Peshastin Irrigation District Pump Exchange Project, ~~Conceptual~~ Preliminary Design

Chelan County Natural Resources Department
411 Washington St. Suite 201, Wenatchee, Washington 98801
Mike Kaputa - Director, (509) 667-6533, Mike.Kaputa@CO.CHELAN.WA.US
PRISM #16-1787

Anticipated Request - SRFB:	$ 169,484
Anticipated Request - Tributary Committee:	$ 29,909
Anticipated Request for Proposal:	**$ 199,393**
Anticipated Other Funding/Contributions/Matches:	$ ~~10,000~~ 0 ~~(Chelan County)~~
Anticipated TOTAL Project Budget:	**$ ~~209~~199,393**

RTT Comments and Applicant Responses

Casey – During low flows there isn't 50 cfs in the Creek and the most biological benefit would be during the 60 to 75 day low flow period when there is usually 20-30 cfs in the creek. Cost benefit would suggest something less than the capacity to pump 50 cfs for the entire irrigation season.
Response: Exhibit 1 in the application summarizes the sizes, durations, and associated project costs for those alternatives that have been recently considered for comparison. The project included in the final proposal would focus on a 30-cfs pump station that would deliver water during a 60- to 75-day low flow period to address this comment.

Jeremy – Is it possible to have a sliding scale model, i.e., if creek hits 20 cfs at diversion, entirely pumpback? Dynamic across the years, using recent years' data to model, then get at cost. Infrastructure costs the same? could you scale it with trigger at diversion, built to max of what is allow but run all season?
Response: The pump station could be designed to operate at up to the maximum capacity and the delivery and duration could vary to match instream flow needs. For example, the system could be designed to operate when flows in Peshastin Creek are less than 20 cfs, assuming operating costs can be covered for longer pumping durations and varying pumping rates. The project included in the final proposal would focus on a 30-cfs pump station that would deliver water during a 60- to 75-day low flow period to address this comment.

Jeremy - how do these diversions affect return flows to icicle?
Response: This is primarily an operational question. The Peshastin Irrigation District (PID) Canal relies on supplemental flows delivered during the late summer from the Icicle Irrigation District (IID) Canal through a siphon that extends from a bifurcation structure on the IID Canal under Highway 97 and Peshastin Creek to the PID Canal. The supplemental water from the IID Canal is Icicle Creek water. Operation of the bifurcation structure and delivery of supplemental water to the PID Canal requires spilling excess water through a spill pipeline to Peshastin Creek to balance inflows and outflows. Operation of the siphon also results in release of excess water at a valve in Peshastin Creek. Pump Station flows could potentially reduce supplemental flow conveyed from the IID Canal and reduce the need to spill excess water. The proposal would evaluate the potential for revising the operation of the bifurcation and siphon to reduce or eliminate discharge of excess flows from the IID Canal to Peshastin Creek.

Kate – Is the proposal being amended from a preliminary design to 30%?
Response: Yes, the proposal includes developing 30%, or preliminary, design. We had confused the terminology. The proposal has been revised to replace references to "conceptual" with "preliminary".

Brandon – what is the maximum can withdrawal?
Response: PID currently diverts up to 50 cfs from Peshastin Creek. They maintain a minimum instream flow of at least 3 cfs past their diversion.

Jeremy – looked at thermal refugia for Peshastin, functioned well until flows went down to 2-3 cfs. So not interested in 30 or 60 day, but more flow dependent or full season. Trigger would have to be in 20-30 cfs range.

Response: See previous responses. The project included in the final proposal would focus on a 30-cfs pump station that would deliver water during a 60- to 75-day low flow period to address this comment.

Chuck – the longer you can maintain the most amount of water will have best biol benefit.

Response: See previous responses.

Casey – liked Jeremy's idea, but need to see an example of triggers for flow and timing. The 2nd alternative on the handout, 30 days, not significant biologically if flows are critical for 60-75 days. But if the proposal included an analysis of the hydrograph in low flow years, that would help evaluate how many days, or some dynamic trigger.

Response: See previous responses.

Jeremy – build 27 cfs pump and set trigger at 30, when hits 30 at diversion, take all 27 out of Wen. Probably the middle ground. If cheaper than full season, might be middle ground with caveat that we try to get icicle water out of there.

Response: See previous responses.

Casey – run that data through hydrograph to show how often that will happen, when it will happen in drier years, gives more operational certainty.

Response: See previous responses. Additional hydropgraph data is provided with the revised proposal.

Joe L – O & M costs figured in, but does low-flow 30-day alternative include O & M for two systems?

Response: O&M costs shown are for the pump exchange system only. PID would still incur O&M for maintenance of canal system. They would still need to operate their diversion and canal upstream of the pump exchange system outside the pumping period. No significant reduction is current O&M of the ditch system is anticipated as a result of the pump exchange project.

General comments from the 3pm session:

- Need to add row to table of current O & M costs including price per share and number of share holders
- Bracket different designs, costs, etc. at different cfs
- On-demand pumpback would be more efficient than full season pump and dump; pumpback for part of year can be ramped up if built to maximum capacity

Response: The system would be designed for flexibility so that it could be operated on-demand, as determined by the operator and instream flow needs. For example, the system would be designed to allow for variable flow rate and pumping duration up to a maximum capacity to more closely match instream flow needs and irrigation demand.

Summary of Revisions from Draft Proposal

The following revisions were made to the proposal in response to RTT comments provided on the draft proposal:

- Language was revised so that the project included in the final proposal would focus on a 30-cfs pump station that would deliver water during a 60- to 75-day low flow period in response to comments about the capacity and ability of the pump station to respond to varying flow conditions in Peshastin Creek.
- Exhibit 1, which lists and compares the costs and benefits of the alternatives that have been recently considered for this project, was updated to include an alternative that would be comprised of a 30-cfs pump station that would deliver water for up to 75 days during the late summer low flow period from the Wenatchee River to the PID Canal. The alternative identified in this proposal is highlighted in blue.
- Figures 3 and 4 were added to provide additional background about the hydrology in Peshastin Creek.
- Reference to "conceptual" design were changed to "preliminary" design because the intent is to carry the design forward to the 30% complete stage.
- The intent of the project and projected benefits were clarified in responses to RTT questions and comments.

	Questions	Answers	Information Resource
REGIONAL INFORMATION			
1	What Upper Columbia subbasin is the project in?	X Wenatchee ☐ Entiat ☐ Methow ☐ Okanogan	
2	What project category is your project?	☐ Restoration X Design Only ☐ Restoration/Protection ☐ Protection ☐ Assessment	
3	What Assessment Unit is the project in?	Peshastin Creek (PES)	*Click Here for Assessment Unit names*
4	What rank restoration and/or protection priority is the assessment unit the project is located in?	Priority Area Designation = Priority 2 AU Restoration Priority = 4 AU Protection Priority = 4	*Click Here for table of Assessment Unit ranks*
5	What is the primary species the project will target?	(Choose one) ☐ Steelhead X Spring Chinook X Bull trout	
6	What secondary species will the project will target?	(Choose one or more if applicable.) X Steelhead ☐ Spring Chinook ☐ Bull trout ☐ Other (please name)	
7	What regional PCSRF Metrics will be implemented with this project?	*Outcome 1: 2.4 miles [RM 2.4-RM 0] flow improvement in Peshastin Creek* *Outcome 2: Up to ~~20~~ 30 cfs flow benefit while pumping facilities are in operation (assumed pumping duration of ~~at least 4 weeks~~up to 75 days of pumping in late summer)*	*Click Here for regional PCSRF Metric definitions*
8	What Primary Ecological Concern does the Project Address? (not required for protection projects)	Water Quantity	*Click here for Ecological Concern definitions*
9	What other Ecological Concerns does the Project Address (not required for protection projects?	Habitat Quantity	*See above*
10	What is the rank priority of the primary ecological concern this project addresses in the assessment unit it occurs (not required for protection projects)	Peshastin Creek, Water Quantity = 1	*Click here for table of Ecological Concern ranks by assessment unit*

Regional Technical Team - Summary Information

Click here for complete RTT scoring criteria

	QUESTION	SUMMARY INFORMATION
1	In one sentence, what is the purpose of your project?	The purpose of this project is to increase late summer flows in lower Peshastin Creek by up to ~~20~~ 30 cfs by providing an alternate point of diversion for irrigation on the main stem Wenatchee River.
2	Location of the Restoration Project	The flow improvement will occur downstream of the Peshastin Irrigation District diversion at RM 2.4 on Peshastin Creek to its confluence with the Wenatchee River and extend to the proposed pump station location at RM 16.5 on the Wenatchee River.
3	In one sentence, identify what you are going to do	Complete ~~conceptual~~ preliminary design for proposed pump exchange facilities that will deliver up to ~~20~~ 30 cfs from the Wenatchee River to the Peshastin Irrigation District Canal for irrigation during the late summer critical low flow period to allow for a corresponding reduction in diversions from Peshastin Creek.
4	How long will it take for the benefits of the project to be realized and how long are they estimated to persist?	The flow improvement would be available when the project is constructed and operational and would persist as long as the pump station is in operation.
5	Benefits to Freshwater Survival or Capacity	The project will increase flows at critical sections of stream channel in lower Peshastin Creek. Low flow through critical sections of the creek is a limiting factor for fish passage for Chinook salmon and bull trout, spawning habitat for Chinook salmon, and rearing habitat for Chinook salmon, bull trout, and steelhead. A weighted useable area (WUA) analysis completed as part of prior studies indicates that increasing late summer flow by 20 cfs will improve passage and increase habitat abundance by approximately 4 times.

Citizens Advisory Committee – Ranking Criteria and Summary Information For complete CAC ranking criteria click here	
CRITERIA	**SUMMARY INFORMATION**
Criterion 1: Benefits to Fish and Certainty of Success (60 pts. as a weighted percentage based upon RTT score)	
Is the project consistent with the Recovery Plan Implementation Strategy?	Yes. This project addresses a priority action in a priority area with priority fish species. The project addresses habitat rearing and access issues for 3 listed fish species; Chinook salmon and bull trout and steelhead. The area impacted is within the historical use area for all three species and would potentially improve limiting habitat for all 3 species.
Is the project/assessment based on proven scientific methods that will meet objectives?	Yes. An appraisal study was completed that evaluated instream water needs for Chinook salmon, bull trout, and steelhead. The analysis was completed by a fisheries biologist using proven scientific methods. The analysis indicated that the additional flow would improve passage and significantly increase useable habitat in lower Peshastin Creek.
Are there any obstacles that could delay the implementation of this project or study (e.g. permitting, design)?	The proposed ~~conceptual~~ preliminary design study will can be completed within 18 months of funding approval. The only obstacle that could delay completion of the ~~conceptual~~ preliminary design study is cooperation of private property owners that would be impacted by the proposed project.
Criterion 2: Project Longevity (30 points)	
Who has the responsibility to manage and maintain the project? What is the responsibility of current or future landowners?	Peshastin Irrigation District will operate and maintain the proposed pump exchange facilities. Part of the ~~conceptual~~ preliminary design process will include coordination with impacted property owners to determine whether the design concept will need to be adjusted to secure easements for the proposed project and define the conditions that would be addressed in those easement agreements.
Has the sponsor successfully implemented projects in the past?	Yes. Chelan County Natural Resources Department has implemented numerous projects that have improved stream flows and habitat conditions in the Wenatchee River Watershed.
Are the benefits associated with the project in perpetuity? *Will the project last only a few years?	Yes. As long as the pump exchange facilities are operated, the project will provide benefit to late summer flows in lower Peshastin Creek.
Is there a high risk of failure associated with this project?	No. The risk of failure is similar to other irrigation diversion improvement projects that involve pumping from surface water and conveyance.
Criterion 3: Project Scope (15 points)	
How much habitat is being protected or gained?	The flow improvement will occur downstream of the Peshastin Irrigation District diversion at RM 2.4 on Peshastin Creek to its confluence with the Wenatchee River and extend to the proposed pump station location at RM 16.5 on the Wenatchee River.
Are threats imminent?	No.
Is the scale of the proposed action appropriate?	Yes.
Criterion 4: Community Support (25 points)	

*Has there been public outreach about this project to assess the level of community support? *Does the project build community support for salmon recovery efforts? *Is there any community outreach planned during and/or after implementation?	Yes. There was limited public outreach during prior studies and evaluation of the project alternatives. The project does build on community support for salmon recovery efforts and pairs nicely with projects being implemented elsewhere in the Wenatchee River Watershed. The project builds on prior efforts of Peshastin Irrigation District to improve efficiency and reduce diversions from Peshastin Creek. Additional outreach would be completed as part of the ~~conceptual~~ preliminary design.
Has the project sponsor secured landowner participation or acceptance?	No. Impacted landowners have been identified and Peshastin Irrigation District has had ~~conceptual~~ preliminary conversations with the key property owners, but additional work will be required during ~~conceptual~~ preliminary design to determine the willingness of these landowners to grant easements.
Will there be public access?	No. Proposed pumping facilities will be secured with a fence or other secure devices to protect the public and prevent damage to the facilities.
Will the project create benefits or raise concerns for particular groups or the community at large?	The project will create significant benefits for fish and is intended to benefit the community at large.
What is the breadth and strength of the partnership supporting the project (technical support, financial, and in-kind contributions, labor)?	There is support for the project from Peshastin Irrigation District and local stakeholders, including other water users in the Wenatchee River Watershed.
Criterion 5: Economics (20 points)	
Does the project represent an opportunity for economic benefit?	Design and construction of the project would provide economic benefit for those contracted to do the work. The project will also provide economic value associated with improved fish passage and habitat.
Will this project help the region move closer to delisting or reduce regulatory intervention?	The project will provide benefit to ESA-listed Chinook salmon.
Is the project budget clearly defined and reasonable?	The project budget for ~~conceptual~~ preliminary design is clearly defined and reasonable.
How much benefit does the project create for the dollars invested?	The estimated project implementation cost compared to the increase in flow provided in lower Peshastin Creek during the late summer is favorable ($~~145~~118,000 per cfs).

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APPENDICIES

Appendix A. *New* Response to comments (*Final Proposal Only*)
Appendix B. GSRO Checklist (completed)

a. Draft GSRO Proposal Checklist
b. Final GSRO Proposal Checklist

Final Application Checklist

In PRISM Online, select "check page for errors" on each page, or "selection application for errors" on the "Submit Application" page to make sure all fields are complete.

✓ PRISM Online Attachment Checklist Items	Template / Form Link
Project Cost Estimate. RCO recommends using our template or similar format. Attach in PRISM and clearly label "Cost Estimate." NEW – include agency indirect in your estimate.	Cost Estimate attached in PRISM
Salmon Project Proposal	Pages 1-10
Landowner Acknowledgement Form (required for projects occurring on land not owned by applicant or which are on state-owned aquatic lands)	Appendix F
Project Partnership Contribution Form. State agencies are required to have a local partner; also suggested for organizations other than the applicant (third party) providing match.	Appendix G
Maps • General vicinity map for all projects • Area of potential effect map for all projects • Site plan for restoration projects • Parcel map for acquisition projects	Figures 1 and 2
Design Materials for Restoration Projects. NOTE that preliminary designs ARE REQUIRED for projects requesting $250,000 or more in SRFB funds.	N/A
Response to Review Panel Draft Application Comments. Applicants must respond to review panel comments by updating their project proposals and PRISM.	See Revised Proposal (After Cover Page)
Project Photographs. At least two photographs of site conditions before project implementation are required in .jpg file format.	Page 11
Barrier Evaluation Forms and Correction Analysis Forms (fish passage projects only)	N/A
Intensively Monitored Watershed Certification, if relevant.	Region or Lead Entity Creates
Deliverables from Previous Phases of Work (for phased projects)	N/A
Other Materials (optional) Waiver of Retroactivity, graphs, parcel maps, letters of support, etc.	See Revised Proposal
Regional Organization Monitoring Project Certification (for regional monitoring projects)	N/A
SRFB Application Authorization	Appendix J
RCO Fiscal Data Collection Sheet	Appendix I

Planning and Combination (Planning and Acquisition) Project Proposal

Project Number	PRISM 16-1787
Project Name	Peshastin Irrigation District (PID) Pump Exchange, ~~Conceptual~~ Preliminary Design
Sponsor	Chelan County Natural Resources Department

List all related projects previously funded or reviewed by RCO:

Project # or Name	Status	Status of Prior Phase Deliverables and Relationship to Current Proposal?
Peshastin Irrigation District Pump Exchange Feasibility and Design	Not funded	

If previous project did not receive funding, describe how the current proposal differs from the original.

Since 2013, a comprehensive evaluation of an additional 12 pump station configurations has been studied and a comparison of common financial metrics has been developed. This information is summarized at http://www.co.chelan.wa.us/natural-resources/pages/icicle-creek-current-project-development (see Exhibit 1 for a summary). The project proposed in this application would benefit flows in Peshastin Creek, which is a high priority, and is scalable to benefit Icicle Creek in the future, if appropriate. The proposal would include review with the RTT and resource agencies during ~~conceptual~~ preliminary design. In addition, the Scope of Work would focus on ~~conceptual~~ preliminary engineering of the proposed pump station and delivery facilities. Restoration of Peshastin Creek would be addressed as a separate project.

PID has a valid water right to divert water from Peshastin Creek. There is no intent by PID to augment its diversions from Peshastin Creek as a result of this project. Diversions from Peshastin Creek will be reduced by the rate of water pumped to the PID Canal from the Wenatchee River. A metering and monitoring plan and a draft Trust Water Agreement are now included in the proposal to ensure that the project provides the intended instream flow benefit.

Since 2013, the Ecology Office of the Columbia River has funded a preliminary evaluation of long-term operating cost funding options. Several federal, state, and local options have been identified. Further evaluation to select a preferred alternative has been funded by OCR this biennium. Given that several pump exchange projects exist that have navigated this issue where exclusive fish benefits are the intended beneficial use, this should not be a barrier moving forward.

1. **Project location.**

The proposed pump station would be located on the Wenatchee River near RM 16.5. The project would provide flow benefit to Peshastin Creek, below the PID diversion at RM 2.4, and to the Wenatchee River, from its confluence with Peshastin Creek to RM 16.5.

2. **Brief project summary.**

The PID Pump Exchange project would enable delivery of irrigation water to the PID Canal directly from a pump station on the Wenatchee River during the late summer when flows in Peshastin Creek are low. Use of the pump station would reduce diversions from Peshastin Creek, which will increase flows in lower Peshastin Creek to improve passage and habitat for Chinook salmon, bull trout, and steelhead.

PID currently diverts up to 50 cfs from Peshastin Creek for irrigation approximately 2.4 miles upstream of its confluence with the Wenatchee River (See Figure 1 – Location Map). An appraisal study was prepared in 2012 to evaluate alternatives for pumping water from the Wenatchee River to the PID Canal (See Figure 2 – Preliminary Alternatives, PID Pump Exchange). A preferred alternative (Alternative 1) was selected that would include a pump station on the right bank of the Wenatchee River at Dryden, near RM 16.5.

The work proposed as part of this application would include ~~conceptual~~ preliminary design for the pump exchange project. ~~Conceptual~~ Preliminary design work will include additional coordination with resource agencies, review with stakeholder groups, additional site investigations, environmental and permitting review, engineering analyses, development of cost analyses, and preparation of a ~~conceptual~~ preliminary design report with ~~conceptual~~ preliminary (30% complete) drawings.

3. **Problems statement.**

A. Describe the problem including the source and scale.

PID currently diverts up to 50 cfs from Peshastin Creek for irrigation. Diversions are typically greatest from early June through the middle of August. Diversions are typically reduced to less than 30 cfs during the late summer when flows drop in Peshastin Creek. Late summer flows in Peshastin Creek typically fall to less than 30 cfs upstream of the diversion and less than 10 cfs downstream of the diversion. Annual flows measured by Ecology in Peshastin Creek are plotted in Figure 3 upstream of the PID diversion (at Ingalls Creek) and downstream of the diversion (at Green Bridge Road). A hydrograph showing the minimum, maximum, and average flows in Peshastin Creek downstream of the diversion is attached as Figure 4.

The diversion from Peshastin Creek contributes to low flow conditions in lower Peshastin Creek that limit fish passage, increase water temperature, and reduce spawning and rearing habitat. Summertime Chelan County has been working with PID

to identify and implement projects designed to improve efficiency and increase late summer flows in Peshastin Creek. PID has implemented water conservation projects (piping projects) to reduce its diversion and has an agreement to maintain a minimum flow through the fishway at its diversion dam.

Low flow in lower Peshastin Creek is a limiting factor for passage for Chinook salmon and bull trout, spawning habitat for Chinook salmon and steelhead, and rearing habitat for Chinook salmon, bull trout, and steelhead. Water quantity is the highest priority ecological concern to be addressed in Peshastin Creek. The Biological Strategy recommends "a project to design and implement pumping from the Wenatchee River to reduce irrigation water withdrawals from Peshastin Creek" as the highest priority habitat action in Peshastin Creek. Additional flow is needed in Peshastin Creek downstream of the PID diversion to improve passage and habitat conditions for bull trout, Chinook salmon, and steelhead. The increased flows would improve late summer fish passage, spawning, and rearing conditions in lower Peshastin Creek.

In addition, during the late summer, diversions to the PID from Peshastin Creek are supplemented by flow from a bifurcation structure and siphon connected to the Icicle Irrigation District (IID) Canal, which is diverted from Icicle Creek. Operation of the bifurcation and siphon requires spilling water from the bifurcation to Peshastin Creek. Water is also discharged through a relief valve from the siphon to Peshastin Creek.

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

Table 1 - Fish Resources Present at the Site

Species	Life History Present (egg, juvenile, adult)	Current Population Trend (decline, stable, rising)	Endangered Species Act Coverage (Y/N)
Spring Chinook	Egg, juvenile, adult	Stable	Endangered
Steelhead	Juvenile, adult	Stable	Threatened
Bull Trout	Juvenile, adult	Stable	Threatened

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

Peshastin Creek has been designated as a Priority 2 area with a major spawning population of steelhead, a minor spawning population of Spring Chinook, and a core area for bull trout. Priority actions for lower Peshastin Creek include increasing instream flow and channel complexity. Several wide riffles in the lower 2 miles of Peshastin Creek pose barriers to migrating adult Chinook due to shallow depths. Low summer flows also limit rearing habitat for Chinook, bull trout, and steelhead. The proposed project will increase late summer flow and the depth of water in lower Peshastin Creek downstream of the PID diversion through wide riffles that currently pose barriers to migrating adult Chinook. The

increased flows will also benefit spawning habitat for Chinook and will improve rearing habitat for Chinook, bull trout, and steelhead.

6. Project goals and objectives.

A. What are your project's goals?

The goal of the project is to increase instream flow in lower Peshastin Creek during the late summer critical low flow period to improve passage and habitat conditions for Chinook salmon, bull trout, and steelhead.

B. What are your project's objectives?

The objectives of the project include:

1. *Establish a pump station that will deliver up to ~~20~~ 30 cfs to the PID Canal for irrigation during the late summer critical low flow period.*
2. *Reduce surface water diversions and increase flows in lower Peshastin Creek by up to ~~20~~ 30 cfs during the late summer critical low flow period to improve passage conditions for Chinook salmon and bull trout, spawning habitat for Chinook salmon, and rearing habitat for Chinook salmon, bull trout, and steelhead.*

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

Work completed to date has identified a preferred alternative for a pump station location on the right bank of the Wenatchee River near RM 16.5 (see Alternative 1 on Figure 2). Additional site investigations are needed to verify that topography, flow conditions, and geology at the preferred pump station location and along the delivery pipeline alignment are suitable. In addition, further outreach and coordination with impacted property owners is needed to determine whether easements and property can be secured for construction and long-term operation.

Instream flows and potential benefits to fish passage and habitat have been evaluated. Additional coordination is needed to review the project and proposed instream flow benefit with resource agencies and other stakeholder groups to identify and address potential concerns. In addition, a monitoring plan and draft Trust Water Agreement will be developed as part of the ~~conceptual~~ preliminary design to further establish the instream flow benefit for lower Peshastin Creek. Environmental review, coordination with regulatory agencies, and identification of permit requirements will also need to be completed as part of the ~~conceptual~~ preliminary design.

Opinions of probable project implementation and long-term costs were prepared. Those costs will need to be refined to reflect the preliminary design. In order for the project to succeed, funding for long-term operating costs will need to be identified. Work has been completed, with funding from OCR, to evaluate options for funding

long-term O&M for pumping projects that benefit fish. Additional work has been funded by OCR during the current biennium to further evaluate these options and identify a preferred option.

7. Project details.

A. Provide a narrative description of your proposed project.

The PID Pump Exchange project would result in the construction of a pump station on the Wenatchee River and a delivery pipeline that would supply up to ~~20~~ 30 cfs for irrigation to the PID Canal during the late summer. Use of the pump station would be coupled with a corresponding reduction in diversions from Peshastin Creek, which would increase flows in lower Peshastin Creek (up to ~~20~~ 30 cfs) and improve passage and habitat for Chinook salmon, bull trout, and steelhead. PID provides water for irrigation to the south side of the Wenatchee River Valley from Peshastin Creek down to the town of Cashmere. PID diverts up to 50 cfs from Peshastin Creek approximately 2.4 miles upstream of its confluence with the Wenatchee River. Due to diversions and natural fluctuations in flow, late-summer flows in lower Peshastin Creek downstream of the PID diversion often fall below 10 cfs. Instream flow analyses have indicated that higher flows are needed to provide adequate fish passage conditions and improve habitat quantity and quality for Chinook salmon, bull trout, and steelhead.

An Appraisal Study (Anchor QEA, December 2012) was completed to evaluate alternatives for pump exchange facilities on the Wenatchee River near Dryden (See Figure 2 – PID Pump Exchange Alternatives. That study identified a preferred alternative (Alternative 1), which would include the following:

- *A pump station on the right bank of the Wenatchee River near Highway 2, approximately 7,250 feet downstream of the confluence with Peshastin Creek, near RM 16.5;*
- *A 1,240-foot delivery pipeline from the pump station to the PID Canal; and*
- *A delivery structure at the PID Canal.*

Additional facilities were identified that would enable delivery of flows to the Icicle Irrigation District Canal, which runs parallel to the PID Canal at a higher elevation. Further refinement of that concept was developed in more recent studies completed to support the Icicle Work Group process. The Appraisal Study recommended further study of the preferred project alternative, including development of more refined operational recommendations, property owner coordination, site investigations, a more detailed environmental and permitting review, more detailed design analyses, a refined cost analysis, and development of ~~conceptual~~ preliminary (30 percent complete) design drawings.

The work proposed under this application would result in ~~conceptual~~ preliminary design of a preferred pump exchange project that would deliver water from the

Wenatchee River to the PID Canal to provide instream flow benefit in Peshastin Creek during the late summer. The ~~conceptual~~ preliminary design would consider the potential for designing the project to be scalable to expand delivery to Icicle Irrigation District to benefit Icicle Creek in the future, if appropriate. The preliminary design work would also evaluate operations and determine whether supplemental flows from the IID Canal could be reduced and whether operational discharges of Icicle Creek water to Peshastin Creek could be reduced.

B. Provide a scope of work.

Table 2 - Proposed Scope of Work

Task	Description	Timeline	Responsible Party	Deliverables
1	Property Owner Coordination: • Work with PID to schedule meetings with impacted private property owners. • Identify property owner concerns and identify impacts to the design concept	May 2016 – Sep 2016	CCNRD, Engineering Consultant	Meeting Notes
2	Instream Flow Benefit Coordination: • Meet with staff from the Washington Department of Fish and Wildlife (WDFW) and other resource agencies to review the project and identify and address concerns. • Present information on potential benefits to fish passage and habitat to stakeholder groups and identify and address concerns. • Prepare a metering and monitoring plan and draft Trust Water Agreement. • Work with PID to identify potential operational improvements to minimize or reduce discharge of Icicle Creek water to Peshastin Creek from the operational spill at the bifurcation or at the relief valve on siphon that conveys water from the Icicle Irrigaition District Canal to the PID Canal.	May 2016 – Oct 2016	CCNRD, Fish Biology and Engineering Consultants	Meeting Notes
3	Site Investigations: • Complete topographic survey of the preferred pump station location and pipeline alignment. • Complete detailed geotechnical investigations of the pump station location and pipeline alignment.	Sep 2016 – Dec 2016	Engineering Consultant	Topographic Survey Base Map, Detailed Geotechnical Memorandum
4	Detailed Environmental and Permitting Review:	Sep 2016 – Dec 2016	Environmental and Engineering Consultant	Field Notes, Written Permitting

Task	Description	Timeline	Responsible Party	Deliverables
	• Complete reconnaissance level field surveys to identify critical habitat within the area impacted by the project. • Review critical area codes. • Perform research to identify potential cultural resources within the project area. • Review project with regulatory agencies to identify permitting requirements.			Strategy, List of Required Permits
5	Engineering and Cost Analyses: • Complete detailed analysis of hydraulics, facility sizing, power requirements, screening and pipeline plan and profile • Refine cost analyses to reflect the ~~conceptual~~ preliminary design	Dec 2016 – May 2017	Engineering Consultant	Refined Opinion of Probable Implementation and Long-term Operating Costs
6	~~Conceptual~~ Preliminary Design Report and Drawings: • Develop a ~~Conceptual~~ Preliminary Design Report outlining the results from work completed in Tasks 1-5. • Develop ~~Conceptual~~ Preliminary (30% Complete) Design Drawings.	May 2017 – Nov 2017	Engineering Consultant	~~Conceptual~~ Preliminary Design Report, ~~Conceptual~~ Prelimilnary Design Drawings
7	Project Management: • Manage the scope and budget, provide updates and invoices.	May 2016 – Nov 2017	CCNRD, Engineering Consultant	Invoices, Project Updates

C. Explain how you determined your cost estimates.

A detailed budget that includes itemized costs is attached in PRISM; the following table is a rolled up version of those costs. The design cost estimate was provided by the engineering and environmental consulting firm that prepared earlier studies for the project (Anchor QEA, LLC). It reflects the level of design described in the Scope of Work.

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Table 3~~2~~ - Proposed Scope of Work

Task	Description	Cost
1	Property Owner Coordination	$10,000
2	Instream Flow Benefit Coordination	$150,000
3	Site Investigations	$658,000
4	Detailed Environmental and Permitting Review	$279,000
5	Engineering and Cost Analyses	$49,000
6	~~Conceptual~~ Preliminary Design Report and Drawings	$31,000
7	Project Management	$7,000
	Indirect Costs (Federal Approved $19.76 x CCNRD Staff Time)	$393
	TOTAL	**$~~209~~199,393**

D. How have lessons learned from completed projects or monitoring studies informed your project?

The PID Pump Exchange Appraisal Study (Anchor QEA, 2012) included an evaluation of instream water needs by a professional fish biologist. That work included PHABSIM modeling to estimate the minimum flows required through wide riffle sections in lower Peshastin Creek to provide adequate fish passage and a weighted usable area (WUA) analysis to estimate the relative abundance of habitat that would be available at different flow rates. The analysis results indicated than an improvement in flow of 20 cfs during the late summer would improve habitat abundance four fold and improve passage in lower Peshastin Creek. A pump station capacity of up to 30 cfs is provided in this proposal to provide flexibility and maximize the additional flow that could be available in Peshastin Creek during the late summer low-flow period.

Additional work completed since 2013 has included evaluation of other pump exchange alternatives that would benefit Peshastin Creek, Icicle Creek, or both. Additional work has been done to compare the costs and benefits of the alternatives and refine the preferred alternative. The project proposed for this application would provide benefit to Peshastin Creek, but could be scalable to provide future benefit to Icicle Creek in the future, if appropriate.

8. How does your project consider and accommodate the anticipated effects of climate change on salmon recovery?

The ~~conceptual~~ preliminary design of pump exchange facilities will consider the anticipated effects of climate change on the hydrograph in the Wenatchee River. Pumping facilities will be designed to accommodate the full range of flow conditions that are anticipated during the late summer low flow period, with consideration for the effects of climate change. In addition, the project will provide greater flexibility in balancing water supply for irrigation with instream flow needs to better address the anticipated effects of climate change on salmon in Peshastin Creek.

9. If your project includes an assessment or inventory (NOTE project may extend across a wide area and cover multiple properties). *N/A*

10. If your project includes developing a design or a feasibility study:

A. Will a licensed professional engineer design your project?
Yes

11. If your project includes a fish passage or screening design, has your project received a Priority Index (PI) or Screening Priority Index (SPI) number? *N/A*

12. Will you apply for permits as part of this project's scope?
No

A. If not, please explain why and when you will submit permits.

The Scope of Work includes a detailed environmental review and identification of permit requirements. Because the project will assess feasibility and identify constraints through additional site visits and property owner coordination, it is proposed that permits be prepared and submitted following ~~conceptual~~ preliminary design. This is a complex project that requires a more complete definition to be provided as part of ~~conceptual~~ preliminary design prior to preparing and submitting SEPA documents and permit applications.

13. Context within the local recovery plan.

A. Discuss how this project fits within your regional recovery plan and/or local lead entity's strategy to restore or protect salmonid habitat

This project addresses a priority action in a priority area with priority fish species. The project addresses habitat rearing and access issues for 3 listed fish species; Chinook salmon, bull trout, and steelhead. The area impacted is within the historical use area for all three species and would potentially improve limiting habitat for all 3 species. Lower Peshastin Creek has been given a Priority Area 2 designation by the RTT with the goal of increasing instream flow and channel complexity. The project would increase late summer flows in the creek to passage for Chinook and bull trout, spawning habitat for Chinook and steelhead, and rearing habitat for Chinook, bull trout, and steelhead.

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

This project offers the largest potential benefit to instream flows in Peshastin Creek of any of the projects that have been evaluated or implemented to date. The need for additional flow in lower Peshastin Creek was highlighted by the low flow, high temperature conditions in the watershed in 2015.

C. If your 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. *N/A*

14. Project proponents and partners.

A. Describe your experience managing this type of project. *CCNRD has a long history of working with water users in the Peshastin Creek Subbasin to plan and develop projects that will address instream flow needs and improve the efficiency and reliability of water supply for out-of-stream uses. CCNRD has worked with PID to implement water efficiency projects that have resulted in instream flow improvements. CCNRD is also implementing similar strategies and completing similar projects throughout the Wenatchee River Watershed.*

B. List all landowner names. *Landowner concerns and land/easement acquisition needs will be identified as part of the ~~conceptual~~ preliminary design. Landowner agreements will be negotiated and secured as part of future phases of work.*

C. List project partners and their roles and contributions to the project. *PID will be the project owner and is supporting project development and ~~conceptual~~ preliminary design. They will contribute by providing input to the design and assisting with landowner coordination.*

D. Stakeholder outreach. *Additional landowner coordination is required as part of ~~conceptual~~ preliminary design to determine whether land/easements can be secured for the proposed pump station and delivery pipeline. The locations and alignment will be adjusted, as needed, to address landowner concerns.*

References

Anchor QEA 2012. *Peshastin Irrigation District Pump Exchange Appraisal Study*. Prepared for Peshastin Irrigation District and Chelan County Natural Resources Department. December 2012.

Anchor QEA 2015. *Summary of Additional Analysis, Icicle and Peshastin Irrigation Districts Pump Exchange*. Prepared for Icicle and Peshastin Irrigation Districts and Chelan County Natural Resources Department. March 27, 2015

Chelan County 2016. http://www.co.chelan.wa.us/natural-resources/pages/icicle-creek-current-project-development. Links to related work completed to support the Icicle Work Group evaluation of potential pump exchange projects.

Photograph 1 – Peshastin Creek near PID Diversion

Photograph 2 – Peshastin Irrigation District Diversion Facilities

Exhibit 1

PID Pump Exchange
Comparison of Dryden and Leavenworth Siphon Pump Exchange Alternatives

Costs and Benefits[1]	Alternative 1 (To PID Only) Dryden Location	Alternative 1 (To PID Only) Dryden Location	Alternative 1 (To PID and IID) Dryden Location	Alternative 6B Leavenworth Location	Alternative 6C Leavenworth Location
Pumping Duration	75-day Low Flow Period	30-day Low Flow Period	30-day Low Flow Period	30-day Low Flow Period	Entire Season (153 Days)
Delivery To	PID Canal Only	PID Canal Only	PID and IID Canals	IID Canal Only	IID Canal Only
Stream that Would Benefit	Peshastin Creek	Peshastin Creek	Icicle and Peshastin Creeks	Icicle Creek	Icicle Creek
Flow Benefit[2]	30 cfs	20 cfs	50 cfs	62 cfs	117 cfs
Opinion of Probable Implementation Costs[3]	**$3,531,000**	**$2,899,000**	**$8,150,000**	**$8,137,000**	**$14,583,000**
Opinion of Probable Annual O&M Costs[4]	$23,589	$18,863	$52,983	$58,184	$100,926
Opinion of Probable Annual Pumping Costs[5]	$47,780	$20,713	$74,240	$77,131	$217,624[10]
Opinion of Probable Annual Replacement Costs[6]	$40,129	$33,609	$87,704	$87,849	$154,243
Opinion of Total Annual Operating and Replacement Costs[7]	**$111,000**	**$73,000**	**$215,000**	**$223,000**	**$473,000**
Present Value of Operating and Replacement Costs Over 50-year Design Life Cycle[8]	$5,516,000	$3,611,000	$10,619,000	$11,030,000	$23,415,000
Total of Probable Project Implementation Costs and Present Value of Operating and Replacement Costs[9]	**$9,047,000**	**$6,510,000**	**$18,769,000**	**$19,167,000**	**$37,998,000**

Notes:

1 Costs are reported in 2014 dollars.

2 Represents the peak design capacity of the proposed pumping system.

3 Represents the revised opinion of probable implementation costs developed based on the Common Assumptions listed in Table 11 of the memorandum *Icicle/Peshastin Irrigation District Pump Exchange Summary of Additional Analysis*.

Exhibit 1

4 Represents the revised opinion of annual O&M costs based on the Common Assumptions listed in Table 11 of the memorandum *Icicle/Peshastin Irrigation District Pump Exchange Summary of Additional Analysis*.

5 Represents the revised annual pumping costs based on the estimated peak horsepower and other Common Assumptions listed in Table 11 of the memorandum *Icicle/Peshastin Irrigation District Pump Exchange Summary of Additional Analysis*. Costs are based on Chelan PUD Rate Schedule 5.

6 Represents the annual deposit required in a replacement fund during the first year of funding to fund replacement of 50% of all facilities during the 50-year design life. Assumes deposits will increase through the life cycle at an assumed 3% rate of inflation.

7 Represents the total of the annual O&M, pumping, and replacements costs (in 2014 dollars).

8 Represents the present value of annual operating costs (in 2014 dollars) projected over a 50-year design life cycle assuming an inflation rate and annual rate of return on replacement fund of 3%.

9 Represents the total of the implementation costs and present value of operating costs over the 50-year design life of the project (in 2014 dollars).

10 The average annual diversion to the Icicle Irrigation District Canal from Icicle Creek from 2006 through 2009 was approximately 28,542 acre-feet. The pumping costs presented in the *Icicle Irrigation District Instream Flow Improvement Options Analysis Study* (Forsgren 2014) assumed the annual volume use would be reduced to 13,991 acre-feet, which would represent nearly a 50% reduction compared to historical diversions. The Opinion of Probable Pumping Costs for Option 6C provided in the table above assumes that the improvements to the system will reduce annual water use by approximately 35%, to 18,500 acre-feet. The actual efficiencies that would result from the proposed improvement project may vary.

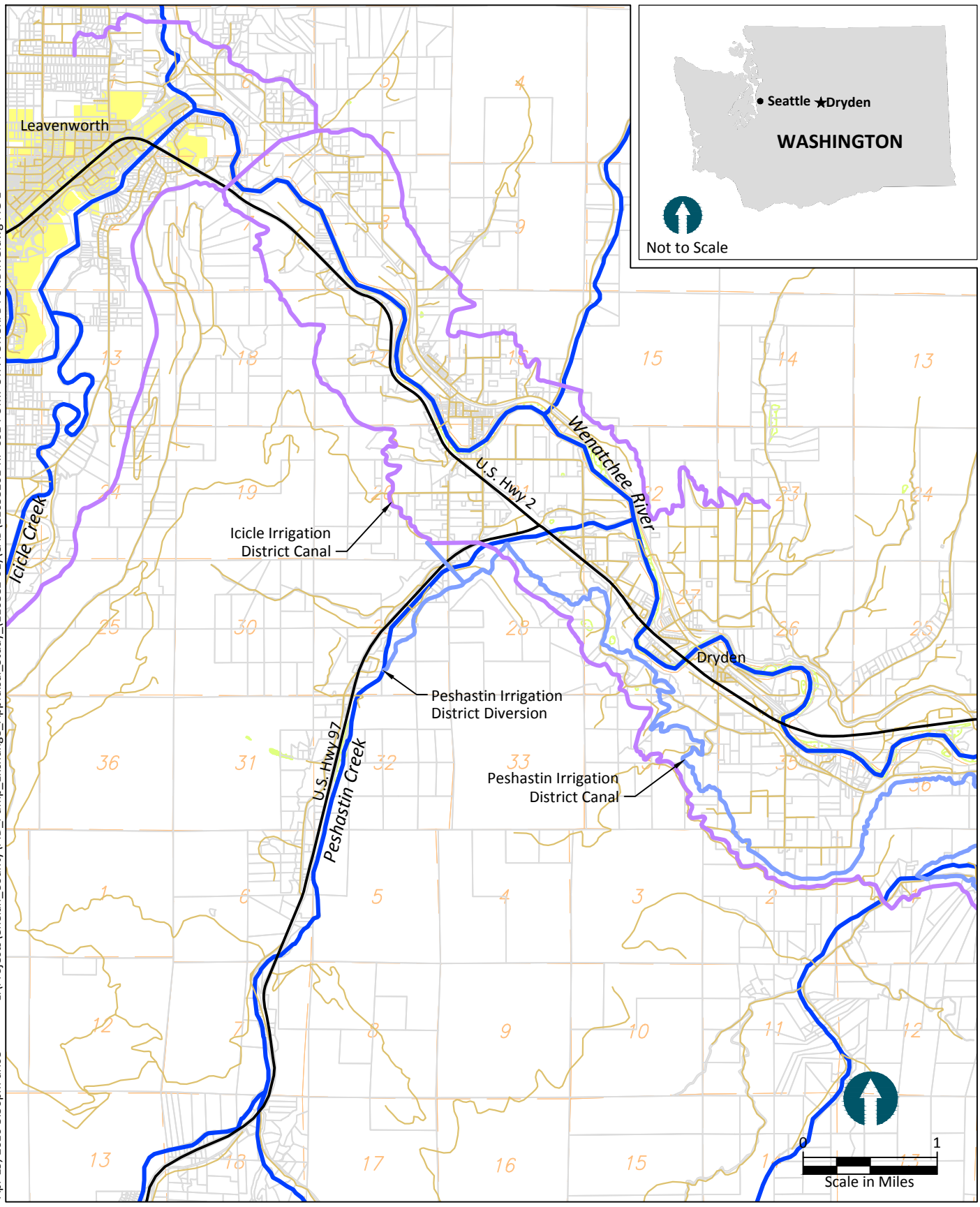
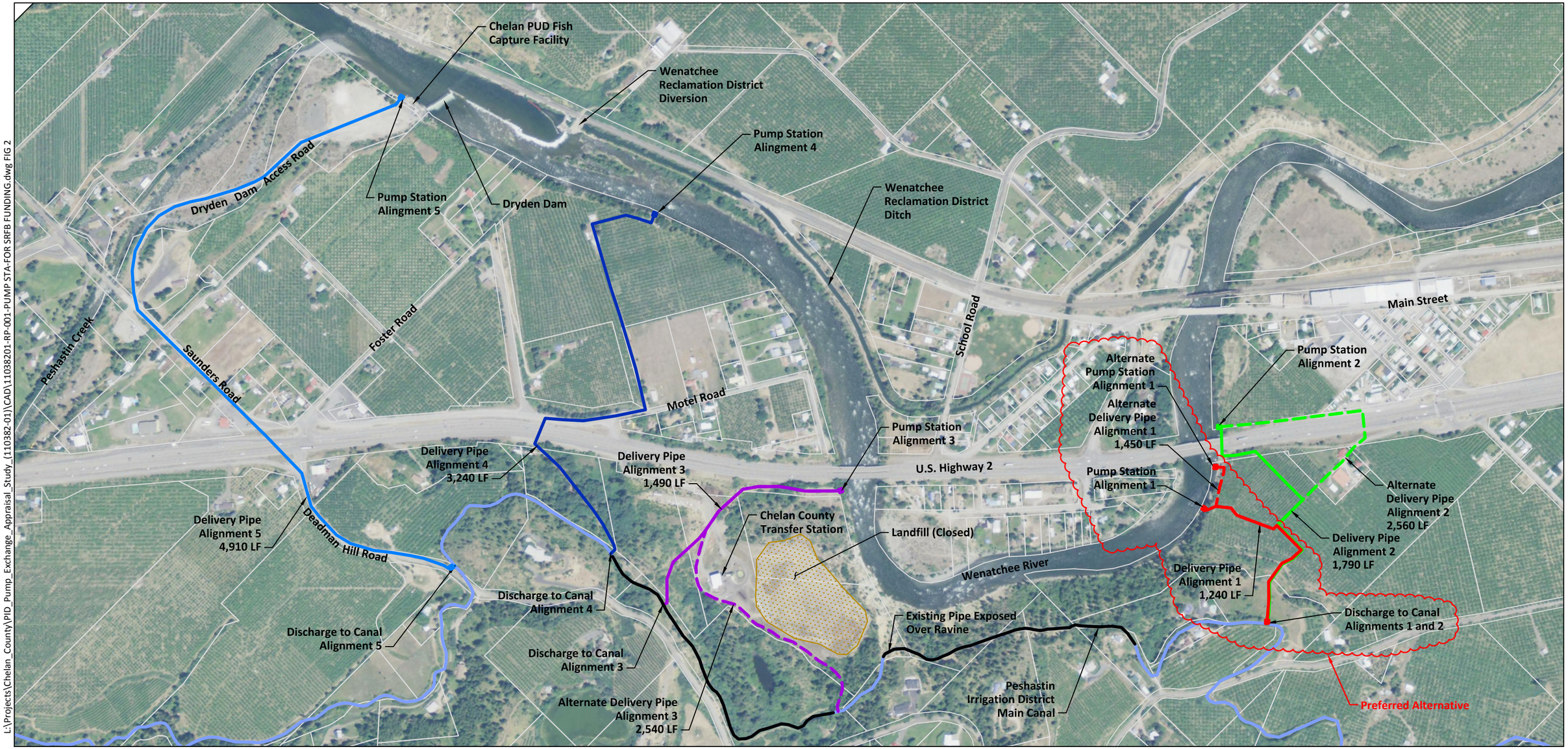


Figure 1
Location Map
Pump Exchange Project
Peshastin Irrigation District



L:\Projects\Chelan_County\PID_Pump_Exchange_Appraisal_Study_(110382-01)\CAD\110382O1-RP-001-PUMP STA-FOR SRFB FUNDING.dwg FIG 2

Apr 15, 2016 3:57pm drice

SOURCE: Basemap with 2006 NAIP Aerial Photography and 10-foot contours generated from LIDAR.

HORIZONTAL DATUM: Washington State Plane North, NAD83.

VERTICAL DATUM: NAVD 88.

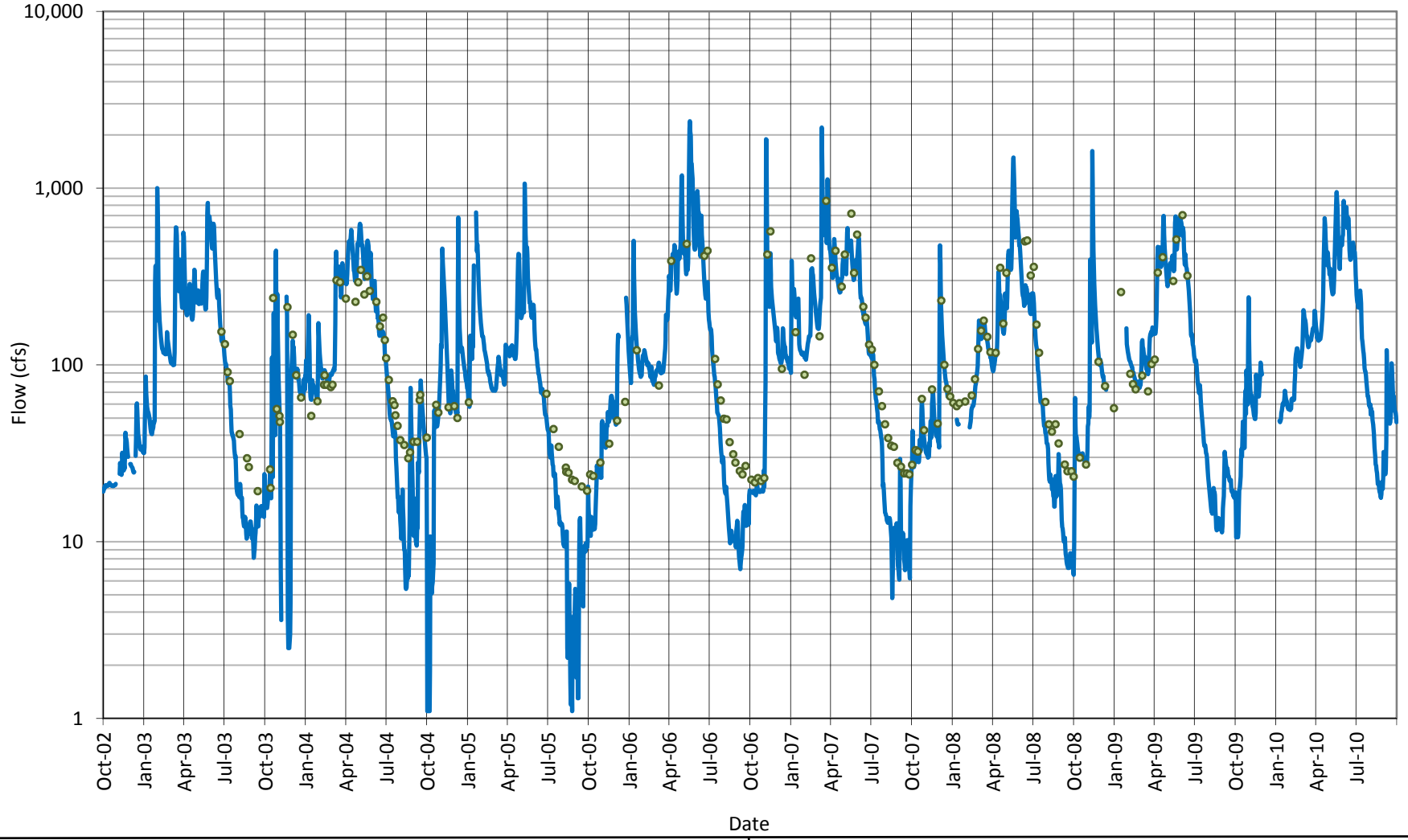
LEGEND:

	Pump Station	Delivery Pipeline
Alternative 1	■ ■	— —
Alternative 2	■ ■	— —
Alternative 3	■ ■	— —
Alternative 4	■ ■	— —
Alternative 5	■ ■	— —
	Proposed	Potential Alternate

Existing PID Ditch
Existing Pipe
Contour (10-foot)
Parcels
Existing Landfill

0 600
Scale in Feet

Figure 2
Preliminary Alternatives - Peshastin Irrigation District Pump Exchange
Pump Exchange Project
Peshastin Irrigation District

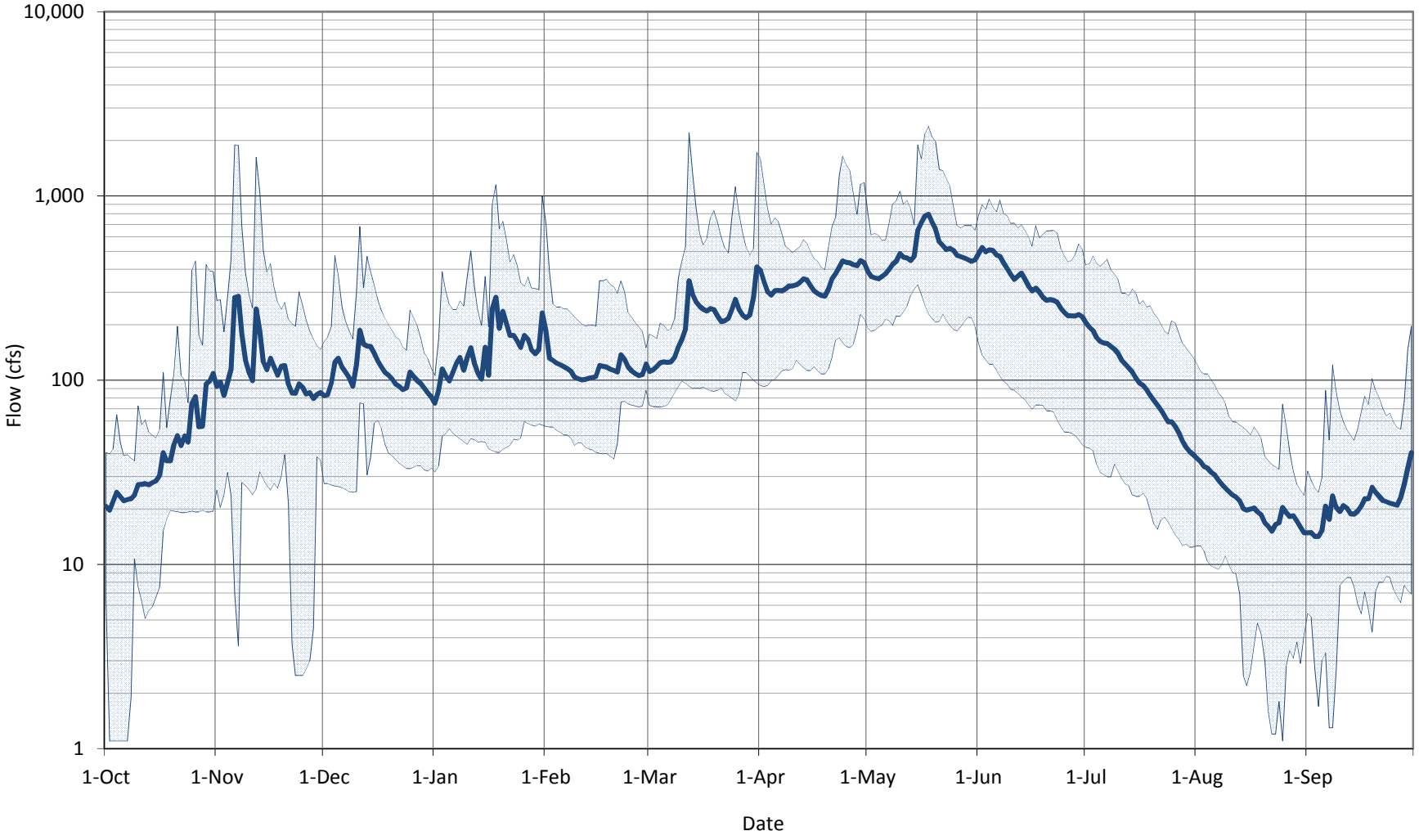


Legend:

ECY 45F070; Peshastin Creek at Green Bridge Road

ECY 45F100; Peshastin Creek Below Ingalls Creek

Figure 3
Peshastin Creek Flows
Water Years 2003-2011
Peshastin Irrigation District



Legend:

Range of flow (2003-2011)

Average

ECY No. 45F070
Peshastin Creek at Green Bridge Road

Figure 4
Comparison of Annual Flow Variation
Peshastin Creek
Peshastin Irrigation District