Project Number	19-1427
Project Name	The Ranch on Swauk Creek Project
Sponsor	Kittitas County Conservation District

List all related projects previously funded or reviewed by RCO:

Project # or Name	Status	Status of Prior Phase Deliverables and Relationship to Current Proposal?
#08-2001: Large Wood Replenishment	Completed	Replenished large woody debris in key reaches of high priority areas in Swauk Creek.
#15-1247: Williams Creek Aquatic Habitat Restoration	Completed	Replaced two undersized culverts to restore fish passage in Williams Creek, a Swauk Creek tributary.
#16-606: Swauk Creek Water Rights Acquisition	Completed	Secured an additional 1.71 cfs in the lower 11.4 miles of Swauk and First Creeks.
#17-1239 Swauk Cr Floodplain Reconnection	Active	Floodplain reconnection and in-stream habitat restoration.
#18-1709: Wood Replenishment in Four Tributaries	Active	Construction of large woody debris jams in lower Swauk Creek.

If previous project was not funded, describe how the current proposal differs from the original.

1. **Project brief.** *In one or two sentences, what do you propose to do?*

The Kittitas County Conservation District proposes to restore fish passage and conserve in-stream flow by consolidating two gravity irrigation diversions on Swauk Creek to a single point of diversion, piping an irrigation conveyance channel to reduce evaporation and infiltration, and planting cottonwood copses in strategic locations to provide shade and future woody debris for the stream and floodplain.

2. **Project location.** *Describe the geographic location, water bodies, and the location of the project in the watershed, i.e. nearshore, tributary, main stem, off-channel, etc.*

The proposed project is located on Swauk Creek (WRIA 39), northwest of Ellensburg, Washington in Kittitas County. The two irrigation diversions are located in northwest quarter of Section 27, Township 20N, Range 17E.

3. **Problem statement.**

Over the past 100 years, the Yakima River Basin has been modified by a complex array of reservoirs, diversion dams, canals, and drains used to divert and convey water. Humans

have not only changed the "basic plumbing" of the system, but have modified the timing, quantity, and quality of the flow in the Yakima River and its tributaries. Today, tributaries to the Yakima River, notably those that are not subject to storage reservoir operations, provide the best opportunities to improve salmonid rearing habitat. Swauk Creek is one of those.

This project proposes to restore year-round fish passage and conserve in-stream flow in Swauk Creek, a valuable tributary for ESA-listed steelhead, as well as coho, Chinook, Pacific Lamprey and other native fishes. The Swauk Creek watershed drains an area of about 100 square miles before entering the Yakima River at River Mile 170.

The Swauk Creek drainage experienced substantial commercial gold prospecting in the late 1800s and early 1900s and the resulting impacts of mining activities are still apparent today. A relatively high degree of fine sediment within the system is often attributed to the long history of suction dredging. In the mid-1950s, US Highway 97 was constructed and Swauk Creek was relocated and channelized to accommodate the highway. Simplification of the channel has reduced large woody material and pools that are important components of stream function and aquatic habitat.

Although the drainage area of Swauk Creek is fairly large, precipitation in the Swauk watershed is minimal, with the majority coming in the form of snow during the winter months. The Upper Yakima limiting factors analysis identifies that the absence of flow in lower Swauk Creek severely limits steelhead production and may preclude coho spawning (Haring 2001, p. 267).

Despite these challenges, Swauk Creek remains an important and productive spawning and rearing stream for ESA-listed steelhead. The National Marine Fisheries Service identifies the Upper Yakima local steelhead population as high risk (NMFS 2011, p. 14). Despite decades of degradation, radiotelemetry data from 2002 - 2014 indicates that 13% of Upper Yakima steelhead spawn in Swauk Creek (USBR 2006, Temple et al., 2015). Swauk Creek is also utilized by coho, Chinook, bull trout, cutthroat trout, Pacific lamprey and other native fishes.

4. List the fish resources present at the site and targeted by this project.

Species	Life History Present (egg, juvenile, adult)	Current Population Trend (decline, stable, rising)	Endangered Species Act Coverage (Y/N)
Middle Columbia Steelhead	All	Decline (historically, with some stabilization in recent years)	Yes, Threatened
Coho	All	Extirpated – Subject to Yakama Nation reintroduction and resulting status.	N

Chinook	Juvenile	Decline (historically, with some stabilization in recent years)	N
Columbia River Bull Trout	All	Decline	Yes, Threatened
Pacific Lamprey	All	Extirpated – Currently being translocated by the Yakama Nation.	N
Cutthroat trout	All	Stable	N
Rainbow Trout	All	Stable	N

5. Describe the limiting factors, and limiting life stages (by fish species) that your project expects to address.

The 2009 Yakima Steelhead Recovery Plan identifies irrigation diversions, low flow and temperature as limiting factors. *Excerpt below*.

- Irrigation diversions have dewatered the lower reaches of many tributaries (e.g., Swauk, Teanaway, Taneum, Manastash and Big creeks), creating flow and temperature conditions that reduce juvenile rearing capacity (p. 116).

The 2001 Habitat Limiting Factors Analysis identifies impacts of mining, low flow, floodplain modification, transportation networks, channel and substrate condition, road density, degraded riparian habitat and water quality as limiting factors. *Excerpts from the Limiting Factors Analysis are below*.

- Mining – Extensive placer mining created extensive alteration of the channel, substrate, and banks, and caused extensive turbidity that affected salmonid production in Swauk Creek (p. 18).

- Fish Access and Flow - Naturally occurring low flows throughout the system, and the absence of flow in the lower 4-6 miles in the fall, severely limit steelhead production (CBSP 1990) (p. 267). It is unknown to what extent the low flows are affected by a combination of loss of natural floodplain water storage, floodplain confinement, impaired riparian function, and water withdrawals

- Floodplain Modification - Historically, Swauk Creek is believed to have included a series of short, flat, unconfined areas, through which the stream meandered in multiple channels (YSS 2001 DRAFT). With the loss of beaver dams and the incising of the channel, the critical water retention function of the wet meadow areas was lost (p. 267).

- Road Construction - Road construction and mining have resulted in the straightening of most stream reaches (Renfrow), steepening channel gradients, and causing downstream bank erosion (KCCD 1999) (p. 268).

- Channel Condition/Substrate Condition - Influences cited by the USFS for the poor habitat condition include mining activities (hydraulic mining and dredging), timber harvest near riparian areas (44% of the watershed has been logged), grazing, roads, and recreation (p. 269).

- Road Density - Road densities in subwatersheds range from 2.2-6.3 mi/mi2 with numerous roads within riparian reserves (MacDonald et al 1999, as cited in USFWS 2001 DRAFT). In addition to the roads, there are numerous old skid roads (p. 269).

- Riparian - Riparian condition is poor in the lower 3 miles, with a general lack of shade and LWD (Mayo, Renfrow). Progressing upstream, willows, alder, and cottonwoods gradually increase until, by RM 8, the stream flows through a conifer forest of increasing density (p. 270).

- Water Quality - Segments within the Swauk Creek watershed are included on the CWA 303(d) impaired water quality list as not meeting state water quality standards for water temperature.

<u>The Ranch on Swauk Creek project is anticipated to address the following limiting factors:</u>

- Middle Columbia River steelhead:
    a) juvenile rearing habitat quality and quantity associated with low summer flows and high temperatures;
    b) obstructed fish passage during the irrigation season.
- Coho
    a) juvenile rearing habitat quality and quantity associated with low summer flows and high temperatures;
    b) summer and fall adult spawner upmigration impaired by low flows;
    c) obstructed fish passage during the irrigation season.
- Spring Chinook:
    a) juvenile rearing habitat quality and quantity associated with low summer flows and high temperatures;
    b) obstructed fish passage during the irrigation season.

6. Project goals and objectives.

A. What are the project goals?

Project goals:

- Eliminate irrigation-related mortality of steelhead, coho, and Chinook at Swauk Creek River Mile 7.71 and significantly reduce the irrigation-related mortality of steelhead, coho, and Chinook at Swauk Creek River Mile 7.92.

- Restore year-round fish passage for all life stages of salmonids at Swauk Creek River Mile 7.71 and River Mile 7.92.

- Improve summer rearing conditions for juvenile steelhead, coho, and Chinook salmon in Swauk by increasing irrigation efficiency, resulting in approximately 0.25 cfs of conserved water (approximately 8% of the water right) available for instream flow benefits.

- Increase canopy cover, provide shade, and produce a source of future large woody debris for Swauk Creek and its floodplain by planting ~1 acre with cottonwood copses.

B. What are the project objectives?

Project Objectives:

- Eliminate a point of diversion on Swauk Creek by consolidating it with an existing point of diversion.

- Eliminate fish entrainment by installing a fish screen, sized adequately for the consolidated water right, that meets and is operated in accordance with National Marine Fisheries Service and Washington Department of Fish & Wildlife fish screening criteria.

- Pipe an irrigation conveyance channel to reduce evaporation and infiltration and increase the efficiency of conveying the adjudicated water right.

- Modify the existing point of diversion to eliminate the need for annual in-stream modifications that create two seasonal fish passage barriers under current conditions.

- Plant cottonwood copses in strategic locations to provide shade and a future source of large woody debris for Swauk Creek and its floodplain.

C. What are the assumptions and constraints that could impact whether you achieve your objectives?

Assumptions:

- Stream dredging, straightening, and riparian clearing have simplified the stream channel, and significantly contributed to degraded stream habitat.
- Low summer and fall stream flows, due to natural hydrology and irrigation withdrawals limit salmonid production.
- Annual check dams associated with irrigation diversion operations create seasonal passage barriers for all fish species in Swauk Creek.

Constraints:

The left bank of Swauk Creek within the project area is in different private ownership. We may need their cooperation for any instream construction at the upper point of diversion.

7. Project details. *Please answer the questions below and all pertinent supplemental questions at the end of the application form.*

A. Provide a narrative description of the proposed project.

The Kittitas County Conservation District proposes to work with private landowners on Swauk Creek to restore fish passage and enhance spawning and rearing habitat for ESA-listed steelhead. Swauk Creek is a high priority for steelhead and salmon recovery in the Upper Yakima Watershed. Lower Swauk Creek is extremely productive, providing important habitat for steelhead, juvenile chinook, coho, rainbow and cutthroat trout, Pacific lamprey, and possibly bull trout.

The Ranch on Swauk Creek project will consolidate two gravity irrigation diversions to a single existing point of diversion with a fish screen that meets and is operated pursuant to NMFS and WDFW fish screening criteria. Consolidating the diversions will eliminate an irrigation point of diversion, and by re-working the consolidation site and installing an adequately sized fish screen, the risk of fish entrainment and mortality will be eliminated for both water right diversions.

The diversions proposed for consolidation are currently screened, but are not functioning within NMFS and WDFW fish screening and passage criteria. The screens were installed in 2007 and were intended to be a temporary screening fix until the Swauk Storage Feasibility Study was completed. The upper screen was replaced with an experimental screen in 2010 when in-stream work was completed. Performance of the experimental screen was poor and it was later swapped out with a rotary wiper screen.

The downstream point of diversion and fish screen do not function properly, likely due to topography and channel incision. Considerable in-stream work must be done annually to operate the diversion. This in-stream work results in a seasonal fish passage barrier during the irrigation season, every year. Due to the topography of the site and the extensive amount of engineering and in-stream work that would be required to make the point of diversion operational in accordance with NMFS and WDFW, the downstream point of diversion will be eliminated with implementation of this project.

The upstream point of diversion will serve as the consolidation site. This site is well situated topographically to adequately deliver the water user's consolidated

adjudicated water right and modifications to the site will be relatively straight-forward. Site modifications will likely include reworking the roughened channel fishway to ensure year-round fish passage of all life stages of salmonids, and alternations to the headgate, fish screen and irrigation ditch. Reworking this site will eliminate the need for annual in-stream work that is required under existing conditions and results in a seasonal fish passage barrier during the irrigation season.

In order to achieve the consolidation, the proposal is to convert the earthen ditch from the diversion point to the intersection with Burke Road to a buried pipeline. At Burke Road, the water will be split with 1.5 cfs continuing to flow westerly in an existing earthen ditch, and the remainder being conveyed to the south in a new pipeline until the intersection with the existing conveyance ditch in the 400 block of Burke Road. Conveying the water right in a pipeline reduces evaporation and infiltration and increases the efficiency of conveying the adjudicated water to the irrigated fields. This will likely contribute to in-stream water savings.

Approximately 1 acre of Cottonwood copses will be planted in strategic locations in the riparian area downstream of the point of diversion to provide shade and future large woody material for the stream and floodplain. The cottonwood copses are intended to fill gaps and complement the existing buffer consisting of ponderosa pine, alder, willow, elderberry, golden currant, dogwood and several other native species. See attached visual for potential sites.

Significant restoration projects including water right purchases and floodplain and in-stream habitat restoration have been undertaken on Swauk Creek. The base streamflow has vastly improved, and side channels and spawning gravel upstream and downstream of this proposal have increased. This project aims to build upon existing efforts. Eliminating a point of diversion, consolidating and adequately screening the most senior water right on Swauk Creek is an invaluable action to protect ESA-listed steelhead and contribute to the vast amount of work that has been accomplished in Swauk Creek.

Given the immense use of Swauk Creek for spawning and rearing, this project is expected to increase steelhead productivity and benefit coho, Chinook, Pacific lamprey, bull trout, and a suite of resident fishes.

B. Provide a scope of work and detailed list of project deliverables.

Tasks	Entity Responsible	Deliverables	Schedule
Permit-level engineering design	KCCD, in cooperation with	Permit-ready design	Winter, 2019

	YTAHP Technical Work Group		
Final design	KCCD	Construction-ready design	Spring, 2020
Contracting	KCCD	Executed construction contract	Summer, 2020
Implementation	KCCD and WDFW Yakima Screen Shop	Diversion decommissioning, diversion consolidation, in-stream work, compliant fish screen, cottonwood planting	Fall, 2021

C. Explain how the sponsor determined cost estimates.

Cost estimates are based on similar projects completed recently by the KCCD or partners.

D. Describe the design or acquisition alternatives considered to achieve the project's objectives. *Why did the sponsor choose the preferred alternative?*

The design of this project will be straightforward. Two gravity diversions will be consolidated to a single, existing point of diversion. Since the consolidation site is existing, the amount of work required is minimized. The site will need to be re-worked to accommodate the consolidated diversion rate; modifications will likely include in-stream work, such as a roughened channel fishway and resizing the headgate and fish screen.

In order to achieve the consolidation, the irrigation water right associated with the lower diversion must be conveyed back to its existing delivery system. This will be achieved by converting the existing earthen ditch for the upper diversion to a pipeline with the capacity to convey all water diverted by the landowner. Consideration is being given to utilizing the existing delivery system for the lower diversion from its headgate. Since that diversion is on the left bank and the upper diversion is on the right bank, the water would have to be conveyed from the new pipeline (in the existing ditch alignment for the upper diversion) either under or over Swauk Creek at approximately the location of the lower diversion site. This appears at this conceptual design stage to be difficult due to topography and access. Instead, conveying the water further west (across Hwy 97) in the existing ditch for the upper diversion until it intersects the small spur road off Burke Road and then continuing the pipeline to the south adjacent to Burke Road for just the water right associated with the lower diversion, could allow that portion to rejoin the existing delivery system where it crosses Burke

Road. The option to convey the water through this route appears much more feasible, however the option to cross over/under the Creek at the lower diversion has not yet been completely eliminated. Cost remains a factor as does agreement from Kittitas County to utilize the ROW on Burke Road.

E. How have lessons learned from completed projects or monitoring studies informed this project?.

The fish screens were intended to be temporary, but the landowner has made long term commitment to farmland. The landowner is working with partners on grazing management, irrigation management, and riparian enhancements that build upon previous habitat improvement projects. Their commitment to maintaining open space and agricultural uses make this the appropriate time to revisit these diversions and ensure fish passage.

F. Describe the long-term stewardship and maintenance obligations for the project or acquired land.

The landowner has committed to continuing an existing Operations & Maintenance (O&M) contract with the Washington Department of Fish & Wildlife to maintain the day-to-day O&M associated with the diversions.

The cottonwood copses will be fenced to protect them from grazing cattle and elk, beaver, and other critters. They will be watered for 2-3 growing seasons to ensure their success. Survivability will be monitored and additional planting will occur, if determined necessary.

8. Explain why it is important to do this project now instead of later.

Swauk Creek is a high priority for steelhead and salmon recovery in the Upper Yakima Watershed. Lower Swauk Creek is extremely productive, providing important habitat for ESA-listed steelhead, juvenile chinook, coho, resident trout and possibly bull trout.

Under existing conditions, Swauk Creek is checked-up in two locations using tarps, wooden boards, and streambed material during the irrigation season to operate the gravity diversions and divert the water user's adjudicated water right. This creates two passage barriers for nearly half of the year. This proposal will eliminate one point of diversion and associated seasonal passage barrier, and re-work the consolidated diversion to reduce or eliminate the in-stream modifications required and allow for year-round fish passage for all life stages of salmonids.

The existing conditions limit ESA-listed steelhead production and impair habitat in lower Swauk Creek. Restored fish passage will benefit steelhead, coho, Chinook, bull trout and other native fishes.

A limiting factor documented in lower Swauk Creek is the degraded riparian habitat. This proposal will plant cottonwood copses at strategic locations, providing shade for the stream and a future source of large woody material for the stream and the floodplain.

9. If the project is a part of a larger overall project or strategy, describe the goal of the overall strategy, explain individual sequencing steps, and which of these steps is included in this application for funding.

Significant restoration projects including water right purchases and floodplain and in-stream habitat restoration have been undertaken on Swauk Creek. The base streamflow has significantly improved, and side channels and spawning gravel upstream of this proposal have increased. This project aims to build upon existing efforts. Consolidating and adequately screening two irrigation diversions, held by the most senior water right user on Swauk Creek, is an important action to protect ESA-listed steelhead and contribute to the vast amount of work that has been accomplished in Swauk Creek.

10. Describe the sponsor's experience managing this type of project.

The Kittitas County Conservation District has successfully managed numerous projects of this size and scope with funding through the Salmon Recovery Funding Board and various other agencies. We work directly with private landowners on a regular basis on irrigation, fish screening, fish passage and habitat improvement projects.

11. List all landowner names.

REDACTED

12. List project partners and their role and contribution to the project. *Attach a Partner Contribution Form (Manual 18, Appendix G) from each partner in PRISM. Refer to Manual 18, Section 3 for when this is required.*

Yakima Tributary Access & Habitat Program – technical expertise and assistance with project permitting

Washington Department of Fish & Wildlife – fish screening and passage expertise, operations and maintenance expertise

13. Stakeholder outreach.

The project does not have any known opposition. There are no public safety concerns. As the project develops, the project sponsor will reach out to adjacent landowners to ensure their cooperation in the project.

Supplemental Questions

Restoration Project Supplemental Questions

Answer the following supplemental questions:

A. Will the sponsor complete, or already completed, a preliminary design, final design, and design report (per Appendix D) before construction?
Yes

i. If no, please describe the design process and list all pre-construction deliverables submitted to RCO for review. Including riparian planting plans.

B. Will a licensed professional engineer design the project?
Yes *If not, please describe the qualifications of the design team.*

C. If this project includes measures to stabilize an eroding stream bank, explain why bank stabilization there is necessary to accomplish habitat recovery. *Bank stabilization criteria required to meet SRFB eligibility is in Section 2 of Manual 18.*

D. Describe the steps the sponsor will take to minimize the introduction and spread of invasive species during construction and restoration. *Specifically consider how the sponsor will use un-infested materials and clean equipment entering and leaving the project area.*

Fish Passage Project Supplemental Questions

A. Describe the passage problem (outfall, velocity, slope, etc.)

At the downstream point of diversion, the channel has incised and does not have enough slope or velocity to divert the adjudicated water. Under existing conditions, the irrigator checks Swauk Creek approximately 100-feet upstream of the point of diversion using galvanized panels and tarps, and directs the water into corrugated pipe where it is conveyed the ~100-feet downstream to the diversion. The in-stream modifications create a seasonal fish passage barrier.

At the upstream point of diversion, the irrigator checks the water using wooden dam boards and tarps to get enough depth to divert the adjudicated water. There are issues with sediment deposition at the headgate and the screen's fish bypass flowing backwards.

B. Describe the current barrier (age, material, shape, and condition).

Both barriers are seasonal and are only in place during the irrigation season. They are created using galvanized panels, tarps and wooden dam boards.

C. Is the current barrier a complete or partial barrier?

The current barriers are created during the irrigation season when the adjudicated water right is being diverted. They are likely full barriers during the low flow times and partial barriers the rest of the irrigation season.

D. If a culvert or arch is proposed, does it employ a stream simulation, no slope, hydraulic, or other design?

E. Describe the amount and quality of habitat made accessible if the barrier is corrected. Has the project received a Priority Index (PI) number? *If so, provide the PI number and describe how it was generated: Physical survey, reduced sample full survey, expanded threshold determination, or Washington Department of Fish and Wildlife generated PI (list source, such as a study or inventory).*

There are no other known barriers on Swauk Creek and there is no PI number.

Swauk Creek is highly productive and removal of an irrigation point of diversion and two seasonal fish passage barriers will directly contribute to increased salmonid production.

F. Identify if there are additional fish passage barriers downstream or upstream of this project.

There are no know fish passage barriers below or above these diversion points.

G. Engineering licensing requirement. *Will a licensed professional engineer design the project?* Yes *If not, please describe the qualifications of the design team.*

Diversions and Screening Project Supplemental Questions

Answer the supplemental questions below.

NOTE: For questions or technical assistance, contact Danny Diedrickson, Department of Fish and Wildlife, (509) 571-5559. Refer to the Washington Department of Fish and Wildlife's *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* for further guidance. To schedule fish passage and diversion inventory and assessment training, contact Christy Rains, Department of Fish and Wildlife, (360) 902-2574.

A. Problem statement information to include in Item 3 in Appendix C-1 of main questions above: *If the diversion is equipped with a fish screen, provide details of why it is not functioning properly from a fish protection perspective (entrainment or impingement).*

The diversions proposed for consolidation are currently screened, but are not functioning correctly and subsequently do not meet NMFS and WDFW fish screening and passage criteria. The screens were installed in 2007 and were intended to be a temporary screening fix until further study was completed. The upper point of diversion has a fish screen, but the fish bypass backwaters the screen and the irrigator must block it to be able to divert for part of the year. At the downstream point of diversion, considerable in-stream work must be done annually to operate the diversion due to topography and channel incision. This in-stream work results in a seasonal fish passage barrier during the irrigation season, every year. Due to the topography of the site and the amount of in-stream work that would likely be required to make the point of diversion operational in accordance with NMFS and WDFW, this point of diversion will be eliminated with implementation of this project.

B. Has the project received a Screening Priority Index (SPI) number*? If yes, provide the SPI and indicate if the Washington Department of Fish and Wildlife developed the SPI.*

There is no SPI calculated for this site.

C. Is this a pump or gravity diversion?

Both are gravity diversions.

D. What is the flow of the diversion in gallons per minute (gpm)? *How was the flow determined (water right, meter–system meter, calculated from irrigation system components or direct measurement during peak spring/summer diversion using a flow meter)?*

The flow of the consolidated diversion will be 1572 gallons per minute. The water rights for this project are as follows:

Lower Diversion (two rights are excised in rotation, so 2 CFS is max diversion amount)

Certificate # S4-83890-J		
Irrigation of 78.4 Acres	2.0 CFS and 588 Acre-Ft	Priority Date: 6/30/1878
Certificate # S4-83930-J		
Irrigation of 20 Acres	2.0 CFSand 150 Acre-Ft	Priority Date: 10/31/1878
Upper Diversion:		
Certificate # S4-84343-J		
Irrigation of 19.8 Acres	1.5 CFS and 148 Acre-Ft	Priority Date: 6/30/1878

E. If it is not possible to determine the flow, then provide the bank-full, cross-sectional area of the ditch, measured 100-300 feet downstream of the point of diversion. *Refer to Section 8.3 of the Washington Department of Fish and Wildlife's Fish Passage Barrier and Surface Water Screening Assessment and Prioritization Manual for instructions on how to collect this information.*

F. For projects that have a goal of saving water:

i. Describe the mechanism that the sponsor intends to use to conserve water (trust, etc.) and explain why this is the preferred approach.

The mechanism to be used is a donation to the Trust Water Rights Program for a specified period of time.

ii. Which steps in the water conservation process will this project proposal complete?

The landowner will submit a Trust Water Rights application for the agreed upon volume of donated water as part of the landowner agreement for the project.

iii. How much water, if any, will be saved because of this project? By what methods are you calculating the amount of water conserved?

The saved water calculations will be based on the length of earthen ditch converted to a pipeline and the Natural Resources Conservation Service protocol ("Farm Irrigation Rating Tool") for determining water savings based on soil type. This estimation will be confirmed by flow measurements that calculate the actual loss at various flow rates.

G. Will a licensed professional engineer design the project? Choose an answer
If not, please describe the qualifications of the design team.

Yes, a licensed professional engineer will design the project.

Comments

Use this section to respond to the comments received after the initial site visits, and then again after submitting the final application.

Response to Site Visit Comments

Please describe how the sponsor responded to the review panel's initial site visit comments. *List each review panel comment and question and identify the response. Use this space to respond directly to the comments or refer to changes in the proposal.*

TAG and CC Comments and Responses:

What is the diameter of the pipe?

The current project plans call for 1400 feet of 14" and 1250 feet of 10" PVC pipe.

Consider a flat plate screen on the diversion.

A flat plate screen will be considered. NMFS fish screening criteria requires diversions of 3cfs or greater to have active cleaning. The consolidated diversion rate for the project is 3.5cfs, therefore active cleaning, such as a brush on a trolley, would need to be installed. This would likely require pulling power to the site, which may significantly increase the cost of the project.

What is the life expectancy of a fish screen?

The practice life of a fish screen as stated in the Field Office Technical Guide for USDA Natural Resources Conservation Service is 15 years. There are several factors that influence the life of a fish screen, such as the type of material, quality and frequency of maintenance, site specific conditions such as flooding around the screen, sediment and debris load in the stream, etc.

Would like to have more detail on exactly where the cottonwood copses are proposed and if more diversity of plant species has been considered?

The cottonwood copses are proposed on the landowner's property downstream of Highway 97. There is a diverse riparian buffer consisting of ponderosa pine, alder, willow, elderberry, golden currant, dogwood and several other native species. The cottonwood copses are planned in locations where there is a gap in the riparian vegetation and are intended to complement the existing buffer. There are local efforts

to boost cottonwood recruitment in the Upper Yakima and this will supplement those efforts. The cottonwood will provide shade and a future source of LWD for Swauk Creek.

Some reviewers heard from the landowner that the ditch would remain open until after it crossed Hwy 97, at which point it would be piped, but heard from the project sponsors that it would be piped from the upper point of diversion—please provide more clarity on this and ensure that the landowner and project sponsors are on the same page.

Originally the discussion included piping the ditch from the diversion all the way through to Burke Road, by sleeving the existing culvert at Hwy 97. The landowner now prefers that the ditch be piped from the diversion to that culvert, and then after, but not tight lined through it. This is being incorporated into the project designs.

Please describe the orange barriers that are installed each season. Are they total fish barriers? During what months do they block fish passage?

Tarps (that are orange in color) and T-posts are installed perpendicular to Swauk Creek at each point of diversion to check the water for the irrigation diversions. The tarps are installed as the hydrograph recedes which varies from year to year. Generally, they are installed in mid- to late June and remain in place until mid- to late October when the irrigation season ends. The tarps form two full passage barriers to adult and juvenile fish in Swauk Creek.

Are the screens for both diversions non-functional during smolt outmigration?

The screens keep smolts out of the irrigation infrastructure, however the fish bypasses are problematic. At the upstream diversion the bypass flows backwards when Swauk Creek flow is elevated in the spring, which is when smolt are out-migrating. Therefore the upstream diversion fish bypass is not adequate when smolt are out-migrating.

At the lower diversion, the irrigator has issues getting enough water to the screen for it to function properly, resulting in minimal flow in the fish bypass. In addition, the bypass outfall is perched due to channel migration after the screen was installed. Therefore the downstream diversion fish bypass is not adequate when smolt are out-migrating.

State Review Panel Comments

1. **The proposal could be improved by strengthening the project objectives as follows:**
   - **Articulate the goal of "… increasing irrigation efficiency, resulting in saved water instream to benefit instream flow," as a SMART objective.**

Use the information provided in the answer to Supplemental Question F (p. 14) to develop this objective. Addressed on pages 5 and 14.

- **Provide metrics for the objective of planting cottonwood copses at strategic locations. How much area will be planted (acres)? What are the criteria for determining the strategic locations?** Addressed on pages 5 and 7 and in the attached visual titled "Potential cottonwood copse locations".

2. **Elaborate on the plans for converting the exiting diversion ditches east/upstream of Burke Road to a pipeline. Will either or both of the ditches be filled in? During the site visit we observed wetland conditions along the north/right bank ditch. Will mitigation be required for loss of wetland function if the flows are piped and/or ditches filled?** Wetlands present and any wetland mitigation will be addressed through the acquisition of the US Army Corps of Engineers Section 404 permit and by the Department of Ecology's Section 401 Water Quality Certification. We are aware that the Corps and Ecology have been requiring that wetlands within a project be delineated and rated. The wetland information is then included in a Restoration Plan that is submitted with the permit package. The Corps will require an overall lift in wetland function and that will be considered as the project design moves forward.

3. **At the site visit the sponsor discussed routing the new pipeline to serve the left bank (south) part of the property under Swauk Creek through a siphon, while the proposal states that it will cross the creek along the Burke Road alignment. Please clarify: can the pipeline utilize the existing road crossing or is a separate siphon needed?** Both options are still being considered although we are strongly leaning toward using the road right-of-way. This question is further addressed on pages 8 and 9.

Response to Post-Application Comments

Please describe how the sponsor responded to the review panel's post-application comments. *List each of the review panel's comments and questions and identify the response. Use this space to respond directly to the comments or refer to changes in the proposal.*