAU OF RECLAMATION

**Map A-5  
Alternative B (Proposed Action)  
and Alternative D**

Phase I

Intake Facilities

Phase II

Construction Area

Contractor Use Area (CUA)

Temporary Pump and Pipeline

Temporary Access Route

Phase I and II

Staging and Storage Site for Construction Equipment and Materials, and Construction Staff Administration

Road

Spillway Pool

Trailhead

Temporary Access Route

Conveyance Pipeline lined with Cure-in-Place Pipe (approximately 4,000 feet)

Pipeline Replacement

Access Routes

Construction Vehicle Turnaround/ Vehicle Parking

LNFH Production Facilities and Associated Structures

LNFH Sand Settling Basin and Inside and Outside Screen Chambers

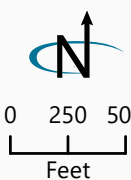


Forest Service Wilderness Area Kiosk

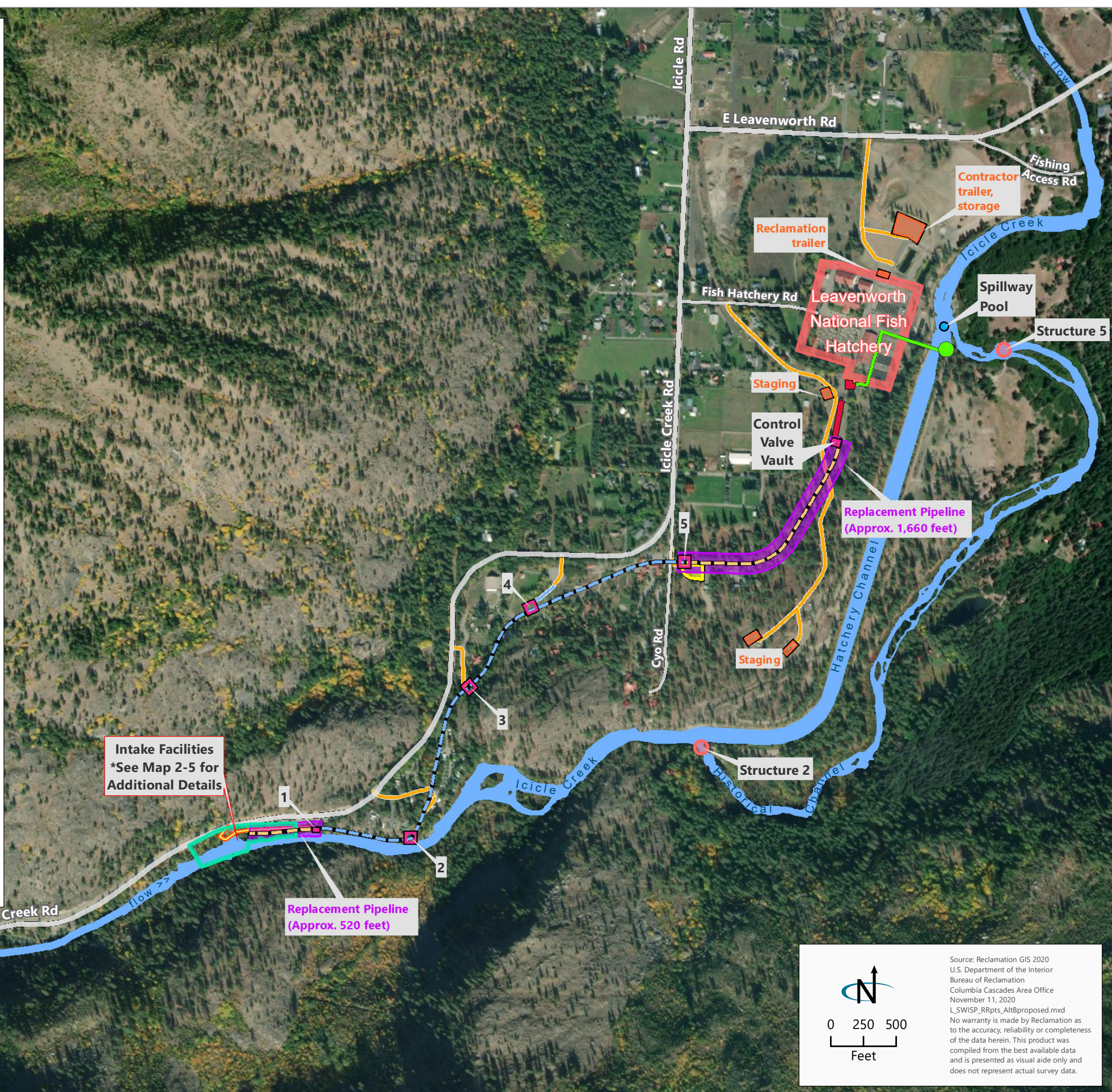
Snow Lakes Trailhead

Intake Facilities  
\*See Map 2-5 for Additional Details

Replacement Pipeline (Approx. 520 feet)



Source: Reclamation GIS 2020  
U.S. Department of the Interior  
Bureau of Reclamation  
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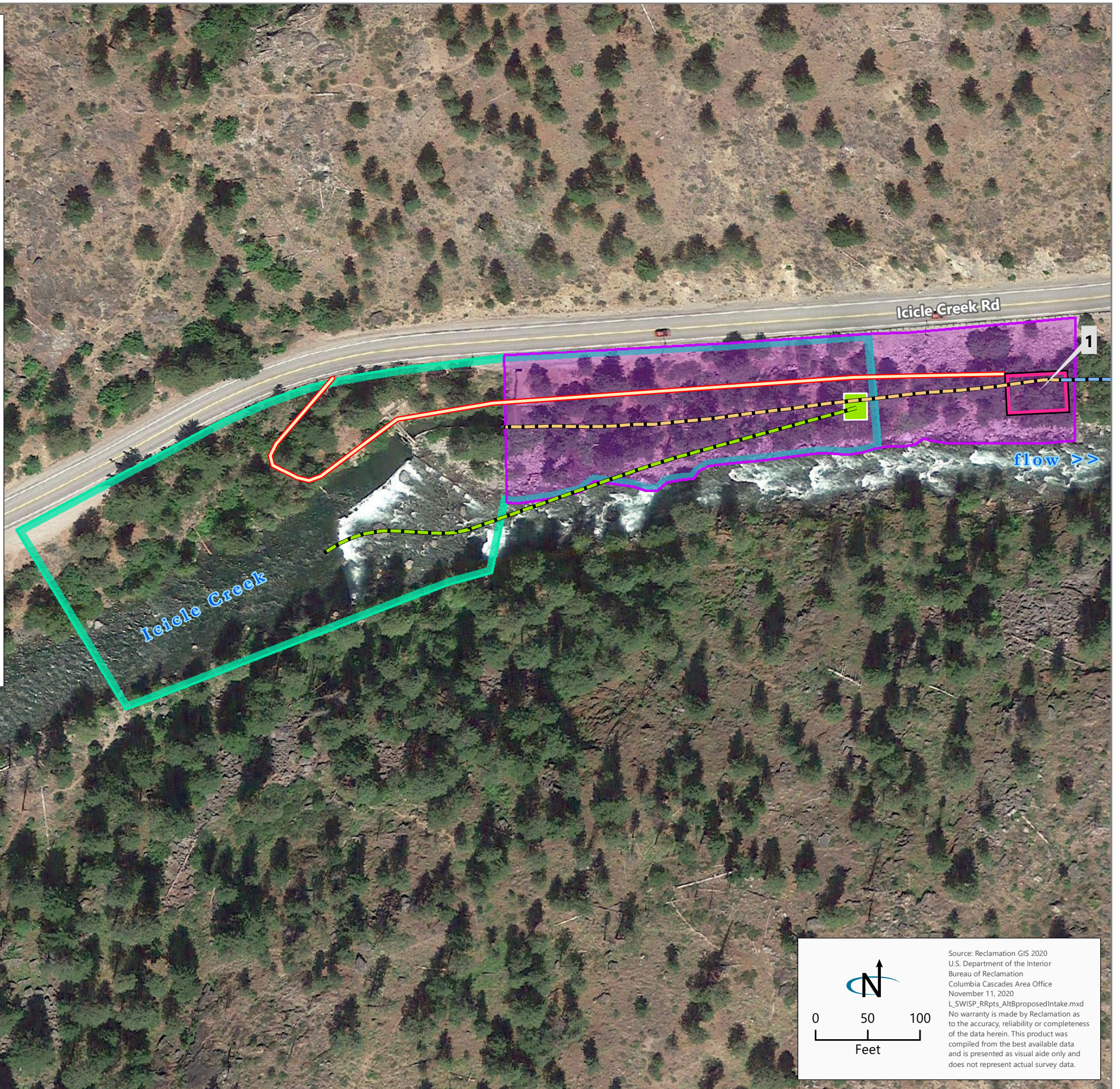
### Map A-6 Alternative B (Proposed Action) and Alternative D: Intake

Phase I

- Intake Facilities
- Gravity Bypass Outlet
- Gravity Bypass Pipeline
- Temporary Access Route

Phase II

- Conveyance Pipeline lined with Cure-in-Place Pipe
- Pipeline Replacement
- Construction Area
- Contractor Use Area (CUA)



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Feet

Source: Reclamation GIS 2020  
U.S. Department of the Interior  
Bureau of Reclamation  
Columbia Cascades Area Office  
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# BUREAU OF RECLAMATION

## Map A-7 Alternative C

### Phase I

Intake Facilities

### Phase II

Construction Area

Contractor Use Area (CUA)

Temporary Pump and Pipeline

Temporary Access Route

### Phase I and II

Staging and Storage Site for Construction Equipment and Materials, and Construction Staff Administration

Road

Spillway Pool

Trailhead

Temporary Access Route

Conveyance Pipeline lined with Cure-in-Place Pipe (approximately 4,520 feet)

Pipeline Replacement

Access Routes

Construction Vehicle Turnaround/ Vehicle Parking

LNFH Production Facilities and Associated Structures

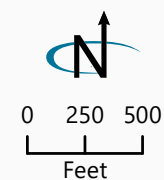
LNFH Sand Settling Basin and Inside and Outside Screen Chambers



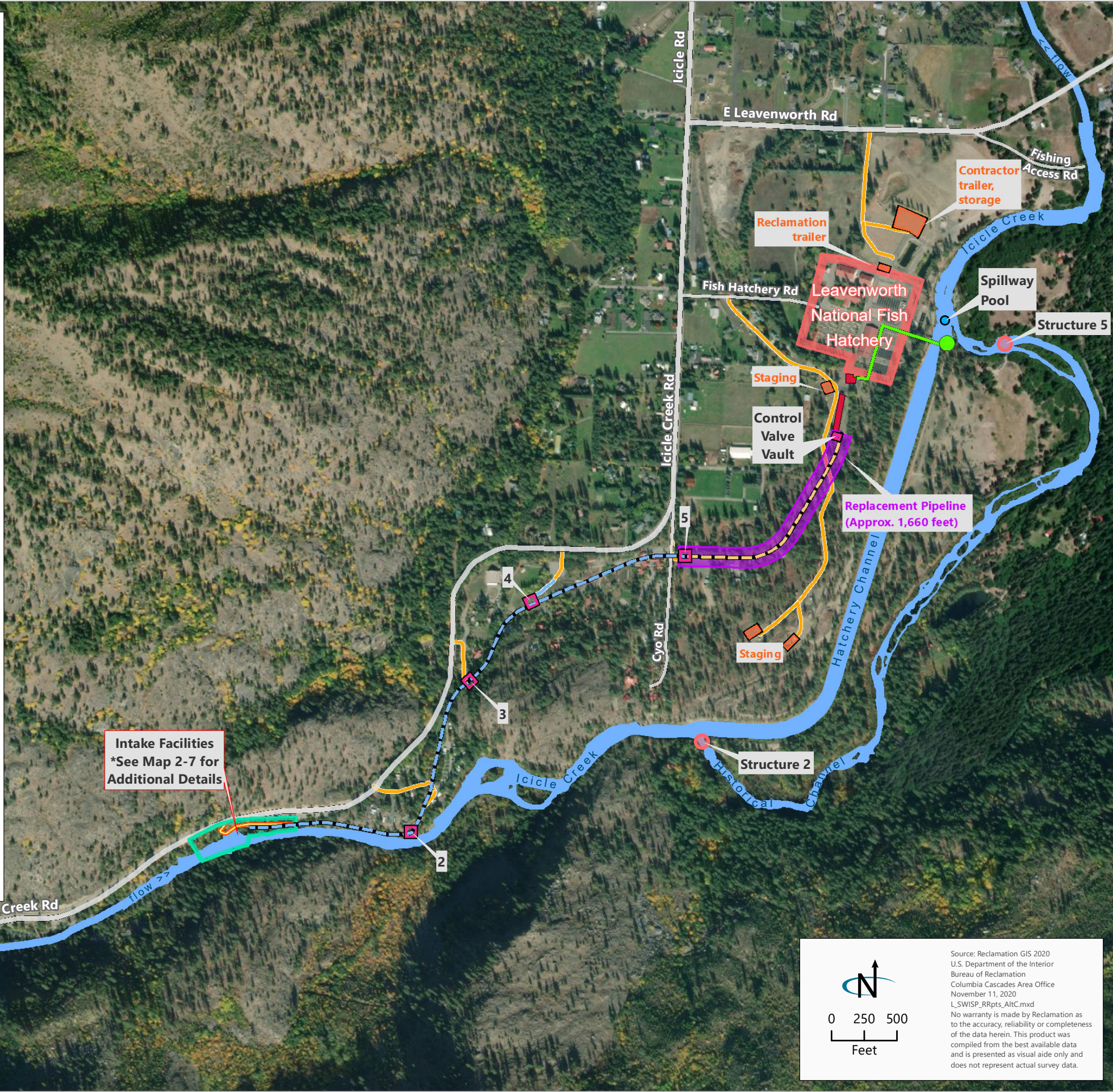
Forest Service Wilderness Area Kiosk

Snow Lakes Trailhead

Intake Facilities  
\*See Map 2-7 for Additional Details



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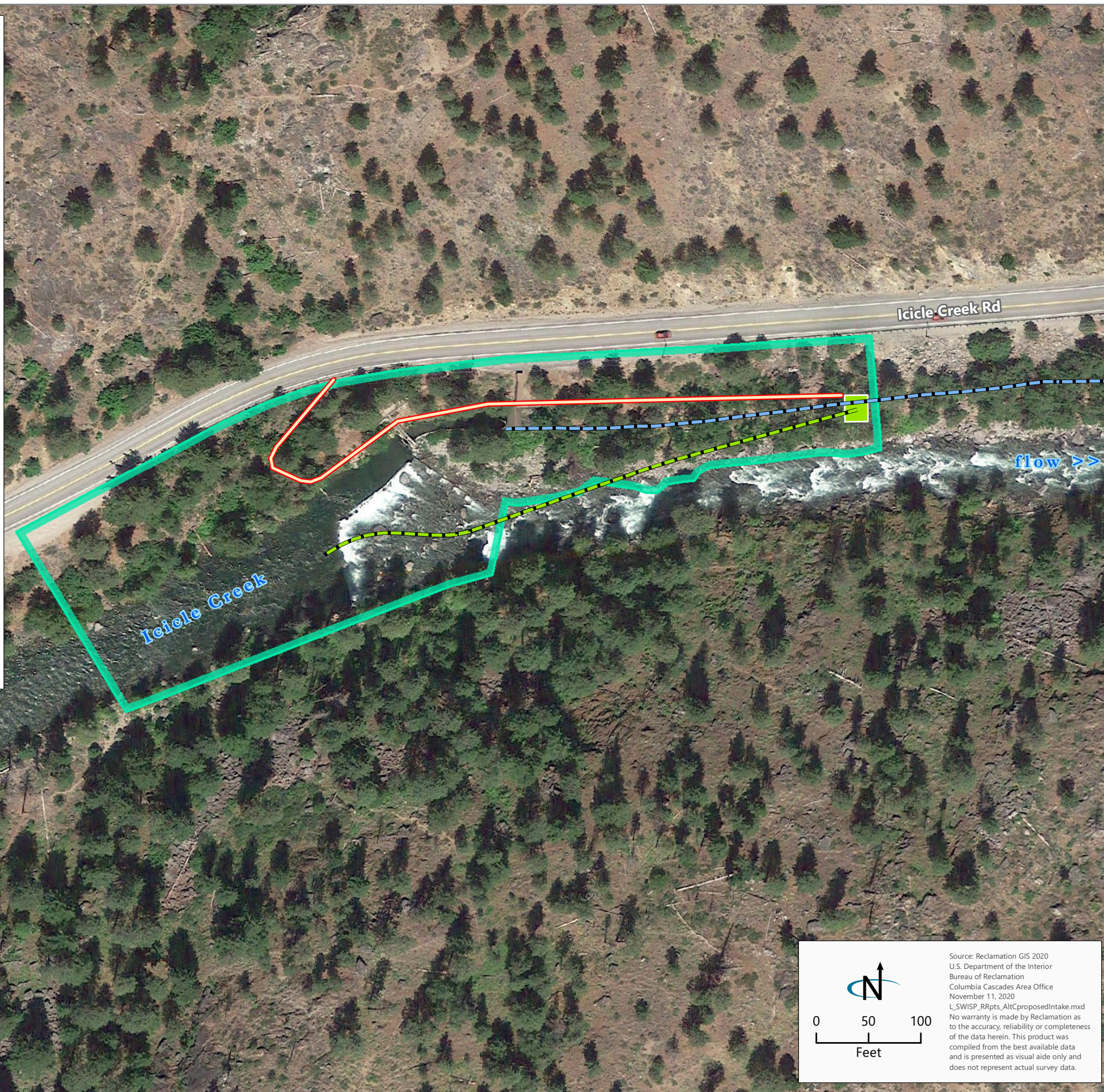
### Map A-8 Alternative C (Intake)

Phase I

- Intake Facilities
- Gravity Bypass Outlet
- Gravity Bypass Pipeline
- Temporary Access Route

Phase II

- Conveyance Pipeline lined with Cure-in-Place Pipe



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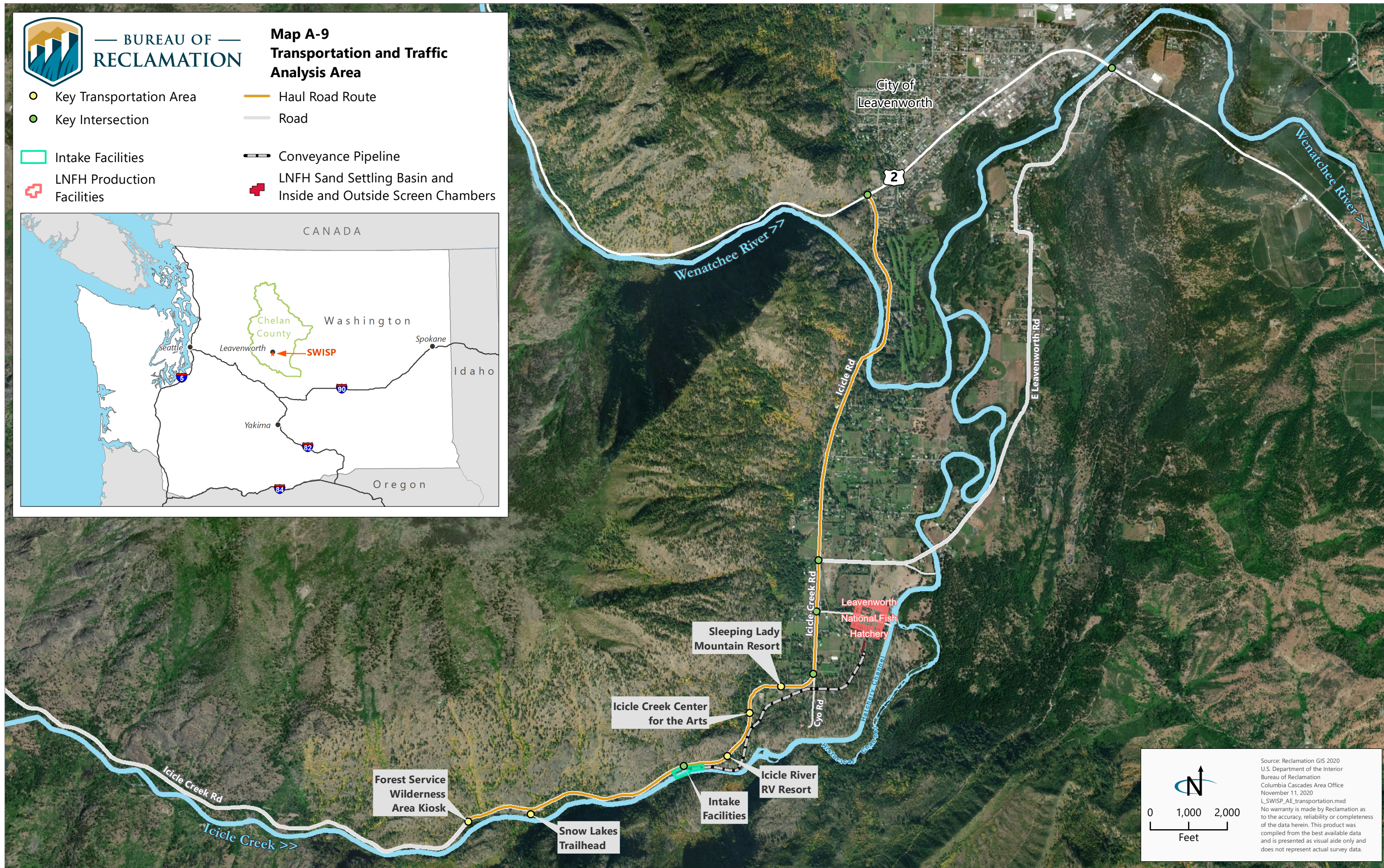
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BUREAU OF RECLAMATION

### Map A-9 Transportation and Traffic Analysis Area

- Key Transportation Area
- Key Intersection
- Intake Facilities
- + LNFH Production Facilities
- Haul Road Route
- Road
- Conveyance Pipeline
- + LNFH Sand Settling Basin and Inside and Outside Screen Chambers



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Source: Reclamation GIS 2020  
U.S. Department of the Interior  
Bureau of Reclamation  
Columbia Cascades Area Office  
November 11, 2020  
L\_SWISP\_AE\_transportation.mxd  
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# **Appendix B**

## Best Management Practices

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# Appendix B. Best Management Practices

## B.1 Best Management Practices

To minimize impacts on resources from the Proposed Action, the Best Management Practices (BMPs) described in **Table B-1** would be implemented. BMPs are drawn from the following sources:

- Biological opinions for LNFH operations, issued by the USFWS (addressing threatened Bull Trout; USFWS 2011) and by the NMFS (addressing endangered spring Chinook Salmon and threatened Steelhead; NMFS 2015, NMFS 2017a).
- General Conservation Measures (GCMs) for ESA-listed salmonids in the programmatic biological opinion for USACE permitting of fish passage and restoration actions in Washington State (FPRPIII; NMFS 2017a).
- GCMs for Bull Trout and other ESA-listed salmonids in the programmatic biological opinion for the Washington State fish passage and habitat enhancement and restoration program (NMFS and USFWS 2008)<sup>1</sup>.
- Measures described in the construction specifications, including measures associated with site layout, temporary access, staging and stockpile areas, equipment use, erosion control, dust abatement, timing of in-water work and worksite isolation, and spill prevention and control.

Reclamation would also obtain required regulatory permits and implement terms and conditions contained therein. If permit requirements, BMPs, or other measures contradict each other, the contract specification requires that the contractor abide by the most stringent of requirements. A list of general, applicable permit conditions is included following **Table B-1**.

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<sup>1</sup> This combined agency programmatic biological opinion expired on December 31, 2013. The USACE and NMFS reinitiated consultation and NMFS has issued subsequent biological opinions for the nationwide permit program. However, the USACE has been operating under consultation extensions from USFWS, with the most recent extension expiring June 30, 2020. Reclamation anticipates that ESA Section 7 consultation with the USFWS for the SWISP Project will result in similar conservation measures as those contained in the expired programmatic biological opinion.

Table B-1. Best Management Practices

Resource Topic	Best Management Practice
General	<ul style="list-style-type: none"> <li>• Heavy equipment use will be limited to that with the least adverse effects on the environment (e.g. minimally-sized, low ground pressure equipment, use of matting, etc.; NMFS 2017a).</li> <li>• Conduct operations to prevent unnecessary destruction, scarring, or defacing of natural surroundings in the vicinity of the work.</li> </ul>
Air Quality and Climate	<ul style="list-style-type: none"> <li>• Dust control and abatement measures will be implemented during construction.</li> <li>• Vehicle traffic on unpaved surfaces would be limited to 10 miles per hour to minimize dust generation.</li> <li>• Vehicle traffic on government rights-of-way, dirt roads, and paved roads through LNFH property would be limited to 10 miles per hour.</li> <li>• Prevent, control, and abate dust pollution on government rights-of-way.</li> <li>• Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities.</li> <li>• Provide means for eliminating atmospheric discharges of dust during mixing, handling, and storing of cement, pozzolan, and concrete aggregate.</li> <li>• Use reasonably available methods and devices to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants.</li> <li>• Do not operate equipment and vehicles that show excessive exhaust gas emissions until corrective repairs or adjustments reduce such emissions to acceptable levels.</li> </ul>
Geology and Soils	<ul style="list-style-type: none"> <li>• The number of temporary access roads will be minimized, and roads will be designed to avoid adverse effects like creating excessive erosion (NMFS 2017a).</li> <li>• Temporary roads and trails across slopes greater than 30 percent will be avoided when feasible (NMFS 2017a).</li> <li>• Existing roadways or travel paths will be used whenever possible (NMFS 2017a).</li> </ul>
Water Resources (Stream Conditions)	<ul style="list-style-type: none"> <li>• Cofferdam placement will maintain natural stream flow, minus the 40 cfs diversion to the hatchery, within the greatest amount of natural streambed width as possible.</li> <li>• Additional flow outage shall require the prior written approval of the COR, and of appropriate Federal and State water quality control agencies.</li> </ul>



Resource Topic	Best Management Practice
Water Resources (Water Quality)	<p data-bbox="617 253 716 279"><b>General</b></p> <ul data-bbox="663 289 1892 529" style="list-style-type: none"> <li data-bbox="663 289 1892 386">• Perform construction activities by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources.</li> <li data-bbox="663 396 1892 493">• Measures shall be taken to ensure that no petroleum products, hydraulic fluid, fresh cement, sediments, sediment-laden water, chemicals, or any other toxic or deleterious materials are allowed to enter or leach into waters of the U.S. (NMFS 2017a).</li> <li data-bbox="663 503 1780 529">• The use of acids for cleaning or preparing concrete surfaces for repair will not be permitted.</li> </ul> <p data-bbox="617 555 793 581"><b>In-water work</b></p> <ul data-bbox="663 591 1892 1317" style="list-style-type: none"> <li data-bbox="663 591 1892 753">• Prepare a Work Area Isolation Plan for all work below the bankfull elevation requiring flow diversion or isolation. Include the sequencing and schedule of dewatering and rewatering activities, plan view of all isolation elements, as well as a list of equipment and materials to adequately provide appropriate redundancy of all key plan functions (e.g., an operational, properly sized backup pump and/or generator) (NMFS 2017a).</li> <li data-bbox="663 763 1892 824">• Use of rapidly deployable prefabricated cofferdam systems would minimize impacts to subgrade and surrounding water.</li> <li data-bbox="663 834 1892 896">• When conducting in-water or bank work, machine hydraulic lines will be filled with vegetable oil for the duration of the Project to minimize impacts of potential spills and leaks.</li> <li data-bbox="663 906 1892 967">• Spill prevention and clean-up kits will be on site when heavy equipment is operating within 25 feet of the water (NMFS 2017a).</li> <li data-bbox="663 977 1892 1039">• To the extent feasible, work requiring use of heavy equipment will be completed by working from the top of the bank (i.e. landward of the OHWM or extreme high tide line) (NMFS 2017a).</li> <li data-bbox="663 1049 1892 1110">• Equipment shall be checked daily for leaks and any necessary repairs shall be completed prior to commencing work activities around the water (NMFS 2017a).</li> <li data-bbox="663 1120 1892 1317">• Equipment will cross the stream in-water only under the following conditions: (NMFS 2017a). <ul data-bbox="714 1149 1892 1317" style="list-style-type: none"> <li data-bbox="714 1149 1892 1211">○ A. Equipment is free of external petroleum-based products, soil and debris has been removed from the drive mechanisms and undercarriage; and</li> <li data-bbox="714 1221 1415 1250">○ B. The substrate is bedrock or coarse rock and gravel; or</li> <li data-bbox="714 1260 1892 1317">○ C. Mats or logs are used in soft bottom situations to minimize compaction while driving across streams; and</li> </ul> </li> </ul>

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<ul style="list-style-type: none"> <li>○ D. Stream crossings will be performed at right angles (90 degrees) to the bank if possible; and</li> <li>○ E. No stream crossings will be performed at spawning sites when spawners of ESA listed fishes are present or eggs or juvenile fish could be in the gravel; and</li> <li>○ F. The number of crossings will be minimized.</li> <li>• Project operations will cease under high flow conditions that could inundate the Project Area, except as necessary to avoid or minimize resource damage (NMFS 2017a).</li> <li>• If high flow or high tide conditions that may cause siltation are encountered during the Project, work shall stop until the flow subsides or the tide falls (NMFS 2017a).</li> <li>• Where practicable, a turbidity and/or debris containment device shall be installed prior to commencing in-water work (NMFS 2017a).</li> <li>• When working in-water, some turbidity monitoring may be required, subject to the Corps permit requirements or CWA section 401 certification. Turbidity monitoring generally is required when working in streams with more than 40 percent fines (silt/clay) in the substrate. Turbidity will be monitored only when turbidity generating work takes place, for example, installation of coffer dams, pulling the culvert in-water, reintroducing water. The applicant will measure the duration and extent of the turbidity plume (visible turbidity above background) generated. The data will be submitted to the Corps, NMFS, and the USFWS immediately following Project construction. Turbidity measurements will be taken in NTUs and are used by project proponents to develop procedures to minimize turbidity and estimate take for future projects (NMFS 2017a).</li> <li>• Equipment used in the instream channel will have containment methods to address possible fuel and oil leaks.</li> </ul>
	<p><b>Erosion and spill prevention and control</b></p>
	<ul style="list-style-type: none"> <li>• A Temporary Erosion and Sediment Control plan and a Spill Prevention Control and Containment plan, commensurate with the size of the Project, must be prepared and carried out to prevent pollution caused by surveying or construction operations (NMFS 2017a).</li> <li>• A Spill Prevention, Control, and Clean-Up plan will be prepared prior to construction for every project that utilizes motorized equipment or vehicles (NMFS 2017a).</li> <li>• A spill prevention and countermeasures plan (SPCC) in accordance with 40 CFR, Part 112 is required where release of oil and oil products could reasonably be expected to enter into or upon navigable waters of the United States or adjoining shorelines in quantities that may be harmful (40 CFR, Part 110), and aggregate on site oil storage capacity is over 1,320 gallons. Only containers with capacity of 55 gallons and greater are included in determining on site aggregate storage capacity.</li> </ul>

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p data-bbox="617 253 1255 279"><b>Erosion and spill prevention and control, continued</b></p> <ul style="list-style-type: none"> <li data-bbox="709 289 1570 315">○ Prevent, stop, and control spills or leaks during construction activities:</li> <li data-bbox="709 324 1016 350">○ Stop source of spill or leak.</li> <li data-bbox="709 360 1108 386">○ Stop migration of spill or leak.</li> <li data-bbox="709 396 1415 422">○ Place berm of sorbent material around perimeter of spill.</li> <li data-bbox="709 431 1045 457">○ Solidify free standing oil.</li> <li data-bbox="663 467 1885 526">● A supply of emergency erosion control materials will be on hand and temporary erosion controls will be installed and maintained in place until site restoration is complete (NMFS 2017a).</li> <li data-bbox="663 535 1885 669">● Landward erosion control methods shall be used to prevent silt-laden water from entering waters of the U.S. These may include, but are not limited to, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas (NMFS 2017a).</li> <li data-bbox="663 678 1856 776">● Control pollutants by use of sediment and erosion controls, wastewater and stormwater management controls, construction site management practices, and other controls including State and local control requirements.</li> <li data-bbox="663 786 1885 987">● Sediment and Erosion Controls: <ul style="list-style-type: none"> <li data-bbox="709 818 1822 915">○ Establish methods for controlling sediment and erosion which address vegetative practices, structural control, silt fences, straw dikes, sediment controls, and operator controls as appropriate.</li> <li data-bbox="709 925 1885 987">○ Institute stormwater management measures as required, including velocity dissipators, and solid waste controls which address controls for building materials and offsite tracking of sediment.</li> </ul> </li> <li data-bbox="663 997 1885 1268">● Pollution Prevention Measures: <ul style="list-style-type: none"> <li data-bbox="709 1029 1856 1127">○ Use methods of dewatering, unwatering, excavating, or stockpiling earth and rock materials which include prevention measures to control silting and erosion, and which will intercept and settle any runoff of sediment-laden waters.</li> <li data-bbox="709 1136 1885 1234">○ Prevent wastewater from general construction activities such as drainwater collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, from entering flowing or dry watercourses without the use of approved turbidity control methods.</li> <li data-bbox="709 1243 1604 1268">○ Divert stormwater runoff from upslope areas away from disturbed areas.</li> </ul> </li> </ul>

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p data-bbox="617 253 1255 279"><b>Erosion and spill prevention and control, continued</b></p> <ul data-bbox="663 289 1881 915" style="list-style-type: none"> <li data-bbox="663 289 1881 630">• Turbidity Prevention Measures: <ul style="list-style-type: none"> <li data-bbox="709 324 1881 454">○ Use methods for prevention of excess turbidity which include, but are not restricted to, intercepting ditches, settling ponds, gravel filter entrapment dikes, flocculating processes, recirculation, combinations thereof, or other approved methods that are not harmful to aquatic life.</li> <li data-bbox="709 464 1881 529">○ Wastewaters discharged into surface waters shall meet conditions of Clean Water Act section 402, the National Pollutant Discharge Elimination System (NPDES) permit.</li> <li data-bbox="709 539 1881 630">○ Do not operate mechanized equipment in waterbodies without having first obtained a Clean Water Act section 404 permit, and then only as necessary to construct crossings or perform the required construction.</li> </ul> </li> <li data-bbox="663 639 1881 704">• Clean up spills or leaks in a manner that complies with applicable Federal, State, and local laws and regulations.</li> <li data-bbox="663 714 1881 915">• Dispose of spilled or leaked materials: <ul style="list-style-type: none"> <li data-bbox="709 750 1881 815">○ Handle and dispose of spilled or leaked materials contaminated with 50 ppm or greater polychlorinated biphenyls.</li> <li data-bbox="709 824 1881 915">○ Handle and dispose of spilled or leaked materials not contaminated or contaminated with less than 50 ppm polychlorinated biphenyls in accordance with applicable Federal, State, and local regulations.</li> </ul> </li> </ul> <p data-bbox="617 938 961 964"><b>Discharge water and wastes</b></p> <ul data-bbox="663 974 1881 1352" style="list-style-type: none"> <li data-bbox="663 974 1881 1104">• All discharge water created by construction (e.g. concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) will be treated to avoid negative water quality and quantity impacts. Removal of fines may be accomplished with bioswales; concrete washout water with an altered pH, may be infiltrated (NMFS 2017a).</li> <li data-bbox="663 1114 1881 1211">• Wastewater from Project activities and water removed from within the work area shall be routed to an upland disposal site (landward of the OHWM or extreme high tide line) to allow removal of fine sediment and other contaminants prior to being discharged to the waters of the U.S. (NMFS 2017a).</li> <li data-bbox="663 1221 1881 1352">• All waste material such as construction debris, silt, excess dirt or overburden resulting from the Project will generally be deposited above the limits of flood water in an upland disposal site. However, material from pushup dikes may be used to restore microtopography (e.g., filling drainage channels) (NMFS 2017a).</li> </ul>

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p data-bbox="617 253 869 279"><b>Storage and staging</b></p> <ul data-bbox="667 289 1892 1055" style="list-style-type: none"> <li data-bbox="667 289 1892 561">• When not in use, vehicles and equipment containing oil, fuel, and/or chemicals will be stored in a staging area located at least 150 feet from the Corps’ jurisdictional boundary of wetlands and waterbodies. If possible, staging will be located at least 300 feet away from the Corps’ jurisdictional boundary of wetlands and waterbodies, and on impervious surfaces to prevent spills from reaching ground water. If moving equipment between the staging area and the worksite would create unacceptable levels of disturbance (for example, requiring multiple stream crossings, multiple passes over sensitive vegetation), a closer staging location with an adequate spill prevention plan may be proposed (NMFS 2017a).</li> <li data-bbox="667 571 1457 597">• Equipment will not be stored overnight in the instream channel.</li> <li data-bbox="667 607 1864 704">• Do not stockpile or deposit excavated materials or other construction materials, near or on, stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the watercourse.</li> <li data-bbox="667 714 1892 1055">• Petroleum Product Storage Tanks Management. <ul data-bbox="718 747 1892 1055" style="list-style-type: none"> <li data-bbox="718 747 1871 812">○ Place oil or other petroleum product storage tanks at least 20 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and any other water source.</li> <li data-bbox="718 821 1220 847">○ Do not use underground storage tanks.</li> <li data-bbox="718 857 1871 987">○ Construct storage area dikes at least 12 inches high or graded and sloped to permit safe containment of leaks and spills equal to storage tank capacity located in the area plus sufficient freeboard to contain the 25-year rainstorm. Line diked areas with an impermeable barrier at least 50 mils thick.</li> <li data-bbox="718 997 1892 1055">○ Areas for refueling operations: Lined with impermeable barrier at least 40 mils thick covered with 2 to 4 inches of soil.</li> </ul> </li> </ul> <p data-bbox="617 1081 1096 1107"><b>Reclamation of temporary disturbance</b></p> <ul data-bbox="667 1117 1892 1317" style="list-style-type: none"> <li data-bbox="667 1117 1755 1182">• All temporary access will be removed (including gravel surfaces) and planted after Project completion (NMFS 2017a).</li> <li data-bbox="667 1192 1892 1317">• Within 7 calendar days from Project completion, any disturbed bank and riparian areas shall be protected using native vegetation or other erosion control measures as appropriate. For erosion control, sterile grasses may be used in lieu of native seed mixes. Alternative methods (e.g. spreading timber harvest slash) may be used for erosion control if approved by the Corps (NMFS 2017a).</li> </ul>

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Resource Topic	Best Management Practice
Water Resources (Water Rights)	<ul style="list-style-type: none"><li>• A total of 40 cfs shall be continuously provided to the LNFH during Phase I construction.</li><li>• A total of 20 cfs shall be continuously provided to the LNFH during Phase II construction activities taking place from April 17 to May 20.</li></ul>
Biological Resources (Vegetation)	<ul style="list-style-type: none"><li>• Preserve natural landscape and preserve and protect existing vegetation not required or otherwise authorized to be removed.</li><li>• Protect vegetation from damage or injury caused by construction operations, personnel, or equipment by the use of protective barriers or other approved methods.</li><li>• Minimize, to the greatest extent practicable, clearings and cuts through vegetation.</li><li>• Do not use trees for anchorages except in emergency cases or as approved by Reclamation. Where approved, wrap the trunk with a sufficient thickness of approved protective material before rope, cable, or wire is placed.</li><li>• Use safety ropes where tree climbing is necessary; do not use climbing spurs.</li><li>• Before bringing construction equipment on site, clean it to remove dirt, vegetation, and other organic material to prevent introduction of noxious weeds, and invasive plant and animal species.</li><li>• Contractor cleaning procedures shall result in equipment being cleaned as well or better than the procedures described in Reclamation Cleaning Manual (Reclamation 2010). Reclamation will inspect construction equipment following procedures described in Reclamation Cleaning Manual before allowing the equipment onsite.</li><li>• Restore contractor use areas to pre-construction condition.</li><li>• Areas of temporary disturbance must be re-seeded according to a revegetation plan.</li></ul>

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Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems)	<p data-bbox="617 253 793 279"><b>Riparian areas</b></p> <ul data-bbox="663 289 1892 915" style="list-style-type: none"> <li data-bbox="663 289 1625 315">• The removal of riparian vegetation for access will be minimized (NMFS 2017a).</li> <li data-bbox="663 324 1829 383">• All native, non-invasive organic material (large and small wood) cleared from the action area for access will remain on site (NMFS 2017a).</li> <li data-bbox="663 393 1877 451">• Boundaries of clearing limits associated with site access and construction will be marked to avoid or minimize disturbance of riparian vegetation, wetlands, and other sensitive sites (NMFS 2017a).</li> <li data-bbox="663 461 1892 737">• If native riparian vegetation is disturbed it will be replanted with native herbaceous and/or woody vegetation after Project completion. Planting will be completed between October 1 and April 15 of the year following construction. Plantings will be maintained as necessary for 3 years to ensure 50 percent herbaceous and/or 70 percent woody cover in year 3, whatever is applicable. For riparian impact areas greater than 0.5 of an acre, a final monitoring report will be submitted to the Corps in year 3. Failure to achieve the 50 percent herbaceous and 70 percent woody cover in year 3 will require the permittee to submit a plan with contingency measures to achieve standards or reasons to modify standards (NMFS 2017a).</li> <li data-bbox="663 747 1864 805">• Per NWP 27, post-planting monitoring may be required for up to 10 years in order to ensure an 80 percent planting survival rate is met.</li> <li data-bbox="663 815 1871 915">• Fencing will be installed as necessary to prevent access to revegetated sites by livestock, beavers or unauthorized persons. Beaver fencing will be installed around individual plants where necessary (NMFS 2017a).</li> </ul>

Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems, continued)	<p data-bbox="617 269 978 293"><b>Fisheries and aquatic wildlife</b></p> <ul data-bbox="667 305 1892 1284" style="list-style-type: none"> <li data-bbox="667 305 1367 329">• Instream work is limited to July 1 through November 15.</li> <li data-bbox="667 337 1892 578">• A minimum depth of 0.8 ft shall be maintained within the greatest amount of the natural stream channel width at all times with placement of cofferdams to facilitate fish passage. Fish passage criteria in Icicle Creek Fish Passage Evaluation for the Leavenworth National Fish Hatchery (Anglin et al. 2013, p. 26-28) should be consulted for minimum depth and maximum velocity criteria. The maximum velocity criteria on pages 26-28 are conservative, but attempts should be made to provide fish passage to the greatest extent practical across the natural stream channel width and hydrograph.</li> <li data-bbox="667 586 1892 751">• Work site dewatering will follow the Dewatering and Fish Capture Protocol in Appendix D (NMFS and USFWS 2008). Fish removal from dewatered work sites would be overseen by a fisheries biologist. Electrofishing for fish relocation/work area isolation must follow the most recent NMFS guidelines (NMFS 2017a). Record all incidents of listed fish being observed, captured, handled, and released (USFWS 2011).</li> <li data-bbox="667 760 1797 824">• Re-watering of the construction site occurs at such a rate as to minimize loss of surface water downstream as the construction site streambed absorbs water (NMFS and USFWS 2008).</li> <li data-bbox="667 833 1850 898">• The design of passage structures will follow the appropriate design standards in the most current version of the NMFS Anadromous Salmonid Fish Facility Design manual (NMFS and USFWS 2008).</li> <li data-bbox="667 906 1829 971">• Roughened channels will be designed to standards contained in the most current version of the NMFS Anadromous Salmonid Fish Facility Design manual (NMFS and USFWS 2008).</li> <li data-bbox="667 979 1797 1003">• Post-construction monitoring of the low-flow fishway would be done to ensure effectiveness.</li> <li data-bbox="667 1011 1892 1141">• Boulder weirs will be low in relation to channel dimensions so that they are completely overtopped during channel-forming, bankfull flow events. Boulder weirs will be placed diagonally across the channel or in more traditional upstream pointing "V" or "U" configurations with the apex oriented upstream (NMFS and USFWS 2008).</li> <li data-bbox="667 1149 1881 1214">• Boulder weirs will be constructed to allow upstream and downstream passage of all native listed fish species and life stages that occur in the stream at all flows (NMFS and USFWS 2008).</li> <li data-bbox="667 1222 1839 1284">• Boulder weirs shall be designed and inspected by a multidisciplinary team (including a salmon or trout biologist) that has experience with these types of structures (NMFS and USFWS 2008).</li> </ul>



Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems, continued)	<ul style="list-style-type: none"> <li>• Screens, including screens installed in temporary pump intakes, will be designed to meet standards in the most current version of the NMFS Anadromous Salmonid Passage Facility Design manual (NMFS and USFWS 2008).</li> <li>• Pumps used to dewater the work isolation area or supply temporary hatchery water during construction, will have a fish screen installed, operated and maintained according to NMFS' fish screen criteria (NMFS 2017a).</li> <li>• All fish screens will be sized to match the water users documented or estimated historic water use or legal water right, whichever is less. Water diversion rates shall not exceed the design capacity of the screen, as calculated by following NMFS Anadromous Salmonid Passage Facility Design manual (NMFS and USFWS 2008).</li> <li>• Irrigation diversion intake and return points will be designed (to the greatest degree possible) to prevent all native fish life stages from swimming or being entrained into the irrigation system (NMFS and USFWS 2008).</li> <li>• Do not use jackhammers in excess of 30 pounds without Reclamation approval. Blasting is not permitted.</li> <li>• Monitor, capture, and release listed fish species in the sand settling basin in accordance with applicable protocol in NMFS (2017a), USFWS (2011), and as identified through consultation for the Project's Biological Assessment.</li> <li>• Schedule annual intake maintenance to avoid the Bull Trout upstream migration period (USFWS 2011).</li> <li>• Disturbing natural-origin spawning salmon and Steelhead during hatchery maintenance activities of diversions and instream structures shall be avoided, as shall disturbing salmon and Steelhead redds (NMFS 2017b).</li> </ul>

Resource Topic	Best Management Practice
Biological Resources (Terrestrial Wildlife)	<ul style="list-style-type: none"> <li>• Schedule all necessary vegetation removal, trimming, and grading of vegetated areas outside of the bird breeding season (generally March 1 to August 31) to the maximum extent practicable.</li> <li>• Avoid construction activities during the bird breeding season to the extent practicable. When Project activities cannot occur outside the bird nesting season (March 1 to August 31), conduct surveys prior to scheduled activity to determine if active nests are present within the Wildlife Analysis Area and buffer any active nesting locations found during surveys. Surveys should be conducted by a qualified biologist no more than seven days prior to disturbance activities. If active nests are detected during these surveys a no-activity buffer zone around the nest will be established by a qualified biologist based on species, Project disturbance level, topography, existing disturbance levels, and habitat type until fledging has occurred. During ongoing Project activities if a bird establishes a new nest the nest vegetation will not be removed or modified but no buffer zone will be required. If there is a pause in Project activities greater than seven days an additional nesting bird survey would be needed.</li> <li>• Reclamation would minimize the highest construction noise disturbance to avoid or minimize impacts on mule deer and mountain goat during sensitive periods to the extent practicable. This is between mid-spring to early fall (May 1-September 30).</li> </ul>
Cultural Resources	<ul style="list-style-type: none"> <li>• As required by the Washington State Historic Preservation Officer, the <i>Plan and Procedures for the Inadvertent Discovery of Cultural Resources and Human Remains</i> (Inadvertent Discovery Plan) will be followed in the case of inadvertent discovery of cultural resources or human remains during construction.</li> <li>• A professional archaeological monitor will be present during ground-disturbing activities.</li> </ul>
Land Use	<ul style="list-style-type: none"> <li>• Restore contractor use areas to pre-construction condition.</li> </ul>

Resource Topic	Best Management Practice
Transportation	<ul style="list-style-type: none"> <li>• Perform work on rights-of-way established by the government as necessary to construct and maintain any roads, bridges, or drainage structures required for establishment and use of haul routes for construction operations.</li> <li>• Use existing available public highways, roads, or bridges as haul routes subject to applicable local regulations.</li> <li>• Minimize interference with or congestion of local traffic.</li> <li>• Provide barricades, flaggers, and other necessary precautions for safety of the public where haul routes cross public highways or roads.</li> <li>• Maintain roadways, parking areas, and haul routes in a sound, smooth condition.</li> <li>• Promptly repair ruts, broken pavement, potholes, low areas with standing water, and other deficiencies to maintain road surfacing and drainage in original or specified condition.</li> <li>• Meet requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, Part 6 (Temporary traffic control; <a href="https://mutcd.fhwa.dot.gov/">https://mutcd.fhwa.dot.gov/</a>) and WAC 296-155-305 (Signaling and flaggers).</li> <li>• Provide cones, delineators, concrete safety barriers, barricades, flasher lights, danger signals, signs, and other temporary traffic control devices as required to protect work and public safety.</li> <li>• Provide flaggers and guards as required to prevent accidents and damage or injury to passing traffic.</li> <li>• Do not begin work along public or private roads until traffic control devices for warning, channeling, and protecting motorists are in place in accordance with approved traffic control plan.</li> <li>• Provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations except at times when vehicles will be turning around at the USFS kiosk or backing onto the Intake Access Road.</li> <li>• Provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations.</li> <li>• Maintain convenient access to driveways and buildings along line of work.</li> <li>• Protect roads closed to traffic with effective barricades and warning signs. Illuminate barricades and obstructions from sunset to sunrise.</li> <li>• Remove traffic control devices when no longer needed.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Do not use jackhammers in excess of 30 pounds without Reclamation approval. Blasting is not permitted.</li> </ul>
Recreation	<ul style="list-style-type: none"> <li>• There are no construction activities (such as parking, storage, or vehicle turnaround) allowed in the Forest Service Snow Lakes Trailhead parking lot.</li> </ul>

Resource Topic	Best Management Practice
Visual Resources	<ul style="list-style-type: none"> <li>Minimize, to the greatest extent practicable, clearings and cuts through vegetation. Irregularly shape authorized clearings and cuts to soften undesirable aesthetic impacts.</li> </ul>
Socioeconomics and Environmental Justice	<ul style="list-style-type: none"> <li>Reclamation policy is to avoid impacts on Indian sacred sites whenever possible. Continued coordination with affected Tribes may result in future identification of sacred sites. If this occurs, Reclamation would further evaluate impacts on these resources. Consultation with the Yakama Nation and Confederated Tribes of the Colville Reservation would identify how to protect sacred sites if they were identified and how to provide continued access if any such sites were affected by Project construction.</li> <li>In-water work would not occur in the spillway pool during the Tribal fishing preparations or season.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>A locate for underground utilities would be coordinated with the Washington Utility Notification Center (<a href="http://www.callbeforeyoudig.org/washington/index.asp">http://www.callbeforeyoudig.org/washington/index.asp</a>) prior to construction.</li> </ul>
Hazardous Materials and Public Health and Safety	<ul style="list-style-type: none"> <li>Vehicle traffic on government rights-of-way, dirt roads, and paved roads through LNFH property would be limited to 10 miles per hour.</li> <li>Nuisance flows from seepage and leakage through the cofferdams will be managed to maintain a safe working environment.</li> <li>Hazardous Waste Disposal: <ul style="list-style-type: none"> <li>Dispose by removal from jobsite.</li> <li>Recycle hazardous waste whenever possible.</li> <li>Dispose of hazardous waste materials that are not recycled at appropriately permitted treatment or disposal facilities.</li> <li>Transport hazardous waste in accordance with 49 CFR 171-179.</li> </ul> </li> <li>Provide protection for personnel and existing facilities from harm due to demolition activities.</li> <li>Arrange protective installations to permit operation of existing equipment and facilities by the government while work is in progress.</li> <li>Inadvertent discovery of hazardous wastes or materials will be reported to Reclamation and Ecology within 24 hours of discovery. Construction in the vicinity of the discovery would cease until the appropriate disposal procedures were identified and carried out in coordination with Reclamation and Ecology.</li> </ul>

Resource Topic	Best Management Practice
Tribal Interests	<ul style="list-style-type: none"><li>• Reclamation policy is to avoid impacts on Indian sacred sites whenever possible. Continued coordination with affected Tribes may result in future identification of sacred sites. If this occurs, Reclamation would further evaluate impacts on these resources. Consultation with the Yakama Nation and Confederated Tribes of the Colville Reservation would identify how to protect sacred sites if they were identified and how to provide continued access if any such sites were affected by Project construction.</li></ul>

Sources: As noted in table.

## **B.2 Regulatory Permit Terms and Conditions**

Reclamation will obtain required regulatory permits and comply with the general, regional, and permit-specific terms and conditions contained therein. A general list of anticipated terms and conditions is included below. Regulating agencies may also impose additional conditions on a project-by-project basis.

### **B.1.1 U.S. Army Corps of Engineers Section 404 Nationwide Permits**

#### ***USACE General Conditions for all NWRPs***

- **Aquatic Life Movements.** All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.
- **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable.
- **Suitable Material.** Material used for construction or discharged must be free from toxic pollutants in toxic amounts.
- **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
- **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
- **Removal of Temporary Fills.** Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
- **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
- **Tribal Rights.** No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.
- **Endangered Species. (a)** No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed.
- **Endangered Species. (d)** As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWRPs.

- Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.
- Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.
- Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed.
- Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)).
- Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification.

***USACE Seattle District NWP Regional Conditions***

- Construction Boundaries: Permittees must clearly mark all construction area boundaries before beginning work on projects that involve grading or placement of fill. Boundary markers and/or construction fencing must be maintained and clearly visible for the duration of construction. Permittees should avoid and minimize removal of native vegetation (including submerged aquatic vegetation) to the maximum extent possible.
- Temporary Impacts and Site Restoration: Native soils removed from waters of the U.S. for project construction should be stockpiled and used for site restoration. Restoration of temporarily disturbed areas must include returning the area to pre-project ground surface contours. If native soil is not available from the project site for restoration, suitable clean soil of the same textural class may be used. The permittee must revegetate disturbed areas with native plant species sufficient in number, spacing, and diversity to restore affected functions. Revegetation must begin as soon as site conditions allow within the same growing season as the disturbance. Temporary erosion and sediment control measures must be removed as soon as the area has established vegetation sufficient to control erosion and sediment.

***NWP 27 (Aquatic Habitat Restoration, Enhancement, and Establishment Activities) Conditions***

- Only native plant species should be planted at the site.

***NWP 33 (Temporary Construction, Access, and Dewatering) Conditions***

- Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding.
- Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows.

- The use of dredged material may be allowed if the district engineer determines that it will not cause more than minimal adverse environmental effects. Following completion of construction, temporary fill must be entirely removed to an area that has no waters of the United States, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate.

### **B.1.2 Ecology Section 401 Water Quality Certification**

#### **General Conditions**

- Stormwater pollution prevention: All projects that involve land disturbance or impervious surfaces must implement stormwater pollution prevention or control measures to avoid discharge of pollutants in stormwater runoff to waters of the State.
  - For land disturbances during construction, the applicant must obtain and implement permits (e.g., Construction Stormwater General Permit) where required and follow Ecology’s current stormwater manual.
  - Following construction, prevention or treatment of on-going stormwater runoff from impervious surfaces shall be provided.

### **B.3 Potential Contractor Plan Submittals**

The list of plans that would need to be prepared before Project construction could begin may include, but are not limited to the following:

- Land Use and Landscape Rehabilitation Plan
- Traffic Control Plan
- Pollution Prevention Plan
- Spill Prevention, Control, and Countermeasure Plan
- Tree and Plant Protection Plan
- Waste Production and Disposal Plan
- Waste Handling and Disposal Plan
- Demolition Plan
- Concrete Removal and Disposal Plan
- Water Control Plan
- Cofferdam Construction Plan
- Seeding Plan
- Work Area Isolation Plan
- Temporary Erosion and Sediment Control Plan
- Inadvertent Discovery Plan



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## B.4 References

- Anglin, D. R., J. J. Skalicky, D. Hines, and N. Jones. 2013. Icicle Creek Fish Passage Evaluation for The Leavenworth National Fish Hatchery. U.S. Fish and Wildlife Service, Columbia River Fisheries Program Office, Vancouver, Washington.
- NMFS (National Marine Fisheries Service). 2015. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation; Leavenworth National Fish Hatchery spring Chinook Salmon Program. National Marine Fisheries Service, West Coast Region, Portland, Oregon.
- \_\_\_\_\_. 2017a. Programmatic Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Seattle District Corps of Engineers Permitting of Fish Passage and Restoration Action in Washington State (FPRP III). West Coast Region, Portland, Oregon.
- \_\_\_\_\_. 2017b. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation, Leavenworth National Fish Hatchery Spring Chinook Salmon Program (Reinitiation 2016). National Marine Fisheries Service, West Coast Region, Portland, Oregon.
- NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2008. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Washington State Fish Passage and Habitat Enhancement Restoration Programmatic. NMFS Tracking No. 2008/03598, USFWS No. 13410-2008-FWS#F-0209. Lacey, Washington.
- Reclamation (U.S. Bureau of Reclamation). 2010. Technical Memorandum No. 86-68220-07-05: Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species, 2010 Edition. Denver, Colorado.
- USFWS (U.S. Fish and Wildlife Service). 2011. Biological Opinion for the operations and maintenance (O&M) of the LNFH and effects on the threatened bull trout (*Salvelinus confluentus*) and its designated critical habitat. USFWS Reference No. 13260-2011-F-0048 and 13260-2011-P-0002. Wenatchee, Washington.

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