



— BUREAU OF —
RECLAMATION

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

Land Use, Utilities, and Service Systems Resource Report



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

November 2020

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.

Existing land uses in the Analysis Area include lands owned and administered by the United States Fish and Wildlife Service (USFWS) and privately-owned lands. The USFWS oversees the public use of lands under their ownership. The private lands consist of residential and commercial uses. The Icicle River RV Resort consists of both residential and commercial uses. Other commercial land uses are associated with the Sleeping Lady Mountain Resort and the Icicle Creek Center for the Arts. The location of the proposed project is outside the City of Leavenworth's urban growth area. This means existing land uses will remain rural and largely unchanged into the foreseeable future (Chelan County 2017).

Utilities include infrastructure such as electrical powerlines, water and wastewater pipelines, natural gas pipelines, and fiber optic cables that serve a group of end users, typically associated with a utility district, municipal boundary, or other utility service area. Service systems are those related to municipal police, fire, health care, transportation, and education services and solid waste disposal. The Chelan County Public Utility District owns and operates electrical utility infrastructure in the Analysis Area. Chelan County provides police, fire, and solid waste services.

There is an aboveground electrical distribution line, with power poles, within the Phase I construction area (i.e., intake construction area) portion of the Analysis Area. There is no known underground water, wastewater, or natural gas infrastructure in the portion of the Icicle Creek Road right-of-way adjacent to the Phase I construction area.

The existing intake facility is the point of diversion for both the Hatchery and the Cascade Orchard Irrigation Company (COIC). The current underground conveyance pipeline lies within land held in fee by the USFWS and in easements acquired by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation). Under a Memorandum of Agreement, the Reclamation transferred custody and accountability of the easements to the USFWS; therefore, the USFWS is responsible for the Operation and Maintenance of the federal facilities and land interests. The current easements are considered a nonpossessory property interest that allows the United States (U.S.) to use and enter upon the real property owned by the underlying fee owners.

There are no foreseeable changes to existing easements or other land entitlements in the Analysis Area. Utility and service system trends in and surrounding the Project Area are expected to remain largely unchanged.

Environmental Consequences

The primary indicator of impacts on land use is any change in the assigned land use. The primary indicator of impacts on utilities and service systems is a change in the number, type, or functionality of utilities and service systems in the Project Area. There would be no change to existing service systems under any alternative.

Alternative A – No Action Alternative

Under the No Action Alternative, there would be no changes to the existing intake facilities or upgrading or replacing the conveyance pipeline. The existing easement containing the underground conveyance pipeline would remain in effect. There would be no change in the current land uses, zoning, landownership, entitlements, or existing utilities aside from routine maintenance or future improvements.

Alternative B – Proposed Action

Under Alternative B, the existing intake facilities would be modified, the conveyance pipeline on USFWS property replaced, portions of the conveyance pipeline would be lined within the existing easements, and the roughened channel would be constructed. There would be no changes to the terms or conditions of the conveyance pipeline easement. There would be no change in the current land uses, zoning, landownership, or entitlements as a result of the Proposed Action, which would be the same as described under Alternative A. Under all action alternatives, Reclamation would obtain a temporary easement or use authorization to accommodate construction activity outside the existing pipeline easement. The duration of the easement or use authorization would be confined to the construction window. The easement or authorization would temporarily preclude other activities from taking place in that area. Once construction is completed the temporary easement or authorization would cease and the existing or temporary easements would be returned to pre-project or better conditions, including reseeding any disturbed areas of vegetation.

Modifying the existing intake facility would result in the relocation of at least one power pole at the intersection of the access road with Icicle Creek Road. The existing intake facility improvements could also result in minor upgrades to the overhead electrical infrastructure. Relocating and upgrading the infrastructure could result in a temporary lapse in electrical supply to area users. If the line would need to be deenergized for safety, the result would be a temporary lapse in service delivery to a small number of users while the relocation and upgrade is completed.

Alternative C

Under Alternative C, the existing intake facilities would be modified, the conveyance pipeline on USFWS-owned land would be lined in the upper section and replaced in the lower section, portions of the conveyance pipeline would be lined within the existing easements, and the roughened channel would be constructed. Impacts under Alternative C would be the same as described under Alternative B.

Alternative D

Impacts under Alternative D would be the same as described under Alternative B.

Table of Contents

Chapter	Page
EXECUTIVE SUMMARY	ES-1
CHAPTER 1. GENERAL PROJECT INFORMATION.....	1
1.1 Project Area.....	1
1.2 Alternatives.....	1
1.2.1 Alternative A – No Action	1
1.2.2 Alternative B – Proposed Action.....	3
1.2.3 Alternative C.....	7
1.2.4 Alternative D	8
CHAPTER 2. RELEVANT LAWS, REGULATIONS, AND POLICY	11
2.1 Federal Laws, Regulations, Statutes, and Orders	11
2.2 State and Local Laws.....	11
CHAPTER 3. AFFECTED ENVIRONMENT.....	13
3.1 Analysis Area.....	13
3.2 Land Use, Utilities, and Service Systems.....	13
3.2.1 Phase I Construction Area – Intake Construction Area	14
3.2.2 Phase II Construction Area – Conveyance Pipeline and CUAs	14
3.2.3 Other Areas.....	15
3.2.4 Trends.....	15
CHAPTER 4. ENVIRONMENTAL CONSEQUENCES	17
4.1 Methods	17
4.1.1 Analysis Indicators.....	17
4.1.2 Issue Statements.....	17
4.1.3 Assumptions	17
4.2 Alternative A – No Action Alternative	17
4.3 Alternative B – Proposed Action.....	17
4.4 Alternative C.....	18
4.5 Alternative D.....	18
4.6 Short-Term Uses and Long-Term Productivity.....	18
4.7 Unavoidable Adverse Impacts.....	19
4.8 Irreversible and Irretrievable Commitment of Resources.....	19
CHAPTER 5. GLOSSARY	21
CHAPTER 6. REFERENCES CITED	23

Appendices

Appendix A. Maps

Appendix B. Best Management Practices

This page intentionally left blank.

Acronyms and Abbreviations

Full Phrase

BMP	Best Management Practice
cfs	cubic feet per second
CIPP	cure-in-place pipe
City	City of Leavenworth
COIC	Cascade Orchard Irrigation Company
CUA	Contractor Use Area
Ecology	Washington Department of Ecology
ESA	Endangered Species Act
EIS	Environmental Impact Statement
Forest Service	U.S. Department of Agriculture, Forest Service
IO&MA	Intake Operations and Maintenance Area
LNFH	Leavenworth National Fish Hatchery
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
O&M	operations and maintenance
PISMA	pipeline intake and sediment management area
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RCW	Revised Code of Washington
ROW	right-of-way
SWISP	Surface Water Intake Fish Screens and Fish Passage
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

This page intentionally left blank.

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)¹. 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 U.S. 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 headworks² 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

¹ 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.

² 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 construction³. 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

³ 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 cofferdams⁴ (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).

⁴ 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, 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 pumps⁵ 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.

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

This page intentionally left blank.

Chapter 2. Relevant Laws, Regulations, and Policy

The section below outlines laws, regulations, and policies that are applicable to land use and provides a brief description of these authorities.

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.

National Environmental Policy Act (NEPA) of 1969—Provides the basis for evaluating potential effects on the environment.

Reclamation Act of 1902—This act allowed for the disposal of federal lands for the development of public works projects to reclaim arid lands.

Rivers and Harbors Act of 1935—This act authorized construction of the Grand Coulee Dam.

2.2 State and Local Laws

State of Washington Growth Management Act (Revised Code of Washington [RCW] 36.70A.070 and Washington Administrative Code [WAC] 356-195-320)—Provides the basis for coordinated land use and infrastructure planning between local governments and utility purveyors.

Washington State Environmental Policy Act of 1971—Directs the state and its local governments to identify probable impacts of projects and potential measures to mitigate impacts.

Shoreline Management Act (RCW 90.58)—This act directs local government to develop shoreline master programs to address planning issues in the land-water interface.

Chelan County Comprehensive Plan 2017-2037—This plan guides the future physical development of land in Chelan County, including placement of utilities and service systems to support land uses.

City of Leavenworth Comprehensive Plan – This plan guides the future physical development of land in the City of Leavenworth, Washington.

This page intentionally left blank.

Chapter 3. Affected Environment

3.1 Analysis Area

The Analysis Area for land use includes the Phase I construction area (i.e., intake construction area), Phase II construction area (i.e., conveyance pipeline and CUAs), other lands owned and administered by the USFWS, and private parcels associated with the Sleeping Lady Mountain Resort, Icicle Creek Center for the Arts, and Icicle River RV Resort (**Map A-9 in Appendix A**). The Analysis Area for utilities and service systems is the Phase I and Phase II construction areas (**Map A-10 in Appendix A**).

3.2 Land Use, Utilities, and Service Systems

The Project Area is located in unincorporated Chelan County, south of the City of Leavenworth (City), and outside the City's urban growth area (**Map A-1 in Appendix A**). The Growth Management Act (RCW 36.70A.070 and WAC 356-195-320) directs local governments to provide municipal infrastructure to support urban development within designated growth boundaries. Outside the urban growth area, local government land use plans encourage lower-density rural land uses. The *Chelan County Comprehensive Plan* defines rural character as areas where there are:

- Open spaces, and the natural landscape and vegetation predominate over the built environment
- Traditional rural lifestyles, rural-based economies, and opportunities to both live and work in rural areas
- Visual landscapes that are traditionally found in rural areas and communities
- Few occurrences of inappropriate conversion of undeveloped land into sprawling, low-density development
- Generally not requirements for the extension of urban governmental services
- Land uses consistent with the protection of natural surface water flows and groundwater and surface water recharge and discharge areas (Chelan County 2017)

The Chelan County and City of Leavenworth Comprehensive Plans (Chelan County 2017; City of Leavenworth 2017) identify the LNFH as a locally and regionally significant recreation area. The LNFH is within the City's parks and recreation services area. In this area, the City coordinates recreation-related land uses with Chelan County and other federal, state, and local land management agencies.

Existing land uses in the Analysis Area include lands owned and administered by the USFWS and privately-owned lands. The USFWS oversees the public use of lands under their ownership. The private lands consist of residential and commercial uses. The Icicle River RV Resort consists of both residential and commercial uses. Other commercial land uses are associated with the Sleeping Lady Mountain Resort and the Icicle Creek Center for the Arts (**Map A-9 in Appendix A**).

Utilities in the Analysis Area include infrastructure such as electrical powerlines, water and wastewater pipelines, natural gas pipelines, and fiber optic cables that serve a group of end users, typically associated with a utility district, municipal boundary, or other utility service area. Private infrastructure, such as septic tanks or private wells, are not considered in this report. Service systems are those related to municipal police, fire, health care, transportation, and education services and solid waste disposal.

Municipal-level utility needs in unincorporated areas, such as the Project Area, are typically fewer because the land pattern is more dispersed. Water and wastewater needs, for example, are mostly fulfilled at the individual parcel level through well and septic systems, rather than by municipal infrastructure. Demand for service systems is less compared with more urbanized areas.

The Chelan County Public Utility District owns and operates electrical utility infrastructure in the Project Area. Chelan County provides police, fire, and solid waste services.

3.2.1 Phase I Construction Area – Intake Construction Area

The Phase I Construction Area is on land owned and administered by the USFWS.

The intake facility is the point of diversion for both the Hatchery and the COIC water rights from Icicle Creek. The COIC water right is for 12 cubic feet per second and the water is transported via the conveyance pipeline to the bifurcation, approximately 1,200 feet east of the intake facility. From the bifurcation point, the pipeline is below ground for approximately 1,200 feet at which point it turns into an open water ditch that crosses approximately 1,000 feet of the Land Use Analysis Area before exiting the Analysis Area to the north. COIC is finalizing plans to relocate its point of diversion to below the Hatchery. Once the new point of diversion is constructed, COIC will no longer divert water at the current intake location and will no longer operate water utility infrastructure in the Analysis Area.

There is an aboveground electrical distribution line, with power poles within the Phase I construction area (i.e., intake construction area) of the Analysis Area. There is no known underground water, wastewater, or natural gas infrastructure in the portion of the Icicle Creek Road right-of-way adjacent to the Phase I construction area.

3.2.2 Phase II Construction Area – Conveyance Pipeline and CUAs

The Phase II construction area is mostly on private land. The current underground conveyance pipeline lies within easements acquired by Reclamation. Under a Memorandum of Agreement, Reclamation transferred custody and accountability of the easements to the USFWS; therefore, the USFWS is responsible for the operation and maintenance of the federal facilities and land interests. The current easements are considered a nonpossessory property interest that allows the U.S. to use and enter upon the real property owned by the underlying fee owners.

Underground utility infrastructure likely exists in portions of the Phase II construction areas within the Analysis Area. Exact locations would be verified before construction.

3.2.3 Other Areas

Staging areas identified within the Analysis Area for land use were specifically chosen because these areas have been previously used and disturbed by LNFH for other construction or maintenance projects. The northeastern portion of the Analysis Area includes the LNFH helipad (**Map A-9 in Appendix A**). The helipad and surrounding open space is used as a staging and landing area during wildfire and wildland rescue operations.

There may be underground utility infrastructure, including abandoned infrastructure, in the Analysis Area for utilities and service systems (**Map A-10 in Appendix A**). Exact locations would be verified before construction.

3.2.4 Trends

Most regional population growth is anticipated for the areas in the urban growth area associated with the City of Leavenworth (Chelan County 2017). The location of the Project is outside the City of Leavenworth's urban growth area. This means existing land uses will remain rural and largely unchanged into the foreseeable future (Chelan County 2017). There are no foreseeable changes to existing easements or other land entitlements in the Analysis Area.

The Chelan County Comprehensive Plan (Chelan County 2017) specifies that rural governmental services should be provided at a level necessary to support and sustain the land use pattern planned for rural areas. The service should not be provided at such a level that it promotes growth or sprawl in rural areas. Utility and service system trends in and surrounding the Analysis Area are expected to remain largely unchanged. However, there may be incremental changes in the type and intensity of land uses in and around the Analysis Area that would require the need to upgrade, expand, or relocate utility infrastructure or modify the frequency, type, or extent of service systems provided. Routine maintenance of infrastructure is expected.

Use of the LNFH helipad and surrounding open space for wildfire and wildland rescue operations will continue to persist into the future. The frequency and duration of use cannot be determined, but will be on an as needed basis and coordinated directly with LNFH.

This page intentionally left blank.

Chapter 4. Environmental Consequences

4.1 Methods

4.1.1 Analysis Indicators

The primary indicator of impacts on land use is any change in the assigned land use. The primary indicator of impacts on utilities and service systems is a change in the number, type, or functionality of utilities and service systems in the Analysis Area.

4.1.2 Issue Statements

There were no comments received during scoping concerning land use, utilities, or service systems.

4.1.3 Assumptions

There would be no permanent changes in land use or service systems under any alternative. Any impacts related to temporary changes in access to lands in the Analysis Area are discussed in the SWISP Project EIS **Transportation and Traffic Resource Report**; impacts related to temporary changes in business activity or viability are discussed in the SWISP Project EIS **Socioeconomics and Environmental Justice Resource Report**.

4.2 Alternative A – No Action Alternative

Under the No Action Alternative, there would be no changes to the existing intake and low head diversion dam or upgrading or replacing the conveyance pipeline, or the need for staging areas or CUAs. The existing easement containing the underground conveyance pipeline would remain in effect. There would be no change in the current land uses, zoning, landownership, entitlements, or existing utilities aside from routine maintenance or future improvements. Any future improvements would be subject to compliance with applicable laws, regulations, and policies, including NEPA.

4.3 Alternative B – Proposed Action

Under Alternative B, the existing intake would be modified, the conveyance pipeline on USFWS-owned land replaced, portions of the conveyance pipeline would be lined within the existing easements, and the roughened channel would be constructed. There would be no changes to the terms or conditions of the conveyance pipeline easement and effects on land use would be the same as Alternative A. There would be no change in the current land uses, zoning, landownership, or entitlements as a result of Alternative B. Reclamation would obtain a temporary easement or use authorization to accommodate construction activity outside the existing pipeline easement, which would allow for temporary access, equipment and material staging, and construction activity. The CUAs within the existing or temporary easements will be returned to pre-project or better conditions, including reseeding any disturbed areas of vegetation. The duration of the easement or use authorization would be confined to the construction window; once construction is completed the temporary easement or authorization would cease. The easement or authorization would

temporarily preclude other activities from taking place in that area, but would not change the underlying land use, ownership, or entitlements.

Alternative B would also result in the relocation of at least one power pole at the intersection of the Intake Access Road with Icicle Creek Road. The intake facilities improvements could also result in minor upgrades to the overhead electrical infrastructure. Relocating and upgrading the infrastructure could result in a temporary lapse in electrical supply to area users. The proposed utility pole relocation and upgrade is a common practice in the industry and similar activities can be completed while the line is energized. If the line would need to be deenergized for safety, the result would be a nearly imperceptible, temporary lapse in service delivery to a small number of users while the relocation and upgrade is completed. In the long-term, the relocation and upgrade would improve service reliability to the intake facilities and surrounding electricity users compared with Alternative A.

In the portions of the Analysis Area outside of the Phase I and II construction areas, there would be no change in the underlying land use, ownership, entitlements, or utilities. Any underground utilities identified during pre-construction utility location verifications would be avoided during construction.

4.4 Alternative C

Impacts on land use, utilities, or service systems under Alternative C would be the same as described under Alternative B.

4.5 Alternative D

Impacts on land use, utilities, or service systems under Alternative D would be the same as described under Alternative B.

4.6 Short-Term Uses and Long-Term Productivity

There would be no changes to the assigned land uses in the Analysis Area under any alternative. Reclamation would obtain a temporary easement or use authorization to accommodate construction activity outside the existing pipeline easement, which would allow for temporary access, equipment and material staging, and construction activity. The duration of the easement or use authorization would be confined to the construction window; once construction is completed the temporary easement or authorization would cease. The easement or authorization would temporarily preclude other activities from taking place in that area, but would not change the underlying land use, ownership, or entitlements. Therefore, the current land use would resume at the end of construction.

The action alternatives would result in the potential for a short-term lapse in electrical service provision associated with the relocation and upgrading of existing electrical infrastructure. There would be no change in use and impacts would be temporary.

4.7 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts on land use, utilities, or service systems under any alternative.

4.8 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of resources related to land use, utilities, or service systems under any alternative.

This page intentionally left blank.

Chapter 5. Glossary

No glossary terms defined.

This page intentionally left blank.

Chapter 6. References Cited

Chelan County. 2017. Chelan County Comprehensive Plan 2017–2037. Wenatchee, Washington.

City of Leavenworth. 2017. City of Leavenworth Comprehensive Plan 2017. Leavenworth, Washington.

NMFS (National Marine Fisheries Service). 1997. Fish Screening Criteria for Anadromous Salmonids. National Marine Fisheries Service, Southwest Region, Long Beach, California.

_____. 2011. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service, Northwest Region, Portland, Oregon.

_____. 2017. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Leavenworth National Fish Hatchery Spring Chinook Salmon Program (Reinitiation 2016). National Marine Fisheries Service, West Coast Region, Portland, Oregon.

USFWS (U.S. Fish and Wildlife Service). 2011. Biological Assessment for the Operation and Maintenance of Leavenworth National Fish Hatchery. Leavenworth, Washington.

This page intentionally left blank.

Appendix A

Maps

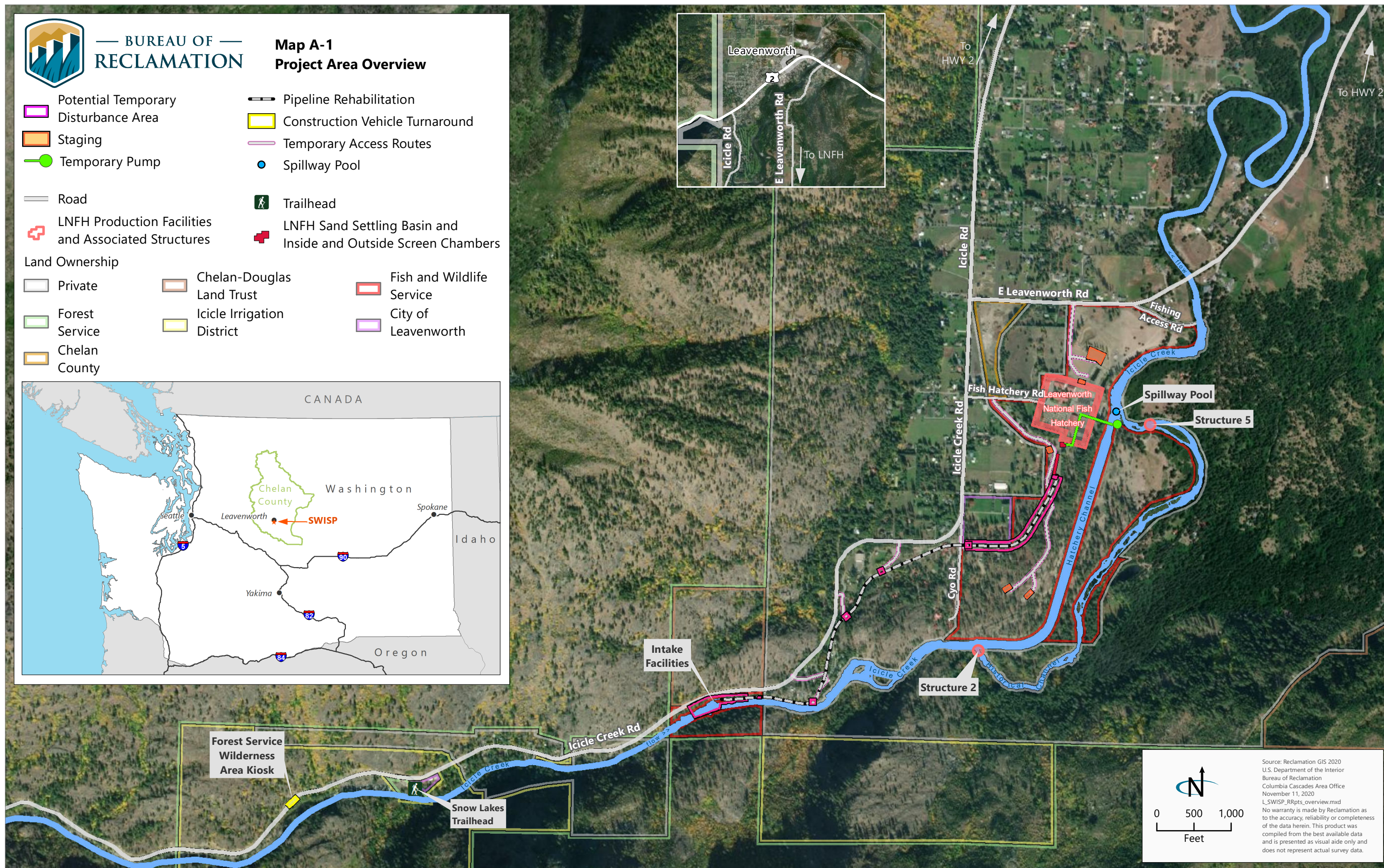
This page intentionally left blank.



BUREAU OF
RECLAMATION

Map A-1 Project Area Overview

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



0 500 1,000
Feet

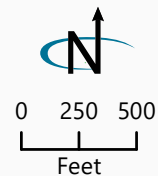
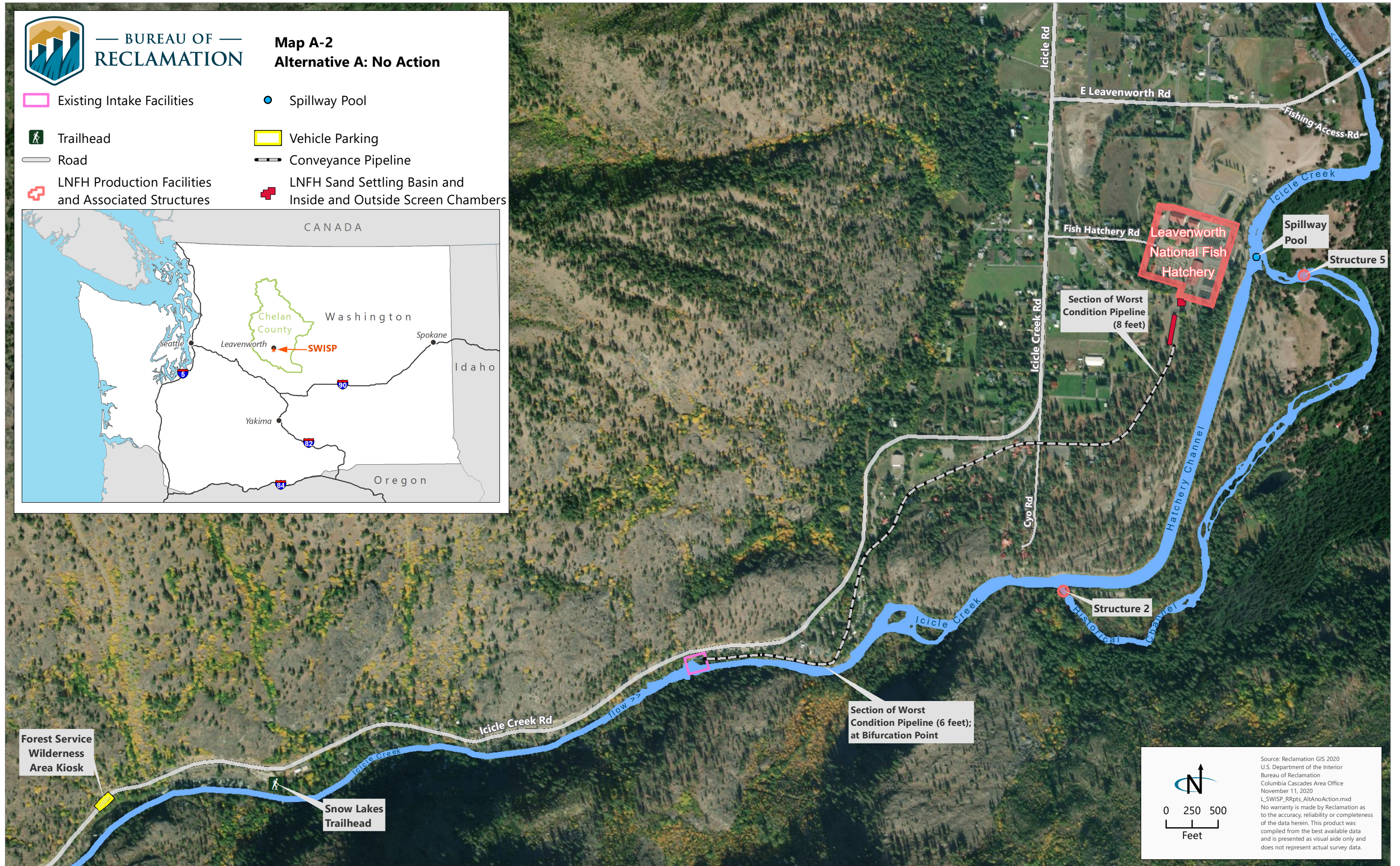
Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_overview.mxd
No warranty is made by Reclamation as to the accuracy, reliability or completeness of the data herein. This product was compiled from the best available data and is presented as visual aid only and does not represent actual survey data.



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
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltAnoAction.mxd
No warranty is made by Reclamation as to the accuracy, reliability or completeness of the data herein. This product was compiled from the best available data and is presented as visual aid only and does not represent actual survey data.

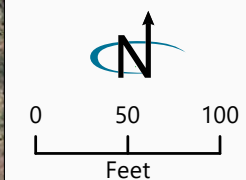
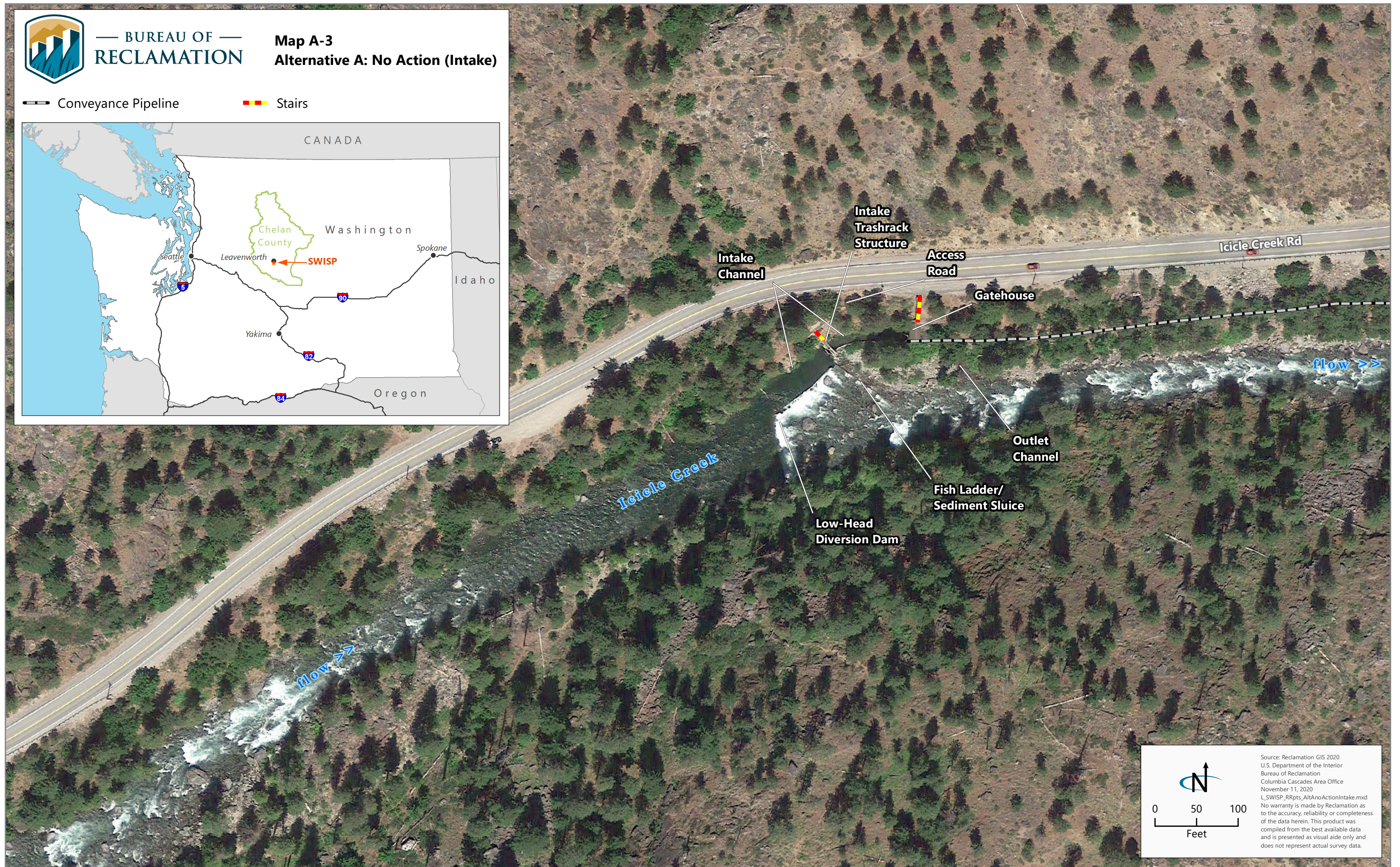


BUREAU OF
RECLAMATION

Map A-3
Alternative A: No Action (Intake)

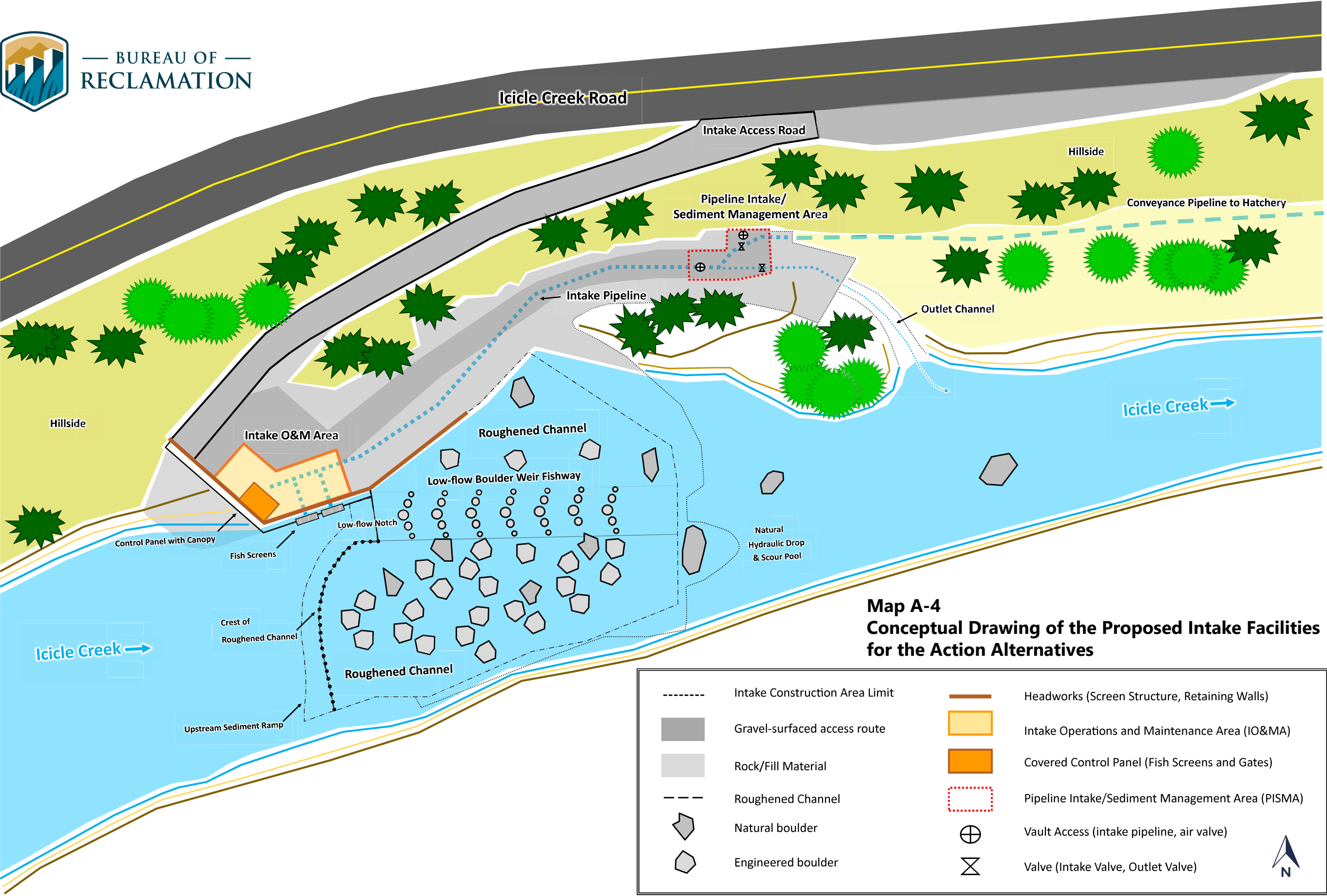
Conveyance Pipeline

Stairs

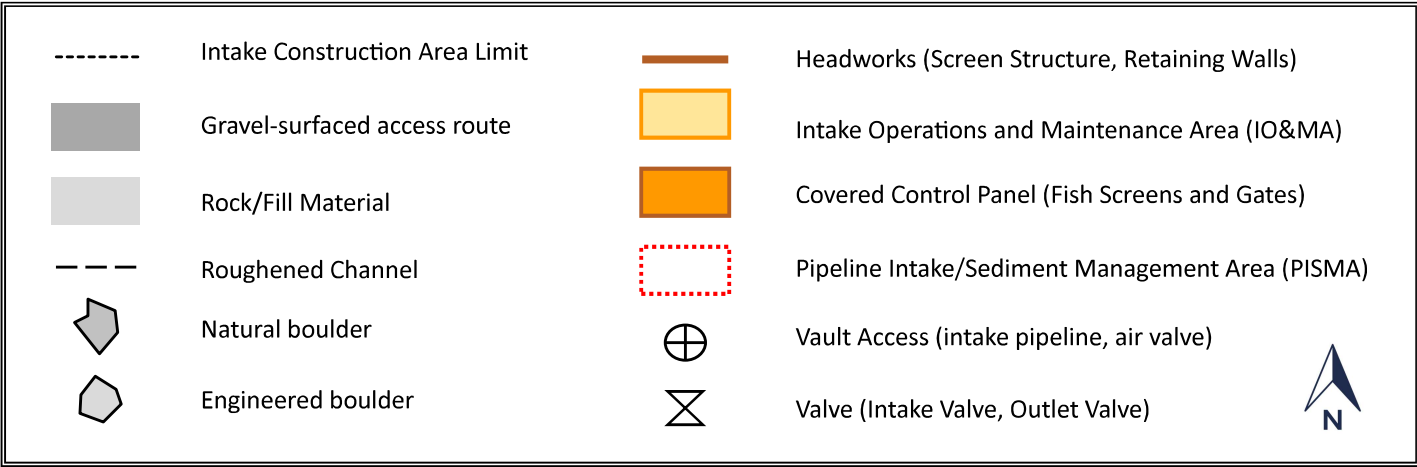


Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltAnoActionIntake.mxd
No warranty is made by Reclamation as
to the accuracy, reliability or completeness
of the data herein. This product was
compiled from the best available data
and is presented as visual aid only and
does not represent actual survey data.

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





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

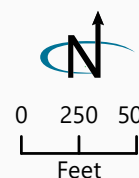


Forest Service
Wilderness
Area Kiosk

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
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltBproposed.mxd
No warranty is made by Reclamation as
to the accuracy, reliability or completeness
of the data herein. This product was
compiled from the best available data
and is presented as visual aid only and
does not represent actual survey data.



BUREAU OF
RECLAMATION

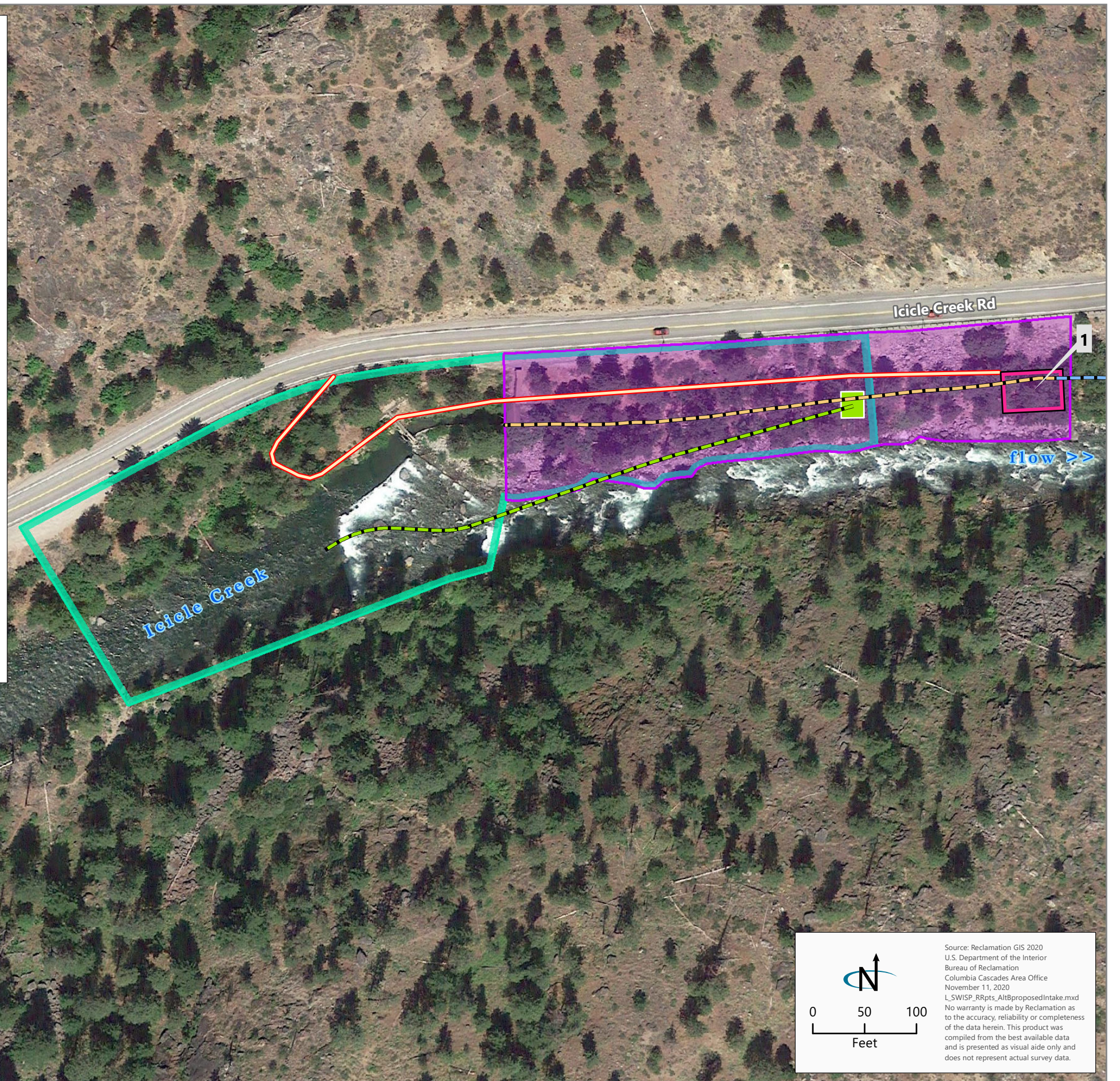
Map A-6
Alternative B (Proposed Action)
and Alternative D: Intake


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)




0 50 100
Feet

Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltBproposedIntake.mxd
No warranty is made by Reclamation as to the accuracy, reliability or completeness of the data herein. This product was compiled from the best available data and is presented as visual aid only and does not represent actual survey data.



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

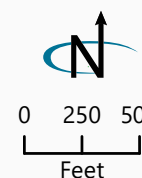
LNFH Sand Settling Basin and
Inside and Outside Screen Chambers



Forest Service
Wilderness
Area Kiosk

Snow Lakes
Trailhead

Intake Facilities
*See Map 2-7 for
Additional Details



Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltC.mxd
No warranty is made by Reclamation as
to the accuracy, reliability or completeness
of the data herein. This product was
compiled from the best available data
and is presented as visual aid only and
does not represent actual survey data.



BUREAU OF
RECLAMATION

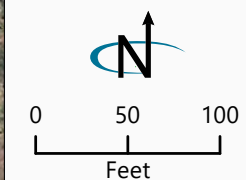
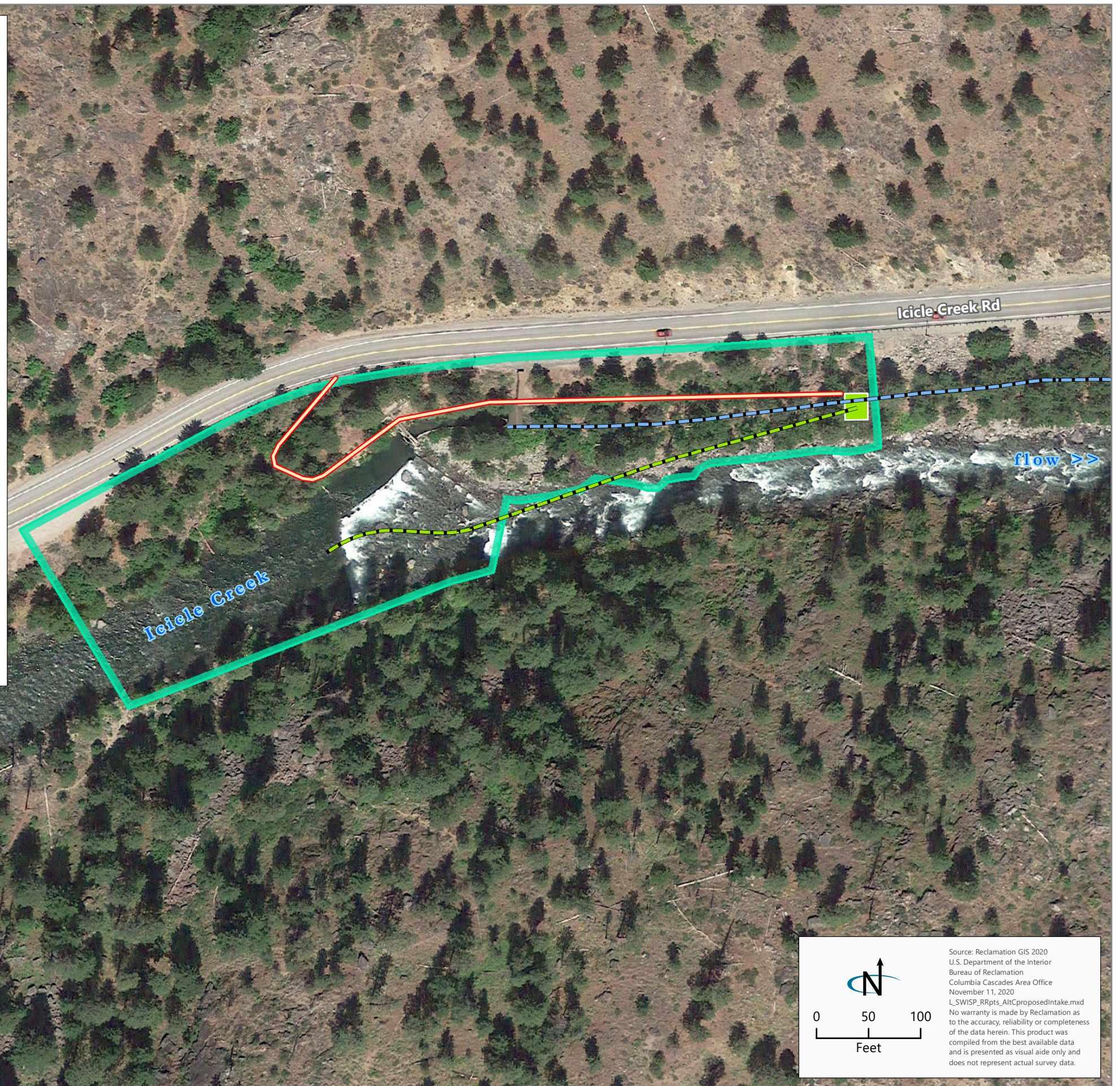
Map A-8 Alternative C (Intake)

Phase I

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

Phase II

- Conveyance Pipeline lined with Cure-in-Place Pipe



Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_AltCProposedIntake.mxd
No warranty is made by Reclamation as to the accuracy, reliability or completeness of the data herein. This product was compiled from the best available data and is presented as visual aid only and does not represent actual survey data.



BUREAU OF
RECLAMATION

Map A-9
Land Use Analysis Area

Property owner (Property name)

Icicle Creek Center for the Arts
Properties, LLC.

Fish and Wildlife Service

Helipad

Intake Facilities

Conveyance Pipeline

LNFH Production Facilities
and Associated Structures

Icicle Properties, LLC.
(Sleeping Lady Mountain Resort)

Private (Icicle River RV Resort)

Spillway Pool

Road

LNFH Sand Settling Basin and
Inside and Outside Screen Chambers

Land Ownership

Private

Forest
Service

Chelan
County

Chelan-Douglas
Land Trust

Icicle Irrigation
District

Fish and Wildlife
Service

City of
Leavenworth



Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_LandUse.mxd
No warranty is made by Reclamation as
to the accuracy, reliability or completeness
of the data herein. This product was
compiled from the best available data
and is presented as visual aid only and
does not represent actual survey data.



BUREAU OF
RECLAMATION

Map A-10 Utilities Analysis Area

Utilities Analysis Area

Intake Facilities

Conveyance Pipeline

Trailhead

LNFH Production Facilities

Construction Vehicle Turnaround

Road

LNFH Sand Settling Basin and
Inside and Outside Screen Chambers



Forest Service
Wilderness
Area Kiosk

Snow Lakes
Trailhead

Intake
Facilities

E Leavenworth Rd

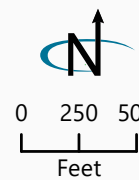
Fish Hatchery Rd

Leavenworth
National Fish
Hatchery

Icicle Creek Rd

Cyo Rd

Icicle Creek Rd



Source: Reclamation GIS 2020
U.S. Department of the Interior
Bureau of Reclamation
Columbia Cascades Area Office
November 11, 2020
L_SWISP_RRpts_Uilities.mxd
No warranty is made by Reclamation as
to the accuracy, reliability or completeness
of the data herein. This product was
compiled from the best available data
and is presented as visual aid only and
does not represent actual survey data.

Appendix B

Best Management Practices

This page intentionally left blank.

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)¹.
- 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**.

¹ 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"> • 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). • Conduct operations to prevent unnecessary destruction, scarring, or defacing of natural surroundings in the vicinity of the work.
Air Quality and Climate	<ul style="list-style-type: none"> • Dust control and abatement measures will be implemented during construction. • Vehicle traffic on unpaved surfaces would be limited to 10 miles per hour to minimize dust generation. • Vehicle traffic on government rights-of-way, dirt roads, and paved roads through LNFH property would be limited to 10 miles per hour. • Prevent, control, and abate dust pollution on government rights-of-way. • Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities. • Provide means for eliminating atmospheric discharges of dust during mixing, handling, and storing of cement, pozzolan, and concrete aggregate. • Use reasonably available methods and devices to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants. • Do not operate equipment and vehicles that show excessive exhaust gas emissions until corrective repairs or adjustments reduce such emissions to acceptable levels.
Geology and Soils	<ul style="list-style-type: none"> • The number of temporary access roads will be minimized, and roads will be designed to avoid adverse effects like creating excessive erosion (NMFS 2017a). • Temporary roads and trails across slopes greater than 30 percent will be avoided when feasible (NMFS 2017a). • Existing roadways or travel paths will be used whenever possible (NMFS 2017a).
Water Resources (Stream Conditions)	<ul style="list-style-type: none"> • 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. • Additional flow outage shall require the prior written approval of the COR, and of appropriate Federal and State water quality control agencies.

Resource Topic	Best Management Practice
Water Resources (Water Quality)	<p>General</p> <ul style="list-style-type: none"> • 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. • 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). • The use of acids for cleaning or preparing concrete surfaces for repair will not be permitted. <p>In-water work</p> <ul style="list-style-type: none"> • 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). • Use of rapidly deployable prefabricated cofferdam systems would minimize impacts to subgrade and surrounding water. • 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. • Spill prevention and clean-up kits will be on site when heavy equipment is operating within 25 feet of the water (NMFS 2017a). • 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). • Equipment shall be checked daily for leaks and any necessary repairs shall be completed prior to commencing work activities around the water (NMFS 2017a). • Equipment will cross the stream in-water only under the following conditions: (NMFS 2017a). <ul style="list-style-type: none"> ○ A. Equipment is free of external petroleum-based products, soil and debris has been removed from the drive mechanisms and undercarriage; and ○ B. The substrate is bedrock or coarse rock and gravel; or ○ C. Mats or logs are used in soft bottom situations to minimize compaction while driving across streams; and

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<ul style="list-style-type: none"> ○ D. Stream crossings will be performed at right angles (90 degrees) to the bank if possible; and ○ 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 ○ F. The number of crossings will be minimized. • 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). • 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). • Where practicable, a turbidity and/or debris containment device shall be installed prior to commencing in-water work (NMFS 2017a). • 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). • Equipment used in the instream channel will have containment methods to address possible fuel and oil leaks.
	<p>Erosion and spill prevention and control</p>
	<ul style="list-style-type: none"> • 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). • 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). • 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.

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p>Erosion and spill prevention and control, continued</p> <ul style="list-style-type: none"> ○ Prevent, stop, and control spills or leaks during construction activities: ○ Stop source of spill or leak. ○ Stop migration of spill or leak. ○ Place berm of sorbent material around perimeter of spill. ○ Solidify free standing oil. • 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). • 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). • 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. • Sediment and Erosion Controls: <ul style="list-style-type: none"> ○ Establish methods for controlling sediment and erosion which address vegetative practices, structural control, silt fences, straw dikes, sediment controls, and operator controls as appropriate. ○ Institute stormwater management measures as required, including velocity dissipators, and solid waste controls which address controls for building materials and offsite tracking of sediment. • Pollution Prevention Measures: <ul style="list-style-type: none"> ○ 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. ○ 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. ○ Divert stormwater runoff from upslope areas away from disturbed areas.

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p data-bbox="617 250 1255 276">Erosion and spill prevention and control, continued</p> <ul data-bbox="667 289 1877 915" style="list-style-type: none"> <li data-bbox="667 289 1877 630">• Turbidity Prevention Measures: <ul data-bbox="718 321 1877 630" style="list-style-type: none"> <li data-bbox="718 321 1877 461">○ 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 data-bbox="718 467 1877 526">○ Wastewaters discharged into surface waters shall meet conditions of Clean Water Act section 402, the National Pollutant Discharge Elimination System (NPDES) permit. <li data-bbox="718 532 1877 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 data-bbox="667 636 1877 701">• Clean up spills or leaks in a manner that complies with applicable Federal, State, and local laws and regulations. <li data-bbox="667 708 1877 915">• Dispose of spilled or leaked materials: <ul data-bbox="718 740 1877 915" style="list-style-type: none"> <li data-bbox="718 740 1877 805">○ Handle and dispose of spilled or leaked materials contaminated with 50 ppm or greater polychlorinated biphenyls. <li data-bbox="718 812 1877 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. <p data-bbox="617 938 961 964">Discharge water and wastes</p> <ul data-bbox="667 977 1877 1354" style="list-style-type: none"> <li data-bbox="667 977 1877 1107">• 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 data-bbox="667 1114 1877 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 data-bbox="667 1218 1877 1354">• 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).

Resource Topic	Best Management Practice
Water Resources (Water Quality, continued)	<p>Storage and staging</p> <ul style="list-style-type: none"> 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). Equipment will not be stored overnight in the instream channel. 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. Petroleum Product Storage Tanks Management. <ul style="list-style-type: none"> 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. Do not use underground storage tanks. 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. Areas for refueling operations: Lined with impermeable barrier at least 40 mils thick covered with 2 to 4 inches of soil. <p>Reclamation of temporary disturbance</p> <ul style="list-style-type: none"> All temporary access will be removed (including gravel surfaces) and planted after Project completion (NMFS 2017a). 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).

Resource Topic	Best Management Practice
Water Resources (Water Rights)	<ul style="list-style-type: none"> • A total of 40 cfs shall be continuously provided to the LNFH during Phase I construction. • 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.
Biological Resources (Vegetation)	<ul style="list-style-type: none"> • Preserve natural landscape and preserve and protect existing vegetation not required or otherwise authorized to be removed. • Protect vegetation from damage or injury caused by construction operations, personnel, or equipment by the use of protective barriers or other approved methods. • Minimize, to the greatest extent practicable, clearings and cuts through vegetation. • 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. • Use safety ropes where tree climbing is necessary; do not use climbing spurs. • 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. • 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. • Restore contractor use areas to pre-construction condition. • Areas of temporary disturbance must be re-seeded according to a revegetation plan.

Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems)	<p data-bbox="617 250 793 276">Riparian areas</p> <ul data-bbox="667 289 1892 915" style="list-style-type: none"> <li data-bbox="667 289 1625 315">• The removal of riparian vegetation for access will be minimized (NMFS 2017a). <li data-bbox="667 321 1829 386">• All native, non-invasive organic material (large and small wood) cleared from the action area for access will remain on site (NMFS 2017a). <li data-bbox="667 393 1877 457">• 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 data-bbox="667 464 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 data-bbox="667 743 1864 808">• 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 data-bbox="667 815 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).

Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems, continued)	<p data-bbox="617 269 978 293">Fisheries and aquatic wildlife</p> <ul data-bbox="667 305 1890 1284" style="list-style-type: none"> <li data-bbox="667 305 1367 329">• Instream work is limited to July 1 through November 15. <li data-bbox="667 337 1890 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 data-bbox="667 586 1890 756">• 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 data-bbox="667 764 1797 821">• 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 data-bbox="667 829 1850 886">• 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 data-bbox="667 894 1829 951">• 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 data-bbox="667 959 1797 984">• Post-construction monitoring of the low-flow fishway would be done to ensure effectiveness. <li data-bbox="667 992 1890 1146">• 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 data-bbox="667 1154 1881 1211">• 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 data-bbox="667 1219 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).

Resource Topic	Best Management Practice
Biological Resources (Fisheries and Aquatic Ecosystems, continued)	<ul style="list-style-type: none"> • 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). • 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). • 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). • 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). • Do not use jackhammers in excess of 30 pounds without Reclamation approval. Blasting is not permitted. • 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. • Schedule annual intake maintenance to avoid the Bull Trout upstream migration period (USFWS 2011). • 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).

Resource Topic	Best Management Practice
Biological Resources (Terrestrial Wildlife)	<ul style="list-style-type: none"> • 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. • 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. • 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).
Cultural Resources	<ul style="list-style-type: none"> • 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. • A professional archaeological monitor will be present during ground-disturbing activities.
Land Use	<ul style="list-style-type: none"> • Restore contractor use areas to pre-construction condition.

Resource Topic	Best Management Practice
Transportation	<ul style="list-style-type: none"> • 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. • Use existing available public highways, roads, or bridges as haul routes subject to applicable local regulations. • Minimize interference with or congestion of local traffic. • Provide barricades, flaggers, and other necessary precautions for safety of the public where haul routes cross public highways or roads. • Maintain roadways, parking areas, and haul routes in a sound, smooth condition. • 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. • Meet 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). • 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. • Provide flaggers and guards as required to prevent accidents and damage or injury to passing traffic. • 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. • 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. • Provide unobstructed, smooth, and dustless passageway for one lane of traffic through construction operations. • Maintain convenient access to driveways and buildings along line of work. • Protect roads closed to traffic with effective barricades and warning signs. Illuminate barricades and obstructions from sunset to sunrise. • Remove traffic control devices when no longer needed.
Noise	<ul style="list-style-type: none"> • Do not use jackhammers in excess of 30 pounds without Reclamation approval. Blasting is not permitted.
Recreation	<ul style="list-style-type: none"> • There are no construction activities (such as parking, storage, or vehicle turnaround) allowed in the Forest Service Snow Lakes Trailhead parking lot.

Resource Topic	Best Management Practice
Visual Resources	<ul style="list-style-type: none"> Minimize, to the greatest extent practicable, clearings and cuts through vegetation. Irregularly shape authorized clearings and cuts to soften undesirable aesthetic impacts.
Socioeconomics and Environmental Justice	<ul style="list-style-type: none"> 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. In-water work would not occur in the spillway pool during the Tribal fishing preparations or season.
Utilities	<ul style="list-style-type: none"> A locate for underground utilities would be coordinated with the Washington Utility Notification Center (http://www.callbeforeyoudig.org/washington/index.asp) prior to construction.
Hazardous Materials and Public Health and Safety	<ul style="list-style-type: none"> Vehicle traffic on government rights-of-way, dirt roads, and paved roads through LNFH property would be limited to 10 miles per hour. Nuisance flows from seepage and leakage through the cofferdams will be managed to maintain a safe working environment. Hazardous Waste Disposal: <ul style="list-style-type: none"> Dispose by removal from jobsite. Recycle hazardous waste whenever possible. Dispose of hazardous waste materials that are not recycled at appropriately permitted treatment or disposal facilities. Transport hazardous waste in accordance with 49 CFR 171-179. Provide protection for personnel and existing facilities from harm due to demolition activities. Arrange protective installations to permit operation of existing equipment and facilities by the government while work is in progress. 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.

Resource Topic	Best Management Practice
Tribal Interests	<ul style="list-style-type: none">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.

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 NWP

- **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 NWPs.

- 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

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.

This page intentionally left blank.