



WAPATO DIVERSION DAM

Post-Feasibility Study Stakeholder Meeting Handout

Background/Summary

The Confederated Tribes and Bands of the Yakama Nation (YN), in conjunction with the U.S. Bureau of Indian Affairs (BIA) and other project partners, are planning improvements to the Wapato Diversion on the Yakima River, about two miles south of Union Gap, Washington. The facility is 100 years old and is the primary point of diversion for the Wapato-Satus Unit of the Wapato Irrigation project (WIP). Improvements at this site are necessary to secure WIP's ability to divert their full diversion allowance, improve sediment and debris management, improve upstream fish passage, address fish mortality, and bring the facility up to modern safety standards.

Project History Timeline

May 2023

Stakeholder Meeting

The group reviewed design concepts based on the overarching design objective of addressing the smolt entrainment and mortality issues at the existing facility. During this meeting, stakeholders requested the Project team complete a Value Planning Study.

September 2023 – October 2024

Wapato Headworks Rehabilitation Construction Project

The goals of this project were to address short-term operational needs (e.g., repairing gates) and collect data for the long-term design (e.g., geotechnical investigations). The project included a significant emergency repair to address previously unknown deficiencies.

October 2023

Value Planning Study

After considering several alternatives, including those with traditional undershot headworks and in-river screening, Project partners and stakeholders selected a preliminarily-preferred alternative to carry forward to a feasibility-level analysis.

Throughout 2024

Feasibility Study

The Project team looked at the alternative advanced out of the Value Planning Study. The general finding of the Feasibility Study is that this alternative appears to be feasible, pending the results of the forthcoming physical modeling, which will evaluate the effectiveness of the layout in addressing fish mortality and entrainment issues.

December 2024 – February 2025

Alternative Concept Analysis

The project team performed a screening-level analysis of additional in-river screening concepts (or concepts with similar objectives) not previously considered during Value Planning. The alternative concept map in this handout presents a hybrid arrangement that incorporates elements of several of these concepts.

February 2025

Post-Feasibility Stakeholders Meeting

DOWL will present results of the Feasibility Study and the screening-level analysis of the alternate concept and will collect stakeholder input. Following this meeting, Project partners will select which alternative(s) to carry forward to physical modeling.

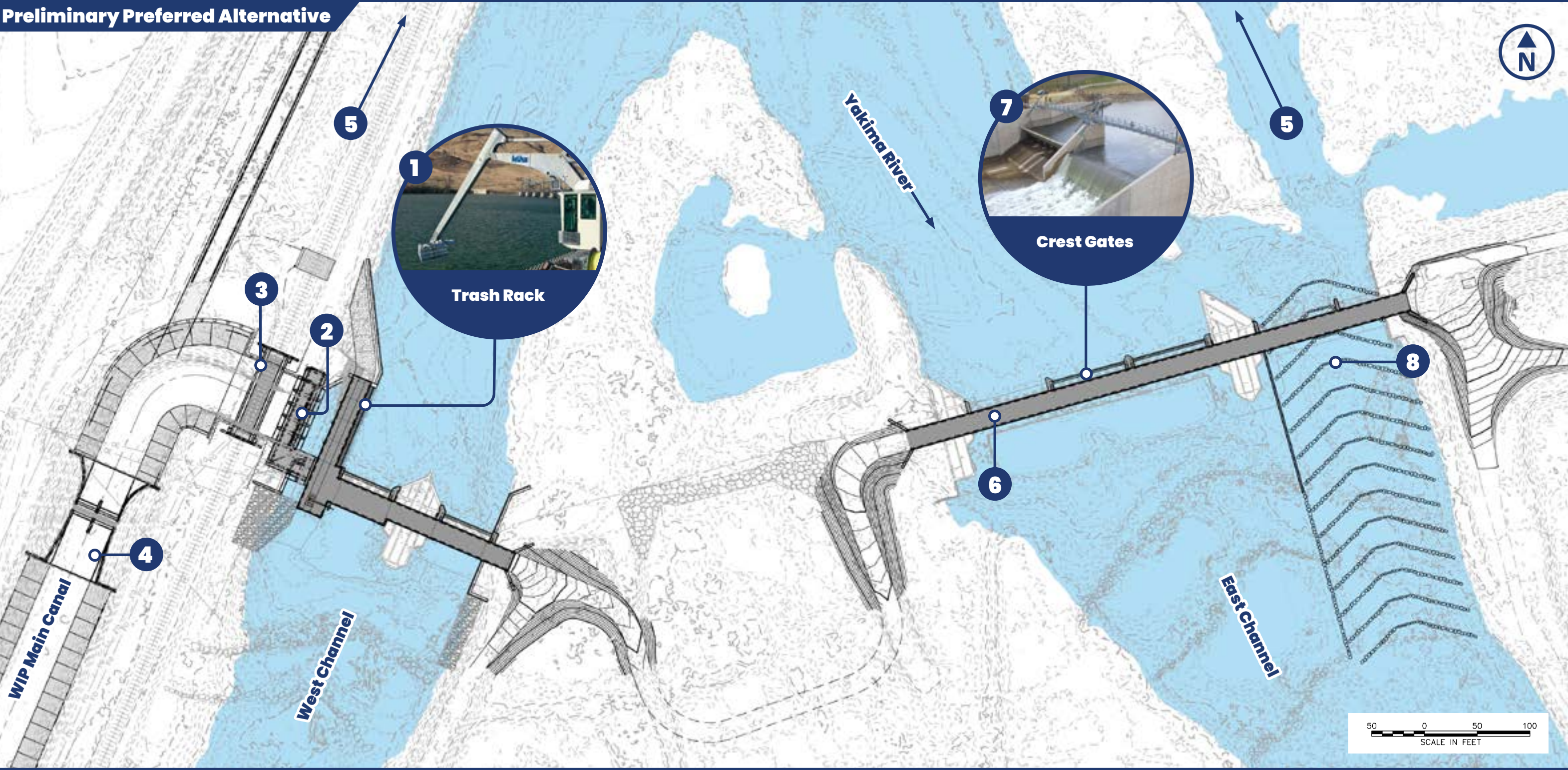
Existing Conditions



- 1 Railroad Bridge**
The existing railroad bridge over the Main Canal constricts canal inlet flow, restricts the work area available for construction, and is likely approaching the end of its service life.
- 2 Main Canal Headworks**
The undershot gate hydraulics result in fish mortality and WIP has difficulty capturing their diversion allowance during low river flows.
- 3 West Channel**
Sediment accumulates in the west channel, restricting WIP's ability to capture their diversion allowance.
- 4 West Diversion**
Large woody debris accumulates on the dam and is difficult and dangerous to remove. There is no ability to get large equipment or materials to the island without a barge.

- 5 Trash Rack**
 - Debris frequently overtops the trash rack and becomes lodged in the headworks forebay, where it can prevent full gate closure and damage equipment.
 - The existing rail-mounted excavator does not meet current safety standards and becomes overwhelmed during flood events.
 - Poor hydraulics: the existing abutment protrudes into the river, creating a low-velocity area at the upstream end of the trash rack.
- 6 Fish Ladders**
Installed by Reclamation in the 1980s and retrofitted with a lamprey passage system. These passage facilities do not pass all species and life stages and become overwhelmed at relatively frequent flood events, delaying mitigation.
- 7 East Diversion**
 - Sediment deposition and vegetation obstruct the east diversion between the east bank and fish ladder, restricting flood capacity.
 - Tribal fishers build fishing structures downstream of the diversion to exercise their treaty fishing rights. Designs should perpetuate and improve Tribal fishing access.

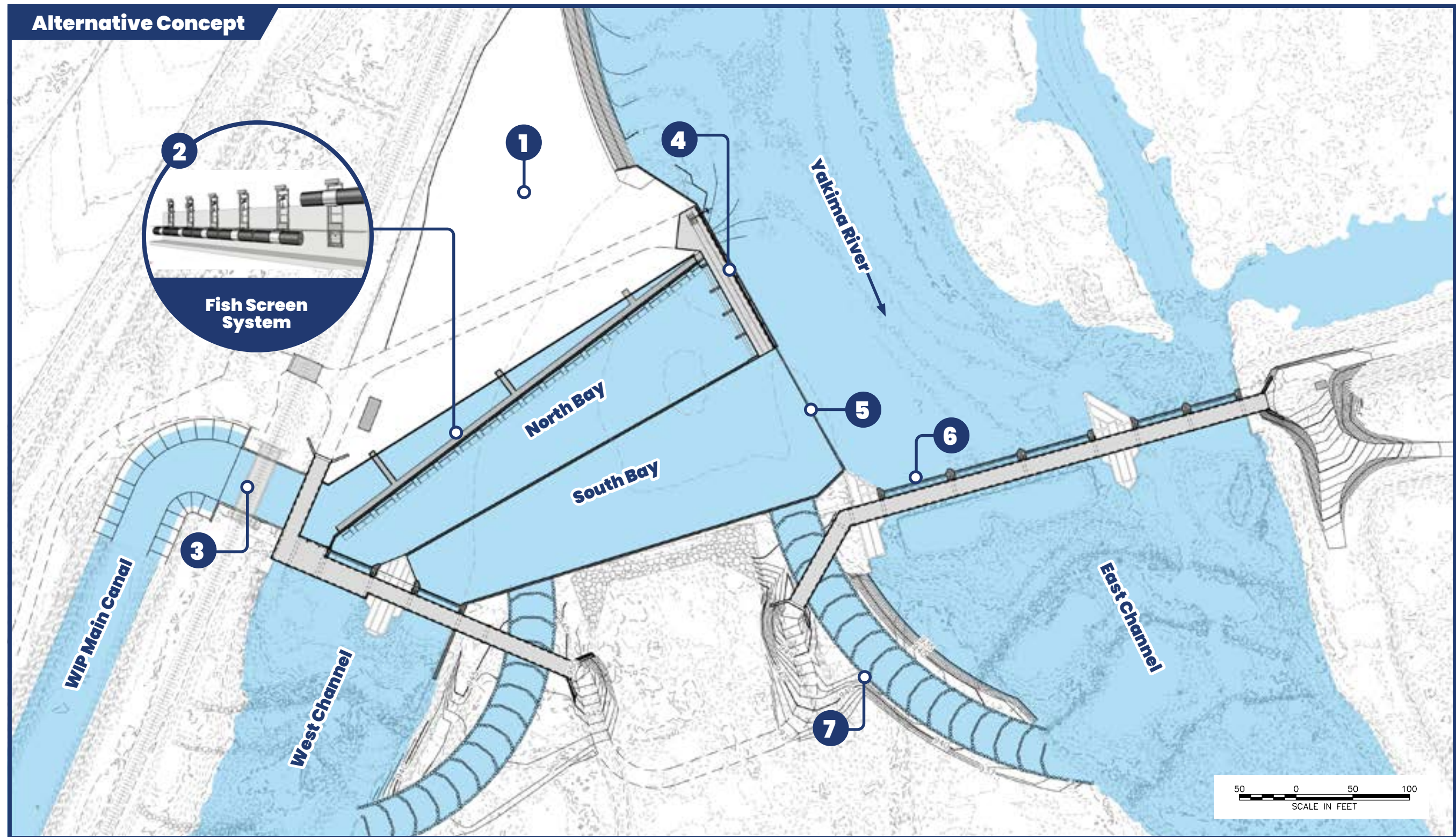
Preliminary Preferred Alternative



- 1 Trash Rack**
Replacing the trash rack and raking system would improve debris management, hydraulics, and operator safety.
- 2 Headworks**
A reconstructed traditional headworks would be designed to address mortality and increase diversion capacity. The structure could use standard slide gates or split-leaf gates if found to better address fisheries goals.
- 3 Railroad Bridge**
A new railroad bridge would accommodate a wider headworks structure and canal. Preferably, a new on-grade crossing would be constructed north of the headworks to improve site access.
- 4 Tailwater Control Structure**
Regulating the canal tailwater may eliminate injuries associated with the headworks undershot gates. The sectional physical model will evaluate the effectiveness of the tailwater control structure.

- 5 Supplemental Headworks and Side Channel Reconnection**
The feasibility of these elements is uncertain.
- 6 Access Bridge**
Installing a bridge across the trash rack, west dam, and east dam would allow WIP to safely access the trash rack, place bulkhead elements on the spillway, maintain crest gate equipment, and deliver materials to the island.
- 7 Crest Gates**
Crest modifications and new gates are needed to flush sediment and debris, improve flood capacity, and increase the checked water surface elevation to the headworks at low flows.
- 8 Fishway (Placeholder Arrangement for Illustrative Purposes Only)**
A new fishway in the east channel (or elsewhere) would improve upstream passage for a variety of species. The feasibility-level design for this element will be completed under a separate agreement between YN and DOWL.

Alternative Concept

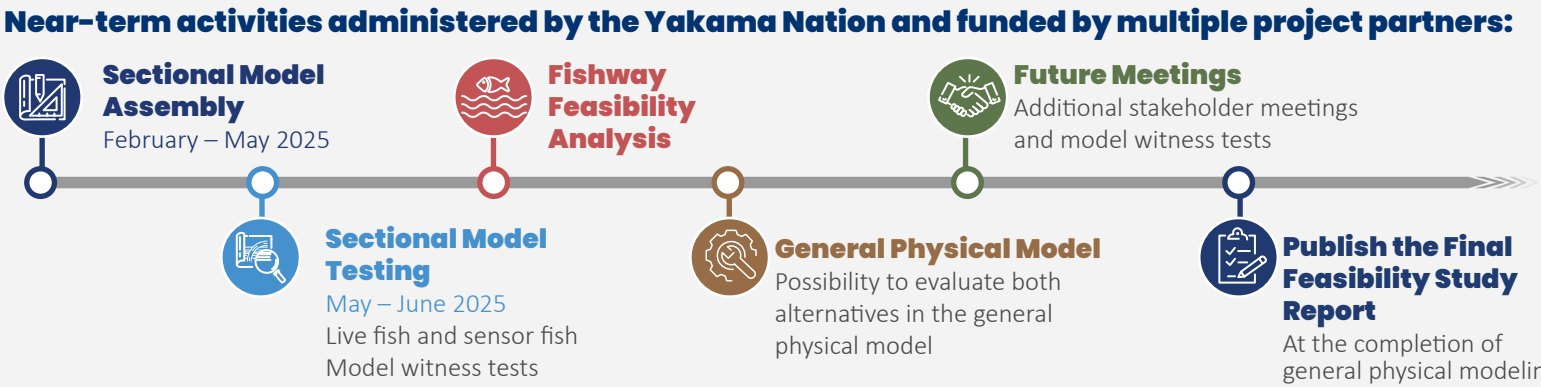


- 1 West Channel Abandonment Area**
The existing inlet of the west channel would be filled to route flows through the north and south bays in the existing island footprint. As currently depicted, the material excavated from the island would roughly balance with the fill for the abandonment area.
- 2 Fish Screen System**
An array of cylindrical tee screens would be used to capture irrigation diversions, eliminating fish entrainment into the canal and associated fish injury.
- 3 Railroad Bridge**
Similar to the preliminary preferred alternative, the railroad bridge would be replaced to reset the service life and improve hydraulics.
- 4 Trash Rack**
A trash rack across the north bay would protect the screen system from debris and could include a debris raking system. The trash rack would include bulkheads or isolation gates to dewater the north bay for maintenance and sediment removal.

- 5 Sediment Wall**
A sediment guide wall at the inlet of the north and south bays would be designed to help reduce the amount of sediment entering the bays.
- 6 Crest Gates**
Crest gates could be installed across the entire east and west diversions to promote sediment continuity, control the flow split during operations, and mitigate upstream flood impacts. Conceptually, the river-right west diversion crest gate would have a full dam-height operational range.
- 7 Fishways**
Fishways for the east and west channels would improve upstream fish passage, maintain flow in the west channel during low flow periods, and help mitigate impacts on upstream flood water surface elevations.

Alternative	Key Benefits	Key Concerns/Drawbacks
Preliminary Preferred Alternative Cost in Current Dollars: ~\$105M* Cost at Assumed Implementation Year: ~\$127M	<ul style="list-style-type: none"> Targets specific causes of mortality, which is an economical way to address the deficiencies of the existing system Generally maintains the existing site layout (i.e., minimal long-term stream and wetland impacts) Specifically targets the O&M deficiencies of the existing facility Likely to reduce impacts on upstream flood water surface elevations 	<ul style="list-style-type: none"> May not reduce fish entrainment into the canal Perpetuates the existing in-canal screening structure that does not meet NMFS criteria The effectiveness of the tailwater control gate and/or headworks gates in addressing mortality issues is pending physical modeling Construction appears to be feasible, but will be challenging and high-risk. In-water work will be significantly limited by seasonal high-water periods and mandatory irrigation periods Construction costs exceed available funding Questionable feasibility of the supplemental headworks component of the Value Planning alternative As currently configured, does not accommodate off-season diversions for groundwater recharge under more extreme winter conditions
Alternative Concept Cost in Current Dollars: ~\$245M* Cost at Assumed Implementation Year: ~\$312M	<ul style="list-style-type: none"> In-river screen eliminates fish entrainment into the canal and associated fish mortality The screen system would better meet current NMFS screen criteria Intake is on the primary river channel (i.e., the east branch) Potential to divert flow during winter for groundwater recharge 	<ul style="list-style-type: none"> Likely adverse impact on upstream flood water surface elevations The constructibility of this concept may not be feasible Much more challenging to regulate flow in to the canal O&M is more complicated and with severe access limitations Significant sediment and debris concerns could jeopardize the feasibility of this concept Construction costs greatly exceed available funding and would require significant cost share by external partners

* The cost estimates for the two alternatives are planning-level and do not necessarily reflect the same level of detail. Current dollars are on a Winter 2024/2025 basis. Neither estimate includes upgrading or removing the existing fish screens.



Other Next Steps/Considerations for the Design Team

- ✓ Coordination with BNSF, Reclamation, tribal fishers, and environmental agencies.
- ✓ Develop a plan for National Environmental Policy Act compliance, including Endangered Species Act and cultural resources consultation.
- ✓ Discuss options for project delivery. It would be preferable to involve a contractor early in the design process.



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