

HIGH HEAD BYPASS UPDATE

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CONSTRAINTS



- Bypass system to replace trap and haul.
- Connect to the planned FSS.
- Operate over full operational pool range.
- Meet all authorized purposes for the project.
- 6 alternatives for 30% EDR



ALTERNATIVE 1



Entrance Route

- Helical (spiral) pipe with multiple inlets to FSS. Helical pipe located in excavation area behind FSS.
- Size helical pipe to dissipate energy from the variable component of total head in the helical pipe upstream of the dam.

Bypass Route

- Use either a single penetration through the left abutment or a penetration to access the existing RO conduit alignment (TBD)
- D/S pipe length (non-valved) switchbacks along dam face to dissipate fixed head

Outfall Route

- Pipe discharges to river after enough energy has been dissipated to meet NMFS outfall criteria. Details TBD.



ALTERNATIVE 2



Entrance Route

- Dual fish lock with multiple inlets in a standalone structure in excavation area behind FSS
- All variable head dissipated in the fish lock

Bypass Route

- Use either a single penetration through the left abutment or a penetration to access the existing RO conduit alignment (TBD)
- D/S pipe length (non-valved) switchbacks along dam face to dissipate fixed head

Outfall Route

- Pipe discharges to river after enough energy has been dissipated to meet NMFS outfall criteria. Details TBD.



ALTERNATIVE 3



Entrance route

– Vertical conduit with multiple inlets.

- Use existing fish horns and fish well if hydraulics can be made to work (to be confirmed).
- Otherwise, use a standalone structure in excavation area behind FSS.
- Need to check whether this alternative can meet pressure guideline.

Bypass Route

– Single penetration through the left abutment or route through RO tunnel (depending on vertical conduit location)

- If existing fish horns/well are used, re-route lower portion of pipe to tie into the RO tunnel alignment d/s of the RO gates

– D/S pipe loop (valved) to dissipate variable head

– D/S pipe length (non-valved) to switchback along dam face to dissipate fixed head

Outfall Route

– Outfall to river after enough energy has been dissipated to meet NMFS outfall criteria. Details TBD.



ALTERNATIVE 4



Entrance Route

- Telescoping pipe with single inlet

Bypass Route

- Single penetration through either the left or right abutment (TBD based on geometry)
- D/S pipe loop (valved) to dissipate variable head
- D/S pipe length (non-valved) to switchback along dam face to dissipate fixed head

Outfall Route

- Pipe discharges to river after enough energy has been dissipated to meet NMFS outfall criteria. Details TBD.



ALTERNATIVE 5



Entrance Route

- Green Peter style entrance with multiple penetrations through left abutment

Bypass Route

- Contractor had initially proposed having the multiple penetrations tap into a pipe that would switchback along the downstream face of the dam; however, USACE requested that the alternative be developed using a layout that is more “true” to Green Peter.
- In response to USACE feedback, this alternative will be developed with multiple inlets through the left abutment that will tap into a single pipe and open channel located on the downstream side of dam

Outfall Route

- Outfall to river via open channel after enough energy has been dissipated to meet NMFS outfall criteria. Details TBD.



ALTERNATIVE 6



Entrance Route

- Single fish lock to lift fish to crest of the dam

Bypass Route

- D/S pipe length (non-valved) to switchback along dam face to dissipate fixed head

Outfall Route

- Outfall to river enough energy has been dissipated to meet NMFS outfall criteria.
Details TBD.



OTHER ALTERNATIVES – UNDER CONSIDERATION



Alternative proposed by ODFW: Piped Downstream Fish Bypass

- Potential Operational Changes – Changes to the reservoir - “Fish Passage Rule Curve”
- Bypass pipe at Elevation less than 1532
- Hybrid system
 - Bypass + Trap and Haul
 - Bypass when reservoir is low; T&H when the reservoir is full or above the bypass operations