# Kachess Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance

## DRAFT Environmental Impact Statement

KITTITAS AND YAKIMA COUNTIES, WASHINGTON

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia-Cascades Area Office
Yakima, Washington

State of Washington
Department of Ecology
Office of Columbia River
Yakima, Washington
Ecology Publication Number: 15-12-001

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# Mission Statements

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

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.

The mission of the Department of Ecology is to protect, preserve and enhance Washington's environment, and promote the wise management of our air, land and water for the benefit of current and future generations.

**Draft Environmental Impact Statement**
**Kachess Drought Relief Pumping Plant and**
**Keechelus Reservoir-to-Kachess Reservoir Conveyance**
**Kittitas County and Yakima County, Washington**


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**Cooperating Governments and Agencies:**

Confederated Tribes and Bands of the Yakama Nation
U.S. Department of Agriculture, U.S. Forest Service
U.S. Department of Energy, Bonneville Power Administration

This Draft Environmental Impact Statement (DEIS) for the Kachess Drought Relief Pumping Plant (KDRPP) and Keechelus Reservoir-to-Kachess Reservoir Conveyance (KKC) was prepared jointly by the Bureau of Reclamation and Washington State Department of Ecology. These projects are part of the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). This DEIS evaluates a No Action Alternative and five action alternatives: Alternative 2A – KDRPP East Shore Pumping Plant; Alternative 2B – KDRPP South Pumping Plant; Alternative 3A – KKC North Tunnel Alignment; Alternative 3B – KKC South Tunnel Alignment; and Alternative 4 – Combined KDRPP and KKC.

This DEIS was prepared in compliance with the National Environmental Policy Act (NEPA) 42 USC 4371 et seq. and the State of Washington Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the SEPA Rules (Chapter 197-11 WAC).

# SEPA FACT SHEET

## Brief Description of Proposal:

The Bureau of Reclamation and the Washington State Department of Ecology have jointly prepared this Draft Environmental Impact Statement (DEIS) on the Kachess Drought Relief Pumping Plant (KDRPP) and Keechelus Reservoir-to-Kachess Reservoir Conveyance (KKC). This document was prepared in compliance with the National Environmental Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA). Ecology is the SEPA lead agency for the proposal.

The action alternatives examine constructing and operating a pumping plant to access up to 200,000 acre-feet of water in Kachess Reservoir during drought years, constructing and operating a gravity flow tunnel from Keechelus Reservoir to Kachess Reservoir, and constructing several projects to enhance the resiliency of bull trout populations in the Kachess and Keechelus watersheds. These projects are part of the Yakima Basin Integrated Water Resources Management Plan (Integrated Plan).

## Proponents and Contacts:

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## Permits, Licenses, and Approvals Required for Proposal:

To implement any component of the action alternative, the lead agency would need to apply for any required permits and comply with various laws, regulations, and Executive Orders. The following are those that are likely to apply:

- National Environmental Policy Act
- Endangered Species Act
- Magnusson-Stevens Fishery Conservation and Management Act
- Fish and Wildlife Coordination Act
- Secretary's Native American Trust Responsibilities
- National Historic Preservation Act
- Native American Graves Protection and Repatriation Act
- Executive Order 11988: Floodplain Management
- Executive Order 11990: Protection of Wetlands
- Executive Order 12898: Environmental Justice
- Executive Order 13007: Indian Sacred Sites
- Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
- Clean Water Act
- State Environmental Policy Act
- Dam Safety Permit
- Hydraulic Project Approval
- Governor's Executive Order 05-05

Additionally, Reclamation and Ecology would coordinate with Kittitas County and Yakima County on the applicability of local regulations, including critical areas regulations and the Shoreline Management Program.

**Authors and Contributors:**

A list of authors and contributors is provided in a section that follows Chapter 5.

**Date of Issue:**

January 9, 2015

**Public Comment Period:**

The DEIS will be available for a 60-day public comment period. Comments must be received or postmarked by 5 p.m. PST on March 10, 2015, and may be submitted orally, in writing via regular mail, by facsimile, or by email to:

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Yakima, Washington 98901-2058
Phone: 509-575-5848, ext. 603

Fax: 509-454-5650
Email: kkbt@usbr.gov

**Public Meetings:**

Reclamation and Ecology will conduct two public meetings to receive comments on the DEIS. The meetings will be held from 4-7 p.m. on the following dates and times and at the following locations:

1. Tuesday, February 3, 2015, Hal Holmes Community Center, 209 N. Ruby Street, Ellensburg, Washington 98926;

2. Thursday, February 5, 2015, U.S. Forest Service, Cle Elum Ranger District, Tom Craven Conference Room, 803 W 2nd Street, Cle Elum, Washington 98922

**Timing of Additional Environmental Review:**
Reclamation and Ecology anticipate releasing the Final EIS on the Kachess Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance in June 2015.

**Document Availability:**

The DEIS can be viewed online at:
http://www.usbr.gov/pn/programs/eis/kdrpp/index.html
and http://www.usbr.gov/pn/programs/eis/kkc/index.html
The document may be obtained in hard copy or CD by written request to the SEPA Responsible Official listed above, or by calling 509-575-5848, ext. 603. To ask about the availability of this document in a format for the visually impaired, call the Office of Columbia River at 509-662-0516. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

**Location of Background Materials:**

Background materials used in the preparation of this DEIS are available online at:

Kachess Drought Relief Pumping Plant
http://www.usbr.gov/pn/programs/eis/kdrpp/index.html

Keechelus Reservoir-to-Kachess Reservoir Conveyance
http://www.usbr.gov/pn/programs/eis/kkc/index.html

Additional information about the Yakima River Basin Integrated Water Resource Management Plan is available at:

http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html.

RECLAMATION
Managing Water in the West

# Kachess Drought Relief Pumping Plant and Keechelus-to-Kachess Conveyance Projects

DEPARTMENT OF ECOLOGY
State of Washington

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# EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY

## Introduction

The U.S. Department of the Interior Bureau of Reclamation and the Washington State Department of Ecology have prepared this Draft Environmental Impact Statement (DEIS) to evaluate the potential environmental effects of implementing two similar and closely related projects in the Yakima River basin in central Washington State:

- Kachess Drought Relief Pumping Plant (KDRPP)
- Keechelus Reservoir-to-Kachess Reservoir Conveyance (KKC)

Reclamation and Ecology are proposing these two projects as well as enhancements to improve the abundance and resiliency of bull trout populations in the basin as part of implementation of the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) (Reclamation and Ecology, 2011h). The Integrated Plan is a comprehensive program of solutions developed to restore ecological functions in the Yakima River system and to provide more reliable and sustainable water resources for the health of the riverine environment and for agricultural, municipal, and domestic needs.

As joint lead agencies, Reclamation and Ecology have prepared this DEIS to meet requirements of both the National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA). The Yakama Nation, U.S. Fish and Wildlife Service (Service), U.S. Forest Service (USFS), and Bonneville Power Administrative (BPA) are cooperating agencies in preparation of the DEIS in accordance with 40 CFR Section 1508.5. Under NEPA, a cooperating agency is any Federal agency, other than the lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in an action requiring an environmental impact statement. In addition, a State or local agency of similar qualifications or an Indian Tribe may by agreement with the lead agency become a cooperating agency.

## Background of the Proposed Action

Reclamation's mission is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. Ecology's mission is to protect, preserve and enhance the State of Washington's environment for current and future generations. Consistent with its mission, Ecology is has been directed by the State legislature to implement actions that provide concurrent benefits for instream and out-of stream uses for the Yakima River basin.

In June 2009, Ecology and Reclamation brought representatives from the Yakama Nation, irrigation districts, environmental organizations, and Federal, State, county, and city

governments together to form the Yakima River Basin Water Enhancement Project (YRBWEP) Workgroup to help develop a consensus-based solution to the basin's water problems. Over the next 18 months, the group developed the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) (Reclamation and Ecology, 2011h)[1].

The Plan includes the following seven elements:

- Reservoir Fish Passage
- Structural and Operational Changes
- Surface Water Storage
- Groundwater Storage
- Habitat/Watershed Protection and Enhancement
- Enhanced Water Conservation
- Market Reallocation

Reclamation and Ecology prepared the program-level *Yakima River Basin Integrated Water Resource Management Plan Programmatic EIS* (Integrated Plan PEIS) to determine the effects of implementing the Integrated Plan (Reclamation and Ecology, 2012)[2]. The Integrated Plan PEIS supports the conclusion that the current water resources infrastructure, programs, and policies in the Yakima River basin are not capable of consistently meeting the demands for fish and wildlife, irrigation, and municipal water supply (Reclamation and Ecology, 2012).

The Selected Alternative identified in Reclamation's Integrated Plan PEIS Record of Decision (Integrated Plan ROD) includes seven elements, each containing distinct actions, that collectively provide a comprehensive approach to water management in the Yakima River basin and meet the need to restore ecological functions and provide more reliable and sustainable water resources for the health of the riverine environment and for agricultural, municipal, and domestic needs (Reclamation, 2013). The KDRPP and KKC, along with enhancements for bull trout populations in the basin, are identified in the Integrated Plan ROD as necessary components of the Integrated Plan that contribute to achieving the Plan's overall goals.

[1] The following websites contain information about implementation of the Integrated Plan:

- http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html
- http://www.ecy.wa.gov/programs/wr/cwp/YBIP.html.

[2] Available online at http://www.usbr.gov/pn/programs/yrbwep/reports/FPEIS/fpeis.pdf

## Proposed Action

Reclamation's Proposed Action is to construct, operate, and maintain one or both of two closely related water resource projects in the upper Yakima River basin pending congressional authorization. Reclamation and Ecology are considering how these two parts of the Proposed Action, alone or in combination, contribute to restoring ecological functions and providing more reliable and sustainable water resources for the health of the riverine environment and for agricultural, municipal, and domestic needs. The two projects are so closely related in overlapping geography, concurrent timing, interrelated operations, cumulative impacts, and interdependence through the Integrated Plan ROD to be considered interconnected parts of a single course of action that should be evaluated in a single EIS (40 CFR 1502.4 and 40 CFR 1508.25). These relationships are detailed in Section 1.5 and Chapter 2 of this DEIS. The two projects being considered under the Proposed Action are described briefly below as:

- Kachess Reservoir Drought Relief Pumping Plant (KDRPP). Deliver up to an additional 200,000 acre-feet of water from Kachess Reservoir during drought years by installing a new deeper outlet works and pumping system to access existing stored water that cannot currently be accessed. Implement an integrated package of aquatic habitat enhancements and assessments focused on improving the abundance and resiliency of bull trout populations in the Yakima River basin.
- Keechelus Reservoir-to-Kachess Reservoir Conveyance (KKC). Augment flows into Kachess Reservoir and reduce flows in the Yakima River downstream from Keechelus Reservoir to Lake Easton[3] by transferring water from Keechelus Reservoir to Kachess Reservoir via a new tunnel. Implement an integrated package of aquatic habitat enhancements and assessments focused on improving the abundance and resiliency of bull trout populations in the Yakima River basin.

## Purpose and Need for the Action

The purpose of the Proposed Action is to fulfill elements of the Integrated Plan ROD signed by Reclamation on July 9, 2013 to help restore ecological functions and provide more reliable and sustainable water resources for the health of the riverine environment and for agricultural, municipal, and domestic needs. The two projects being considered under the Proposed Action respond to specific conditions in the Yakima River basin that adversely affect and are affected by Reclamation's facilities and operations. Those conditions are identified here as the need associated with each of the two projects.

[3] Lake Easton is a reservoir on the Yakima River created by the Easton Diversion Dam, which supplies the Kittitas Reclamation District. The Yakima River flows into Lake Easton from the southwest and the Kachess River from the northwest.

Needs related to KDRPP:

- Demand for irrigation water by existing users in the Yakima River basin exceeds supply in drought years, which can lead to substantial prorationing of water deliveries and economic losses to farmers[4].
- The productivity and function of aquatic habitat conditions for bull trout in tributaries above Keechelus and Kachess reservoirs, as well as throughout the Yakima River basin, is not of consistent quality, and in areas is substantially degraded. In addition, passage within these tributaries is in some cases impaired or blocked.

Needs related to KKC:

- Runoff from the Keechelus watershed in a typical year is greater than can be contained in the reservoir for release when most needed for instream, agricultural, municipal, and domestic uses.
- Current operations at Keechelus Dam result in high flows in the upper Yakima River during the irrigation season that impair rearing habitat for steelhead and spring Chinook upstream of Lake Easton.
- The productivity and function of aquatic habitat conditions for bull trout in tributaries above Keechelus and Kachess reservoirs, as well as throughout the Yakima River basin, is not of consistent quality, and in areas is substantially degraded. In addition, passage within these tributaries is in some cases impaired or blocked.

The objectives of each of the two projects are identified below followed by a discussion of the conditions that give rise to the identified needs and objectives.

The objectives of KDRPP are to:

- Access stored water in Kachess Reservoir that is currently unavailable in order to improve water supply during periods of drought, with a goal of approaching not less than 70 percent of proratable water rights whenever feasible[5].
- Implement the Bull Trout Enhancement (BTE) package of aquatic habitat enhancements, and accomplish assessments of current conditions and limiting factors for bull trout populations in the Yakima River basin to improve the effectiveness of future enhancement actions.

[4] Concerns regarding economic loss are discussed in the Integrated Plan FEIS in Section 1.3, Purpose and Need for the Action, on pages 1-5 and 1-6.

[5] The basis for this threshold for prorationing is discussed in the Integrated Plan FEIS in Section 1.3, Purpose and Need for the Action, on pages 1-5 and 1-6.

A substantial portion of the water stored in Kachess Reservoir is below the existing reservoir outlet. Thus, this stored water is not accessible under existing conditions due to the physical configuration of the dam. If made accessible, this water could be utilized to increase water supply during periods of drought and provide greater flexibility to deliver water to meet Reclamation's contractual obligations.

Regarding bull trout, the Service listed the Columbia River Basin Distinct Population Segment (DPS) of bull trout as threatened under the Endangered Species Act (ESA) in June 1998. The Service identified 12 subpopulations of bull trout in the Yakima River basin and designated critical habitat in a number of reaches of the Yakima River and tributaries (Reclamation and Ecology, 2014b). As an outcome of the Integrated Plan, consensus has emerged among the Yakama Nation and resource agencies with jurisdictions around an integrated package of aquatic habitat enhancements and assessments focused on improving the abundance and resiliency of bull trout populations in the Yakima River basin. The package of enhancements and assessments is referred to as Bull Trout Enhancement (BTE). The existing conditions in the basin that contributed to the listing of bull trout and the uncertainties of climate change have created an imperative for implementing affirmative steps as identified in the BTE. These conditions related to bull trout and the BTE are the same for KDRPP and KKC.

The objectives of KKC are to:

- Capture excess runoff from the Keechelus watershed
- Improve capabilities for refilling Kachess Reservoir during and following dry and drought years
- Reduce high flows from Keechelus Dam in the upper Yakima River during irrigation season to improve rearing habitat for steelhead and spring Chinook upstream of Lake Easton
- Implement the BTE package of aquatic habitat enhancements, and accomplish assessments of current conditions and limiting factors for bull trout populations in the Yakima River basin to improve the effectiveness of future enhancement actions.

The storage capacity of Kachess Reservoir is greater than the runoff in the Kachess watershed. Because of this, Kachess Reservoir does not refill in some years, especially after droughts, creating a need for additional inflow to the reservoir. On the other hand, total available runoff in the Keechelus watershed is greater than the storage capacity of Keechelus Reservoir. Consequently, this water is released down-river during the spring runoff period and is not utilized for total water supply available (TWSA) or targeted for fish benefits.

TWSA is defined as:

> *That amount of water available in any year from natural flow of the Yakima River, and its tributaries, from storage in the various Government reservoirs on the Yakima River watershed and from other sources, to supply the contract obligations of the United States to the Yakima River and its tributaries* (Civil Action No. 21 (1945 Consent Decree) Article 4, 1st Para.).

During the irrigation season, releases of stored water from Keechelus Reservoir create undesirably high flows in the Keechelus reach of the Yakima River that affect rearing habitat for steelhead and spring Chinook. As part of Reclamation's operation of the Yakima Project, these releases are necessary to meet contractual obligations to various water users. An alternative means to convey water stored in Keechelus Reservoir to points of diversion farther down the system would enable Reclamation to reduce high flows in the Yakima River and improve fish habitat while meeting contractual obligations.

Reclamation's Federal actions would be to construct, operate, and maintain one of the alternatives evaluated in this EIS. These Federal actions that require review under NEPA, and are the focus of this EIS. Reclamation's decisions that will rely upon the analysis presented in this EIS and supporting documents are:

- Determination that the feasibility of alternatives to provide additional water for irrigation needs and improve habitat below Keechelus Dam and evaluation of those alternatives under NEPA is complete.
- Determination that Reclamation will or will not pursue a recommendation for congressional action to authorize or fund the implementation of an alternative or combination of alternatives.
- If Reclamation decides to pursue a recommendation for congressional action for authorization or funding, which alternative or combination of alternatives will be recommended.

Ecology's State actions will be to participate financially, issue permits as required, and issue water rights as necessary for one of the alternatives evaluated in this EIS. These State actions require review under SEPA in this EIS.

# Alternatives

## Alternative 1 – No Action

The No Action Alternative represents the most likely future in the absence of implementing any of the proposals that are part of the Proposed Action. The No Action Alternative forms the baseline for comparison of potential impacts of the Proposed Action and its alternatives. Under *Alternative 1 – No Action*, Reclamation and Ecology would not implement the Proposed Action. Reclamation would continue to manage water supply provided by Kachess and Keechelus reservoirs consistent with current operational practices and constraints. The current operations served as the basis for analyzing impacts of the Proposed Action.

For the purpose of this DEIS, Reclamation and Ecology consider the *Alternative 1 – No Action* to include the following:

- Planned and designed projects
- Authorized projects that have identified funding for implementation
- Projects scheduled for implementation

The following projects meet the criteria for No Action.

***YRBWEP Phase II***

The Yakima River Basin Water Enhancement Project Act of 1994, commonly referred to as YRBWEP Phase II, provides for a water conservation program with joint Federal and State funding coupled with local matches. The program provides economic incentives to implement structural and nonstructural water conservation measures. As required by YRBWEP Phase II, a Conservation Advisory Group and Reclamation completed a *Basin Conservation Plan* in 1998, and implementation of conservation measures identified in the plan is ongoing (Yakima River Basin Conservation Advisory Group, 1998). *Alternative 1 – No Action* includes those conservation measures currently being implemented. The *Basin Conservation Plan* also includes limited provisions to acquire land and water rights on a permanent and temporary basis to improve instream flows.

On-going YRBWEP Phase II projects that fit the criteria in Section 2.3.2 are:

- Roza Irrigation District Reregulation Reservoir which will conserve 8,584 acre-feet annually when construction is completed and it is operational in 2016.
- Sunnyside Division Board of Control Phase IIB Enclosed Lateral Improvement Projects which will conserve 6,461 acre-feet annually when construction is completed and it is operational in 2032.

***WSDOT I-90 Snoqualmie Pass East Phase 2A***

Another project that meets the no action criteria is the Washington State Department of Transportation's (WSDOT) I-90 - Snoqualmie Pass East Phase 2A - Keechelus Dam Vicinity

to the Stampede Pass Interchange project. As part of this project, WSDOT and the Federal Highway Administration (FHWA) will replace a 2.1-mile section (milepost 59.9 to 62.0) of existing interstate highway with a new six-lane highway, add a new chain-up area, stabilize rock slopes, remove and reclaim the Price Noble Creek Rest Area and sno park, and construct a wildlife over-crossing near Price Noble Creek. Construction is scheduled to begin in spring 2015 with completion planned for fall 2019. WSDOT evaluated the impacts of this project in the *I-90 - Snoqualmie Pass East Final EIS and Section 4(f) Evaluation* (WSDOT, 2008).

## Alternative 2A – KDRPP East Shore Pumping Plant

### *KDRPP East Shore Pumping Plant Facilities*

KDRPP consists of a series of facilities to pump water from Kachess Reservoir and convey it to the Kachess River, which discharges to the Yakima River at Lake Easton. KDRPP would allow the reservoir to be drawn down to about elevation 2,110, approximately 80 feet lower than the current outlet and 152 feet below full pool by using a pumping plant. This would allow access to up to an additional 200,000 acre-feet of water that is currently stored in the reservoir below the elevation of the existing outlet (elevation 2,192.75).

The pumping plant would be used to deliver up to 200,000 acre-feet of water during drought years to downstream Yakima Project irrigation districts, including Kittitas Reclamation District (KRD), Roza Irrigation District (RID), and the Wapato Irrigation Project (WIP)[6]. Reclamation and Ecology define a drought year as a year when water supply falls below 70 percent of proratable water rights. KDRPP would enable delivery of enough water to contribute to increasing prorationing up to 70 percent. As described in Section 1.3 of the Integrated Plan PEIS, 70 percent would provide a water supply sufficient to prevent severe economic losses to proratable water rights users (Reclamation and Ecology, 2012).

Reclamation would use the pumping plant during drought years and could possibly use it in following years as the reservoir is refilling to a level above the existing gravity outlet. This would result in the reservoir being drawn down to the gravity outlet level (elevation 2,110) by about August in drought years. KDRPP would deliver water stored in Kachess Reservoir throughout the remainder of the water year and until the reservoir refills above the gravity outlet level. At the proposed rate of 1,000 cfs, it would take about 101 days to pump the entire 200,000 acre-feet of stored water that is below the elevation of the existing outlet. Section 4.3 includes information about expected reservoir levels under operation of KDRPP.

*Alternative 2A – KDRPP East Shore Pumping Plant* includes a mostly underground pumping plant located on the east shore of Kachess Reservoir (Figure ES-1). The pumping plant would receive water via a tunnel from an intake located on the floor of the reservoir.

[6] Kennewick Irrigation District is also considering participating in the KDRPP proposal.

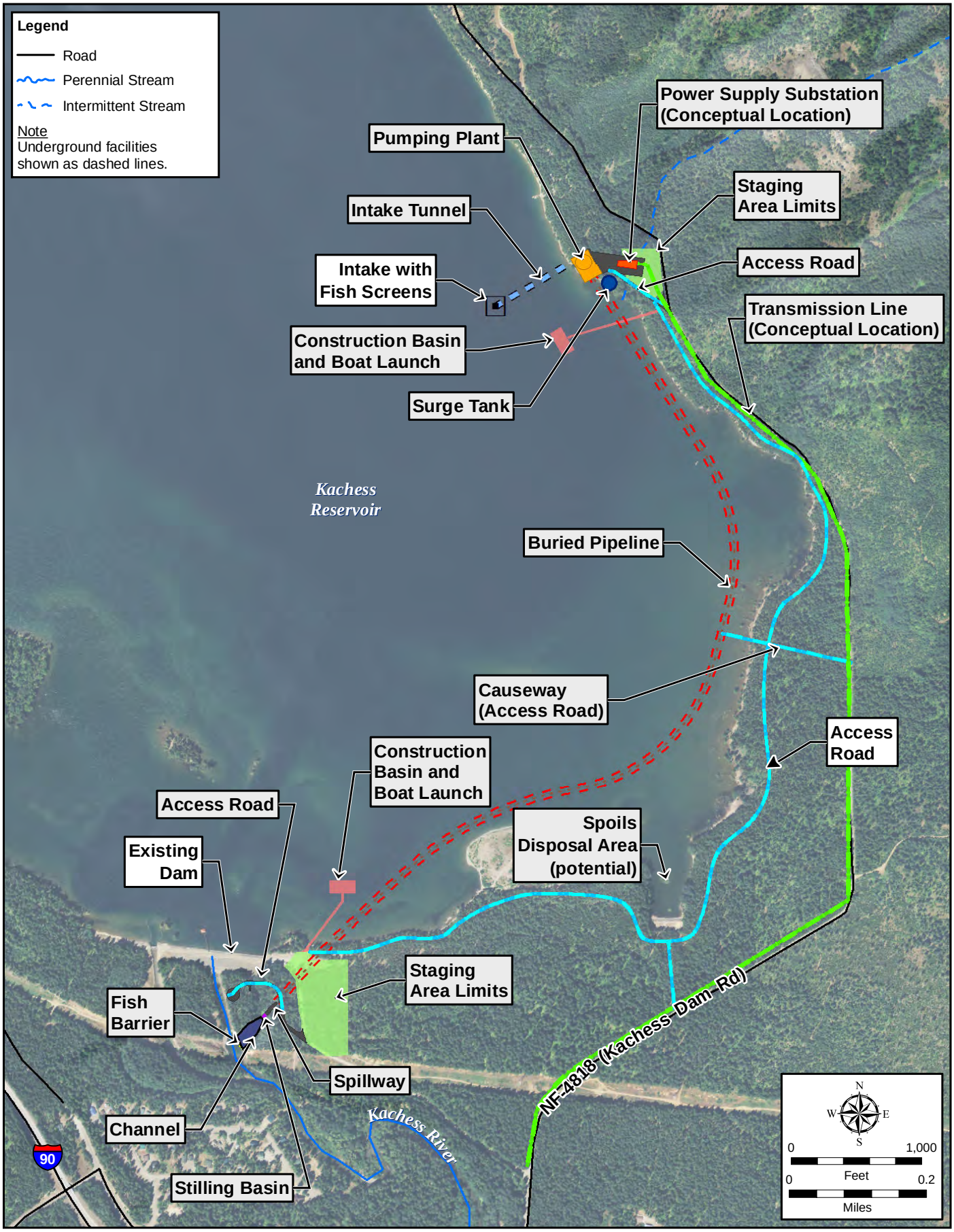


**Figure ES-1. Alternative 2A – KDRPP East Shore Pumping Plant Overview**

A pipeline located on the reservoir bed would convey water from the pumping plant to a spillway and discharge structure located just downstream from the existing Kachess Dam outlet channel, where it would be released to the Kachess River. The pumping plant would require power which would be supplied via a connection with an existing Puget Sound Energy substation in Easton.

***Bull Trout Enhancement***

Reclamation and Ecology are developing a Memorandum of Understanding (MOU) with the Service, National Marine Fisheries Service (NMFS), USFS, Washington Department of Fish and Wildlife (WDFW), and the Yakama Nation to implement bull trout enhancement (BTE) to enhance the resiliency of bull trout populations in the Yakima River basin. The BTE is included as a component of all the action alternatives evaluated in this DEIS. The BTE includes actions to enhance bull trout habitat as well as assessments of future efforts to enhance bull trout populations. This DEIS evaluates proposed stream channel and floodplain restoration at Gold Creek and stream passage improvement at Cold Creek. Both creeks are tributaries of Keechelus Reservoir.

The BTE includes habitat restoration and enhancement actions at Gold Creek and Cold Creek, studies of improved bull trout passage for Kachess Reservoir tributaries (Kachess River and Box Canyon Creek), studies of fish passage improvements on the South Fork Tieton River, and assessments of bull trout population enhancements and nutrient enhancement in Kachess and Keechelus reservoirs. This DEIS evaluates the impacts of the actions proposed at Gold and Cold creeks (Figure ES-2). If the studies and assessments of the other BTE actions recommend implementation of specific actions, Reclamation and Ecology would undertake additional NEPA and SEPA analysis and obtain regulatory approvals, including ESA consultation.

Habitat restoration and enhancement to address dewatering of Gold Creek include:

- Improving the stream channel
- Reconfiguring Gold Creek Pond and regarding berms surrounding the pond to reduce stream dewatering
- Filling Heli’s Pond and its outlet channel

Reclamation and Ecology would partner with the USFS to replace the bridge on USFS Road NF-4832 to restore the Gold Creek floodplain, a project for which the USFS has already prepared a NEPA Environmental Assessment (EA) and Finding of No Significant Impact (USFS, 2011a and 2011d). The new Gold Creek USFS Bridge would span the floodplain of Gold Creek (approximately 725 feet wide) and would provide the following benefits: improved hydrologic connectivity, lower stream velocities, improved channel migration, floodplain restoration, restored capacity for sediment transport, reduced sediment and temperature, and improved groundwater flow.

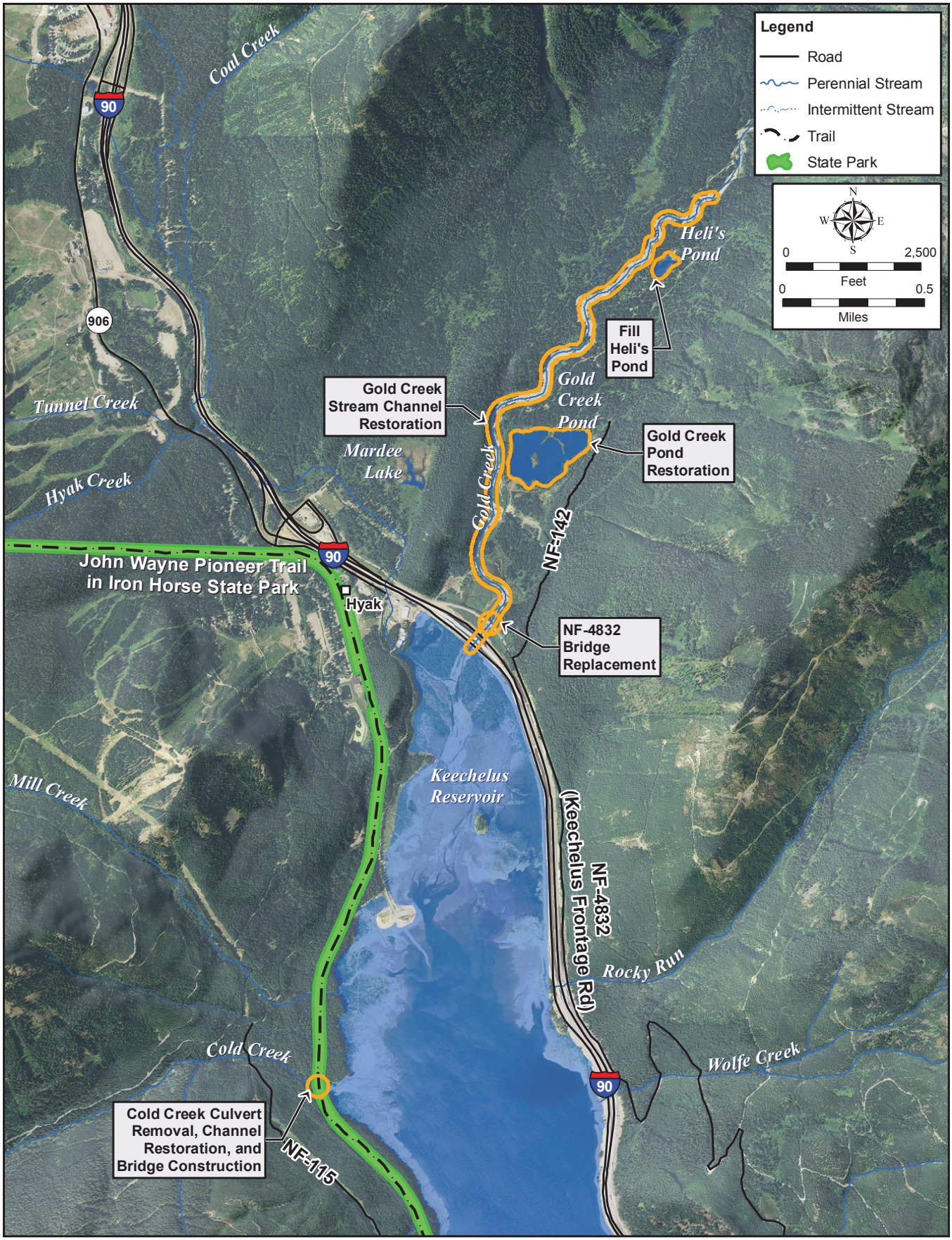


**Figure ES-2. Bull Trout Enhancement Area at Gold Creek and Cold Creek**

At Cold Creek, Reclamation and Ecology would remove the existing passage barrier at the mouth of the creek to allow bull trout access to the stream. The project would include excavating the John Way Pioneer Trail to remove the existing concrete culvert and building a new bridge to accommodate the trail. The project would include regrading the stream and habitat restoration.

#### *Mitigation*

Reclamation and Ecology would provide mitigation for impacts associated with *Alternative 2A – KDRPP East Shore Pumping Plant.* Specific mitigation measures are described in Chapter 4 at the end of each resource section. Reclamation and Ecology would also comply with the environmental commitments for the Proposed Action as described below.

### Alternative 2B – KDRPP South Pumping Plant

#### *KDRPP South Pumping Plant Facilities*

*Alternative 2B – KDRPP South Pumping Plant Alternative is* similar to *Alternative 2A* except that the intake and pumping plant would be located at the south end of the reservoir downstream from Kachess Dam and adjacent to the Kachess River (Figure ES-3). The proposed south pumping plant would be adjacent to the existing outlet works discharge pool, just downstream from the existing Kachess Dam outlet channel, where the water would be released to the Kachess River. Thus a pipeline between the pumping plant and outlet works would not be needed.

#### *Bull Trout Enhancement*

The BTE projects would be the same as described for *Alternative 2A – KDRPP East Shore Pumping Plant.*

#### *Mitigation*

Reclamation and Ecology would provide mitigation for impacts associated with *Alternative 2B – KDRPP South Pumping Plant.* Specific mitigation measures are described in Chapter 4 at the end of each resource section. Reclamation and Ecology would also comply with the environmental commitments for the Proposed Action as described below.

### Alternative 3A – KKC North Tunnel Alignment

#### *KKC North Tunnel Alignment Facilities*

KKC consists of an underground tunnel to convey water from Keechelus Reservoir to Kachess Reservoir. This would allow Reclamation to reduce flows in the upper Yakima River, thereby improving rearing habitat for steelhead and spring Chinook, and improving the ability to refill Kachess Reservoir following drought years. The proposed conveyance extends east from the Keechelus Dam outlet and discharges on the west shore of Kachess Reservoir.

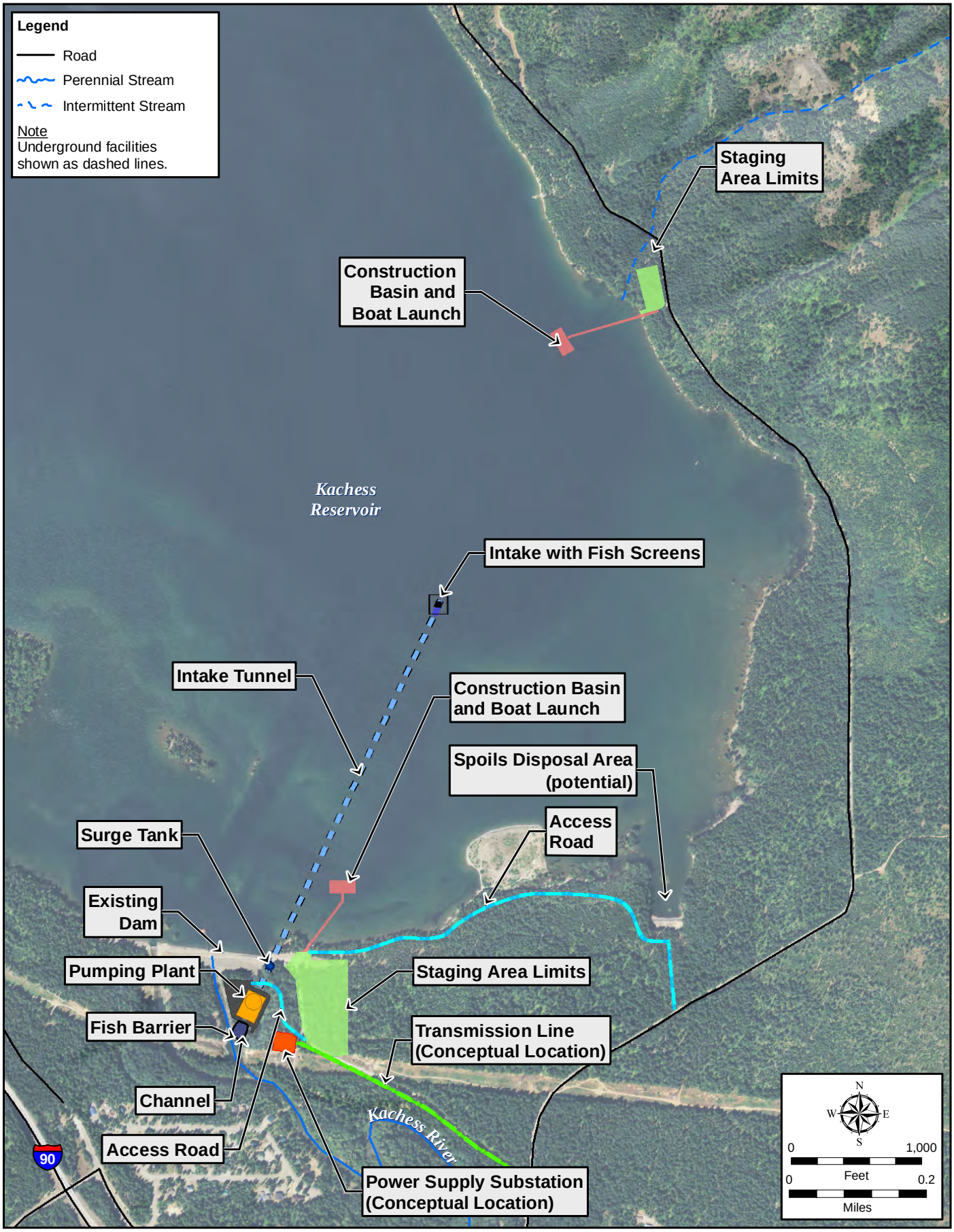


**Figure ES-3. Alternative 2B – KDRPP South Pumping Plant Overview**

Reclamation would operate KKC by diverting water by gravity flow from the Yakima River downstream of Keechelus Reservoir to the Kachess Reservoir. Reclamation would transfer flows in all years when Keechelus Reservoir is above its target pool elevation and Kachess Reservoir is below target pool elevation. Under existing conditions, flows released from Keechelus Reservoir are too high in summer months to provide habitat for anadromous fish. This proposal would reduce flows in July and August and provide a more gradual reduction in flows until September.

This DEIS evaluates two alternatives for KKC: *Alternative 3A – KKC North Tunnel Alignment* and *Alternative 3B – KKC South Tunnel Alignment*. The alternatives primarily differ in how the tunnel and portals are configured. Reclamation would operate KKC the same, regardless of the location of the facilities.

The *Alternative 3A – KKC North Tunnel Alignment* extends east from the Keechelus Dam area to an outlet on the west shore of Kachess Reservoir (Figure ES-4). The tunnel is a single segment tunnel that would be excavated upgradient from a portal at Kachess Reservoir. The tunnel design evaluated in this DEIS curves slightly to the south to avoid a rock formation that would require deep excavation to install the tunnel. Additional geotechnical information (expected spring 2015) would be considered in selecting the tunnel route. This DEIS assumes the curved tunnel alignment because it represents a worst-case scenario for environmental analysis. All of the facilities would be same regardless of whether the curved or straight tunnel alignment is selected.

#### *Bull Trout Enhancement*

The BTE projects would be the same as described for *Alternative 2A – KDRPP East Shore Pumping Plant.*

#### *Mitigation*

Reclamation and Ecology would provide mitigation for impacts associated with *Alternative 3A – KKC North Tunnel Alignment.* Specific mitigation measures are described in Chapter 4 at the end of each resource section. Reclamation and Ecology would also comply with the environmental commitments for the Proposed Action as described below.

### Alternative 3B – KKC South Tunnel Alignment

#### *KKC South Tunnel Alignment Facilities*

*Alternative 3B – KKC South Tunnel Alignment* is similar to *Alternative 3A – KKC North Tunnel Alignment.* All of the facilities located in the Keechelus Dam area would be the same as proposed for *Alternative 3A – KKC North Tunnel Alignment* (Sections 2.6.1.1 through 2.6.1.4). The tunnel would start at the Keechelus Reservoir portal, but would be located further south than for *Alternative 3A*, discharging into Kachess Reservoir at the Kachess Reservoir portal just to the south of the portal proposed for *Alternative 3A* (Figure ES-5). In order to reduce truck traffic on Kachess Lake Road and eliminate the need to relocate that road, the access portal for construction would be located near the I-90 Exit 62 Stampede Pass interchange. Construction from this portal would be done in two segments, one extending northwest to the Keechelus portal and one extending northeast to the Kachess Reservoir outlet. *Alternative 3B* also includes the BTE activities identified in *Alternative 2A*, Section 2.4.5.

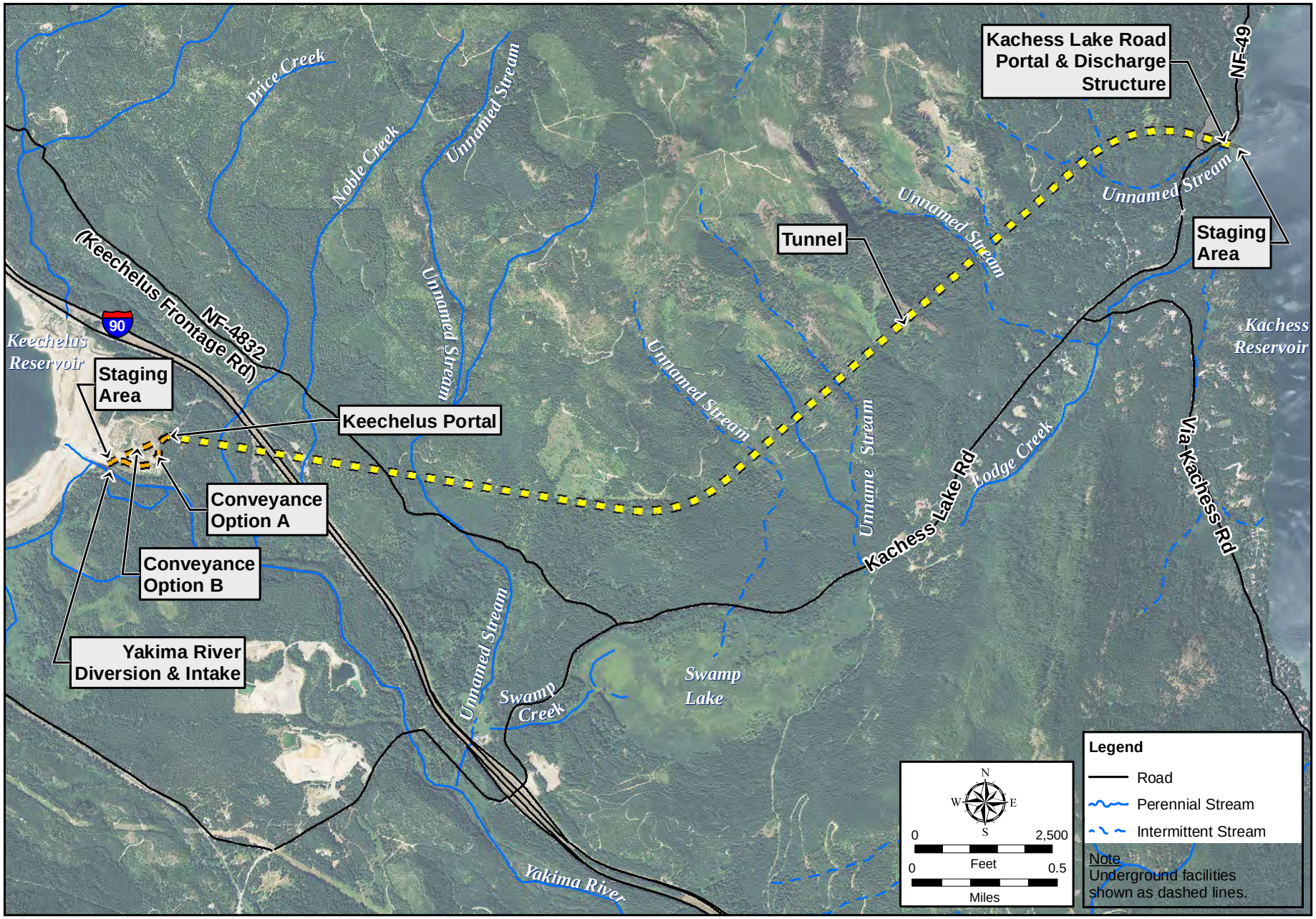


**Figure ES-4. Alternative 3A – KKC North Tunnel Alignment Overview**

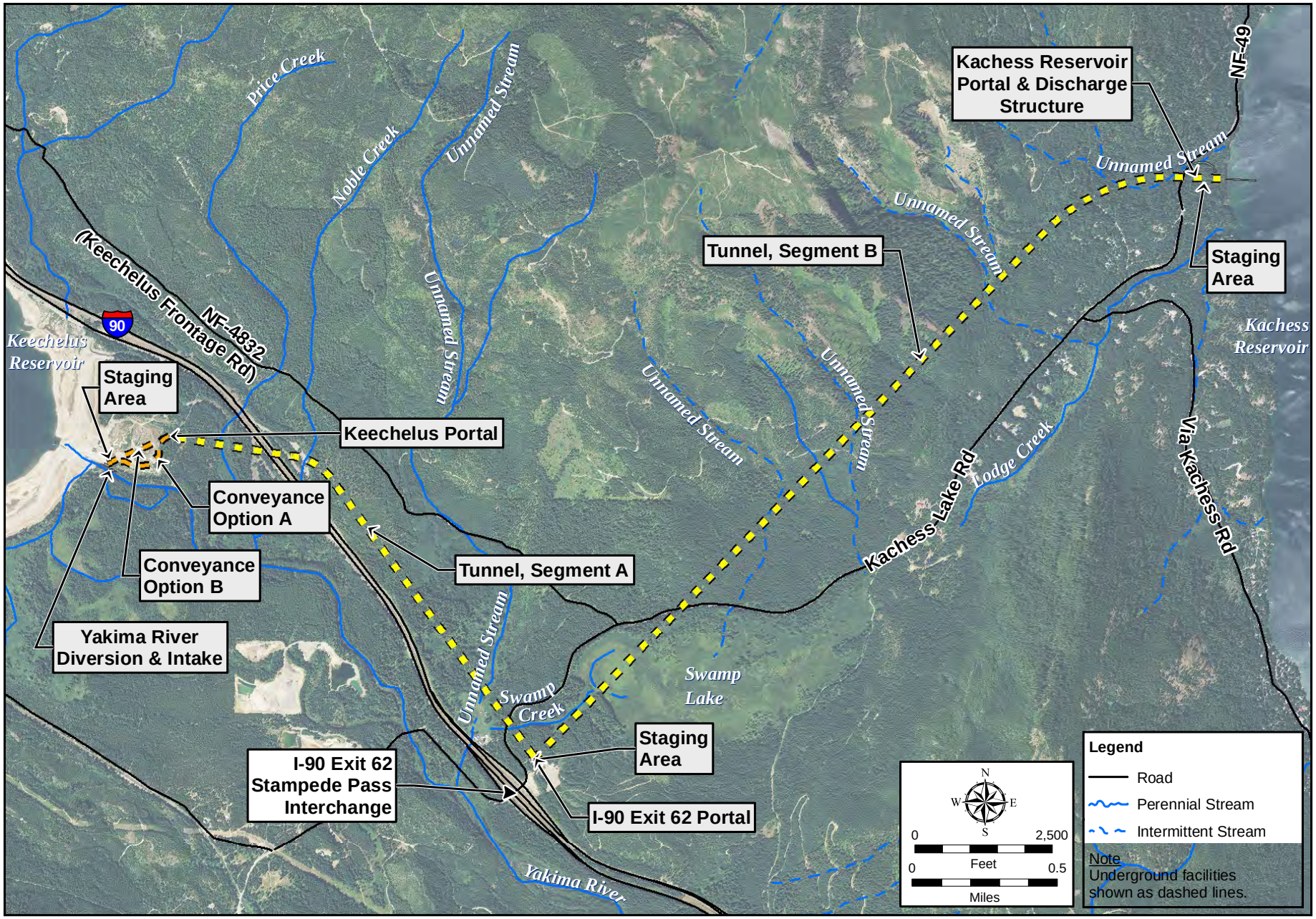


**Figure ES-5. Alternative 3B – KKC South Tunnel Alignment Overview**

***Bull Trout Enhancement***

The BTE projects would be the same as described for *Alternative 2A – KDRPP East Shore Pumping Plant.*

***Mitigation***

Reclamation and Ecology would provide mitigation for impacts associated with *Alternative 3B – KKC South Tunnel Alignment.* Specific mitigation measures are described in Chapter 4 at the end of each resource section. Reclamation and Ecology would also comply with the environmental commitments for the Proposed Action as described below.

## Alternative 4 – Combined KDRPP and KKC

***Combined KDRPP and KKC Facilities***

Under *Alternative 4 – Combined KDRPP and KKC*, Reclamation and Ecology would implement the KDRPP and KKC together to provide more flexible water management. In addition to allowing Reclamation to reduce artificially high flows in the Keechelus Reach, combined operation of KDRPP and KKC would speed up refill of Kachess Reservoir after it has been drawn down in drought years under KDRPP. The facilities and construction processes for each component would be the same as described for *Alternatives 2A* or *3B* and *Alternatives 3A* or *3B* and Reclamation and Ecology.

***Bull Trout Enhancement***

The BTE projects would be the same as described for *Alternative 2A – KDRPP East Shore Pumping Plant.*

***Mitigation***

Reclamation and Ecology would provide mitigation for impacts associated with *Alternative 4 –Combined KDRPP and KKC.* Specific mitigation measures are described in Chapter 4 at the end of each resource section. Reclamation and Ecology would also comply with the environmental commitments for the Proposed Action as described below.

## Summary of Environmental Consequences

Chapter 4 of the DEIS describes the environmental consequences of the alternatives, including the No Action Alternative as well as mitigation measures for potential impacts. Table ES-1 provides a summary of impacts and benefits associated with the No Action and four action alternatives.

All of the action alternatives include major construction impacts including increased dust, vehicle emissions, noise, and traffic on local roadways and I-90. Construction, including removal of vegetation, would temporarily disrupt fish and wildlife, including Endangered Species Act listed bull trout and northern spotted owl. Construction at Kachess Reservoir and Gold and Cold creeks would temporarily disrupt the usability and quality of recreation. Construction could also damage or alter identified National Register of Historic Places sites.

KDRPP (*Alternatives 2A* and *2B*) would increase water supply to proratable irrigation districts from 19 to 23 percent and bring the supply close to the 70 percent of entitlements goal. KDRPP would lower the level of Kachess Reservoir by up to 80 feet, which would impact fish access to reservoir tributaries and the upper Kachess basin. Lower reservoir levels would increase slope stability risks on the reservoir rim and could impact water quality by increasing water temperature and decreasing dissolved oxygen. Lower reservoir levels could also cause lower groundwater levels, negatively impacting water supply for residents. The reservoir drawdown would negatively impact visual quality and recreation by exposing a large area of reservoir bed and making the existing boat launches unusable. Stream restoration at Gold and Cold creeks would alter the character or recreation at Gold Creek Pond and the Cold Creek segment of the John Wayne Pioneer Trail.

KKC (*Alternatives 3A* and *3B*) would reduce artificially high flows in the Keechelus Reach of the Yakima River, improving habitat for anadromous fish. KKC would cause a minimal increase in water supply for proratable irrigation districts. Fluctuations in water levels in Kachess Reservoir would reduce connectivity between the reservoir and tributary habitats. Transferring water from Keechelus Reservoir to Kachess Reservoir could introduce contaminants such as PCBs to Kachess Reservoir.

Combined operation of KDRPP and KKC (*Alternative 4*) would have the same impacts as the individual projects, but would provide a greater benefit to proratable water supply than KDRPP alone and KKC would help refill Kachess Reservoir more rapidly following operation of KDRPP.

Under all action alternatives, the BTE would improve habitat for bull trout, other fish, and wildlife in the Gold and Cold creek areas. Improvements would increase streamflows, improve fish passage, and provide a surface water connection between the creeks and Keechelus Reservoir.

**Table ES-1. Summary Comparison of Impacts**

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Earth** | | | | | |
| Shoreline erosion, if any and seismic hazards would continue as under existing conditions. | Construction: Erosion during construction and seismic and slope stability risks not significant impacts.<br><br>Operation: Increased risk of slope stability on the reservoir rim. Long-term erosion not significant. | Same as *Alternative 2A*. | Construction: Erosion during construction and seismic and slope stability risks not significant impacts.<br><br>Operation: Long-term erosion not significant. | Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |
| **Surface Water Resources** | | | | | |
| There would be a continued inadequacy of water supply for proratable irrigators in drought years. Summer streamflows in the Keechelus Reach would remain artificially high. When Keechelus Reservoir level falls below elevation 2,466, tributary access for bull trout would be adversely impacted for approximately 115 days in 81 percent of years. This would be a significant impact to fish passage. The pool elevation would remain within the current operating range of the reservoir. | Construction: Construction would not affect water resources.<br><br>Operation: Water supply to proratable water users would be improved significantly by 19 to 23 percent in drought years, raising the proration to about 64 percent of entitlement. In multiple drought years, the improvement would be less.<br><br>Keechelus Reservoir would be operated to help Kachess Reservoir refill following a drought. This would result in a slightly lower mean Keechelus Reservoir pool level, with a maximum reservoir drawdown of 15 feet in late summer.<br><br>When Keechelus Reservoir level falls below elevation 2,466, bull trout access to tributaries is adversely impacted. This would at the same frequency as the No Action, but for a longer duration. However, the pool elevation would remain within the current operating range of the reservoir and would not significantly affect Keechelus Reservoir operations.<br><br>Kachess Reservoir would be drawn down by as much as 80 feet below existing low pool conditions and take 2 to 5 years following a drought to refill.<br><br>The drawdown of Kachess Reservoir would increase the occurrence and duration of reservoir pool levels below elevation 2,220. Below that elevation, fish cannot pass between the Kachess and Little Kachess basins, significantly impacting fish passage. Relative to *Alternative 1*, this would occur 5 percent more often and the duration would increase by 56 days during those years.<br><br>The drawdown of Kachess Reservoir would increase the duration of reservoir levels below elevation 2,226—the level at which access for bull trout to tributary streams is significantly impacted. Frequency would be the same as *Alternative 1*, but duration would increase by 44 days (from means of 109 to 153) during those years. | Same as *Alternative 2A*. | Construction: There would be no impacts from construction.<br><br>Operation: *Alternative 3A* would yield a minimal improvement in water supply to proratable users in drought years, but not enough to be significant.<br><br>During post-drought years, Keechelus Reservoir maximum pool elevations would be lower and minimum elevations higher.<br><br>Keechelus Reservoir levels would fall below 2,466 in 10 percent fewer years than *Alternative 1* and for 15 fewer days during those years. This would be a significant benefit to fish passage. The pool elevation would remain within the current operating range of the reservoir, and would not significantly affect Keechelus Reservoir operations.<br><br>Summer streamflows in the Keechelus Reach would be reduced by 400 cfs, greatly improving fish habitat conditions.<br><br>Streamflow changes in other Yakima River reaches would not have significant effects because flow would remain within current operating ranges.<br><br>Streamflow in the Kachess River would change, but would fall within current operating ranges; thus no significant effect would result.<br><br>The BTE would improve streamflow in Gold and Cold creeks during late summer and fall, when Keechelus Reservoir water levels are at their lowest. The BTE would provide a surface water connection from the streams to the reservoir pools, providing better seasonal passage conditions for bull trout and significantly benefiting fish passage. | Same as *Alternative 3A*. | Construction: Construction would not affect water resources.<br><br>Operation: Proratable water supply would be increase to about 66 percent of entitlement during single drought years. In multiple drought years, the improvement would be less.<br><br>Keechelus Reservoir would be operated to help Kachess Reservoir refill following a drought. This would result in a slightly lower mean Keechelus Reservoir pool level, with a maximum reservoir drawdown of 15 feet in late summer.<br><br>Keechelus Reservoir level would fall below elevation 2,466 approximately 130 days in 74 percent of years, significantly adversely impacting tributary access for bull trout.<br><br>The pool elevation would remain within the current operating range of the reservoir and would not significantly affect Keechelus Reservoir operations.<br><br>Kachess Reservoir would be drawn down by as much as 80 feet below existing low pool conditions. It would take 2 to 5 years following a drought for Kachess Reservoir to refill to normal operating levels.<br><br>The drawdown of Kachess Reservoir would increase the occurrence and duration of reservoir pool levels below elevation 2,220. Below that elevation, fish cannot pass between the Kachess and Little Kachess basins, significantly impacting fish passage. Relative to *Alternative 1*, this would occur 5 percent more often and the duration would increase by 56 days during those years.<br><br>The drawdown of Kachess Reservoir would increase the duration of reservoir levels below elevation 2,226—the level at which access for bull trout to tributary streams is significantly impacted. Frequency would be the same as *Alternative 1*, but duration would increase by 44 days during those years. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| | Streamflow changes in Yakima River reaches would not have significant effects because flow would remain within current operating ranges.<br><br>Streamflow in the Kachess River would change, but would be within current ranges; thus would not be significant.<br><br>The BTE would improve streamflow in Gold and Cold creeks during late summer and fall, when Keechelus Reservoir water levels are at their lowest. The BTE would provide a surface water connection from the streams to the reservoir pools, providing better seasonal passage conditions for bull trout and significantly benefiting fish passage. | | | | Summer streamflows in the Keechelus Reach would be reduced by 400 cfs, significantly improving habitat conditions for fish.<br><br>Streamflow changes in other Yakima River reaches and the Kachess River would be within current operating ranges. |
| **Surface Water Quality** | | | | | |
| No changes would occur to current reservoir operations, reservoir levels, or streamflows that would affect water quality.<br><br>If a severe long-term drought occurs, or conditions worsen because of climate change, water levels in reservoirs could significantly drop and, with warmer air temperatures, affect long-term water quality conditions for such parameters as DO and water temperature. | Construction: During construction, oil, grease, total petroleum hydrocarbons, suspended sediment, nutrients, and construction wastewater could enter receiving water. With BMPs the potential for contamination would be minimized.<br><br>Operation: Lower reservoir pool levels during drought and post-drought recovery periods could cause turbidity, temperature, and DO in the Kachess Reservoir to be out of compliance with State surface water quality standards. No long-term significant impacts would be expected because suspended material would be localized and settle out as the reservoir bed stabilizes.<br><br>After a drought and its recovery, the potential for water heating and depressed DO concentrations would diminish.<br><br>If a severe long-term drought occurs or conditions worsen because of climate change, water levels in the reservoir could drop significantly, affecting DO and water temperatures resulting in potentially significant impacts.<br><br>Exceedance of the State standard for temperature and turbidity may occur at the outlet to Kachess River during extended drought and drought recovery.<br><br>No long-term water quality impacts are expected from the BTE. Stream restoration may help to lower peak water temperatures and improve DO conditions by improving the depth and flow conditions in Gold Creek. | Same as *Alternative 2A*. | Construction: Same as *Alternative 2A*.<br><br>Operation: Operations would not cause an increase in sedimentation, turbidity, temperature, nutrients, fecal coliform bacteria, or TDG, or a decrease in DO.<br><br>If a severe long-term drought occurs or conditions worsen because of climate change, water levels in the reservoirs could drop, affecting long-term water quality conditions in Kachess Reservoir for DO and temperature.<br><br>Water quality in Kachess Reservoir could be modified by the introduction of contaminants from Keechelus Reservoir inflow.<br><br>No long-term water quality impacts are expected from operation of the BTE following construction. Stream restoration may help to lower peak water temperatures and improve DO conditions by improving the depth and flow conditions in Gold Creek. | Same as *Alternative 3A*. | Construction: Same as *Alternatives 2A* and *3A*.<br><br>Operation: During nondrought conditions, water quality impacts would be similar to those described for *Alternative 3A*. During drought and drought recovery years, water quality impacts on Kachess Reservoir and Kachess River due to lower Kachess Reservoir pool levels would be similar to those described for *Alternative 2A*.<br><br>Water quality impacts on the Keechelus Reach of the Yakima River would be similar to those described for *Alternative 3A*. During drought recovery, Keechelus Reservoir pool elevations may be lower than existing conditions, potentially resulting in more surface heating during the summer months as the reservoir pool level recovers.<br><br>No long-term water quality impacts are expected from operation of the BTE following construction. Stream restoration may help to lower peak water temperatures and improve DO conditions by improving the depth and flow conditions in Gold Creek. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Groundwater** | | | | | |
| Impacts to groundwater would be the same as under existing conditions. | Construction: Groundwater levels and wells would not be impacted. Inadvertent spills may affect groundwater quality but would be minimized by utilizing BMPs.<br>Operation: Operation may result in decreased groundwater levels in aquifers adjacent to the reservoirs, potentially decreasing the water supply to wetlands, springs, streams, or wells. | Same as *Alternative 2A*. | Construction: There may be temporary impacts to groundwater levels or wells from dewatering. Inadvertent spills may affect groundwater quality but would be minimized by utilizing BMPs.<br>Operation: Operation would not impact groundwater contributions to streams, springs, wetlands or wells. | Same as *Alternative 3A*. | Same as *Alternative 2A* and *3A*. |
| **Fish** | | | | | |
| Existing passage problems in the reservoirs would continue.<br>Artificially high streamflows in the Keechelus Reach would continue to provide unsuitable habitat for anadromous fish.<br>Climate change may influence prey availability, decrease habitat complexity and connectivity, increase river and reservoir temperatures, and may lead to less operational flexibility to meet instream flow requirements. | Construction: Construction would reduce shoreline vegetation adjacent to Kachess Reservoir. Temporary increases in turbidity would occur during construction. During construction, increased noise levels may disturb fish. Blasting may be required, thus noise levels could be significant.<br>Operation:<br>*Water temperature* – Reduction in Kachess Reservoir minimum pool elevation may increase water temperatures in Kachess Reservoir.<br>*Turbidity* - Reduction in Kachess Reservoir minimum pool elevation would expose the lower reservoir bed to wave action and increase turbidity.<br>*Food based prey* - Available prey would be reduced in both reservoirs.<br>*Habitat complexity* - Reduction in Kachess Reservoir minimum elevation and lower Keechelus Reservoir levels after drought years would reduce shoreline vegetation and habitat complexity. Lower reservoir levels after drought years would reduce shoreline vegetation and habitat complexity within Keechelus Reservoir.<br>*Habitat connectivity* - Reduction in Kachess Reservoir minimum pool elevation would reduce connectivity between reservoir habitats as well as between reservoir and tributary habitats. Lower Keechelus Reservoir levels after drought years would reduce connectivity between reservoir and tributary habitats. The BTE would increase habitat connectivity between reservoir and tributary habitat in Keechelus Reservoir.<br>*Entrainment* - Increased risk of entraining resident fishes with small larval stages in the new intake in Kachess Reservoir. | Construction: Same as *Alternative 2A*, but noise disturbance would be less than *Alternative 2A*.<br>Operation:<br>Impacts to temperature, food based prey, habitat connectivity, and entrainment would be the same as *Alternative 2A*.<br>*Habitat complexity* – Impacts the same as *Alternative 2A*, but the footprint of *Alternative 2B* is smaller. | Construction: During construction increased noise levels and turbidity may disturb fish.<br>Operation:<br>*Food based prey* - Available prey would be reduced in Kachess Reservoir, but would increase within Keechelus Reservoir.<br>*Habitat complexity* - Greater fluctuations in Kachess Reservoir level would reduce shoreline vegetation and habitat complexity.<br>Smaller fluctuations in Keechelus Reservoir level would increase shoreline vegetation and habitat complexity.<br>*Habitat connectivity* - Lower reservoir levels would reduce connectivity between reservoir and tributary habitats in Kachess Reservoir.<br>Reduced frequency and duration of passage impediments would increase connectivity between reservoir and tributary habitats in Keechelus Reservoir.<br>The BTE would increase habitat connectivity between reservoir and tributary habitat in Keechelus Reservoir.<br>*River flow* - Summer instream flows in the Yakima River would meet targets in most years and increase salmon production and resident fish habitat in the Keechelus Reach.<br>*Transmission of disease or invasive species* - The conveyance of water would increase the risk of transmitting diseases and exotic species to Kachess Reservoir. | Same as *Alternative 3A*. | Construction: Same as *Alternatives 2A* and *3A*.<br>Operation:<br>*Temperature* – Reduction in Kachess Reservoir minimum pool elevation may increase water temperatures in Kachess Reservoir.<br>Following drought years, reductions in Keechelus Reservoir pool elevation may increase water temperatures in Keechelus Reservoir.<br>*Turbidly* – Reduction in Kachess Reservoir minimum pool elevation would expose the lower reservoir bed to wave action and increase turbidity.<br>*Food based prey* - Available prey would be reduced in Kachess Reservoir but only available zooplankton prey would be reduced within Keechelus Reservoir.<br>Impacts to habitat complexity, connectivity and entrainment would be the same as *Alternative 2A*.<br>Impacts to nutrients and river flow, as well as impacts from transmission of disease or invasive species would be the same as *Alternative 3A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Vegetation and Wetlands** | | | | | |
| There would result in a net benefit to wetlands and vegetation in the extended study area, associated with proposed mitigation for the I-90 Phase 2A project. | Construction: Temporary loss of riparian and upland vegetation would not be significant.<br>Operation: Prolonged drawdown of Kachess Reservoir may result in establishment of invasive species and changes to wetland hydrology and vegetation communities during drought years. This would not be significant with the implementation of invasive species control and wetland mitigation.<br>There would be a permanent loss of less than 1 acre of wetland, which would be mitigated to ensure no net loss. Permanent loss of riparian and upland vegetation would not be significant.<br>The BTE would benefit up to 30 acres of wetlands in the Gold Creek drainage. | Same as *Alternative 2A.* | Construction: Temporary loss of riparian and upland vegetation would not be significant. There may be temporary impacts to wetlands from dewatering.<br>Operation: No net loss of wetlands.<br>Permanent loss of riparian and upland vegetation would not be significant.<br>The BTE would have a beneficial impact on up to 30 acres of wetlands in the Gold Creek drainage. | Construction: Same as *Alternative 2A*.<br>Operation: Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |
| **Wildlife** | | | | | |
| Wildlife conditions would remain similar to existing conditions, but wildlife would benefit from the ongoing wildlife connectivity improvements of the I-90 Phase 2A project. | Construction: Impacts to habitat are significant for localized species with small home ranges and not significant for transient species that occupy the larger watershed. Permanent habitat loss would be 18 acres.<br>Disturbances to wildlife from construction activities or noise are considered significant.<br>Impacts from the BTE would be positive or negative depending on the species.<br>Operation: Disturbance from noise, light or human activities are not significant. | Construction: Same as *Alternative 2A*, except habitat loss would be 8 acres.<br>Operation: Same as *Alternative 2A*. | Construction: Same as *Alternative 2A*, except habitat loss would be 4 acres.<br>Operation: Same as *Alternative 2A*. | Construction: Same as *Alternative 2A*, except habitat loss would be 1.5 acres.<br>Operation: Same as *Alternative 2A*. | Construction: Same as *Alternative 2A* and *3A*, except habitat loss would be 8 to 22 acres, depending on which combination of KDRPP and KCC is chosen.<br>Operation: Same as *Alternative 2A*. |
| **Threatened and Endangered Species** | | | | | |
| Habitat conditions would be similar to existing conditions.<br>Climate change could exacerbate existing negative bull trout habitat conditions as well as limit<br>Reclamation's flexibility to meet instream flow requirements for bull trout and MCR steelhead.<br>Habitat connectivity improvements associated with the I-90 Phase 2A project would improve conditions for bull trout and northern spotted owl. | Construction: There would be significant loss of habitat that supports the northern spotted owl. *Alternative 2A* would have the largest area of vegetation removal.<br>Increased noise is not expected to result in harm or injury to northern spotted owl; however, it may cause disturbance behaviors.<br>Turbidity from construction may negatively impact bull trout and MCR steelhead.<br>Operation: The BTE would improve habitat for bull trout. There would be no other operational impacts on threatened and endangered species. | Same as *Alternative 2A*, except vegetation loss and noise impacts would be less. | Same as *Alternative 2A*, except vegetation loss and noise impacts would be less than *Alternatives 2A* and *2B*. | Same as *Alternative 2A*, except vegetation loss and noise impacts would be less than *Alternatives 2A*, *2B*, and *3A*. | Same as *Alternative 2A* and *3A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Visual Quality** | | | | | |
| There would be no changes to visual quality. | Construction: There would be no significant impacts from construction.<br>Operation: Kachess Reservoir drawdowns during drought years would have significant impacts due to changes in overall landscape character and desirability from a recreation perspective. The drawdown would potentially conflict with scenic integrity and visual quality objectives. The east shore pumping plant would have a significant impact because it would substantially contrast with and interrupt the visual character and integrity of the landscape. | Construction: There would be no impacts from construction.<br>Operation: Kachess Reservoir drawdowns during drought years would have significant impacts due to changes in overall landscape character and desirability for recreation. The drawdown would potentially conflict with scenic integrity and visual quality objectives. New facilities would not contrast with or interrupt the visual character and integrity of the landscape. | Construction: There would be no significant impacts from construction.<br>Operation: New facilities would not contrast with or interrupt the visual character and integrity of the landscape. | Same as *Alternative 3A*. | Same as *Alternative 2A*, *2B*, *3A*, or *3B* depending on which combination of KDRPP and KKC is chosen. |
| **Air Quality** | | | | | |
| Impacts to air quality would not increase over existing conditions. | Construction: Construction would result in increased emissions and fugitive dust throughout construction, but would not be significant.<br>Operation: Emissions and fugitive dust would not have a significant impact on sensitive receptors. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternatives 2A* and *3A*. |
| **Climate Change** | | | | | |
| There would be no significant production of GHGs.<br>Climate change could adversely impact operation of the reservoirs because of changes in runoff timing and volume. | Construction: There would be no significant production of GHGs.<br>Operation:<br>There would be no significant production of GHGs.<br>Climate change predictions indicate that Reclamation would need to increase operation of KDRPP. This is not considered a significant impact because KDRPP would still contribute to increasing water supply.<br>The effects of climate change would decrease winter, spring, and fall attainment of instream flow targets. Summer attainment of instream flow targets in the Keechelus Reach of the Yakima River would be improved by the effects of climate change. These impacts are not considered significant.<br>Climate change effects could offset some of the potential benefits of the BTE, but also increase the need for the BTE. | Same as *Alternative 2A*. | Construction: There would be no significant production of GHGs.<br>Operation: Same as *Alternative 2A*, except summer attainment of instream flow targets would be unchanged. | Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Noise** | | | | | |
| There would be no increase in noise over existing conditions. | Construction: Construction would result in increased noise throughout the construction period. Impacts are not considered significant because noise would remain below Class A noise levels at existing noise sensitive receptors.<br>Ground-borne vibration could be an occasional nuisance during construction hours, but would not be significant.<br>Operation: There would be no noise impacts from operation. | Same as *Alternative 2A*. | Construction: Construction would result in increased noise throughout the construction period. Noise levels could potentially exceed maximum permissible levels, but noise would be intermittent and well below the pain threshold levels that affect human health.<br>Ground-borne vibration could be an occasional nuisance during construction hours, but impacts would not be significant.<br>Operation: No noise impacts are anticipated. | Same as *Alternative 2A*. | Same as *Alternatives 2A* and *3A*. |
| **Recreation** | | | | | |
| Similar to existing conditions. Continued increased demand, boat launches would remain inaccessible at certain times of the year and climate change may negatively affect opportunities. Construction of I-90 Phase 2A would temporarily impact recreation. | Construction: Construction would impact usability and quality of recreation at adjacent undeveloped recreation sites, but the impacts would be minor as the majority of the reservoir shore would remain available.<br>Construction for the BTE would impact recreation at the Gold Creek Pond Picnic Area and John Wayne Pioneer Trail.<br>Operation: Impacts from reservoir drawdown would be significant because the boat launch at Kachess Campground would be inaccessible more often than with *Alternative 1*.<br>Loss of fishing opportunities would also be significant due to loss of boating access and impacts on fish species.<br>The drawdown of Kachess and Keechelus reservoirs would significantly impact usability and quality of recreation during drought years and as the reservoir refills because of the extent and slope of the exposed reservoir bed.<br>Recreational use would be restored following construction of the BTE actions, but the character of recreation at these sites would change. | Same as *Alternative 2A*. | Construction: Construction could disrupt quality of recreation, but the impact would not be significant.<br>Operation: There would be no significant impact.<br>Recreational use would be restored following construction of the BTE, but the character of recreation at these sites would change. | Same as *Alternative 3A*. | Same as *Alternative 2A* and *3A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Land and Shoreline Use** | | | | | |
| Current trends would continue and there would be an increased potential for the prorationing of irrigation water due to climate change. Long-term negative changes in land use could potentially result from these indirect impacts on water reliability. | Construction: There would be temporary disruption of land use.<br>Operation: Some property easements or acquisitions would be necessary for the pumping plant site and possibly for the transmission line, and the BTE.<br>Improved reliability of proratable water supply would be provided. | Construction: Same as *Alternative 2A*.<br>Operation: Some property easements or acquisitions may be necessary for the transmission line and the BTE.<br>There would be improved reliability of proratable water supply. | Construction: Same as *Alternative 2A*.<br>Operation: Some property easements or acquisitions may be required for KKC facilities and the BTE. | Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |
| **Utilities** | | | | | |
| There would be no impacts to utilities. | Construction: Interruption of services is not anticipated.<br>Operation: There would be no impacts to electricity, wastewater, or telecommunications. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. |
| **Transportation** | | | | | |
| Similar to existing conditions, except construction traffic on I-90 and there would be long-term beneficial effects resulting from the I-90 Phase 2A project. | Construction: Construction would result in a more-than-moderate increase in vehicle traffic time and is considered significant.<br>The increase would not affect the ability of emergency personnel to respond to an incident or interrupt school bus routes, because the delays would be intermittent and of short-term duration.<br>No road closures are planned.<br>No changes are anticipated to existing access for pedestrians, snowmobiles, or bicycles along local roadways. There is no anticipated impact to existing parking areas.<br>Safety risks and deterioration of roads are not considered significant.<br>Operation: Impacts would not be significant because there would be minimal increases in traffic delays; no interruption to other means of transportation; no interruption to emergency vehicle response time; no parking impacts; and no deterioration of roads. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Cultural Resources** | | | | | |
| Similar to existing conditions. | Construction: Construction at Kachess Reservoir could damage or alter the identified NRHP-eligible site and potential additional sites that have not yet been identified.<br>The Cold Creek passage improvements would permanently change the John Wayne Pioneer Trail, but trail use would continue.<br>Operation: The additional 80-foot drawdown of Kachess Reservoir would expose large portions of shoreline, potentially exposing cultural resources to degradation, looting, or vandalism. | Same as *Alternative 2A*. | Construction: Construction at Keechelus Reservoir could damage or alter the identified NRHP-eligible site and potential additional sites that have not yet been identified.<br>The Cold Creek improvements would change the John Wayne Pioneer Trail, but trail use would continue.<br>Operation: The additional 15-foot drawdown of Keechelus Reservoir would expose large portions of shoreline, potentially exposing cultural resources to degradation, looting, or vandalism. | Same as *Alternative 3A*. | Same as *Alternative 2A* and *3A*. |
| **Indian Sacred Sites** | | | | | |
| There would be no impacts. | To date, Reclamation has identified no Indian sacred sites in the study area. No impacts are anticipated. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. |
| **Indian Trust Assets** | | | | | |
| There would be no impacts. | To date, Reclamation has identified no Indian trust assets in the study area. No impacts are anticipated. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A*. | Same as *Alternative 2A* |
| **Socioeconomics** | | | | | |
| No impacts are anticipated and existing trends would continue. | Construction: Direct impacts on income and employment would be generally positive, but not significant.<br>Workers may displace customary recreational visitors during summer, but would offset lost recreation related business.<br>Operation:<br>As a result of improved water supply, agricultural output during drought years would be significantly higher. | Same as *Alternative 2A*. | Construction: Impacts would be the same as *Alternative 2A*, but to a lesser degree.<br>Operation: Direct impacts on income, employment, lodging, would be generally positive, but not significant. There would be no impact on agricultural output. | Same as *Alternative 3A*. | Construction: Impacts would be the same as *Alternative 2A*, but to a greater degree.<br>Operation: Direct impacts on income, employment, lodging, would be generally positive, but not significant.<br>As a result of improved water supply, agricultural output during drought years would be significantly higher relative to *Alternative 1* and more than KDRPP alone. |
| **Environmental Justice** | | | | | |
| No impacts are anticipated. | Construction: No significant impacts.<br>Operation: No disproportionate impacts to minority or low-income populations.<br>Impacts to fish species in Kachess Reservoir could cause a significant impact to subsistence living. | Same as *Alternative 2A*. | Construction: No significant impacts.<br>Operation: No disproportionate impacts to minority or low-income populations. | Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |

| No Action Alternative | Alternative 2A | Alternative 2B | Alternative 3A | Alternative 3B | Alternative 4 |
|---|---|---|---|---|---|
| **Environmental Health and Safety** | | | | | |
| There would be no increase in environmental health and safety risks over existing conditions. | Construction: There would be no impacts from hazardous sites or construction traffic.<br>Operation: Full drawdown would expose areas with steep slopes around Kachess Reservoir which would increase the risk from falling. | Same as *Alternative 2A*. | Construction: There would be no impacts from hazardous sites or construction traffic.<br>Operation: No impacts are anticipated. | Same as *Alternative 3A*. | Same as *Alternatives 2A* and *3A*. |

## Cumulative Impacts

Cumulative impacts are the effects that may result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Section 4.25 of this DEIS evaluates cumulative impacts. The various environmental element sections in Chapters 3 and 4 of the DEIS also examine many of the cumulative impacts. Those analyses discuss the effects of past processes and trends that have cumulatively influenced or led to the resource conditions that exist today.

In addition, Reclamation considers two projects to be a reasonably foreseeable future projects—the Cle Elum Pool Raise Project and ongoing construction on Interstate-90 (I-90). The Cle Elum Pool Raise Project would provide benefits to fish and streamflow conditions that would be beneficial at a basin-wide level when implemented with other proposed projects. The Cle Elum Pool Raise Project could also cumulatively contribute to regional trends toward reduced habitat, impacts to historic and cultural resources, and construction impacts in the region. Construction traffic for all projects would travel on I-90. Dust, noise, and overall traffic would be additive, although these impacts would be limited to the period of construction. While the impacts on traffic of the individual projects would not be significant, the impacts, combined with the ongoing construction on the I-90 Snoqualmie Pass East Project, would cause additive impacts. These cumulative impacts would create a nuisance for people traveling on I-90 as well as residents and recreationists in the Proposed Action areas and on the I-90 corridor.

## Environmental Commitments

Environmental commitments are measures or practices adopted by a project proponent to reduce or avoid adverse effects that could result from project operations. Chapter 4 describes specific mitigation measures for project impacts on each resource. The following list summarizes major environmental commitments for the KDRPP and KKC proposals. Reclamation and Ecology share the responsibility to ensure obligations to protect natural resources are fulfilled.

- Obtain all applicable Federal, State and local permits.
- Prior to construction, conduct site-specific geotechnical studies to identify subsurface issues, unstable slopes, and other local factors that could contribute to slope instability and increase erosion potential.
- Conduct continued monitoring of site conditions and erosion potential.

- Develop a surface water quality monitoring program in cooperation with Ecology to monitor changes in water quality associated with the project.
- Monitor wells near Kachess Reservoir to determine if the additional reservoir drawdown lowers groundwater levels. Develop appropriate mitigation strategies if water levels are impacted.
- Enter into a Memorandum of Understanding (MOU) (Appendix A) with Ecology, the Yakama Nation, Service, and WDFW. The MOU provides a framework in which to coordinate and facilitate cooperation among the parties to develop and implement improvements to bull trout habitat within the Yakima River basin as described in the Bull Trout Enhancement Report in Appendix C and consistent with environmental commitments in this section.
- Support a study to examine reservoir productivity and food web impacts from future use of Kachess Reservoir inactive storage.
- Provide bull trout passage between Box Canyon Creek and Kachess Reservoir and between the Little Kachess and Kachess basins to offset impacts of additional draw down at Kachess Reservoir. Conduct general passage improvement activities within Kachess and Keechelus reservoirs.
- Prior to construction, conduct wetland surveys using current wetland delineation methodology. Design projects to avoid wetland impacts. If wetland impacts occur, comply with mitigation measures established in permit conditions to ensure no net loss.
- Prior to construction, coordinate with USFS to determine the presence of any Sensitive or Survey and Manage species and take steps to minimize impacts to those species.
- Monitor for infestations of invasive plant species associated with project ground disturbances and periods of prolonged drawdown of the reservoirs and implement suppression strategies to control invasive plant populations.
- If feasible, extend boat ramps at Kachess Reservoir when the reservoir is drawn down during drought years.
- Implement a public communication strategy to prepare recreation users for the significant impacts on recreation at Kachess Reservoir.
- Implement a construction traffic management plan with specific traffic management measures and procedures for construction contractors.
- Prior to construction, conduct cultural resource studies of all areas that would be disturbed by construction.
- In consultation with DAHP and affected Indian Tribes, develop a treatment plan for all cultural resources directly impacted by the project.

- Develop a Cultural Resource Management Plan to address ongoing and future operational and land management implications of the proposed project.
- Prior to construction, survey utilities in construction areas and take appropriate measures to minimize conflicts with any identified utilities.
- Install signage and post notices to ensure that the general public understands potential safety issues associated with steep slopes along the reservoir.

Reclamation would implement current BMPs when appropriate, to enhance resource protection and avoid additional potential affects to surface and groundwater quality, earth resources, fish, wildlife, and their habitats.

- Haul oils or chemicals to an approved site for disposal and use vegetable-based lubricants in machinery when working in or near water to prevent petroleum products from entering surface or groundwater.
- Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) per Ecology's rules and regulations. The plan would include erosion control methods, stockpiling, site containment, shoreline protection methods, equipment storage, fueling, maintenance, washing, and methods to secure a construction site under circumstances of an unexpected high water or rain event.
- Equip all construction equipment with environmental spill kits to contain petroleum products in the event of a leak.
- Require all contractors to have a Spill Prevention Plan and a Toxics Containment and Storage Plan.
- Develop and implement a spill plan to implement containment of construction materials such as treated woods, contaminated soils, concrete, concrete leachate, grout, and other substances that may be deleterious or toxic to fish and other aquatic organisms.
- Develop a plan for safe handling and storage of potentially toxic construction materials, fuels, and solvents for staging sites in close proximity to receiving waters and riparian areas.
- Place stockpiles of earthen materials to minimize runoff into nearby receiving waters.
- Require all contractors to inventory noxious weed populations by marking with temporary fencing to avoid spreading weeds to other areas in accordance with Federal, State and local weed control requirements.
- Continue with ongoing weed control efforts on disturbed lands following construction and revegetation in accordance with Federal, State and local requirements.

## Public Involvement

Reclamation and Ecology initiated the public scoping process for this DEIS in October 2013. Reclamation and Ecology held two public scoping meetings in Yakima, Washington on November 20, 2013 and two scoping meetings in Cle Elum, Washington on November 21, 2013. At the meetings, Reclamation described the Proposed Action and gave attendees the opportunity to comment on the project, the scope of the EIS, the EIS process, and resources evaluated in the EIS.

The scoping period began October 30, 2013, and concluded December 16, 2013. During this period 39 comment documents and telephone calls were received. The comments covered a wide range of environmental effects. One of the major concerns was the effect of the additional drawdown of Kachess Reservoir and its ability to refill following the drawdown. Comments expressed concerns about the effects of the drawdown on fish, recreation access, groundwater wells, aesthetics, and property values. Concerns about the KKC proposal related to whether the project could benefit flows and fish in the upper Yakima River and the impacts on aquatic species from the transfer of water from one reservoir to another. Other concerns included impacts of a tunnel on groundwater flow and transportation corridors, coordination of the project with other projects in the area such as the I-90 Snoqualmie East Project, and construction impacts.

Reclamation and Ecology prepared a Scoping Summary Report that summarizes the comments received (Reclamation and Ecology, 2014i). Reclamation will provide the report to readers upon request, or a reader can access the report from the Yakima River Basin Water Enhancement Project (YRBWEP) 2011 Integrated Plan website: http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html.

## Consultation and Coordination

Reclamation will consult with the U.S. Fish and Wildlife Service (Service) and NMFS under the Endangered Species Act (ESA) and has begun initial conversations about the consultation. Reclamation has completed consultation with the Service under the Fish and Wildlife Coordination Act. Reclamation has initiated consultation with the Washington Department of Archaeology and Historic Preservation under Section 106 of the National Historic Preservation Act. Government-to-Government consultation with the Confederated Tribes of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Confederated Tribes of the Colville Reservation is ongoing. Reclamation has contacted the Bureau of Indian Affairs (BIA) Yakima Office and the BIA Colville Tribes Office regarding Indian Trust Assets or trust lands in the project area.

Reclamation and Ecology are committed to ongoing coordination with the Tribes and resource agencies. Reclamation will complete ESA coordination with the Service and NMFS. Reclamation will complete cultural resource surveys and will continue coordination with the DAHP on impacts to cultural resources. Reclamation and Ecology will continue to consult with the Yakama Nation, CTUIR, and Colville Confederated Tribes.

## What Comes Next?

### Public Review of the DEIS

Reclamation and Ecology announced the release of this DEIS on their websites and in local and regional newspapers. These announcements included the timeframe for public review and dates, times, and locations of public meetings. The public will have 60 days to review and provide comments on the DEIS.

Two public hearings will be held during the public review period, as described on the Fact Sheet. Participants will be encouraged to provide comments through several mechanisms, including written comment cards, letters, e-mails, and oral comments at the meeting.

Reclamation and Ecology will give equal consideration to all comments received on the DEIS, regardless of how submitted, and will post the comments on the KDRPP and KKC websites at: http://www.usbr.gov/pn/programs/eis/kdrpp/index.html and http://www.usbr.gov/pn/programs/eis/kkc/index.html.

### Preparation of the Final EIS

Reclamation and Ecology will carefully consider all comments received on the DEIS and will consider adjusting alternatives, supplementing or improving the analysis, or making factual corrections in response to substantive comments. Reclamation and Ecology will begin preparing the Final EIS in spring 2015.

### Record of Decision

Reclamation will conclude the NEPA process by issuing a Record of Decision no sooner than 30 days after the FEIS is completed. The Record of Decision will identify Reclamation's decision on the Proposed Action, and will describe the basis for that decision.