

Joint Resolution

Between

**Okanogan County Commissioners'
Resolution No. 130-2020**

and

**City of Omak
Resolution No. 69-2020**

and

**Oroville-Tonasket Irrigation District
Resolution No. 2020-03**

A joint resolution of the Initiating Governments approving the Okanogan River Watershed Plan (WRIA 49) as modified by Addendum and recommending the addendum be forwarded to Washington State Department of Ecology for approval.

Whereas: September 23, 2004, Okanogan County, Oroville-Tonasket Irrigation District and the City of Omak came together as the Initiating Governments to form the Okanogan Watershed Planning Unit (Planning Unit) as prescribed in RCW 90.82 to develop and adopt the **Okanogan Watershed Plan for Water Resource Inventory Area (WRIA) 49 pursuant to RCW, The Watershed Planning Act.**

Whereas: As the lead agency, Okanogan County, by action of the Board of Okanogan County Commissioners on April 6, 2010 approved the Okanogan Watershed Plan as proposed by the Initiating Governments and Planning Unit; and

Whereas: RCW 90.94 authorizes the local development of watershed plan addendums for identifying certain population growth and sources of water to offset said growth demands between 2018 and 2038, and

Whereas: The Initiating Governments re-formed the Okanogan Watershed Planning Unit with the intent that it be made up of a variety of stakeholders, from business, agriculture and citizens with a variety of interests, and

Whereas: Okanogan Watershed Planning Unit developed, with support of technical agencies and private contractors, a watershed plan addendum that addresses all required elements of RCW 90.94.020, and

Whereas: RCW 36.70, Planning Enabling Act gives authority to the Planning Commission to conduct public hearings and make recommendations to the Board of County Commissioners, and

Whereas: A public hearing was conducted on September 28, 2020 before the Okanogan County Planning Commission where staff provided information and any member of the public had opportunity to give public testimony for the official record, and

Whereas: The Okanogan County Planning Commission heard public testimony and considered all material that was entered into the public record and took into consideration all comments when making their decision, and

Whereas: The Okanogan County Planning Commission adopted the Finding of Fact (Attachment A) and Conclusions of Law (Attachment B) of resolution 2020-01 on September 28, 2020, which formally transmitted the recommendation of approval to the Board of County Commissioners, and

Whereas: it is hereby acknowledged that approval of the watershed plan under 90.82 is not included in the scope of the Planning Enabling Act; however, consideration by the Okanogan County Planning Commission is considered a formality, a courtesy and informative process for considering updates to the Comprehensive Plan.

Whereas: Okanogan Watershed Planning Unit voted to recommend plan approval by the Initiating Governments on October 1, 2020, and

Whereas: The Planning Unit members will continue to work with Okanogan County through the adaptive management process on remaining disagreements. Planning unit members wish to encourage the Initiating governments to support the implementation of this plan in an adaptive method to ensure water resources are protected for local domestic, agricultural, industrial, and aesthetic uses as the highest priority. The planning unit has signed a letter supporting the addendum in Attachment C.

NOW, THEREFORE, THE INITIATING GOVERNMENTS OF WRIA 49 DO HEREBY JOINTLY RESOLVE AS FOLLOWS:

- 1) The Okanogan County Board of County Commissioners approves the Okanogan River Watershed Plan as modified by Addendum (WRIA 49), recommends said addendum be submitted to Washington State Department of Ecology for approval and authorizes the Chair to sign this resolution, and
- 2) The Okanogan County Board of County Commissioners hereby expresses intent and commitment to formalize establishment of the WRIA 49 Watershed Planning Unit as a long-term advisory group made up of a broad representation of stakeholders including interested members as presently exists that to track implementation of the WRIA 49 Watershed Plan and makes recommendations to the BOCC on future watershed management issues within WRIA 49; and
- 3) The Omak City Council approves the Okanogan River Watershed Plan as modified by Addendum (WRIA 49), recommends said addendum be submitted to Washington State Department of Ecology for approval, and authorizes the Mayor to sign this resolution, and

- 4) The Oroville-Tonasket Irrigation District approves the Okanogan River Watershed Plan as modified by Addendum (WRIA 49), recommends said addendum be submitted to Washington State Department of Ecology for approval, and authorizes the Chair to sign this resolution.

Dated in Okanogan, Washington this 20th day of October, 2020.



ATTEST:

Laleña Johns, CMC
Clerk of the Board

**BOARD OF COUNTY COMMISSIONERS
OKANOGAN, WASHINGTON**

Jim DeTro
Jim DeTro, Chairman

Chris Branch
Chris Branch, Member

Andy Hover
Andy Hover, Member

City of Omak

Dated at Omak, Washington this 5th day of October, 2020

Cindy Gagne
Cindy Gagne, Mayor

ATTEST:

Connie Thomas
Connie Thomas, City Clerk

Oroville-Tonasket Irrigation District

Dated at Oroville, Washington this 8 day of October, 2020

Chair

ATTEST:

Secretary

Attachment A

NOTICE OF FINDINGS OF FACT

ADOPTION OF THE OKANOGAN WATERSHED PLAN ADDENDUM (WRIA 49)

The Okanogan Regional Planning Commission held a public hearing on Monday, September 28, 2020 at 7:00 p.m. in the Commissioners' Hearing Room in the Okanogan County Administration Building located at 123 5th Avenue North, Okanogan, Washington.

During the meeting, consideration was given to recommend to the Board of Okanogan County Commissioners to adopt the Okanogan Watershed Plan Addendum (WRIA 49).

The proposal lies within WRIA 49 of Okanogan County. Contact Okanogan County Planning for specific project information.

The following are **findings of fact**, supports the Okanogan County Planning Commission's recommendation to adopt the Okanogan River Basin Watershed Plan (WRIA 49).

1. RCW 90.94 authorizes the local development of watershed plan addendums for identifying certain population growth and sources of water to offset said growth demands between 2018 and 2038.
2. The Initiating Governments, Okanogan County, Oroville-Tonasket Irrigation District and the City of Omak, came together and re-formed the Okanogan Watershed Planning Unit comprised of a variety of stakeholders, from business, agriculture and citizens with a variety of interest.
3. Okanogan Watershed Planning Unit developed with support of technical agencies and private contractors, a watershed plan addendum that addresses all required elements of RCW 90.94.020.
4. The Planning Unit began meeting once per month in October 2018 and adopted their own operating procedures.
5. The Planning Department submitted a SEPA checklist for the adoption of this Plan Addendum for WRIA 49 and a Threshold of Non-Significance was issued on September 1, 2020 by the Responsible SEPA Official.
6. The SEPA and DNS were published in the Omak Okanogan County Chronicle (Okanogan County's periodical of record) on September 16, 2020 initiating a comment period which ended on September 28, 2020.
7. On September 28, 2020 the Okanogan County Regional Planning Commission conducted a public hearing, considered written comments, and heard verbal testimony for the proposed WRIA 49 Plan Addendum.
8. Okanogan Watershed Planning Unit voted to recommend plan adoption by the Initiating Governments on October 1, 2020.

Attachment B

NOTICE OF CONCLUSIONS OF LAW

The following are **conclusions of law**, that support the Okanogan County Planning Commission's recommendation to adopt Okanogan River Basin Watershed Plan (WRIA 49) the drawn from the findings of fact

1. Okanogan County as an Initiating Government chose to join in the development of a watershed plan addendum authorized under RCW 90.94.
2. Okanogan Watershed Planning Unit developed a watershed plan addendum that was consistent with RCW 90.94.
3. Under RCW 90.94 Okanogan Watershed Planning Unit approved their watershed plan addendum and sent it to the Initiating Governments for their adoption.
4. Okanogan County Regional Planning Commission heard public testimony and agreed to recommend to the Okanogan County Board of County Commissioners to adopt the Okanogan River Basin Watershed Plan Addendum (WRIA 49) by Resolution 2020-01.

Attachment C

Okanogan Watershed Planning Unit Letter of Recommendation to Adopt the Okanogan
Watershed Plan Addendum per RCW 90.94.020.

October 1, 2020

To: Okanogan Watershed Initiating Governments:

- Okanogan County
- City of Omak
- Oroville-Tonasket Irrigation District

From: Okanogan Watershed Planning Unit

SUBJECT: Letter of Recommendation to Adopt the Okanogan Watershed Plan Addendum per RCW 90.94.020.

To Whom It May Concern:

The Okanogan Watershed Planning Unit was re-appointed and augmented to develop an addendum related to domestic exempt water use for the Okanogan Watershed Plan (2009). This addendum identifies anticipated growth and increased domestic-exempt water demand, potential water off-set projects, watershed scale net ecological benefit projects, and evaluates said benefits which shows an overall net benefit for Water Resource Inventory Area (WRIA) 49. We hope you will give as much consideration and thoughtful insight into how you use this information and our recommendations as we did into the development of the plan.

Planning Unit members whose names are listed below did by voice vote at their October 1, 2020 meeting hereby agree to support this plan addendum. Members recognize and agree that each member may or may not support individual elements, decisions, or recommendations of the plan, the members below support the addendum as presented. The Planning Unit Members will continue to work with Okanogan County to work to ensure that remaining disagreements are resolved through the included adaptive management process. In addition, Okanogan County will continue to acknowledge that the Planning Unit is an ongoing entity, that will be consulted in development and implementation of comprehensive planning for water resource management in the basin.

Planning Unit members further wish to explicitly encourage the Initiating Governments to support to the extent possibly the implementation of this plan in an adaptive method to ensure water resources are protected for local domestic, agricultural, industrial, and aesthetic uses as the highest priority.

RESOLUTION NO. 69-2020

**A RESOLUTION OF THE OMAK CITY COUNCIL APPROVING A JOINT
RESOLUTION OF THE OKANOGAN COUNTY COMISSIONERS, THE
OROVILLE-TONASKET IRRIGATION DISTRICT, AND THE CITY OF OMAK
FOR THE SUBMISSION OF THE WRIA 49 ADDENDUM**

Whereas: September 23, 2004, Okanogan County, Oroville-Tonasket Irrigation District and the City of Omak came together as the Initiating Governments to form the Okanogan Watershed Planning Unit (Planning Unit) as prescribed in RCW 90.82 to develop and adopt the Okanogan Watershed Plan for Water Inventory Area (WRIA) 49 pursuant to RCW, The Watershed Planning Act.

Whereas: RCW 90.94 authorizes the local development of watershed plan addendums for identifying certain population growth and sources of water to offset said growth demands between 2018 and 2038; and

Whereas: The Initiating Governments re-formed the Okanogan Watershed Planning Unit with the intent that, it be made up of a variety of stakeholders, from business, agriculture, and citizens with a variety of interests; and

Whereas: Okanogan Watershed Planning Unit developed, with support of technical agencies and private contractors, a watershed plan addendum that addresses all required elements of RCW 90.94.020; and

Whereas: it is the consensus of the Okanogan Water Shed Planning Unit to recommend the Watershed Plan Addendum to the Initiating Governments for its approval and submission to the Washington State Department of Ecology.

NOW, THEREFORE BE IT RESOLVED by the City Council of the City of Omak, that the Joint Resolution of the Okanogan County Commissioners, Oroville-Tonasket Irrigation District and the City of Omak, Attached hereto as Exhibit "A", is hereby approved and the Mayor is authorized to sign and Submit the plan addendum on behalf of the City of Omak..


PASSED AND APPROVED this 5th day of October, 2020

SIGNED:



Cindy Gagné, Mayor

ATTEST:



Connie Thomas, City Clerk

APPROVED AS TO FORM:



Michael Howe, City Attorney

Okanogan County Regional Planning Commission
Okanogan County, WASHINGTON

Resolution No. 2020-01

A resolution to recommend Adoption of the Water Resource Inventory Area (WRIA) 49 Watershed Plan Addendum to the Okanogan County Board of Commissioners by the Planning Commission and to adopt Attachment A – the WRIA 49 Watershed Plan Addendum, Attachment B- Findings of Fact, and Attachment C- Conclusions of Law.

WHEREAS, this addendum to Okanogan County's (County) 2009 watershed plan (Plan Addendum) has been prepared to meet the requirements of Engrossed Substitute Senate Bill (ESSB) 6091 and Chapter 90.94 Revised Code of Washington (RCW), and to demonstrate that the County and WRIA 49 stakeholders have evaluated and developed streamflow restoration strategies to offset potential exempt-well development impacts in the area over the required 20-year planning horizon (through 2038); and

WHEREAS, the preparation of this Plan Addendum has been completed through a collaborative effort with the WRIA 49 Initiating Governments and Planning Unit members; and

WHEREAS, the process was supported by convening the WRIA 49 Planning Unit to review technical tasks and memorandums, policy decisions, and to create this Plan Addendum; and

WHEREAS, the passage of ESSB 6091, as codified by Chapter 90.94 RCW, requires that an update to the WRIA 49 Watershed Plan be approved by the Washington Department of Ecology (Ecology) by February 1, 2021; and

WHEREAS, WRIA 49 has an instream flow rule in place governed by Washington Administrative Code (WAC) 173-549; and

WHEREAS, watersheds with existing instream flow rules and existing watershed plans, including WRIA 49, ESSB 6091 and Chapter 90.94 RCW allows wells for new domestic permit-exempt withdrawals to continue to be authorized by counties through their building permit process while a watershed plan update is developed to address future domestic permit-exempt well use and associated streamflow restoration projects; and

WHEREAS, a key criterion addressed in this Plan Addendum is the Net Ecological Benefit (NEB) evaluation for WRIA 49. NEB defines the projected future water demand "offset" options sufficient to produce a net ecological benefit to aquatic habitats and species in WRIA 49; and

WHEREAS, a SEPA Determination of Non-Significance was issued on September 1, 2020; and

WHEREAS, notice of all public hearings and public meetings on this matter have been published according to law.

WHEREAS, after consideration of all comments and exhibits the Planning Commission has determined the WRIA 49 Plan Addendum is compliant with ESSB 6091 and Chapter 90.94 RCW; and

Attachment A

NOTICE OF FINDINGS OF FACT

ADOPTION OF THE OKANOGAN WATERSHED PLAN ADDENDUM (WRIA 49)

The Okanogan Regional Planning Commission held a public hearing on Monday, September 28, 2020 at 7:00 p.m. in the Commissioners' Hearing Room in the Okanogan County Administration Building located at 123 5th Avenue North, Okanogan, Washington.

During the meeting, consideration was given to recommend to the Board of Okanogan County Commissioners to adopt the Okanogan Watershed Plan Addendum (WRIA 49).

The proposal lies within WRIA 49 of Okanogan County. Contact Okanogan County Planning for specific project information.

The following are **findings of fact**, supports the Okanogan County Planning Commission's recommendation to adopt the Okanogan River Basin Watershed Plan (WRIA 49).

1. RCW 90.94 authorizes the local development of watershed plan addendums for identifying certain population growth and sources of water to offset said growth demands between 2018 and 2038.
2. The Initiating Governments, Okanogan County, Oroville-Tonasket Irrigation District and the City of Omak, came together and re-formed the Okanogan Watershed Planning Unit comprised of a variety of stakeholders, from business, agriculture and citizens with a variety of interest.
3. Okanogan Watershed Planning Unit developed with support of technical agencies and private contractors, a watershed plan addendum that addresses all required elements of RCW 90.94.020.
4. The Planning Unit began meeting once per month in October 2018 and adopted their own operating procedures.
5. The Planning Department submitted a SEPA checklist for the adoption of this Plan Addendum for WRIA 49 and a Threshold of Non-Significance was issued on September 1, 2020 by the Responsible SEPA Official.
6. The SEPA and DNS were published in the Omak Okanogan County Chronicle (Okanogan County's periodical of record) on September 16, 2020 initiating a comment period which ended on September 28, 2020.
7. On September 28, 2020 the Okanogan County Regional Planning Commission conducted a public hearing, considered written comments, and heard verbal testimony for the proposed WRIA 49 Plan Addendum.
8. Okanogan Watershed Planning Unit voted to recommend plan adoption by the Initiating Governments on October 1, 2020.

Attachment B

NOTICE OF CONCLUSIONS OF LAW

The following are **conclusions of law**, that support the Okanogan County Planning Commission's recommendation to adopt Okanogan River Basin Watershed Plan (WRIA 49) the drawn from the findings of fact

1. Okanogan County as an Initiating Government chose to join in the development of a watershed plan addendum authorized under RCW 90.94.
2. Okanogan Watershed Planning Unit developed a watershed plan addendum that was consistent with RCW 90.94.
3. Under RCW 90.94 Okanogan Watershed Planning Unit approved their watershed plan addendum and sent it to the Initiating Governments for their adoption.
4. Okanogan County Regional Planning Commission heard public testimony and agreed to recommend to the Okanogan County Board of County Commissioners to adopt the Okanogan River Basin Watershed Plan Addendum (WRIA 49) by Resolution 2020-01.

WATERSHED PLAN ADDENDUM

Okanogan River Basin (WRIA 49)

Prepared for: Okanogan County and the WRIA 49
Planning Unit

Project No. 190259 • October 1, 2020 FINAL

Prepared by: Aspect Consulting, in partnership with Confluence
Environmental



earth + water

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- B Technical Memorandum on Identified Projects and Subbasins, Aspect Consulting, 2020
- C Summary of NEB analysis methods and results used for WRIA 49 Watershed Planning Memorandum, Confluence, 2020
- D Hydrology and Hydraulics Input to EDT Modeling, Aspect, 2020

Executive Summary

This addendum to Okanogan County's (County) 2009 watershed plan (Plan Addendum) has been prepared to meet the requirements of ESSB 6091 and Chapter 90.94 Revised Code of Washington (RCW), and to demonstrate that the County and Watershed Resource Inventory Area (WRIA) 49 stakeholders have evaluated and developed streamflow restoration strategies to offset potential exempt-well development impacts in the area over the required 20-year planning horizon (through 2038). Preparation of this Plan Addendum has been completed through a collaborative effort with the WRIA 49 Initiating Governments and Planning Unit members. The process was supported by convening the WRIA 49 Planning Unit to review technical tasks and memorandums, policy decisions, and create this Plan Addendum.

The passage of Engrossed Substitute Senate Bill (ESSB) 6091, as codified by Chapter 90.94 RCW, requires that an update to the WRIA 49 Watershed Plan be approved by the Washington Department of Ecology (Ecology) by February 1, 2021.

WRIA 49 has an instream flow rule in place governed by Washington Administrative Code (WAC) 173-549. For watersheds with existing instream flow rules and existing watershed plans, including WRIA 49, ESSB 6091 and Chapter 90.94 RCW allows wells for new domestic permit-exempt withdrawals to continue to be authorized by counties through their building permit process while a watershed plan update is developed to address future domestic permit-exempt well use and associated streamflow restoration projects. A key criterion addressed in this Plan Addendum is the Net Ecological Benefit (NEB) evaluation for WRIA 49. NEB defines the projected future water demand "offset" options sufficient to produce a net ecological benefit to aquatic habitats and species in WRIA 49.

WRIA 49 Instream Flow Rule

WRIA 49 has an instream flow rule in place governed by WAC 173-549, enacted on June 9, 1988, that established year-round minimum instream flows in four stream management units (three on the Okanogan River and one on the Similkameen River) and results in new water right appropriations provisioned to curtailment when instream flows are not met. The instream flow rule established seasonal closures from May 1 to October 1 to water right appropriations on all perennial streams in WRIA 49, except those with established minimum instream flows (limited to the mainstem Okanogan and Similkameen Rivers). The rule also seasonally closed the Upper Okanogan stream management unit from June 15 through August 31 with the exception of single-domestic use and stockwater use.

Subbasin Delineation

The Planning Unit used the steelhead habitat restoration potential estimated using the Okanogan Ecosystem Diagnosis and Treatment (EDT) model to guide the definition of planning subbasins used in the WRIA 49 plan addendum. These results were compiled by

1. The projects are eligible to be counted towards NEB under Chapter 90.94 RCW, meaning they were proposed, contracted, and/or funded for construction after January 2018;
2. The project is likely to result in effects on aquatic habitat conditions within the WRIA 49 anadromous zone that can be estimated through modeling, and;
3. The project description and available supporting information are sufficient to characterize the potential effect of the proposed action using EDT model environmental input parameters.

Projects designated as Tier 1 meet all three of these criteria and were advanced for EDT modeling. Table ES-1 shows the selected projects that resulted from this process. Figure ES-1 shows the locations of the proposed projects.

Net Ecological Benefit Summary and Conclusions

A NEB evaluation was completed consistent with Ecology's Final Guidance for Determining Net Ecological Benefit. Key conclusions of the WRIA 49 NEB evaluation are as follows:

- The effects of future consumptive use impacts of permit-exempt wells, which are calculated to total 203 acre-feet (CU), are likely to be small; the EDT model predicts that future consumptive use would result in a net reduction in steelhead abundance of less than 1 adult and 52 juveniles at the WRIA level
- The EDT model predicts that future consumptive use would have no significant effect on summer/fall Chinook salmon abundance at the WRIA level (less than 1 fewer juveniles)
- The proposed Tier 1 water offset projects proposed in the Plan Addendum achieve a significant net positive streamflow benefit (up to a 2,666 acre-foot surplus) at the WRIA level, assuming all project were implemented in the planning period.
- Proposed Tier 1 water offset projects are capable of maintaining or increasing instream flows in all analysis subbasins except the Similkameen, where no Tier 1 projects are currently proposed.
- The EDT model analysis estimates that the Tier 1 projects in the Plan Addendum would produce a net increase of 119 adult and 5,850 juvenile steelhead, and 18 adult and 4,826 juvenile summer/fall Chinook salmon at the WRIA level.
- The full implementation of all Tier 1 non-water offset projects would increase habitat potential for steelhead at the WRIA level and in all analysis subbasins except the Similkameen where projected consumptive use effects are negligible
- The proposed Tier 1 projects would increase habitat potential for summer/fall Chinook salmon at the WRIA level and in all subbasins except Salmon Creek where this species does not and did not historically occur.
- Consumptive use effects in the Similkameen subbasin could be fully offset by the instream flow benefits of a proposed Tier 2 non-water offset project in Sinlahekin Creek.

Table ES-1. Summary of Proposed WRIA 49 Offset Projects
WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190258)

Project	WRIA 49 Subbasin/Stream	Tier Ranking	Sponsor	Project Type ¹	Description	Consumptive Use Offset	Instream Flow Benefit	Affected Stream Length (mi) ²	Estimated Cost	Requires O&M?
Antoine Valley Ranch (AVR) ³	Antoine-Whitstone/ Antoine Creek	Tier 1	Washington Water Trust, CTCR, Trout Unlimited	O&NEB	Conservation acquisition of 2,524-acre Antoine Valley Ranch (AVR) and senior water rights totaling 1,294 af. Includes ownership of Fanchers Dam with its related storage 500 AF capacity. Project will provide flow augmentation and retiming for summer baseflow and thermal benefits, and support future habitat restoration in a valuable spawning tributary.	Up to 1,294 afy	1.8 cfs (average)	5.4 (flow restoration may support restoring access to additional ~12 miles of habitat between AVR and Fanchers Dam)	\$7.9-\$8.5 million	Yes
Conservancy Island Side Channel Reclamation	Bonaparte-Johnson/ Okanogan River	Tier 1	City of Okanogan	NEB	Restore Conservancy Island side channel connectivity with Okanogan River, providing access to historical Chinook salmon and steelhead spawning and rearing habitat.	--	--	0.9	\$850,000	Yes
Johnson Creek Fish Passage	Bonaparte-Johnson/ Johnson Creek	Tier 1	Trout Unlimited	NEB	Package of 3 90.94-eligible fish passage restoration projects funded by the Brian Abbot (Washington State) Fish Barrier Removal Board. Provides access from mouth upstream to Duck Lake diversion.	--	--	4	\$2.7 million	No
Loup Loup Creek Diversion Improvements ³	Swamp-Loup Loup/ Loup Loup Creek	Tier 1	CTCR, Washington Water Trust	NEB&LO (O pending additional study)	Replace unlined diversion ditch with pipe to eliminate leakage and evaporation losses. Water savings will be dedicated to instream flows.	TBD	0.38 cfs (average), ~275 afy	2.17	\$1.7 million	Yes
OTID Tributary Supplementation ³	Johnson-Bonaparte/ Bonaparte Creek Antoine-Whitstone/ Swash Creek, Antoine Creek, Whitstone Creek, Nhemle Creek	Tier 1	Oroville-Tanasket Irrigation District	NEB&LO	Use existing diversion infrastructure to provide flow augmentation in lower reaches of select Okanogan tributary streams from April 1 to October 15.	460-525 afy	1.2-1.3 cfs (Apr-Oct)	5.7	\$10,500	Yes
Pine Creek Water Right Acquisition ³	Bonaparte-Johnson (Middle Okanogan)	Tier 1	Okanogan County / OCD	O	Purchase the Pine Creek Trust Water Right (CG4-23592(A)C) from Ecology for consumptive use offset.	625.7 afy	0.86 cfs	51	\$1,300 per af	No
Salmon Creek Source Substitution	Salmon Creek	Tier 1	City of Okanogan	NEB&LO	Transfer 300 gpm municipal surface water diversion right from Salmon Creek to an existing or new groundwater well in continuity with Okanogan River.	485 afy	0.67 cfs	3.7	\$250,000, +\$10,000 annual O&M	Yes
Salmon Lake Storage	Salmon Creek	Tier 1	Bureau of Reclamation, CTCR, Okanogan Irrigation District	O&NEB	Residential infrastructure purchase or improvements to allow for full use of Salmon Lake reservoir pool. Provides increased storage for flow retiming.	~1,000 afy	2.1 cfs (average)	18.8	\$175,000 to \$652,000 depending on management option	Yes
Whitstone Creek Flow and Temperature Augmentation	Antoine-Whitstone/ Whitstone Creek	Tier 1	Whitstone Irrigation District	NEB	Improve conveyance system to increase irrigation system efficiency and reduce maintenance. Provide 1 to 1.5 cfs additional instream flow in Whitstone Creek from Apr-Oct to for flow and temperature augmentation.	425-485 afy	1-1.5 cfs inflow (Apr-Oct) at 5-7 degrees C below ambient surface water temperature	3.3	In development	Yes
Aeneas Lake Irrigation District Efficiencies	Bonaparte-Johnson (Middle Okanogan)	Tier 2	OCD	NEB	Reduce the amount of excess water pumped from the mainstem Okanogan River. This would reduce the over-pumping and return flow to the river, which is expected to reduce turbidity in that location.	--	--	TBD	\$30,000	Yes
Conconully Dam Replacement	Salmon Creek	Tier 2	Bureau of Reclamation, Okanogan Irrigation District	O&NEB	Proposed dam replacement, with potential to increase available storage and provide fish passage to historically accessible headwaters of Salmon Creek.	Unspecified	Unspecified	TBD	Unspecified	Yes
Highlands Springs Protection and Enhancement	Bonaparte-Johnson (Middle Okanogan)	Tier 2	Okanogan Highlands Alliance	NEB	Partner with range lessees, landowners, and the U.S. Forest Service (USFS) to assess the condition of water resources, repair spring protection infrastructure, and install fencing and troughs to protect undeveloped springs.	--	--	TBD	\$20,000 + \$5,000- \$10,000 annual O&M	Yes
Irrigation Efficiency Projects	Multiple	Tier 2	OCD	O&NEB	Opportunistic irrigation efficiency projects throughout WRIA 49 reducing overall water demand. Water savings will be dedicated to instream flows.	TBD	Unspecified	TBD	Unspecified	Yes
Loup Loup Creek Channel and Riparian Improvements	Swamp-Loup Loup/ Loup Loup Creek	Tier 2	OCD	NEB	Improve instream habitat and riparian conditions along 600 feet of Loup Loup Creek, improving spawning habitat for ESA-listed steelhead. Riparian buffers will be increased from 10 feet to 30-100 feet.	--	--	0.11	Unspecified	No
Methow Beaver Project ³	Antoine-Whitstone/ Whitstone Creek, Swamp-Loup Loup, Bonaparte-Johnson	Tier 2	Methow Beaver Project	NEB	Increase late season streamflow by adding and improving channel structure and floodplain connection to restore natural watershed functions.	--	--	TBD	\$550,000	No
Okanogan Highlands Water Riparian Restoration	Antoine-Whitstone/ Whitstone Creek	Tier 2	Okanogan Highlands Alliance	NEB	Restoration techniques will vary by site, depending on geomorphology, land use, streamflow, instream structure and roughness, etc., but will include structural adjustments to improve flow and storage, plant native species, and	--	--	TBD	\$10,000-\$65,000 + \$1,000-\$15,000 annual O&M	Yes
Okanogan River Riparian Enhancement	Antoine-Whitstone/ Whitstone Creek	Tier 2	OCD	NEB	Maintain four previously planted acres on the 2-mile long stretch of property. This will include replacement of dead plants, adaptive management for weed control, and irrigation.	--	--	2	\$55,000 + \$1,500 annual O&M	Yes
Pine Creek Riparian Restoration	Bonaparte-Johnson (Middle Okanogan)	Tier 2	OCD	NEB	Protect riparian and wetland areas from water quality impacts from livestock using downed 'jackstraw' logs. These scattered logs mimic natural barriers to browsing and protect natural regeneration of riparian plants and new plantings.	--	--	0.13	12,000 + \$2,000 annual O&M	Yes
Salmon Creek Streambank Stabilization Projects	Salmon Creek	Tier 2	OCD	NEB	Restore and enhance riparian vegetation by planting woody shrub and tree species for the purpose of providing woody debris recruitment into Salmon Creek as a means of creating habitat for invertebrates, which will enhance food sources for	--	--	TBD	\$16,000 + \$900 annual O&M (5 years)	Yes

Table ES-2. Water NEB Results

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

NEB Subbasin	Water-for-Water Offset		Tributary Offset ¹		Net Ecological Benefit			
	Net change (afy)	Net change (cfs)	Net change (afy)	Net change (cfs) ²	Adult	Juvenile	Adult	Juvenile
					Steelhead Neq	Steelhead Neq	Chinook Neq ³	Chinook Neq ³
Loup Loup-Swamp (Lower Okanogan)	-37	-0.51	275 (approx)	0.38	2	118	2	2,537
Salmon Creek	1,000 (+988)	1.36	1,499	2.07	111	5,539	--	--
Bonaparte-Johnson (Middle Okanogan)	626 (+626) ⁴	0.864	123	0.17	4	83	14	1,999
Antoine-Whitestone (Upper Okanogan) ⁵	1,160 (+1,099)	1.52	2,371	3.28	2	110	1	305
Similkameen ⁶	-10	-0.01	-	-	0	0	1	166
WRIA 49 Total	2,786 (+2,666)	3.22	6,753	5.9	119	5,850	18	4,826

¹ Tributary Offset is the total instream flow increase in Okanogan River tributaries that support summer steelhead, combining water-for-water offset projects and Tier 1 non-water offset projects.

² Net change (cfs) values are average over 1 year. All non-water offset projects provide flow augmentation during specific periods (e.g. April through October) to optimize habitat benefits for steelhead.

³ Chinook NEB effect from Highway 20/Conservancy Island side channel project

⁴ Pine Creek water-for-water offset applies in mainstem Okanogan only (no tributary offset or measurable NEB effect)

⁵ Tributary offset and NEB estimate include AVR project with full instream flow benefit of 1,294 afy, including additional non-water offset of 134 afy.

⁶ The Tier 2 Sinlahekin Wildlife Area Impoundments Improvement project provides sufficient potential tributary offset in the Similkameen subbasin to avoid consumptive use effects and produce additional NEB benefit for resident fish species. A net tributary offset of zero is assumed for the purpose of the NEB determination.

1 Introduction

The passage of Engrossed Substitute Senate Bill (ESSB) 6091, as codified by the Chapter 90.94 Revised Code of Washington (RCW), requires that an update to the existing Watershed Plan for Water Resource Inventory Area (WRIA) 49, the Okanogan Watershed, be approved by the Washington Department of Ecology (Ecology) by February 1, 2021.

Passage of the law followed the 2016 *Whatcom County v. Hirst, Futurewise, et al.* Washington State Supreme Court Decision (the “Hirst decision”). The Hirst decision shifted the burden of establishing legal water availability from Ecology to the individual counties when approving development projects supplied by permit-exempt groundwater withdrawals under RCW 90.44.050². The decision resulted in curtailment of rural development throughout much of the state.

For watersheds with existing instream flow rules and existing watershed plans, including WRIA 49, ESSB 6091 and Chapter 90.94 RCW allows for new permit-exempt wells to continue to be authorized by counties through their building permit process while a watershed plan update is developed to address future permit-exempt well use and associated streamflow restoration projects.

WRIA 49 has an instream flow rule in place governed by Washington Administrative Code (WAC) 173-549. This Watershed Plan Addendum (Plan Addendum) has been prepared to update the existing Watershed Management Plan (Watershed Plan) for WRIA 49 to address objectives of the 2018 Streamflow Restoration law (Chapter 90.94 RCW)³. The Watershed Plan was approved by the Okanogan Planning Unit (Planning Unit) in 2009 under the Watershed Planning Act (RCW 90.82).

This Plan Addendum was developed by the WRIA 49 Initiating Governments (IGs) and Planning Unit with facilitation assistance from the Okanogan Conservation District (OCD), and technical assistance from Aspect Consulting, LLC (Aspect) and their subconsultants Confluence Environmental Company (Confluence) and ICF International, Inc (ICF). The Plan Addendum was developed to meet the requirements of Chapter 90.94 RCW, with reference to Ecology’s Streamflow Restoration Policy and Interpretive Statement (Ecology, 2019a) and Final Guidance for Determining Net Ecological Benefit (Ecology, 2019b). Ecology’s Vanessa Brinkhuis also provided important guidance and served as liaison with the agency. In addition, periodic technical review and comment was provided by Ecology’s Jim Pacheco, Tom Culhane, and Matt Rakow. This work was

² RCW 90.44.050 exempts certain groundwater withdrawals from the requirement to obtain a water right permit. The exemption applies to single or group domestic uses, industrial use, and irrigation of lawn or non-commercial gardens up to one-half acre provided that total withdrawals do not exceed 5,000 gallons per day and allows for an unlimited quantity for stock watering purpose

³ In January 2018, the Legislature passed the Streamflow Restoration law that is intended to help restore streamflows to levels necessary to support robust, healthy, and sustainable salmon populations while providing water for homes in rural Washington. <https://ecology.wa.gov/Water-Shorelines/Water-supply/Streamflow-restoration> <https://ecology.wa.gov/Water-Shorelines/Water-supply/Streamflow-restoration>

- In RCW 90.94.020(4)(c): *“Prior to adoption of the updated watershed plan, the department must determine that actions identified in the watershed plan, after accounting for new projected uses of water over the subsequent twenty years, will result in a net ecological benefit to instream resources within the water resource inventory area.”*

To support planning units in meeting the net ecological benefit (NEB) requirement, Ecology issued its Final Guidance for Determining Net Ecological Benefit (Ecology GUID 2094, 2019b). This guidance includes minimum planning requirements, which includes:

- Utilization of clear and systematic logic
- Delineation of subbasins
- Estimation of new consumptive water uses
- Evaluation of impacts from new consumptive water use
- Description and evaluation of projects and actions for their offset potential

1.2 Initiating Governments and Planning Unit Coordination

Okanogan County, the City of Omak, and the Oroville-Tonasket Irrigation District are the IGs for the Okanogan Watershed (WRIA 49). Okanogan County serves as the Lead Agency. The IGs began planning for an addendum for the Okanogan Watershed Plan in summer of 2018. During initial discussions the IGs invited the Confederated Tribes of the Colville Reservation (CTCR) to participate in the process as required under RCW 90.94.020(3). There was discussion and investigation to determine if an invitation to the Yakama Indian Nation would be appropriate but was subsequently decided the Yakama’s do not have traditional or negotiated rights in the Okanogan Watershed. The CTCR chose to participate as a non-voting member of the Technical Committee only.

The Initiating Governments started the Chapter 90.94 RCW planning process with the organizations that were represented in the previous planning unit process, plus the addition of new members to broaden the Planning Unit’s representation. Ultimately 27 seats were identified for the Planning Unit. Planning Unit membership is shown in Table 1. The Planning Unit designated a Technical Advisory group (TAG) to evaluate and recommend potential restoration projects to the Planning Unit. TAG membership is shown in Table 1 (attached).

The Planning Unit began meeting once per month in October 2018. During the winter of 2018/2019 the Planning Unit developed and approved operating rules, which incorporated making decisions by consensus where possible, but allowed for voting using Robert’s Rules of Order if two attempts to discuss and reach consensus were to fail on given issues and decisions. This decision-making process was reconfirmed at the June 2, 2020 meeting. Agendas and minutes for Planning Unit meetings are available on the Okanogan County’s website:

https://www.okanogancounty.org/planning/wria_49_plannng_unit.html

several key tributaries are designated critical habitat for ESA-listed salmonids in WRIA 49.

The WRIA is characterized by mountainous terrain, with elevations ranging from about 840 feet at the confluence of the Okanogan with the Columbia River, to 8,245 feet at Tiffany Mountain and 7,257 feet at Mount Bonaparte, the highest points on the western and eastern sides of the WRIA, respectively. Over two dozen peaks in the WRIA exceed 3,000 feet.

WRIA 49 lies within an ecologically diverse region that includes portions of three distinct Level III ecoregions and encompasses all or portions of five regionally unique Level IV ecoregions (USEPA 2010). The mainstem Okanogan River and surrounding valley (Okanogan Valley, Level IV ecoregion 10m) are part of the Columbia Plateau ecoregion while the surrounding highlands are ecologically distinct components of different mountain ranges. The western highlands are part of Level III ecoregion 10, the North Cascades, and encompass portions of Level IV ecoregions 77d and 77e, the Pasayten/Sawtooth Highlands and Okanogan Pine/Fir Hills, respectively. The eastern highlands are in Level III ecoregion 15, the Northern Rocky Mountains, and include Level IV ecoregions 15g and 15x, the Western Okanogan Semiarid Foothills and Okanogan Highland Dry Forest, respectively.

Major municipalities within WRIA 49 include Oroville, Tonasket, Omak, Okanogan, Conconully, Pateros, Riverside, and Brewster. Agriculture consisting primarily of hay and tree fruit crops, commercial timber, and cattle comprise the majority of economic activity. Irrigated agriculture is the predominant land use on the valley floors of the Okanogan River and in several tributary drainages. Irrigation water is sourced under water right authorizations from groundwater and surface water sources by private entities and nine irrigation districts, reclamation districts, or canal companies. CTR lands comprise the southeastern portion of WRIA 49 on the east side of the Okanogan River south of Riverside.

2.2.1 Climate and Hydrology

The climate of the Okanogan River valley is generally warm and dry in the summer and cold and wet in the winter, with sub-humid mountainous climate conditions becoming more prevalent at higher elevations to the east and west. The current 30-year average annual maximum and minimum temperatures in Omak are 61.1 and 37.8°F, respectively. Temperatures above 90 and below freezing are common in summer and winter, respectively.

Average annual precipitation is 14.75 inches, occurring primarily in fall and winter as a mix of rain and snow with snow predominant at higher elevations (NCDC 2020). Most of the water flowing through WRIA 49 originates in British Columbia. The greatest snowpack accumulation occurs mostly in the western and northern portions of the basin. Precipitation varies by location, ranging from less than 10 inches at low elevation near the confluence of the Okanogan and Columbia Rivers to greater than 30 inches in the highest elevations along the western boundary of the basin.

The Okanogan and Similkameen are primarily snowmelt-driven systems with highest streamflows occurring during the freshet from April through July. Approximately 70 to

from the Okanogan River is a major source for groundwater in thick sediments of the Okanogan River valley.

Bedrock comprised primarily of intrusive and metamorphic rocks have little or no intrinsic permeability. This limits recharge and constrains groundwater flow to secondary fractures. As a result, fewer wells are completed in bedrock and those that are generally exhibit low yields.

Two primary studies address groundwater conditions in WRIA 49. Walters (1974) characterized basin wide surface water and groundwater resources by summarizing data collected during various studies and examining drillers logs for wells in the Okanogan River valley and major tributaries. The USGS (Sumioka and Dinicola, 2009) examined groundwater-surface water interactions in four major tributaries (Tunk, Bonaparte, Antoine, and Tonasket Creeks) by measuring streamflows and hydraulic gradients at several measurement sites. Various smaller studies characterizing localized groundwater conditions and groundwater-surface water interactions have been completed, including studies completed for the CTCR and in support of water right permitting activities throughout the basin.

The body of evidence from available studies indicates the lower reaches of many WRIA 49 tributaries are hydraulically disconnected from groundwater due to streambeds that lie several tens of feet or more above the groundwater table. These stream reaches lose flow through the streambed as they traverse the coarse-grained sediments on glacial terraces before their confluence with the Okanogan River. Losing flow conditions in these streams can impact aquatic habitat and impede fish migration between the mainstem river and upper tributary reaches. Additionally, losing conditions in the lower reaches of tributaries suggest groundwater flow does not always observe topographic divides in areas having thick unconsolidated and sediments such as the Okanogan River valley floor.

2.2.3 Current Aquatic Habitat Conditions

This summary of aquatic habitat conditions in the Okanogan River system complements the description provided in the previous Okanogan Watershed Plan (Okanogan Watershed Planning Unit 2009), which is incorporated here by reference. This section summarizes the current status of aquatic habitat conditions in WRIA 49. Detailed information about habitat conditions can be obtained from the web-based Okanogan Habitat Status and Trends Report (HSTR), available at <https://ecosystems.azurewebsites.net/hstr-okanogan/>. The Okanogan HSTR summarizes EDT model results for Chinook salmon and steelhead and includes identification of priority habitats and limiting factors at assessment unit (subwatershed) and reach scales. These results are based on detailed habitat monitoring data collected by the Okanogan Basin Monitoring and Evaluation Program (OBMEP).

WRIA 49 bounds the U.S. portion of the Okanogan/Similkameen 6th Field Hydrologic Unit, the largest and most complex watershed in the Upper Columbia region. The majority of watershed drainage area lies in British Columbia but the majority of accessible anadromous habitat is in WRIA 49. This creates complex management challenges requiring coordinated transboundary planning and implementation.

important tributary streams, leading to loss of aquatic habitat function. Conversely, wildfires have altered the hydrographs for some tributaries causing Chiliwist Creek that has been intermittent for decades to now run perennially for several years based upon multiple eye-witness accounts.

Current WRIA 49 Aquatic Habitat

Today WRIA 49 provides aquatic habitat for a diversity of anadromous and resident fish species, including ESA-listed Upper Columbia steelhead (*Oncorhynchus mykiss*) and summer/fall run Chinook salmon (*O. tshawytscha*). A large run of sockeye salmon (*O. nerka*) migrates through WRIA 49 to access spawning and rearing habitats in the Canadian portion of the Okanogan subbasin. Spring Chinook salmon were historically present in the Okanogan system but have been extirpated since the 1930s by the combined effects of hydropower development, overfishing, and habitat degradation. The CTCR are currently attempting to reintroduce an experimental population of spring Chinook to WRIA 49 under ESA Section 10(j) (79 FR 40004).

Other native fish species documented in the watershed include resident rainbow trout, westslope cutthroat trout (*O. clarkii lewisi*), mountain whitefish (*Prosopium williamsoni*), northern pikeminnow (*Ptychocheilus oregonensis*), suckers (*Catostomus* spp.), dace and other Cyprinids, and sculpins (*Cottus* spp.). Several introduced non-native species have become established in WRIA 49, including largemouth and smallmouth bass (*Micropterus* spp.), sunfish (*Lepomis* spp.), bullheads (*Ameiurus* spp.), white crappie (*Pomoxis annularis*), and yellow perch (*Perca flavescens*) (Hughes and Herily 2012).

OBMEP has prioritized aquatic habitats in the WRIA 49 based on current habitat function and restoration potential for steelhead and Chinook salmon. The highest priority subwatersheds for steelhead habitat restoration in WRIA 49 are Omak Creek, the Similkameen River, Antoine Creek, Salmon Creek, and Johnson Creek. The highest priority habitats for summer/fall Chinook salmon are located on the mainstem between Chiliwist Creek and Tunk Creek.

This prioritization is based on EDT modeling results for habitat and biological data collected from 2014-2017, the most recently completed 4-year monitoring cycle, and documented core production areas for steelhead and Chinook salmon. OBMEP uses the Okanogan EDT model to evaluate habitat restoration potential in each subwatershed in the system. These results were used to define analysis subbasins for this Watershed Plan and provide a basis for NEB evaluation using the EDT model. See the Okanogan HSTR for additional details on how habitat prioritization was conducted.

2.3 Instream Flow Rule

WRIA 49 has an instream flow rule in place governed by WAC 173-549, enacted on June 9, 1988, that established year-round minimum instream flows in four stream management units (three on the Okanogan River and one on the Similkameen River) and has resulted in new water right appropriations provisioned to curtailment when instream flows are not met.

2.4.1 WRIA 49 Planning Update Subbasins

Based on the above considerations (and as described in Appendix B), the Planning Unit identified the following planning subbasins for use in the Plan Addendum as shown in Figure 1:

- **Loup - Swamp (Lower Okanogan)** – This subbasin consists of two adjacent HUC-10 watersheds: Loup Loup Creek and Swamp Creek. These watersheds contain smaller creeks draining the region west of the mouth of the Okanogan River and south of the City of Okanogan.
- **Salmon Creek** – This subbasin consists of the HUC-10 Salmon Creek watershed, a tributary to the Okanogan River that drains the region west of the City of Okanogan and Omak. Salmon Creek discharges to the Okanogan River at Okanogan.
- **Bonaparte-Johnson (Middle Okanogan)** – This subbasin consists three HUC-10 watersheds including the Okanogan River and several steelhead-bearing tributary streams located on opposite sides of the mainstem. Bonaparte Creek drains the region east of Tonasket and discharges to the Okanogan River at Tonasket. Tunk Creek drains the region east of the Okanogan River and north of Riverside and the Omak Creek drainage. Tunk Creek discharges to the Okanogan River north of Riverside. Johnson Creek drains the region east of Salmon Creek and west of the Okanogan River. Johnson Creek discharges to the Okanogan River at Riverside.
- **Antoine-Whitestone (Upper Okanogan)** – This subbasin consists of three HUC-10 watersheds that include the mainstem Okanogan River and several steelhead bearing tributaries located on opposite sides of the river. Antoine and Siwash creeks drain the region east of the Okanogan River and north of Tonasket and discharge to the river north of Tonasket. Tonasket Creek and Ninemile Creek drain the region east of the Okanogan River at Lake Osoyoos and discharges to the lake at and near Oroville, respectively. Whitestone and Aeneas creeks drain to the west side of the Okanogan River to the north and south of the City of Tonasket, respectively.
- **Similkameen** – This subbasin consists of the HUC-8 Similkameen River that originates in Canada and drains the Sinlahekin Creek region located north of the Salmon Creek drainage and west of the Whitestone drainage. The Similkameen discharges to the Okanogan River at Oroville.

By proximity, the mainstem Okanogan River is included by reference in each of the adjacent subbasins as noted above (i.e., lower, middle, upper), from the confluence with the Columbia River to the Canadian Border. Figure 1 also shows the anadromous fish zone and EDT model domain.

Based primarily on the Okanogan Parcel GIS data and the Okanogan County's Building Permit Database each parcel was flagged as being developed or undeveloped, whether it was/is developed as a residence, and (in some cases) how many residential units it contains. In total, this yielded an estimate of 12,598 total dwellings in the portion of WRIA 49 not falling on CTCR lands.

Next, GIS was used to evaluate whether each given parcel is served (or not) by a permitted (water right) source of domestic water such as a Group A or Group B public water system. Parcels falling outside the boundaries of these water systems or water-right-places of use were assumed to be self-supplied with a permit-exempt well. Of the 12,598 total dwellings, 5,957 are estimated to be self-supplied.⁶

To forecast the 20-year increase from this present-day estimate, a range of potential growth rates were considered. The primary sources for this analysis were estimates/data from the Washington State Office of Financial Managements (OFM), including data from the Small Area Estimates Program (SAEP), and an analysis of Okanogan County building permits trends by the County's Office of Planning and Development. Analysis and review of the various datasets, yielded the following growth rate-based "scenarios":

- **Low-growth scenario: 6 percent**
Based on OFM's SAEP estimate for WRIA 49 total population change (5.7 percent) and on the OFM/Okanogan County medium growth scenario for population change for all of Okanogan County from 2019 to 2038 (7.2 percent), rounded to reflect uncertainty.
- **Medium-growth scenario: 10 percent**
Based on the trend suggested by Okanogan County's building permit analysis (10 percent), the 2010 to 2019 OFM SAEP housing unit growth trends for WRIA 49 (9.6 percent), rounded to reflect uncertainty. This is the growth rate suggested for the purposes of quantifying forecasted impacts on instream flows associated with permit-exempt well growth and the identification of water and non-water offset requirements.
- **High-growth scenario: 30 percent**
Based on OFM's high growth scenario population projections through 2038 for all of Okanogan County (29.3 percent) as well as the maximum subbasin-specific 20-year SAEP-based block group-based estimate (29.4 percent, for Antoine-Whitestone-Upper Okanogan), rounded to reflect uncertainty.

⁶ 5,777 would be the total if parcels in the Duck Lake Groundwater Aquifer Area were excluded. Self-supplied residences in Duck Lake Groundwater Aquifer Area still rely on what would be considered permit-exempt wells, which is why they are included in the *current* estimates presented here (see Table 2). However, because of the previous water right adjudication and the fact that mitigation is available through the Okanogan Irrigation District, future permit-exempt well connections in the Area are excluded from the subsequent 20-year forecasts (see Table 3).

3.3 Projected Consumptive Use Impacts

Table 3 (below) shows the estimated consumptive use impacts in each WRIA 49 subbasin for the three selected growth scenarios over the 20-year planning horizon (through 2038). Figure 2 shows the locations of projected consumptive use impacts by subbasin. The range of estimated impacts is between 122 afy (0.168 cfs) and 607 afy (0.837 cfs) additional consumptive water use from new permit-exempt well connections in WRIA 49 (excluding the Duck Lake Aquifer Groundwater Subarea and CTCR reservation lands).

Table 3. Total Consumptive Water Use Impact by Growth Scenario

Subbasin	6% Growth (Low Scenario)		10% Growth (Medium Scenario)		30% Growth (High Scenario)	
	New Permit-Exempt Well Connections	Consumptive Water Use Impact (afy) ¹	New Permit-Exempt Well Connections	Consumptive Water Use Impact (afy) ¹	New Permit-Exempt Well Connections	Consumptive Water Use Impact (afy) ¹
Loup Loup-Swamp (Lower Okanogan) ²	63	22.2	106	37.3	317	111.0
Salmon Creek	19	6.7	32	11.2	97	34.0
Bonaparte-Johnson (Middle Okanogan) ²	143	50.3	238	83.7	714	249.9
Antoine-Whitestone (Upper Okanogan)	104	36.6	173	60.9	519	181.7
Similkameen	17	6.0	29	10.2	86	30.1
TOTAL²	346	122	578	203	1,733	607

¹Based on a per-permit exempt well connection consumptive water use estimate of 0.35 afy

²Excludes CTCR reservation lands and the Duck Lake Aquifer Area

For the purposes of quantifying forecasted impacts on instream flows associated with permit-exempt well growth and the identification of water and non-water offset projects for Chapter 90.94 RCW offset, **the Medium-growth scenario has been adopted as the primary planning number.** The Medium scenario rate of 10 percent is consistent with the overall average of all growth rates reviewed (see Appendix A). Table 4 provides a detailed breakdown of the total and consumptive use associated with the 20-year Medium-growth scenario by subbasin.

While consumptive use impacts are steady state, they represent the greatest percentage of surface flow during the low flow periods of late summer and early fall. Several water offset projects are included in this Plan Addendum that focus on providing the greatest benefit during low flow periods (discussed in Section 4).

Project proposals for inclusion in the Plan Addendum were solicited from Planning Unit and TAG members over four months beginning in December 2019. Over 30 project proposals were received. Several of these proposals were evaluated at a 2-day TAG workshop in January 2020 and the balance were evaluated as they were received. The two-day TAG workshop was an open meeting for members of the TAG and Planning Unit. The group was attended by a broad range of interests, including representatives from the County, Ecology, non-governmental organizations (NGOs), irrigation districts, landowners, and non-profit groups, such as the Farm Bureau.

A two-tier scheme was used to distinguish projects presenting the highest potential for providing measurable streamflow restoration benefits. Tier 1 projects include both water-for-water offset and non-water offset that are sufficiently well defined to:

1. Quantify a consumptive use offset;
2. Estimate a net effect on instream flow and/or;
3. Estimate an effect on aquatic habitat conditions (e.g. habitat area, fish passage, water temperature conditions, etc.).

Tier 2 projects include those projects that are likely to provide future water-for-water and non-water offset benefits but the current proposals are not well defined enough to quantitatively estimate their effects. We are relying exclusively on the Tier 1 projects to demonstrate that the Plan Addendum offers sufficient resources to fully offset future consumptive use and achieve NEB at the WRIA level. The Tier 2 projects are additional resources that can be adaptively managed to achieve Plan Addendum objectives and Chapter 90.94 RCW requirements as they are more fully defined. These projects also provide an additional factor of safety if one or more Tier 1 projects cannot be implemented as planned.

The Planning Unit elected to use the Okanogan EDT Model, previously developed for anadromous reaches of the mainstem and tributaries to the Okanogan River, as the primary method to quantitatively evaluate the effects of proposed water offset and non-water projects on NEB in WRIA 49. The NEB effects of Tier 2 water offset and non-water offset projects were evaluated qualitatively.

The identified water offset and non-water offset Tier 1 and 2 project suite, relative ranking, and recommendation for adaptive management was formally adopted by the Planning Unit at the May 7, 2020 Planning Unit meeting, and later reaffirmed following adoption of this Plan Addendum and supporting technical documents.

A subset of the proposed Tier 1 projects were selected for EDT modeling based on the following criteria:

1. The projects are eligible to be counted towards NEB under Chapter 90.94 RCW, meaning they were proposed, contracted, and/or funded for construction after January 2018;
2. The project is likely to effect aquatic habitat conditions within the WRIA 49 anadromous zone that can be estimated through modeling, and;

mainstem and discharging to the tributary (before flowing down the tributary and re-joining the mainstem). This instream flow benefit contributes to the 'tributary offset'⁸ results calculated at the subbasin and WRIA level. The tributary offset is the total tributary instream flow effect used to model NEB effects in EDT. Several submitted non-water offset project proposals met the first Tier 1 evaluation criterion (i.e., they are Chapter 90.94 RCW eligible) but did not meet conditions 2 or 3 and are therefore designated as Tier 2. These projects are likely to contribute to positive NEB but insufficient information is available to quantify their effect on the environment at this time.

Some of the non-water offset projects provide significant instream flow benefits in tributaries, while allowing for some portion of that water to be withdrawn from the Okanogan mainstem. Relocating water withdrawals from tributaries to the mainstem would contribute to NEB because steelhead and resident fish rely on these tributary habitats, and the proposed Tier 1 water offset projects would negate any resulting mainstem flow deficit.

All non-water offset projects selected for consideration by the Planning Unit are summarized in Table 5 and presented in Appendix B. The projected effects of Tier 1 non-water offset projects on the environment and the associated ecological parameters used to model these effects in EDT are described in Appendix C. In addition, Appendix C provides clear and systematic rationale how each project provides water offset or contributes toward NEB. The projected effects of all modeled Tier 1 projects on aquatic habitat conditions for Okanogan steelhead, summer/fall Chinook salmon, and resident native fish are presented with the NEB evaluation in Section 6.

4.4 Opportunistic Projects

This Plan Addendum includes the opportunistic pursuit of future project opportunities, recognizing that additional resources for adaptively managing Chapter 90.94 RCW requirements are likely to emerge over time. These pursuits can be linked with increases or decreases in actual versus currently estimated new exempt well demand, which would potentially shift appropriate offset project needs. As described above, several types of opportunistic projects have been identified, including the Irrigation Efficiencies Grant Program, which provide water and non-water offset value, bank stabilization, and riparian planting projects. Additional opportunistic projects are expected to be identified and completed over the planning horizon as they are identified, landowner permission is granted, and funding is obtained. Opportunistic projects will be reviewed and vetted by the lead entity and Planning Unit to ensure they are appropriate for helping meet water offset and/or NEB and incorporated into the plan through adaptive management as discussed in the sections below.

⁸ Tributary offset is the total projected instream flow increase in Okanogan River tributaries that support summer steelhead, combining water-for-water offset projects and Tier 1 non-water offset projects.

This plan implementation and adaptive management approach has been developed to reflect the strong local values expressed by both the Initiating Governments and Planning Unit members. Specifically, retention of water rights for both current and future out-of-stream uses is a top priority. In addition, the Planning Unit seeks to protect and improve the quality of life for all inhabitants, which means protecting water quality and quantity for farmers, native tribes, families, wildlife, and recreation. The water offsets and projects contributing to NEB presented in this plan will be managed to meet Chapter 90.94 RCW plan requirements, while maximizing the amount of water available for future water needs, both out-of-stream and in-stream uses.

5.1 Plan Implementation Framework

Implementation of the WRIA 49 Watershed Plan Update will be achieved through the efforts of multiple Planning Unit member organizations in the watershed but will require ongoing management by a lead entity (Okanogan County). Tasks envisioned over the 20-year implementation period include:

- Water and non-water offset project development and implementation including:
 - Prioritization of projects based on tributary and/or mainstem offset and NEB requirements, while maintaining or enhancing current reliability, instream flows, and future agricultural uses;
 - Identification of funding sources for projects identified in this plan;
 - Securing funding;
 - Project design and project construction; and
 - Development of new opportunistic offset project ideas and concepts as part of adaptive management.
- Water and non-water offset project operation and maintenance, including associated monitoring
- Coordination and tracking of projects implemented to achieve NEB over the planning horizon including:
 - Tracking and documenting locations of projects;
 - Current project status (i.e. proposed, in design, under construction, operational); and
 - Quantity of water offset provided and/or habitat improvement achieved compared to the existing EDT model predications.
- Tracking WRIA 49 permit-exempt demand including number of permit-exempt wells authorized each year using a County-based water accounting software based on a review of new building permits.
- Regular reporting of actual permit-exempt well demand, offset project status, offset surplus/deficit tracking, and changes in plan implementation. Every five years, a summary of plan implementation and adaptive management tasks and status will be prepared for submittal to Ecology.
- Communication with Planning Unit members and the public regarding offset project sponsorship, project coordination, plan implementation and associated NEB status.

Okanogan County, IGs, or other Planning Unit entities may contract with outside parties to facilitate project implementation.

Responsibilities include:

- Serving as lead proponent for their proposed projects, including securing funding, implementation, operation and maintenance, and sharing information with Okanogan County necessary for project tracking and reporting
- Tracking of new non-water offset project opportunities and notifying Okanogan County of identified potential projects

Other Planning Unit members, NGOs, and agencies may be added to this list if they become lead proponents for new offset projects as plan implementation progresses. This includes the numerous Tier 2 projects identified in this plan and future opportunistic projects.

5.3 Funding

Implementation of the WRIA 49 Watershed Plan Update will require funding for capital projects, project operation and maintenance, and ongoing program management. The following section provides an overview of funding mechanisms authorized through ESSB 6091 and Chapter 90.94 RCW, potential new funding mechanisms, and options for funding plan implementation.

ESSB 6091 authorized \$300 million in capital funds to be dispersed between 2018 to 2033 to incentive local implementation of plans, including but not limited to the following uses:

- Implement watershed restoration and enhancement projects developed under RCW 90.94.020 and 90.94.030
- Collect data and complete studies necessary to develop, implement, and evaluate watershed restoration and enhancement projects

In 2019, Ecology adopted a rule to establish process and criteria for prioritizing and approving funding applications. Chapter 173-566 WAC. Under Ecology's rule, projects located in watersheds planning under RCW 90.94.020, such as WRIA 49, and included in watershed plans adopted under RCW 90.94.020 will be given "added priority", (WAC 173-566-150).

The projects identified for this Plan Addendum were evaluated based on a collaborative approach of the Planning Unit. The entities that have proposed projects contained in this Plan Addendum have a long history of successfully implementing similar projects. The Planning Unit recognizes there is an active, knowledgeable base of local entities to implement projects. As each project is funded, implementation of that project will include funding to ensure long-term success and consistency with other water resource protection measures. In addition to the Streamflow Restoration Grant program there are other applicable state and federal grant programs, including:

- Bureau of Reclamation WaterSmart Programs (e.g. Drought Resiliency, Water Efficiency, and Water Market programs)
- Ecology Office of Columbia River grant program

The Plan Addendum proposes to achieve this through periodic updates to each of the Implementing Governments and a requirement to reconvene the entire planning unit on a minimum five-year interval to review the accuracy of the Plan Addendum's initial projections for growth and offset project implementation and a commitment to make periodic updates as needed. The Planning Unit believes that without such commitment to consistent engagement and participation, the addendum holds little promise of achieving the plans long-term objective of predictable continued growth.

Adaptive management was discussed in a June 11, 2020 WRIA 49 Planning Unit meeting. Several potential components were presented to the Planning Unit, including:

- Projects presented in the plan shall be considered a “menu” of options to meet the requirements Chapter 90.94 RCW and the 20-year exempt well demand identified in this plan. Identification of a particular project does not obligate the Planning Unit to implement the project and/or dedicate available water offset, in whole or part, or associated NEB benefits to the Chapter 90.94 RCW process.
- A 5-year cycle for reviewing the status of the WRIA 49 Watershed Plan Addendum and associated actions was proposed.
- Several variables to consider for review and associated actions were proposed:
 - Status of actual exempt well demand: Periodic evaluation of actual new exempt well demand relative to estimates included in this Plan Addendum.
 - Status of project funding and implementation: Review the water and non-water offset projects that have been implemented to date, offset totals, and the availability of project funding for implementation of proposed offset projects.
 - Availability of opportunistic water and non-water offset projects: Update the offset project list to incorporate new projects that have been identified by Planning Unit members following approval of this Plan Addendum, and to remove projects included in this addendum that no longer appear likely to be implemented or are no longer consistent with local values. Opportunistic projects can stem from a variety of sources, including future landowner interest in applicable projects and future studies.
 - Coordinate with County Comprehensive Plan Updates to ensure those efforts are aligned with the WRIA 49 Watershed Plan Update
- Opportunities to accelerate or add offset projects if the magnitude of 20-year exempt well demand incorporated into this Plan Addendum is lower than actual demand. Similarly, projects may be delayed, substituted, or removed if the estimated demand was higher than actual demand.
- Opportunities to receive credits for water offsets in excess of 20-year exempt well demands, in the event a subsequent mitigation requirement is launched in the future.
- Opportunities to use eligible quantities of water in excess of the 20-year water offset requirement that will be protected from relinquishment and available for other out-of-stream uses (i.e., water bank). The Planning Unit understands the eligibility requirements under Ecology's Water Resource Program Final

buyers and sellers. In addition, the buyers have applied for funding from the Streamflow Restoration grant program. Therefore, while the Planning Unit does not have consensus agreement of the project concept, it is an opportunistic project that would more than satisfy the 20-year permit-exempt well offset, and the Planning Unit recognizes its responsibility to maximize local benefit of the basin resources, even if it may conflict with group values, and would count available offset toward the 20-year exempt well impacts.

- **Pine Creek Water Right Acquisition** – Ecology’s Office of Columbia River (OCR) has water available for immediate purchase. The land has already been fallowed, and the water right is currently protected from relinquishment in the State’s Trust Water Right Program (TWRP). The water right has 625.7 acre-feet of consumptive use available for mitigation downstream of Janis Rapids on the mainstem Okanogan River, of which 225.7 acre-feet are only available for mitigation within Okanogan County. The remaining 400 acre-feet of consumptive use may be used further downstream out of the County. The mitigation suitability of the water right provides for year-round uses in continuity with the mainstem Okanogan River. However, under the Chapter 90.94 RCW process, the water right only provides for water offset, and does not significantly contribute toward NEB in tributary subbasins. Therefore, the Planning Unit views the Pine Creek water as having a greater long-term mitigation potential beyond Streamflow Restoration. However, it is identified as a highly reliable option that is immediately implementable and has been included in the plan to provide certainty.
- **Salmon Lake Storage** – The project would increase the storage capacity of Salmon Lake. The Draft Environmental Impact Statement (DOE, 2004) indicates that it is not necessary to alter the height of the dam to increase water storage but structures and infrastructure around the lake would need to be relocated to prevent inundation. Relocating 12 cabins, approximately 2,000 feet of septic pipe and 8 septic tanks would make approximately 1,000 acre-feet of storage capacity available for flow retiming. The additional volume would contribute to the 3,600 ac-ft. dedicated to provide perennial flow downstream of the Okanogan Irrigation District diversion dam. This additional volume would augment or extend the duration of migration flows, augment summer baseflow, and augment winter base flow as needed to increase over-winter survival of steelhead, resulting in significant NEB. It is the Planning Unit’s expectation that, in addition of the significant contribution to NEB in Salmon Creek, if constructed, the Salmon Lake Storage project would also provide for greater irrigation reliability both in Salmon Creek (although some quantities would be protected instream) and stored water would be available for additional out-of-stream uses from sources in continuity with the mainstem Okanogan River within WRIA 49.

Additional Tier 2 projects are also available to ensure that the minimum 20-year consumptive use offset set under the Chapter 90.94 RCW requirements are fully satisfied. Two of the Tier 2 projects (Sinlahekin Wildlife Area Improvement Project and Conconully Dam Replacement) have the potential to satisfy a significant portion (if not

6 Net Ecological Benefit Evaluation

As required by RCW 90.94.020.4(b) and 4(c), this Plan Addendum must include actions sufficient to offset projected future water demand and provide habitat benefits sufficient to produce NEB. Ecology (2019b) established policy guidance for conducting NEB evaluations. The guidance states that the NEB analysis should consider the impacts of projected future water demand, identify projects and actions that provide additional benefits to instream resources above and beyond those provided by consumptive use offsets, and present a clear statement of findings that the proposed actions will or will not achieve NEB.

The Ecology guidance further stipulates that the NEB evaluation must consider the extent of aquatic habitat affected; the presence, distribution, and life stage requirements of important fish species; and ecosystem structure, function, and composition. The guidance places emphasis on improving conditions for Pacific salmonid populations listed under ESA requirements, followed by other native anadromous and resident fish species. Elements of the NEB analysis may be conducted at the individual subbasin level, but the final determination is made on the net effect of all proposed actions at the WRIA scale.

6.1 Okanogan Ecosystem Diagnosis and Treatment Model

The WRIA 49 Planning Unit elected to use the Okanogan EDT model to conduct the NEB analysis. EDT is a life cycle-based habitat model that synthesizes data and information about fish habitat conditions into quantitative metrics that describe habitat potential. Access to the Okanogan EDT model is being provided by OBMEP. OBMEP developed the Okanogan EDT model to support long-term habitat status and trends monitoring and restoration planning under the Columbia Basin Fish Accords, which provide federal funding to state and tribal governments to promote the conservation and recovery of salmon and steelhead populations listed under the ESA. OBMEP, the CTCR Okanogan Subbasin Habitat Improvement Program (OSHIP), and other subbasin stakeholders use Okanogan EDT results to help identify and prioritize habitat protection and restoration actions. As such, the Okanogan EDT model implicitly incorporates the large body of knowledge about the Okanogan River system, watershed ecology, and the biology of anadromous and resident fish to evaluate projects and actions described in this plan. The quantitative methods and assumptions used in the application of the model apply the same clear and systematic logic as other existing local plans being developed and implemented in WRIA 49. This statement is further supported by the sections below.

The Okanogan EDT model is an ideal tool for supporting the WRIA 49 NEB analysis because:

- EDT is a life cycle-based model with a spatial and temporal dispersal component that emulates the full range of life history expression for the target species;
- The Okanogan model covers over 180 miles of mainstem and tributary stream reaches in WRIA 49, including all currently accessible anadromous habitat and nearly all tributaries likely to be affected by future consumptive use demand;

fish would benefit these species. Likewise, the proposed irrigation efficiency project in Loup Loup Creek would increase instream flows both within and upstream of the anadromous zone, benefitting resident fish throughout the watershed.

6.2 EDT Model Analysis Approach

The baseline condition (BASE scenario) used for the Okanogan EDT model analysis is the OBMEP 2017 habitat status and trends monitoring scenario. This scenario is based on habitat monitoring data collected by OMBEP from 2014 through 2017 and provides a useful representation of average habitat conditions over this recent four-year period. Where appropriate, BASE scenario conditions were modified in specific tributaries to reflect habitat actions that occurred after 2017 but are Chapter 90.94 RCW ineligible. All BASE scenario modifications are described in Appendix C.

The Planning Unit used a sensitivity analysis approach to evaluate the impacts of future consumptive use on aquatic habitat performance in WRIA 49. The sensitivity analysis used a conservative overestimate of demand effects on wetted channel width under low flow conditions to provide a factor of safety for demonstrating NEB. The sensitivity analysis approach and results are summarized in Section 7.1, and are described in detail in Appendix C.

The NEB analysis scenario maintains the sensitivity analysis effect in all tributaries where no Tier 1 water offset or non-water offset projects are proposed. In tributaries where flow restoration of some type is proposed, either water-for-water or tributary instream flow offset, the NEB scenario considers the net effect of the projected change in streamflow on baseflow channel width as well as other potentially beneficial effects, such as improved habitat composition, reduced low flow variability, improved fish passage, and reduced water temperatures. The intent of this approach is to conservatively overestimate the potential effects of future water demand to provide a factor of safety for the NEB evaluation. The sensitivity analysis approach and results for the consumptive use impact analysis are summarized in Section 6.3. The water-for-water and non-water offset projects used in the NEB evaluation are described in Sections 4.2 and 4.3, respectively. The results of the NEB evaluation are provided in Section 6.4. Detailed descriptions of proposed streamflow and habitat restoration projects used in the NEB evaluation and the EDT analysis parameters used to represent the predicted effects of these projects on the environment are provided in Appendix C.

6.3 Future Consumptive Use Impact Analysis

As discussed in Section 3 of this Plan Addendum, consumptive use in WRIA 49 is projected to increase by an estimated 203 afy in WRIA 49 over the 20-year Chapter 90.94 RCW planning horizon. This increase in demand is distributed disproportionately over the four planning subbasins considered in the Plan Addendum, ranging from a low of 10.2 afy in the Similkameen subbasin to a maximum of 83.8 afy in the Bonaparte-Johnson (Middle Okanogan) subbasin. This translates to a steady state reduction in streamflow ranging from -0.014 to -0.116 cfs, respectively (Table 6 below).

The ultimate distribution of these streamflow effects will depend on the number of tributary streams in each subbasin and where future development takes place. In the

Table 6. Estimated increase consumptive use in WRIA 49 and projected sensitivity analysis effects on adult and juvenile steelhead *Neq* using the Okanogan EDT model

NEB Subbasin	Estimated Self-Supplied Parcels	New Well Dwellings	Consumptive Use		Sensitivity Analysis Effect on Steelhead <i>Neq</i> (change from BASE conditions)	
			afy ²	cfs	Adult	Juvenile
Loup Loup-Swamp (Lower Okanogan)	1,058	106	37.3	0.052	19 (0)	1,069 (-3)
Salmon Creek	324	32	11.3	0.016	120 (-1)	8,944 (-36)
Bonaparte-Johnson (Middle Okanogan) ⁴	2,379	238	83.8	0.116	32 (0)	1,908 (-5)
Antoine-Whitestone (Upper Okanogan)	1730	173	60.9	0.084	62 (0)	3,756 (-8)
Similkameen	286	29	10.2	0.014	51 (0)	2,056 (0)
TOTAL	5,777	578	203	0.281	304 (-1)	18,875 (-52)
¹ Based on a per-residence total water use estimate of 0.59 afy						
² Based on a per-residence consumptive water use estimate of 0.35 afy						
³ Subbasin is located entirely on CTCR lands, no parcels under Chapter 90.94 RCW jurisdiction.						
⁴ Excludes the Duck Lake Aquifer Area						

6.4 Net Ecological Benefit Analysis Results

The results of the Okanogan EDT model analysis will be used to evaluate whether the proposed water and non-water Tier 1 projects in WRIA 49 can achieve NEB at the WRIA scale and in all Okanogan subbasins. Supporting Okanogan EDT model results for the NEB analysis are discussed in Appendix C and summarized below:

- **BASE and NEB Scenario Results (Table 7).** EDT model results for the revised BASE and NEB project scenarios by analysis subbasin, and net effect of Tier 1 water offset and non-water offset NEB-contributing projects on adult and juvenile steelhead and Chinook salmon *Neq*. These results indicate that the streamflow and habitat benefits of proposed offset and non-water offset projects will demonstrably increase habitat potential for anadromous species at the WRIA level and in four out of five analysis subbasins.
- **Water NEB Results (Table 8).** NEB analysis results summary, including water offset balance, total tributary offset balance, and the estimated beneficial effect of Tier 1 streamflow and habitat restoration projects on salmon and steelhead resources in WRIA 49. These results indicate that the proposed water offset projects will achieve sufficient water offset to compensate for exempt well demand with a factor of safety at the WRIA level. Non-water offset projects will provide additional instream flow restoration sufficient to achieve a net increase in tributary instream flows in all but one analysis subbasin. Collectively, the water

where the EDT model predicted improved habitat performance for steelhead and Chinook salmon.

- Consumptive use effects on steelhead in the Similkameen subbasin were not modeled because the sensitivity analysis assumptions were not applied to mainstem reaches, however any incremental effect on steelhead or other aquatic species could be fully offset by the instream flow benefits of a proposed Tier 2 non-water offset project in Sinlahekin Creek.
- The Tier 2 Sinlahekin Creek project would also provide habitat benefits for resident fish species, such as rainbow trout, cutthroat trout, mountain whitefish, native suckers, and sculpins.
- Based on the quantitative benefits to steelhead and Chinook salmon from Tier 1 projects demonstrated by EDT at the subbasin and WRIA level, the qualitative benefits to resident fish provided by these projects, and the additional benefits and factor of safety provided by Tier 2 projects, the Plan Addendum can achieve NEB at the subbasin and WRIA level.
- The water offset and non-water offset projects in this Plan Addendum would provide a net surplus of water offset, tributary offset, and ecological benefit sufficient to adaptively manage for future water demand and meet Chapter 90.94 RCW requirements with a factor of safety.
- The proposed projects are realistic, are in project categories that are supported by state and federal funding programs, have viable sponsors and defensible conceptual designs, and include some projects that have already been implemented.
- The WRIA 49 Planning Unit has reached concurrence that this Plan Addendum demonstrates that the combined components of the plan achieve NEB consistent with Chapter 90.94 RCW requirements.

Limitations

Work for this project was performed for the Okanogan County (Client) on behalf of the WRIA 49 Planning Unit, and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Table 1. WRIA 49 Planning Unit and Technical Advisory Group Members

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

Organization	Representative	Initiating Government	Planning Unit Member	Participation
Okanogan County	Chris Branch	X		Yes
OTID	Jay O'Brien	X		Yes
City of Omak	Todd McDaniel	X		Yes
Water Right Holders (Government)				
Coville Tribe	Charles Brushwood			Yes
Washington State Department of Ecology	Vanessa Brinkhuls			Yes
Washington Department of Fish and Wildlife	Connie Iten			Yes
City of Okanogan	Christopher Johnson		X	Yes
City of Tonasket	Christa Levine		X	Yes
City of Oroville	Jon Neal			No
Town of Conconully				No
Town of Riverside	Sharma Dickinson		X	Yes
City of Brewster	Lee Webster			No
Water Right Holders (Private)				
North	Nicole Kuchenbuch		X	No
Central	Jim Soriano		X	Yes
South	Rod Haeberle		X	Yes
Irrigation Districts				
Aeneas	-			No
Alta Vista	-			No
Aston	-			No
Brewster Flat	-			No
Crumbacher	-			No
Helensdale	-			No
Okanogan	-			No
Pinecrest	-			No
Pleasant Valley	-			No
Sun Crest	-			No
Westview	-			No
Whitestone	Rob Inlow		X	Yes
Other Organizations				
Okanogan Conservaiton District	Amy Martin			Yes
Okanogan PUD No. 1	Scott Verjraska		X	Yes
Okanogan County Cattlemen's Association	Jerry Barnes		X	Yes
Well Drillers	Chester LaFountaine		X	No
Okanogan County Horticulture Association	Dick Lorz		X	Yes
Realtors	Rocky Devon		X	Yes
Okanogan County Farm Bureau	Dick Ewing		X	Yes
Economic Alliance	Roni Holder-Diefenbach		X	Yes
Okanogan Land Trust	Stacy Shutts		X	Yes
Okanogan Highlands Alliance	Jennifer Weddle		X	Yes
Columbiana	Rick Gillespie		X	Yes
Landowner at-large - North	Mike Kelly		X	Yes
Landowner at-large - Central	Jim Utt		X	Yes
Landowner at-large - South	Tory Wulf		X	No
Trout Unlimited	Jacquelyn Wallace			Yes
Washington Water Trust	Greg McLaughlin			Yes
Private Timber Management	Bob McDaniel		X	Yes

Table 5. Summary of Proposed WRIA 49 Offset Projects
WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

Shishahkin Wildlife Area Improvement Project	Similkameen	Tier 2	Oroville-Tonasket Irrigation District, Washington Department of Fish and Wildlife	O&NEB	Impoundment and diversion system improvements to support instream flows in Shishahkin Creek. A portion of water savings will be dedicated to instream flows.	Unspecified	Unspecified	42	\$750,000	Yes
Tunk Valley Dry Forest Restoration	Bonaparte-Johnson (Middle Okanogan)	Tier 2	OCD, DNR	NEB	1,100-acre project to create long-term habitat quality and ecological integrity by moving stands back towards more dispersed, larger diameter trees at a much-reduced density.	—	—	—	Unspecified	Yes

1 O&NEB = consumptive use offset project with or without additional habitat restoration that contributes to NEB; NEB = streamflow and/or habitat restoration project that contributes to NEB; LO = Local Tributary Offset

2 The approximate length of tributary or mainstem reach measurably affected by the proposed non-water offset project. For the Highway 20 culvert replacement project the affected length covers the Conservancy Island side channel from its historical upstream and downstream connection points with the mainstem Okanogan River.

3 Indicates project applied for 2020 Streamflow Restoration Grant funding.

Table 8. Water NEB Results

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

NEB Subbasin	Water-for-Water Offset		Tributary Offset ¹		Net Ecological Benefit			
	Net change (afy)	Net change (cfs)	Net change (afy)	Net change (cfs) ²	Adult	Juvenile	Adult	Juvenile
					Steelhead Neq	Steelhead Neq	Chinook Neq ³	Chinook Neq ³
Loup Loup-Swamp (Lower Okanogan)	-37	-0.51	275 (approx)	0.38	2	118	2	2,537
Salmon Creek	1,000 (+988)	1.36	1,499	2.07	111	5,539	--	--
Bonaparte-Johnson (Middle Okanogan)	626 (+626) ⁴	0.864	123	0.17	4	83	14	1,999
Antoine-Whitestone (Upper Okanogan) ⁵	1,160 (+1,099)	1.52	2,371	3.28	2	110	1	305
Similkameen ⁶	-10	-0.01	-	-	0	0	1	166
WRIA 49 Total	2,786 (+2,666)	3.22	6,753	5.9	119	5,850	18	4,826

¹ Tributary Offset is the total instream flow increase in Okanogan River tributaries that support summer steelhead, combining water-for-water offset projects and Tier 1 non-water offset projects.

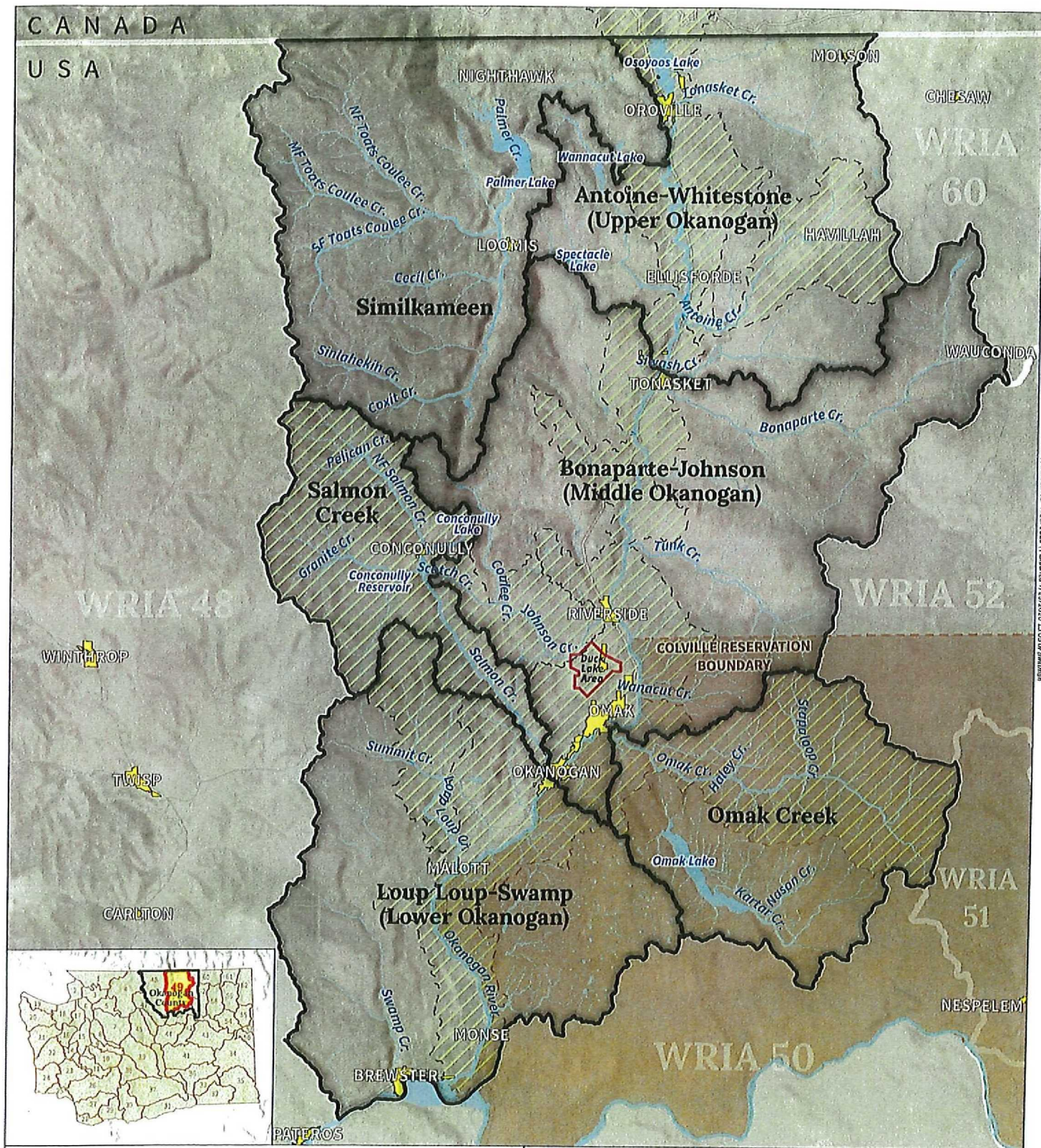
² Net change (cfs) values are average over 1 year. All non-water offset projects provide flow augmentation during specific periods (e.g. April through October) to optimize habitat benefits for steelhead.

³ Chinook NEB effect from Highway 20/Conservancy Island side channel project

⁴ Pine Creek water-for-water offset applies in mainstem Okanogan only (no tributary offset or measurable NEB effect)

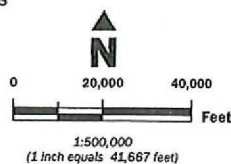
⁵ Tributary offset and NEB estimate include AVR project with full instream flow benefit of 1,294 afy, including additional non-water offset of 134 afy.

⁶ The Tier 2 Sinlahekin Wildlife Area Impoundments Improvement project provides sufficient potential tributary offset in the Similkameen subbasin to avoid consumptive use effects and produce additional NEB benefit for resident fish species. A net tributary offset of zero is assumed for the purpose of the NEB determination.



- WRIA49 Subbasins
- Duck Lake Aquifer Area
- Anadromous Fish Subbasin Area

- Colville Reservation
- Towns



WRIA 49 Subbasins

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum
Okanogan County, WA

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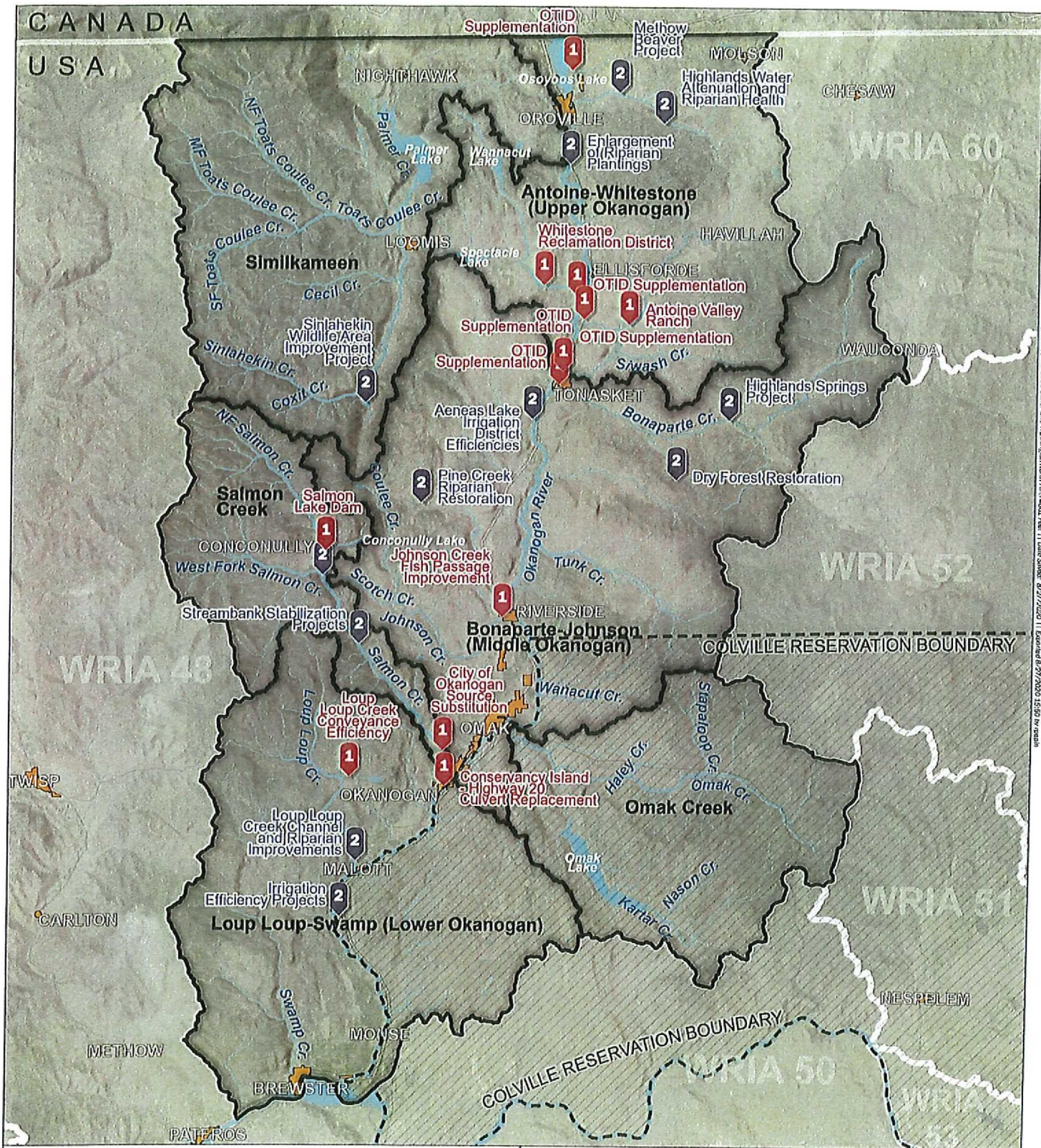
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190259

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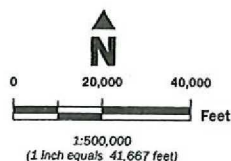
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FIGURE NO.

1



- WRIA 49 Subbasins
- Tier 1 Project Location
- Tier 2 Project Location
- Colville Reservation



Tier 1 and 2 Project Locations

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum
Okanogan County, WA



AUG-2020

PROJECT NO.
190259

BY
PPW
REVISED BY
TDC / RAP

FIGURE NO.
3

October 1, 2020

To: Okanogan Watershed Initiating Governments:

- Okanogan County
- City of Omak
- Oroville-Tonasket Irrigation District

From: Okanogan Watershed Planning Unit

SUBJECT: Letter of Recommendation to Adopt the Okanogan Watershed Plan Addendum per RCW 90.94.020.

To Whom It May Concern:

The Okanogan Watershed Planning Unit was re-appointed and augmented to develop an addendum related to domestic permit-exempt water use for the Okanogan Watershed Plan (2009). This addendum identifies anticipated growth and increased domestic-exempt water demand, potential water off-set projects, watershed scale net ecological benefit projects, and evaluates said benefits which shows an overall net benefit for Water Resource Inventory Area (WRIA) 49. We hope you will give as much consideration and thoughtful insight into how you use this information and our recommendations as we did into the development of the plan.

Planning Unit members whose names are listed below did by voice vote at their October 1, 2020 meeting hereby agree to support this plan addendum. Members recognize and agree that each member may or may not support individual elements, decisions, or recommendations of the plan, the members below support the addendum as presented. The Planning Unit Members will continue to work with Okanogan County to work to ensure that remaining disagreements are resolved through the included adaptive management process. In addition, Okanogan County will continue to acknowledge that the Planning Unit is an ongoing entity, that will be consulted in development and implementation of comprehensive planning for water resource management in the basin.

Planning Unit members further wish to explicitly encourage the Initiating Governments to support to the extent possibly the implementation of this plan in an adaptive method to ensure water resources are protected for local domestic, agricultural, industrial, and aesthetic uses as the highest priority.



MEMORANDUM

Project No. 190259

October 1, 2020

To: Angela Hubbard, Okanogan County Office of Planning & Development

From:

A handwritten signature in blue ink, appearing to read "Parker Wittman".

Parker Wittman
Associate Data Scientist
pwittman@aspectconsulting.com

A handwritten signature in blue ink, appearing to read "Tyson D. Carlson".

Tyson D. Carlson, LHG
Senior Associate Hydrogeologist
tcarlson@aspectconsulting.com

**Re: Evaluation of Future Permit-Exempt Well Demand
WRIA 49 Chapter 90.94 RCW Streamflow Restoration Plan Addendum**

Summary of Findings

The passage of Engrossed Substitute Senate Bill (ESSB) 6091, as codified by Chapter 90.94 Revised Code of Washington (RCW), requires that an update to the existing Watershed Plan for Water Resource Inventory Area (WRIA) 49, the Okanogan River Basin, be approved by the Washington Department of Ecology (Ecology) by February 1, 2021. A forecast of consumptive water use for new permit-exempt wells over a 20-year period involves making three principal estimates:

1. An estimate the total number of *new residences* expected to be supplied by permit-exempt wells over the 20-year planning horizon
2. An estimate of consumptive *indoor water use* for each permit-exempt well
3. An estimate of consumptive *outdoor water use* for each permit-exempt well

An evaluation of future permit-exempt well demand was conducted based on recent Ecology guidance. There are an estimated 12,598 current total dwellings in the evaluated portion of WRIA 49 (not falling on Confederated Tribes of the Colville Reservation (CTCR) lands) and of those dwellings, 5,777 were estimated to be potentially permit-exempt well sources i.e., self-supplied by a domestic water source and not served by a larger water system.

Assuming a 10 percent growth scenario through 2038, the estimated future domestic dwelling growth in WRIA 49 subbasin resulted in 578 new dwellings, which would be domestic permit-

The total amount of water needed for ESSB 6091 offset and mitigation projects in WRIA 49 is the sum of the indoor and outdoor consumptive use estimates per-permit-exempt well connection (residences) times the number of forecasted new residences connected to permit-exempt wells.

Generally, permit-exempt wells are unmetered and the actual volume of water withdrawals are unknown. The portion of water that is or is not returning to the water system for any given well, or any given geographic setting—i.e., the consumptive portion of water use—is variable. Thus, the estimates presented in this memo rely on a number of practical and generally accepted assumptions (per *ESSB 6091 - Recommendations for Water Use Estimates*), local (WRIA/Okanogan County) trends, and observed patterns.

Additionally, for the purposes of project identification and offset planning, future permit-exempt well consumptive water use estimates are aggregated and totaled for each individual subbasin of WRIA 49.

Geographic Setting: WRIA 49, Subbasins, and Analysis Extent

The boundaries of WRIA 49 as established in WAC 173-500-990 are shown in Figure 1 (attached). WRIA 49 encompasses the portion of the Okanogan River drainage basin falling within the United States including its primary tributary, the Similkameen River, and other numerous perennial and intermittent stream drainages comprising tributaries to the Okanogan. WRIA 49 is completely within the boundaries of Okanogan County and includes the major municipalities of Oroville, Tonasket, Omak, Okanogan, Conconully, and Mallott.

Excluded from the scope of this analysis are the lands of the CTCR, which comprise the eastern portion of WRIA 49 lying east of the Okanogan River and south of Riverside (see Figure 1).

To support watershed planning and offset project identification⁵, the Planning Unit divided WRIA 49 into five subbasin areas⁶ (as seen in Figure 1):

1. Loup Loup - Swamp (Lower Okanogan)
2. Salmon Creek
3. Bonaparte-Johnson (Middle Okanogan)
4. Antoine- Whitestone (Upper Okanogan)
5. Similkameen

⁵ Regarding subbasins, ESSB 6091 - Recommendations for Water Use Estimates states: “ESSB 6091 is written in the context of Water Resources Inventory Area (WRIA)-wide mitigation, so Ecology interprets the words ‘same basin or tributary’ to refer to subareas or subbasins as opposed to entire WRIs. For the purposes of this document, the term ‘subbasin’ is equivalent to the words ‘same basin or tributary’ as used in sections 202(4)(b) and 203 (3)(b). Planning groups must delineate subbasins within WRIs, and these subbasins must be suitably sized to allow meaningful determinations of whether mitigation is in-time and in the same subbasin in the context of highest priority and lower priority projects, without being so small that they are unwieldy (e.g. a WRIA might be divided into eight subbasins). In some instances, subbasins may not correspond exactly with hydrologic basin delineations (i.e. watershed divides).”

⁶ See the corresponding Plan Addendum memorandum: “Summary of Subbasin Assessments and Project Identification”

discussed later in this memo) a large number of parcels were spot checked to confirm the outputs of this methodology.

In total, this yielded an estimate of 12,598 total dwellings in the portion of WRIA 49 not falling on CTCR reservation lands.

Parcels Served by Public Water Systems

Aspect used GIS to evaluate whether each given parcel is served (or not) by a permitted (water right) source of domestic water such as a Group A or large Group B public water system. Using GIS, public water system service area boundaries were overlaid with parcel areas. A parcel (and its associated housing units) was assumed to be served by a given water system if its centroid falls within the service area boundary of that system. Residential parcels falling outside of permitted water service area boundaries (or domestic water right places-of-use) were then assumed to be self-supplied by a permit-exempt well¹¹.

Public Water System Service Area Boundaries

Washington State Department of Health (DOH) provides a GIS dataset of public water system service area boundaries. However, this dataset was not comprehensive of all Group A systems in WRIA 49—and did not include any service area delineations of Group B systems.

To establish which water system delineations were missing from the dataset, all active public water systems in WRIA 49 were downloaded from the DOH SENTRY Internet query page¹². This list was then cross referenced with the initial GIS service area delineations to establish which Group A and larger Group B systems (greater than six connections) did *not* have boundaries in the GIS¹³. Where possible, a variety of data sources were used to delineate water system boundaries missing from the DOH data, including domestic water rights places of use from Ecology's Water Rights Tracking System (WRTS) and Geographic Water Information System (GWIS); city limits; water system plans; and parcel legal descriptions/boundaries. Not all system boundaries were able to be delineated in GIS¹⁴. The final dataset used for this analysis contains the approximate service area boundaries for 43 systems in WRIA 49¹⁵.

See Table 1 (attached) for details on these water systems.

¹¹ This is a simplifying assumption. It is possible that residences inside the service area boundaries of a public water system are supplied by permit-exempt wells. However, establishing how many (or which) parcels this applies to was not feasible within the scope of this work.

¹² <https://fortress.wa.gov/doh/odwsentry/portal/odw/si/Intro.aspx>

¹³ Group B systems with six or fewer connections are most often supplied by permit-exempt wells—whereas larger Group B systems with more than six connections usually have a water right permit. Thus, identifying the service area boundaries for larger Group B systems was a relative priority.

¹⁴ See Table 1 (attached). 30 water systems (including 7 Group A and 23 Group B with more than six residential connections) were not located in GIS. These water systems represent approximately 385 residential connections, which is about 5% of the total estimated residential public water system connections in WRIA 49 (based on DOH data).

¹⁵ Only three (of 29 total) Group A community water system service area boundaries in WRIA 49 were unable to be identified (representing 114 residential connections).

Growth Rate from OFM's Okanogan County 2017 to 2050 Year-over-year Projections

In collaboration with county agencies, OFM periodically publishes county-specific, year-over-year population growth estimates¹⁷. These estimates, which were last updated and published in 2017, forecast annual population growth out to the year 2050. OFM's estimates are provided in low-, medium-, and high-growth scenarios. For Okanogan County, OFM estimates the following population change percentages between 2019 and 2038:

- Low-growth scenario: -6.0 percent (decrease)
- Medium-growth scenario: 7.2 percent
- High-growth scenario: 29.3 percent

It should be noted that these projections are for population change (not housing units) and for all of Okanogan County.

Growth Rate from OFM SAEP (2010 to 2019 Estimates)

One primary recommendation for estimating future permit-exempt well demand in Ecology's *ESSB 6091 - Recommendations for Water Use Estimates* (Ecology, 2018) is to use basin-specific, year-over-year growth numbers from OFM SAEP to extrapolate forward (based on the previous 10 years of data).

OFM's SAEP estimate for WRIA 49¹⁸ puts the ten-year *population* change (2010 to 2019) at 2.58 percent and the ten-year change in total housing units at 4.7 percent (see Table 3, below). Extrapolated 20 years forward to 2038, this would imply 5.2 percent increase in population and a 9.6 percent increase in total housing units.

Table 3. OFM Population Forecast for WRIA 49 2010-2019

	Total Population	Total Housing Units	Occupied Housing Units
2010	30,037	14,349	11,672
2011	30,051	14,436	11,723
2012	30,168	14,528	11,760
2013	30,209	14,596	11,794
2014	30,312	14,671	11,814
2015	30,463	14,775	11,880
2016	30,324	14,826	11,914
2017	30,505	14,894	11,956
2018	30,700	14,957	11,996
2019	30,811	15,024	12,032
Numeric Change, 2010 to 2019	774	675	360
Percent Change, 2010 to 2019	2.6%	4.7%	3.1%
Extrapolated 20-year change	5.2%	9.6%	6.3%

¹⁷ <https://www.ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections>

¹⁸ Updated 9/11/2019. <https://www.ofm.wa.gov/washington-data-research/population-demographics/population-estimates/small-area-estimates-program>

Table 4. Subbasin-specific 20-year Growth Trends from OFM SAEP Block Groups (GIS)

Subbasin	2000 Estimated Population	2019 Estimated Population	Estimated 20-year Percent Change in Population (2000 to 2019)	2000 Estimated Number of Housing Units	2019 Estimated Number of Housing Units	Estimated 20-year Percent Change in Housing Units (2000 to 2019)	2000 Estimated Number of Occupied Housing Units	2019 Estimated Number of Occupied Housing Units	Estimated 20-year Percent Change in Occupied Housing Units (2000 to 2019)
Antoine-Whitestone (Upper Okanogan)	5,188	5,631	8.5%	2,636	3,410	29.4%	1,999	2,315	15.8%
Bonaparte-Johnson (Middle Okanogan)	13,849	14,593	5.4%	6,151	7,139	16.1%	5,265	5,904	12.1%
Loup Loup-Swamp (Lower Okanogan)	6,487	6,972	7.5%	2,573	2,836	10.2%	2,216	2,431	9.7%
Salmon Creek	610	551	-9.7%	322	337	4.6%	235	243	3.5%
Similkameen	1,398	1,361	-2.6%	706	779	10.3%	551	557	1.1%
<i>Total</i>	<i>27,532</i>	<i>29,108</i>	<i>5.7%</i>	<i>12,388</i>	<i>14,501</i>	<i>17.1%</i>	<i>10,266</i>	<i>11,450</i>	<i>11.5%</i>

The values in Table 4 suggest that the subbasin areas of WRIA 49 have experienced variable growth over the prior 20 years—and it is reasonably likely that the variability will continue in the next 20 years. At the same time, the overall WRIA 49 growth estimates are roughly in line with other WRIA-wide growth estimates reviewed as part of this study. It is also notable that the overall range of subbasin-specific growth rates (around 5 to 30 percent) is consistent the overall range of growth scenarios suggested by other data/methods. Because of this, and because permit-exempt well impact quantification/mitigation is happening at the WRIA-scale, growth rates are applied uniformly across the subbasins as “scenarios”, rather than applying different growth rates to different subbasins.

Selecting Growth Rates for the Study

The potential growth rates calculated or cited above span a wide range, from -6 percent (OFM low-growth scenario for Okanogan County population) to 29.3 percent (OFM high-growth scenario for Okanogan County population).

For the purposes of estimating potential permit-exempt well growth in this Study, the following growth rates are used:

- **Low-growth scenario: 6 percent**

This is based on OFM’s SAEP estimate for WRIA 49 total population change (5.7 percent) and on the OFM/Okanogan County medium growth scenario for population change for all of Okanogan County from 2019 to 2038 (7.2 percent), rounded to reflect uncertainty.

Table 5. Estimated Number of New Permit-Exempt Well Connections by Growth Scenario

Subbasin	Estimated Current Number of Permit-Exempt Well Connections	6% Growth Scenario: New Permit- Exempt Well Connections by 2038	10% Growth Scenario: New Permit- Exempt Well Connections by 2038	30% Growth Scenario: New Permit- Exempt Well Connections by 2038
Antoine-Whitestone (Upper Okanogan)	1,730	104	173	519
Bonaparte-Johnson (Middle Okanogan)*	2,559	154	256	768
Loup Loup-Swamp (Lower Okanogan)*	1,058	63	106	317
Salmon Creek	324	19	32	97
Similkameen	286	17	29	86
Total*	5,957	357	596	1,787

Notes: *excluding areas in CTCR reservation lands.

Buildout Analysis

In the context presented here, a buildout assessment is a parcel-scale quantification of possible future residential development based on zoning-based restrictions (e.g., minimum lot size), existing development on a given parcel, current parcel ownership (e.g., federal), conservation easements, and other practical or physical constraints on future development. It is meant to quantify how many residences *could* reasonably be added in a given area. Buildout is not a prediction or projection—nor should it be used as such. In this Study, buildout potential was considered as a possible limit on the 20-year development projection in each basin.

The results of Aspect's buildout analysis (see Table 6, below) were generally consistent with a similar analysis conducted by The Okanogan County Office of Planning and Development in 2019. The buildout potential of WRIA 49 is orders of magnitude greater than even the high-growth scenario of 30 percent—and is not a constraint on the 20-year forecast(s) in this Study, at the WRIA or subbasin level.

Table 6. High Growth Exempt Well Estimate Compared to Buildout

Subbasin	2038 High-growth Projection for New Exempt Well Parcels	Developable Lands Outside of Existing Public Water Service Areas	
		Number of Existing Undeveloped Developable Parcels	Buildout Lots (subdivision on presently undeveloped lots)
Antoine-Whitestone (Upper Okanogan)	519	3,396	29,106
Bonaparte-Johnson (Middle Okanogan)*	768	3,909	56,985
Loup Loup-Swamp (Lower Okanogan)*	317	1,938	47,768
Salmon Creek	97	394	5,096
Similkameen	86	744	16,693
Total*	1,787	10,381	155,648

Notes: *excluding areas in CTCR lands.

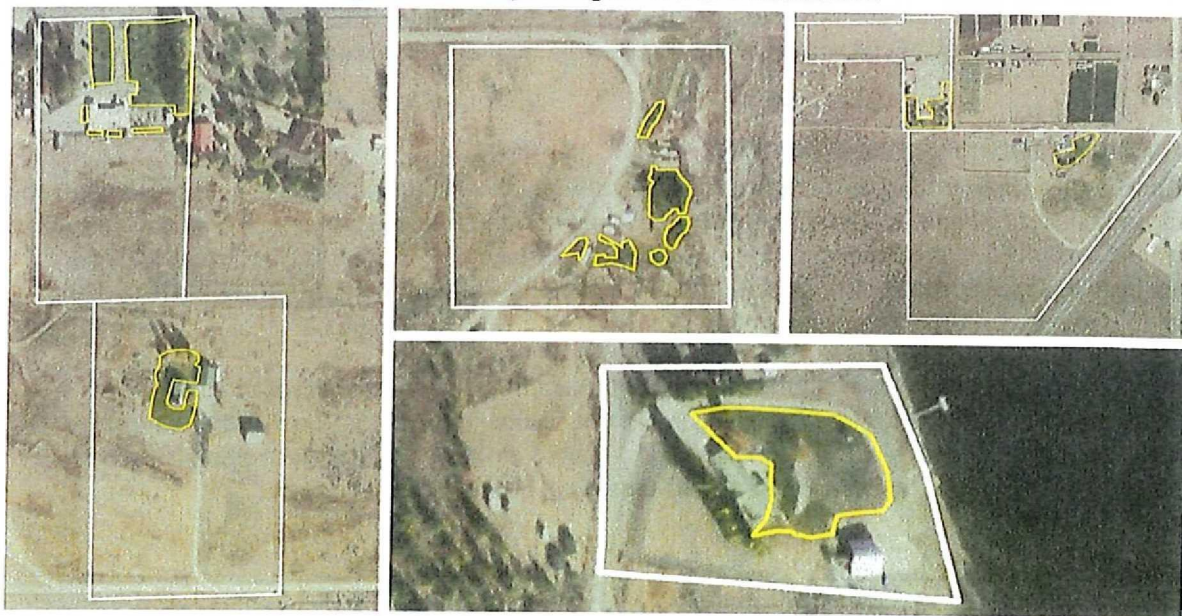
“Indicator parcels” were defined as residential parcels that are likely receiving water from permit-exempt wells *that do not have a separate source of irrigation water*. There were total 2,874 parcels in WRIA 49 meeting these criteria²³.

After identifying the total sample set of indicator parcels matching the above criteria in WRIA 49, 18 percent of these parcels²⁴ were selected at random²⁵ *from within each* of the twelve 12th-digit United States Geological Survey (USGS) Hydrologic Unit Codes (HUCs) in the WRIA²⁶. This selection method was used to ensure an even geographical distribution of parcels for review. The location of these parcels can be seen in Figure 4 (attached).

Each of the selected parcels was reviewed visually using GIS software, inspecting and comparing aerial images from the National Agriculture Imagery Program (NAIP) for the years 2011, 2013, 2015, and 2017. Areas that showed clear, visible signs of irrigation (chiefly, bright green areas set apart from dry, brown, grassy areas) were delineated. All clearly indefinable larger-scale agricultural activity was excluded, as was any unmaintained pasture or field areas and native landscape/forest. Homes with no visible or obvious irrigated footprint were tracked as such, with a value of zero irrigated acres counting towards the overall average.

Figure 5 (below) show a selection of the irrigated area delineations. The identified irrigated acreage is outlined in yellow and the parcel boundaries are shown as white lines.

Figure 5. Example Irrigated Area Delineations



²³ 2,874 is just under half of the total number of estimated exempt well-connected parcels in WRIA 49, suggesting that about half of all exempt well parcels in the WRIA have separate sources of irrigation water.

²⁴ This yields a 95% confidence level with less than 4% margin of error.

²⁵ Using the “random selection within subsets” algorithm in QGIS

²⁶ At the time this analysis was conducted, the WRIA 49 Planning Unit had not yet divided the WRIA into six subbasins used for the purposes of the Plan Update.

Total Consumptive Use Estimates for New Permit-Exempt Well Connections by Subbasin

The outdoor and indoor water use estimates outlined above suggest a *total* water use for each permit-exempt well connection of 0.59 afy (526 gpd) **with 0.35 afy (314 gpd) of that being consumptive water use.**

These numbers can be multiplied by the estimated number of new permit-exempt wells in a given growth scenario/subbasin to establish the total amount of water needed for water and non-water offset (i.e., NEB contributing) projects in WRIA 49, by subbasin.

Exclusion of Duck Lake Aquifer Groundwater Area

Parcels within the Duck Lake Groundwater Management Subarea (as defined in WAC 173-132-010)³⁰, which falls completely within the Bonaparte-Johnson (Middle Okanogan) subbasin, north of Omak (see Figure 1, attached), were excluded from the final tally and 20-year forecast of permit-exempt wells. This area has been the subject of a previous water right adjudication. Mitigation is currently available through the Okanogan Irrigation District. As such, future self-supplied parcels in this area are not counted for the purpose of mitigation planning in the Plan Update.

Based on a comparison between the Okanogan County parcel GIS and a shapefile (provided by the County) there are 303 total parcels in the Duck Lake Groundwater Management Subarea, 180 of which are developed as residences (and likely self-supplied with permit-exempt wells).

Results

Table 8 (below) shows the estimated consumptive use impacts in each WRIA 49 subbasin for the three selected growth scenarios over the 20-year planning horizon (through 2038). The range of estimated impacts is between 122 afy (0.168 cubic feet per second (cfs)) and 607 afy (0.837 cfs) additional consumptive water use from new permit-exempt well connections in WRIA 49 (excluding the Duck Lake Aquifer Groundwater Subarea and CTCR lands).

³⁰ <https://apps.leg.wa.gov/WAC/default.aspx?cite=173-132>

Notable Sources of Uncertainty and Conservatism in Estimates

Different components of the estimates in this study incorporate varying degrees of uncertainty. Where possible, this Study has conservatively (over-) estimated future consumptive use demand from permit-exempt wells. These considerations have been noted in prior sections of this report—but key sources of uncertainty and the effect on the overall estimates are summarized below.

- **Occupied housing units vs. total housing units:** OFM data indicate (see Table 3) that there is a notable difference in the number of total housing units in WRIA 49 (15,024) vs. the number of housing units that are occupied full-time (12,032)—an occupancy rate of about 80 percent. The lower number is more in line with the parcel-based estimate of current housing units developed for this Study (12,598), but that may have more to do with the exclusion of CTCR lands than dwelling occupancy.

For the purposes of estimating current and future water use, all residences/housing units/dwellings have been assumed to be occupied full-time. However, this is almost certainly not the case. Adjusting for estimated occupied residences would reduce the overall demand estimate. Additionally, given that it is suggested in the data that there is a housing surplus in WRIA 49, it could be assumed that some portion of future population growth will be into *existing* residences (which have already been accounted for), rather than into new development.

- **County-wide growth vs. rural growth:** The high growth scenario rate (30 percent) is based on an Okanogan County-wide estimate (inclusive of urban areas and WRIA 48). However, a high rate of growth in Okanogan County is likely to be driven by urban growth (almost all of which would be covered by water system service areas)—with rural growth making up a smaller portion/percent. Again, this suggests that a 30 percent increase is likely to be a highly conservative overestimate for rural growth and, by extension, permit-exempt well growth.
- **Not all domestic water right permits accounted for:** The public water system service area boundaries used to identify parcels that are supplied by permitted sources (chiefly, Group A and larger Group B water systems) is not inclusive of every domestic water right permit in WRIA 49. It is reasonable to assume that some number of parcels outside these service area boundaries have domestic water supplies tied to water rights. Thus, the estimate of current (and by extension) and future parcels served by permit-exempt wells in WRIA 49 could be a slight overestimate.
- **High percentage of homes in WRIA 49 have separate sources of irrigation water:** The consumptive use forecast presented in the memo assumes that all new permit-exempt well connections will be used for water both indoors and outdoors. However, based on a GIS overlay analysis, perhaps as many as half of the total permit-exempt well residences/parcels in Okanogan County are within irrigation water right places of use and/or irrigation district services areas. Presuming that some number of future permit-exempt wells will also receive irrigation water from permitted sources would reduce the overall demand estimate.
- **Equal growth rate assumed in all subbasins:** The analysis of OFM SAEP census block group GIS data between 2000 and 2019 shows that the past 20 years have seen inconsistent population/well growth rates across the subbasin areas of WRIA 49 (See Table 4). While it

TABLES

Table 9. Water Use Impacts (Detail) by Growth Scenario

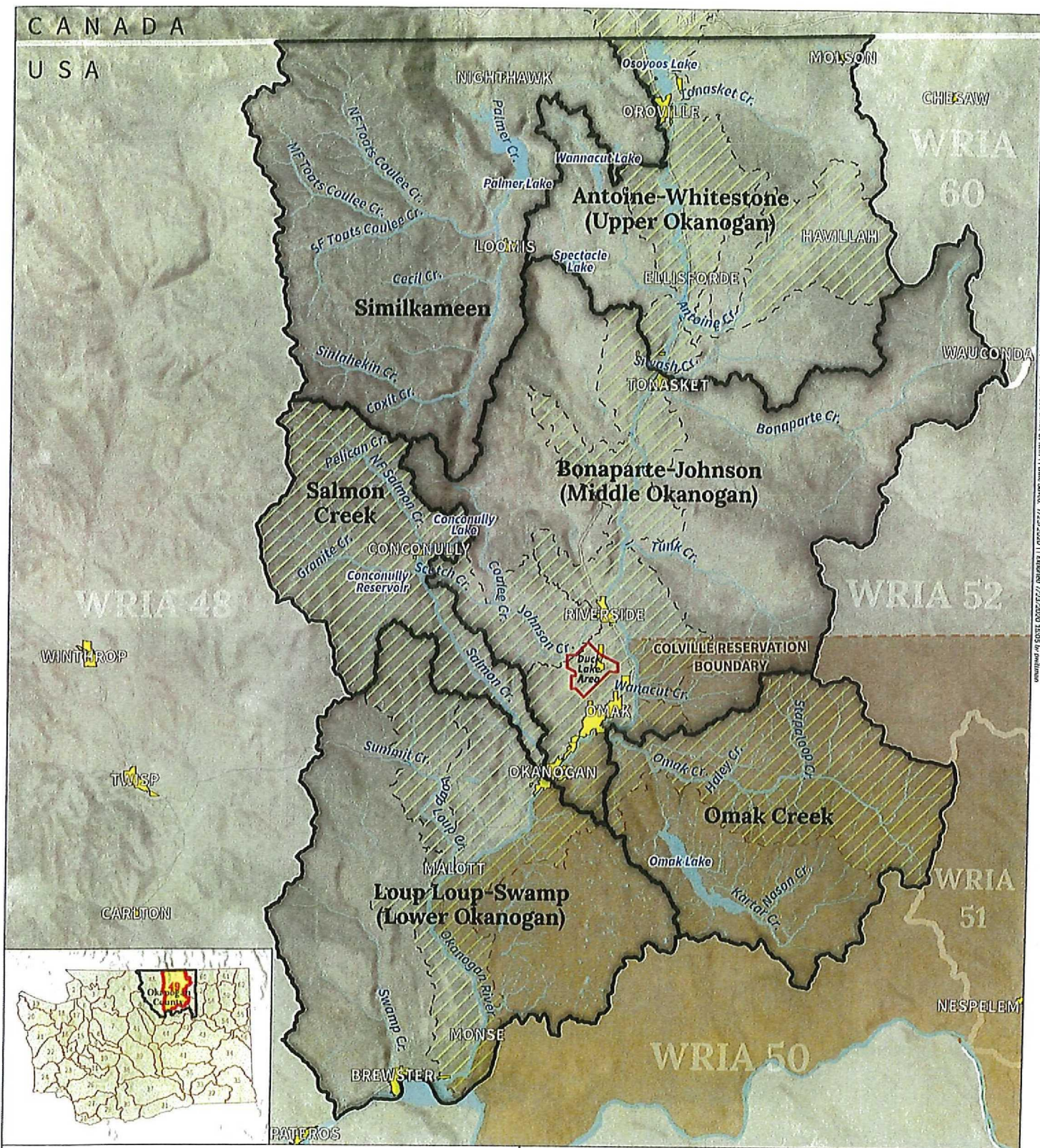
Evaluation of Future Exempt Well Demand - WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

Subbasin	New Permit-Exempt Well Connections	6% Growth (Low Scenario)					
		Total Water Use (afy)			Consumptive Water Use (afy)		
		Indoor (0.17 afy per dwelling)	Outdoor (0.42 afy per dwelling)	Total	Indoor (0.017 afy per dwelling)	Outdoor (0.335 afy per dwelling)	Total
Loup Loup-Swamp (Lower Okanogan)*	63	10.7	26.5	37.2	1.1	21.1	22.2
Salmon Creek	19	3.2	8.0	11.2	0.3	6.4	6.7
Bonaparte-Johnson (Middle Okanogan)*	143	24.3	60.1	84.4	2.4	47.9	50.3
Antoine-Whitestone (Upper Okanogan)	104	17.7	43.7	61.4	1.8	34.8	36.6
Similkameen	17	2.9	7.1	10.0	0.3	5.7	6.0
TOTAL	346	59	145	204	6	116	122

Subbasin	New Permit-Exempt Well Connections	10% Growth (Medium Scenario)					
		Total Water Use (afy)			Consumptive Water Use (afy)		
		Indoor (0.17 afy per dwelling)	Outdoor (0.42 afy per dwelling)	Total	Indoor (0.017 afy per dwelling)	Outdoor (0.335 afy per dwelling)	Total
Loup Loup-Swamp (Lower Okanogan)*	106	18.0	44.5	62.5	1.8	35.5	37.3
Salmon Creek	32	5.4	13.4	18.8	0.5	10.7	11.2
Bonaparte-Johnson (Middle Okanogan)*	238	40.5	100.0	140.5	4.0	79.7	83.7
Antoine-Whitestone (Upper Okanogan)	173	29.4	72.7	102.1	2.9	58.0	60.9
Similkameen	29	4.9	12.2	17.1	0.5	9.7	10.2
TOTAL	578	98	243	341	10	194	203

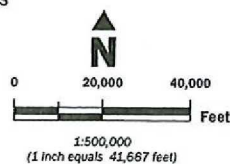
Subbasin	New Permit-Exempt Well Connections	30% Growth (High Scenario)					
		Total Water Use (afy)			Consumptive Water Use (afy)		
		Indoor (0.17 afy per dwelling)	Outdoor (0.42 afy per dwelling)	Total	Indoor (0.017 afy per dwelling)	Outdoor (0.335 afy per dwelling)	Total
Loup Loup-Swamp (Lower Okanogan)*	317	53.9	133.1	187.0	5.4	106.2	111.6
Salmon Creek	97	16.5	40.7	57.2	1.6	32.5	34.1
Bonaparte-Johnson (Middle Okanogan)*	714	121.4	299.9	421.3	12.1	239.2	251.3
Antoine-Whitestone (Upper Okanogan)	519	88.2	218.0	306.2	8.8	173.9	182.7
Similkameen	86	14.6	36.1	50.7	1.5	28.8	30.3
TOTAL	1,733	295	728	1,022	29	581	610

*Excludes the Duck Lake Aquifer Area and CTCR lands



- WRIA49 Subbasins
- Duck Lake Aquifer Area
- Anadromous Fish Subbasin Area

- Colville Reservation
- Towns



WRIA 49 Subbasins

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum
Okanogan County, WA

Aspect
CONSULTING

JUL-2020

PROJECT NO.
190259

BY
PPW

REVISED BY

FIGURE NO.

1

APPENDIX B

Technical Memo on Identified Projects and Basins

- The highest priority recommendations include replacing the quantity of consumptive water use during the same time as the impact and in the same basin or tributary.
- Lower priority projects include projects not in the same basin or tributary and projects that replace consumptive water supply impacts only during critical flow periods.
- Non-water offset projects include projects such as aquatic habitat, fish passage, and water quality improvements that serve to supplement water-offset projects such that the overall plan meets the Net Ecological Benefit (NEB) standard required by Chapter 90.94 RCW.

Evaluation Process

Ecology is required to determine that actions identified in the watershed plan, after accounting for new projected uses of water over the subsequent 20 years, will result in a NEB² to instream resources within the WRIA.

In order to meet the requirements of RCW 90.94.020(b), the Planning Unit followed a streamlined five-step evaluation process, including the following:

1. Defining the 20-year permit-exempt well consumptive use impacts
2. Defining water-for-water projects at the watershed scale
3. Defining offset gaps in time and space at the subbasin scale
4. Define a list of NEB projects
5. Determine NEB, consensus recommendations on watershed plan update and Initiating Governments' approval

This memorandum is intended to serve the following purposes:

- To document the rationale for WRIA 49 subbasin delineation, including considerations of tributary restoration potential.
- To provide results of subbasin assessments completed to identify and evaluate potentially viable projects in WRIA 49, including both water and non-water offset projects that contribute to NEB.
- To provide descriptions of identified water and non-water offset projects to the WRIA 49 Planning Unit for review.
- To document WRIA 49 Planning Unit review of and concurrence with the proposed project list, prior to incorporating the selected projects into the addendum.

In evaluating NEB, the Planning Unit elected to use the Ecosystem Diagnosis and Treatment (EDT) Model previously developed for anadromous reaches of the mainstem and tributaries to the

²Ecology GUID-2094 defines NEB as: "the outcome that is anticipated to occur through implementation of projects in a plan to yield offsets that exceed impacts within: a) the planning horizon; and, b) the relevant WRIA boundary."

information was not available to consider groundwater divides when delineating subbasins, and the Planning Unit decided to use HUC boundaries for planning subbasins.

- **Habitat potential and EDT modeling considerations:** The mainstem Okanogan and Similkameen rivers and several key tributaries comprise water bodies of significance to ESA-listed salmonids in WRIA 49. The EDT model generates an array of results useful for describing habitat potential for salmon and steelhead and identifying protection and restoration priorities. For the NEB analysis, the Planning Unit is evaluating a single EDT reporting metric, equilibrium abundance, also referred to as Neq. Neq is the theoretical population size that a given quantity and quality of habitat can support over time.
- **EDT Neq results** provides a useful means for evaluating the relative restoration potential of the different subwatersheds in WRIA 49. EDT characterizes restoration potential by comparing the performance for two different types of habitat scenarios, the template, or restoration ideal, and the patient, or current conditions. Subwatersheds with the largest template Neq for the target species have the greatest habitat potential. The larger the difference between the template and the patient Neq the greater the potential restoration gain. For example, Salmon Creek has an adult steelhead Neq of 321 under the Okanogan EDT template scenario and 117 under the most current patient scenario, translating to a potential restoration gain of 204 adult steelhead. Note, Omak Creek was not considered because the entire watershed is located on reservation lands of the Colville Confederated Tribes (CCT).

The Planning Unit used the EDT estimated restoration potential by HUC12 subwatershed to guide the definition of planning subbasins used in the WRIA 49 plan addendum. Each analysis subbasin includes at least one tributary or mainstem subwatershed with a potential restoration gain of 10 or more adult steelhead. Subbasin definition also considered the anticipated distribution of future domestic water demand and proposed streamflow restoration projects in WRIA 49.

WRIA 49 Planning Update Subbasins

Based on the above considerations, the Planning Unit identified the following planning subbasins for use in the Plan Addendum as shown in Figure 1:

- **Loup - Swamp (Lower Okanogan)** – This subbasin consists of two adjacent HUC-10 watersheds: Loup Loup Creek and Swamp Creek. These watersheds contain smaller creeks draining the region west of the mouth of the Okanogan River and south of the City of Okanogan.
- **Salmon Creek** – This subbasin consists of the HUC-10 Salmon Creek watershed, a tributary to the Okanogan River that drains the region west of the City of Okanogan and Omak. Salmon Creek discharges to the Okanogan River at Okanogan.
- **Bonaparte-Johnson (Middle Okanogan)** – This subbasin consists three HUC-10 watersheds including the Okanogan River and several steelhead-bearing tributary streams located on opposite sides of the mainstem. Bonaparte Creek drains the region east of Tonasket and discharges to the Okanogan River at Tonasket. Tunk Creek drains the region east of the Okanogan River and north of Riverside and the Omak Creek drainage. Tunk Creek discharges to the Okanogan River north of Riverside. Johnson Creek drains the

- Soil Types (USDA SSURGO Database)
- Stream reaches that are subject to closures under WAC 173-549
- Total Maximum Daily Loads (TMDL) listings (Ecology)
- Stream conditions and fish presence in the Columbia River Instream Atlas (Ecology, 2016)

The ArcGIS project containing the above data and water rights database was uploaded to the WRIA49 Subbasin Assessment Webmap.³ Within the webmap, a query tool allows the user to export a table of the water right database filtered by subbasin, priority date, and/or purpose of use codes. The additional data for cross reference can be toggled on and off by the user for ease of comparison. Together with the aerial photos and other data provided on the webmap, the query tool provides the user a real-time basis of analysis to identify how much water associated with valid water rights is available in the subbasin for different types of offset projects.

The subbasin assessment was later refined with the rationale for subbasin delineation and the restoration potential of each tributary to identify potential water offset projects as described in the sections below. The online tool also provided the basis for ongoing Planning Unit discussion of project locations and type, included relative effectiveness whether it was a water offset project and/or a project contributing toward NEB.

Data and shapefiles included in the WRIA49 Subbasin Assessment Webmap are also included as an electronic attachment (i.e., thumb drive) to this document.

Solicitation of Project Proposals

At the December 5, 2019, Planning Unit meeting, Aspect presented the range of permit-exempt-well consumptive use estimates for the 20-year planning horizon, discussed potential alternatives for delineating subbasins, and solicited input from the Planning Unit for water and non-water offset (NEB contributing) projects. Confluence Environmental (Confluence) introduced the EDT model and discussed how it will be used to evaluate restoration projects for NEB. Following the meeting, Aspect provided email and hard copy Preliminary Project Proposal templates to Planning Unit members. The project templates prompted project sponsors to provide the following information about potential projects:

- General Project Description
- Water source for water offset projects (existing water right, groundwater, surface water)
- Quantity, timing, and location (tributary and mainstem reaches benefited)
- Factors contributing to NEB (instream flow benefit, fish habitat enhancement; channel, floodplain, or riparian restoration, etc.)
- Data gaps to identify unknowns about project benefits or implementation feasibility
- Cost estimates, if any are known, for study/design, construction, and operations/maintenance

³ At the time of publication, the WRIA49 Subbasin Assessment Webmap is maintained at the following link:
https://maps.aspectconsulting.com/wria_49/index.html

Considerations for Implementing Proposed Offset Projects

Ecology's GUID-2094 suggests planning groups consider the following factors:

- Cost of implementation
- Technical feasibility of implementation
- Operations and maintenance needs and costs
- Parties identified to undertake specified project or action
- Political support (i.e., local and stakeholder support)
- The role of uncertainty, including projected trends, in the offset estimates and project or action benefits
- The duration of project or action compared to the duration of the new consumptive water use
- Connections to existing projects and actions, such as land use regulations
- The role of adaptive management in plan implementation

Additional scoring metrics used in similar project evaluations were also presented to the TAG. These included the criteria used by the Upper Columbia Regional Technical Team (UCRTT) on evaluation of fish barrier removal projects in anadromous streams, including several projects located in WRIA 49, and criteria used by the Upper Columbia Salmon Recovery Board to evaluate project proposals. Project implementation feasibility was evaluated based on landowner willingness, design effort, construction effort, site access, site management, regulatory requirements/permitting, risk and uncertainty, and value.

To the extent possible at this stage of offset project proposals and development, these factors are considered in the offset project descriptions presented in this memorandum.

Summary of Proposed Projects

A total of 20 restoration projects were identified by sponsors for consideration by the WRIA 49 Planning Unit. Water and non-water offset projects contributing to NEB were designated as Tier 1 (8) and Tier 2 (12) based on discussion and criteria presented at the January TAG workshop and later Planning Unit meeting(s). Each project, along with a broad characterization of whether the project provides offset and/or contribution NEB, is described briefly below. Projects identified by the Planning Unit for inclusion in the Plan Addendum are summarized in Table 1. Locations of the projects are shown on Figure 2. Copies of project proposals received from sponsors containing detailed descriptions as submitted are included as Appendix A.

Additional project background and detailed narrative specific to how the projects were conceptualized as contributing to NEB and parameterized for the purposes of EDT modeling is provided in Appendix C (Confluence, 2020) of the Plan Addendum. In addition, Appendix C provides the clear and systematic rationale how each project provides water offset or contributes toward NEB.

Johnson Creek Fish Passage – In August 2018, Trout Unlimited signed a funding contract with the Washington Recreation & Conservation Office to remove a fish passage barrier near the mouth of Johnson Creek underneath Cooper Street in the Town of Riverside. Later in August 2019, Trout Unlimited signed additional contracts to remove three additional fish passage barriers on Johnson Creek: 1) an undersized culvert beneath Highway 97 and associated trash rack, 2) a perched and undersized culvert below Green Acres Road, and 3) an undersized culvert and associated headcut below State Street in the Town of Riverside.

These four fish passage improvement projects build upon a multi-year, multi-phase effort that has been ongoing since 2015 to replace eight barriers currently blocking fish passage in the lower mile of Johnson Creek. Once these four barriers are removed, this effort will have replaced five undersized barrier culverts with appropriately sized box culverts, and removed three other in-channel barriers. Completion of these projects will reconnect the lower section of Johnson Creek with high quality habitat above Green Acres Road, restoring over nine miles of prime spawning and rearing habitat. In addition to increasing access to ideal habitat for summer steelhead and chinook, this effort is providing appropriately sized, low-maintenance infrastructure for the Town of Riverside, and reducing flood risk to local property owners.

Specific to Streamflow Restoration, and based Ecology's technical assistance provided (and described in the Plan Addendum), three of the culvert projects are eligible to be counted as a project under Chapter 90.94 RCW. The Johnson Creek culvert under Highway 97 and associated trash rack immediately upstream are required by other mitigation requirements, and therefore not available to be included toward NEB.

Project Cost: These projects are currently fully funded at a combined cost of \$2.7 million.

Loup Loup Creek Diversion Improvements – The proposed project will target improvements to a specific diversion on Loup Loup Creek. This project could include a variety of operational changes, distribution system improvements, and increased water delivery efficiency. The proponents have identified that a major upstream diverter has existing facilities, such as a storage reservoir, which could play a part in adjusting the timing of flows to benefit habitat and instream flow in lower Loup Loup Creek. Enhanced conveyance efficiency could further optimize delivery into the storage reservoir where storage is owned by the diverter. WWT has support from CCT fisheries staff for pursuing efficiency projects with water users along Loup Loup Creek to enhance flows which would benefit summer steelhead, spring Chinook salmon, and coho salmon, all of which have inhabited Loup Loup Creek.

A preliminary estimate indicates that potential water savings could increase stream flow in Loup Loup Creek by approximately 5 to 10 cfs throughout the year, providing water offset at the subbasin scale (see footnote above) and contributing toward NEB in Loup Loup Creek. It is expected that the full extent of the irrigation efficiencies water (i.e., leakage) will be placed in the State's Trust Water Right Program and not available for future out-of-stream uses. However, Ecology may choose to manage the water instream at a reduced rate to account for in-basin return flows and to ensure impairment of senior water rights does not occur. In addition, additional consumptive use associated with reduction of evapotranspiration of vegetation along with current ditch alignment was not quantified under this evaluation. It is expected that additional consumptive use offset will be available as determined by additional study and permitting investigations.

Salmon Creek Source Substitution – The City of Okanogan has a municipal water right claim to divert waters from Salmon Creek for municipal uses. The claim has a 1908 priority date. The City maintains a collections system, reservoir, and delivery pipeline for the use of the right. The City has maintained the water source as a future source to meet municipal needs.

The City is proposing to transfer the water right from Salmon Creek to an existing or new groundwater well in continuity with the Okanogan River. The project would need to provide funding to mitigate any existing facilities on Salmon Creek that would impact habitat projects and would need to provide adequate funding to improve the new or existing groundwater well to meet state requirements. The project would benefit in-stream flows in Salmon Creek by eliminating the diversion right to 300 gpm (about 484 acre-feet), providing water offset at the subbasin scale⁴ and contributes to NEB.

Ecology recently published a focus sheet on the implications of *Foster v. Ecology* State Supreme Court's decision on water rights permitting, including evaluation of Streamflow Restoration projects. The ruling significantly limits Ecology's ability to approve change application that do not perfectly match the season, timing, and place of use between the existing water right and a proposed change. Specific to the Salmon Creek source substitution project, the year-round diversion is proposed to be replaced by a well in continuity with the mainstem Okanogan River. Final well siting has not been completed, and the City has several locations that are both downstream from the Salmon Creek confluence and in high continuity with the Okanogan River. Because the project is water budget neutral and the water right authorizes a year-round season of use, seasonal pumping lag effects are not anticipated to impair instream flows, and final well siting will limit pumping impacts to the mainstem Okanogan River downgradient of the Salmon Creek confluence. Therefore, *Foster* implications are not expected to negatively impact implementation of this project.

Project Cost: Project development and design is estimated at approximately \$50,000, project construction of a new municipal water supply well is estimated at \$200,000, and annual O&M is approximately \$10,000.

Salmon Lake Storage – Increase storage for retiming of up to 1,000 acre-feet of water benefitting instream flows in Salmon Creek. A draft Environmental Impact Statement (DEIS) was developed to restore perennial flow in Salmon Creek. One alternative identified in the DEIS that was considered but not pursued was raising the height of Salmon Lake Dam. Due to the number of existing cabins and associated septic systems, this alternative was eliminated (though if the cabin leases were eliminated, this alternative could be reevaluated).

Recent information indicates that the project will be beneficial for increasing storage without changing the height of the dam. This would require structures and infrastructure to be relocated to prevent their inundation. According to the DEIS, twelve cabins would need to be relocated. Also, approximately 2,000 feet of septic pipe and eight septic tanks would need to be moved.

⁴ This project provides water offset in the subbasin level by shifting total and/or consumptive use impacts to the mainstem Okanogan River. However, this offset will not be counted toward required water offset at the WRIA scale.

Highlands Springs Protection and Enhancement – Protecting springs, seeps, and water resources enhances multiple use of public and private lands. The Okanogan Highlands Alliance (OHA) is committed to monitoring and improving infrastructure that protects and restores water resources and the habitats that rely on these water resources. OHA's objectives are to partner with range lessees, landowners, and the U.S. Forest Service (USFS) to assess the condition of water resources, repair spring protection infrastructure, and install fencing and troughs to protect undeveloped springs. The project will contribute to NEB.

Project Cost: Estimated cost for project development and design is about \$20,000 to develop and pilot systems of monitoring and repair work. Project construction depends on repair needs at specific sites. USFS provides materials for repairs done on USFS land, with costs in staff/contractor labor. Project annual O&M to monitor, repair and install new infrastructure, estimated cost: \$5,000-10,000, depending on sites selected and identified needs

Irrigation Efficiency Projects – Complete on-farm irrigation efficiency projects throughout WRIA 49 reducing overall irrigation water demand. On-farm Irrigation Efficiency Projects are opportunistic in nature and will be completed over the 20-year planning horizon when willing landowners (and funding) are identified. These projects historically have been funded under Washington State's Irrigation Efficiencies Grant Program (IEGP). Two on-farm projects are currently identified in the Loup Loup – Swamp Subbasin (not to be confused with the Loup Loup Creek Diversion Improvement project above). Depending on location, irrigation efficiency projects would provide both water offset and NEB in adjacent tributaries. Final project-specific offset values will be determined during permitting, as water savings will be dedicated to instream flows.

Project Cost: Funding requirements will be dependent on required upgrades and size (i.e., number of acres). For example, a replacement of wheel line (at 65 percent efficiency) with center pivot (90 percent efficient) for 45 acres of irrigation, conveyance piping, and diversion pump, is estimated to cost \$4,800 (design), \$56,000 (construction), and \$1,100 (annual power costs).

Loup Loup Creek Channel and Riparian Improvements – The Okanogan Conservation District is working with a landowner to improve instream habitat and riparian condition along 600 feet of Loup Loup Creek. The location is near the town of Malott. The project will improve spawning habitat for ESA-listed steelhead. Redds are documented by CCT on adjacent properties; however, this property was not surveyed due to previous accessibility issues. Riparian buffers will be increased from 10 feet to 30-100 feet. The project would contribute to NEB in the Loup Loup subbasin.

Project Costs: Cost estimate pending additional study and identification of appropriate funding sources.

Methow Beaver Project – The Methow Beaver Project (MBP) proposes to restore streamflow in degraded and structure-deficient low order stream channels impacted by fire and anthropogenic activities using process-based restoration (PBR) strategies in eight sub-basins of the Methow (5) and Okanogan (3) River watersheds. MBP believes that restoration actions can be developed and implemented within a three-year period in stream segments above the anadromous zone. These actions are to the intended benefit of groundwater recharge, extended streamflow, downstream

Okanogan River Riparian Enhancement – This project would maintain four previously planted acres on the 2-mile long stretch of property (WQC-2015-OkanCD-0009). This will include replacement of dead plants, adaptive management for weed control, and irrigation. Weed management will occur on the previously planted four acres and six additional acres. The goal of this activity is to improve surface water quality through ensuring successful riparian planting. Proper monitoring and adaptive management increase successful establishment of effective riparian cover, increase the diversity of habitat for the aquatic ecosystem (particularly to increase woody debris recruitment), and—especially important in this reach of the Okanogan River—erosion control, to reduce sedimentation in the mainstem Okanogan River. The project will contribute to NEB.

Project Cost: Project construction is estimate at \$54,116 and annual O&M at \$1,500.

Pine Creek Riparian Restoration – This project is part of BMPs for a Riparian Restoration project designed to protect riparian and wetland areas from water quality impacts from livestock using downed ‘jackstraw’ logs. These scattered logs mimic natural barriers to browsing and protect natural regeneration of riparian plants and new plantings. Monitoring will track effectiveness on livestock exclusion and vegetation. In addition, the program will maintain four completed projects, develop three restoration plans, and provide community outreach.

The Pine Creek location will construct jackstraw barriers to protect 1.7 acres of riparian wetland and 662 feet of ephemeral stream from livestock with a 35-foot minimum buffer; install off-site water development, submitting a design to the Ecology Project Manager for review and approval prior to installation; implement weed management for Canada thistle across 0.25 acres; install 65 riparian plants within the pockets of jackstraw. The project will contribute to NEB.

Project Cost: Project development and design is estimated at \$27,295; construction at \$92,455, and project annual O&M at \$2,000 for a total of all three jackstraw projects.

Salmon Creek Streambank Stabilization Projects – The objective of two Conservation Reserve Enhancement Program (CREP) project is to restore and enhance riparian vegetation by planting woody shrub and tree species for the purpose of providing woody debris recruitment into Salmon Creek as a means of creating habitat for invertebrates, which will enhance food sources for threatened and endangered fish species. This CREP project can only be installed after the eroding stream bank is stabilized. This project will maintain the stabilized stream bank and provide additional food for fish whose survival is enhanced by the addition of saved water from a nearby OCD Irrigation Efficiencies project.

The combined streambank stabilization/CREP project will help reduce sedimentation, contribute to stream complexity and fish habitat enhancement, and maintain cooler stream temperatures. Noxious weeds will also be removed and controlled, possibly being replaced by pollinator plants. The project will contribute to NEB is in the Salmon Creek subbasin.

Project Cost: Design and construction of the streambank stabilization is estimated to be \$11,000 and \$16,000, respectively, followed by maintenance at \$3,000 for 3 years. CREP costs

Projects Not Advanced for Evaluation

Several projects were not selected to be included in the plan addendum. These projects and their fatal flaw(s) from further consideration under Streamflow Restoration included the following:

OTID Water Right Purchase – OTID would make available up to 100 acre-feet (consumptive use) for purchase to offset future impacts from permit-exempt wells. The senior water right (CS4-ADJ01P2@13) is currently held in the State's Trust Water Right Program (TWRP) under a Trust Water Agreement with Ecology. The price is set at \$10,000 per acre-foot (CU), which is considered a high unit price, and the Planning Unit has alternative more cost-effective water off-set projects available.

Okanogan Irrigation District (OID) Diversion Improvements – The project would increase fish passage through a major irrigation diversion on Salmon Creek. In addition, the project would contribute toward perennial year-round flow in the Salmon Creek, which is identified as a limited factor in restoration potential. However, this project is regarded as being completed under other mitigation requirements, and therefore not eligible under the Chapter 90.94 RCW requirements.

Shankers Bend Storage – The project including constructing a new dam impounding up to 1.3 million acre-feet on the Similkameen River benefitting flows in the mainstem Similkameen and Okanogan Rivers. This project has been the subject of several studies, including the most recent Similkameen River Appraisal Level Study (Okanogan County PUD, 2009) which concluded the probable construction costs between \$289 million to over \$1 billion dollars. The scope of the project was considered too great to be reliably completed under the Chapter 90.94 RCW planning horizon.

Palmer Lake – The project would increase storage in Palmer Lake by constructing a dike at the north end of the lake to raise lake levels and protect against flooding from the Similkameen River. Stored water would be retimed to benefit the mainstem Similkameen and Okanogan Rivers. However, inundation of viable farmland and private property would likely occur. At this time, the Planning Unit did not want to pursue this project under Streamflow Restoration.

Kernal Drainage – The project included the feasibility of diverting drainage water to benefit instream flows in lower Salmon Creek. The project was not included due to a number of data gaps that would not be filled by the planning deadline.

Sourdough Creek Riparian Restoration – This project is part of a Livestock BMPs for Riparian Restoration project designed to protect riparian and wetland areas from water quality impacts by livestock using downed jackstraw logs. However, the project location is just outside the WRIA 49 boundary and therefore not advanced for consideration.

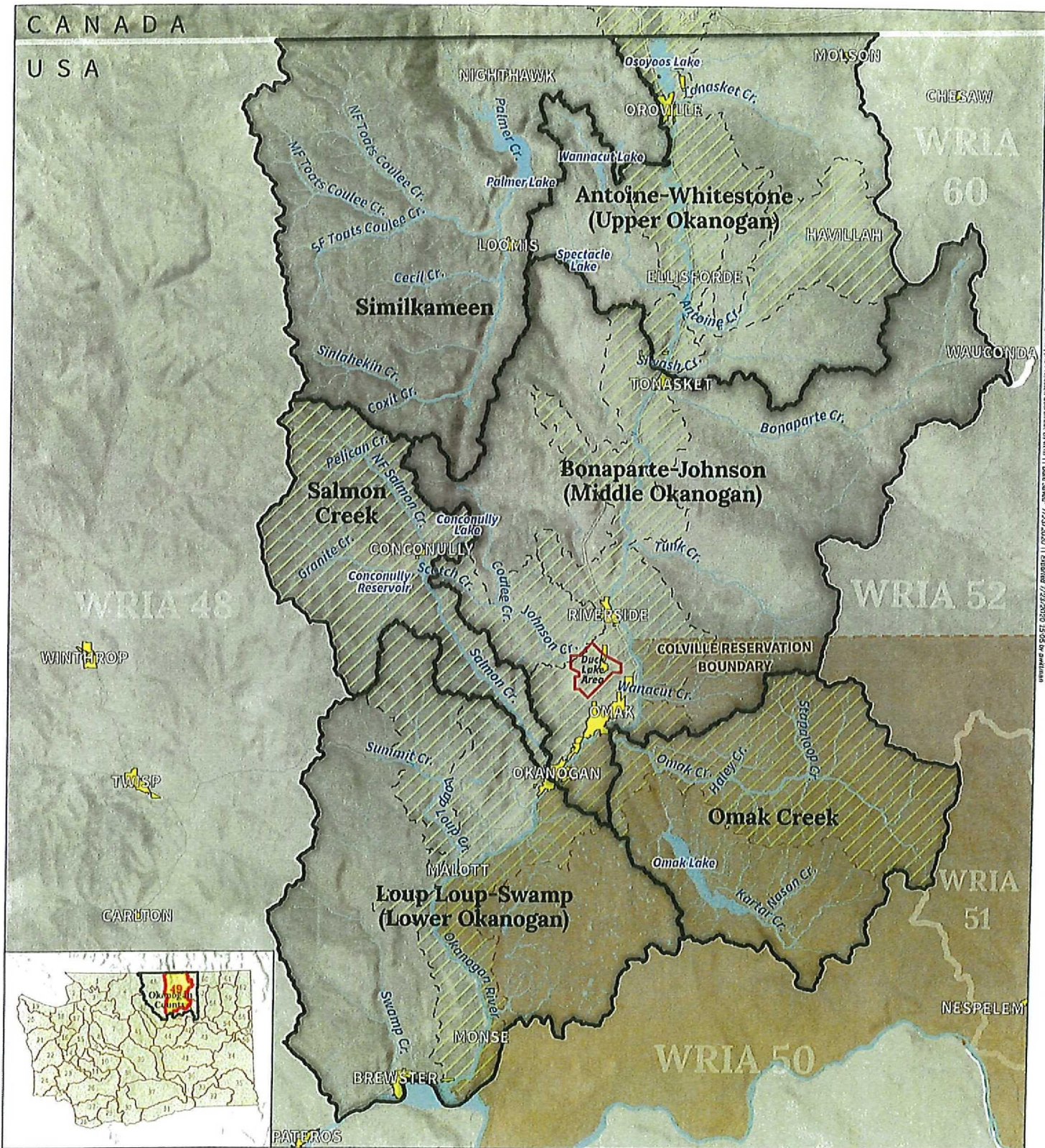
Limitations

Work for this project was performed for Okanogan County (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

TABLES

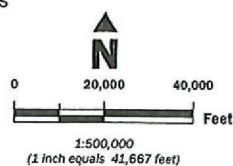
Table 1. Summary of Proposed WRIA 49 Offset Projects
WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum (190259)

Pino Creek Riparian Restoration	Bonaparte-Johnson (Middle Okanogan)	Tier 2	OCD	NEB	Protect riparian and wetland areas from water quality impacts from livestock using downed 'jacketraw' logs. These scattered logs mimic natural barriers to browsing and protect natural regeneration of riparian plants and new plantings.	-	-	0.13	12,000 + \$2,000 annual O&M	Yes
Salmon Creek Streambank Stabilization Projects	Salmon Creek	Tier 2	OCD	NEB	Restore and enhance riparian vegetation by planting woody shrub and tree species for the purpose of providing woody debris recruitment into Salmon Creek as a means of creating habitat for invertebrates, which will enhance food sources for threatened	-	-	TBD	\$16,000 + \$900 annual O&M (5 years)	Yes
Siniahokin Wildlife Area Improvement Project	Similkameen	Tier 2	Croville-Toneskat Irrigation District, Washington Department of Fish and Wildlife	O&NEB	Impoundment and diversion system improvements to support instream flows in Siniahokin Creek. A portion of water savings will be dedicated to instream flows.	Unspecified	Unspecified	42	\$750,000	Yes
Tunk Valley Dry Forest Restoration	Bonaparte-Johnson (Middle Okanogan)	Tier 2	OCD, DNR	NEB	1,100-acre project to create long-term habitat quality and ecological integrity by moving stands back towards more dispersed, larger diameter trees at a much-reduced density.	-	-	-	Unspecified	Yes
1 O&NEB = consumptive use offset project with or without additional habitat restoration that contributes to NEB; NEB = streamflow and/or habitat restoration project that contributes to NEB; LO = Local Tributary Offset										
2 The approximate length of tributary or mainstem reach measurably affected by the proposed non-water offset project. For the Highway 20 culvert replacement project the affected length covers the Conservancy Island side channel from its historical upstream and downstream connection points with the mainstem Okanogan River.										
3 Indicates project applied for 2020 Streamflow Restoration Grant funding.										



- WRIA 49 Subbasins
- Duck Lake Aquifer Area
- Anadromous Fish Subbasin Area

- Colville Reservation
- Towns



WRIA 49 Subbasins

WRIA 49 RCW 90.94 Streamflow Restoration Plan Addendum
Okanogan County, WA

Aspect
CONSULTING

JUL-2020

PROJECT NO.
190259

BY
PPW
REVISED BY
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FIGURE NO.
1

APPENDIX A

- Tier 1 Project Proposals**
- Tier 2 Project Proposals**
- Projects Not Advanced**

Antoine Valley Ranch

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:
Antoine Valley Ranch Land and Water Acquisition

2. Proposal Preparer(s):
Colville Tribes Fish and Wildlife Program

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

Acquire fee title to the Antoine Valley Ranch (AVR), real property comprised of 2524.34 acres, more or less, located between Tonasket and Havillah with a physical street address of 245-B Fancher Road, Tonasket, Washington 98855.

Colville Tribes would take fee title subject of AVR and propose to manage it for fish and wildlife conservation purposes as described in a resource management plan to be developed. The primary purpose of the acquisition is to acquire AVR's appurtenant water rights to restore instream flow in Antoine Creek for the benefit of ESA-listed summer steelhead. AVR's water rights are described in the attached 2017 trust water rights memo from Aspect Consulting.

Although the Colville Tribes would propose to convey title to AVR's appurtenant water rights to the Trust Water Rights Program after acquisition it would also work with the Department of Ecology to change the season of use/release schedule of the Fancher Reservoir storage and release rights to optimize steelhead habitat/passage, production and survival (see attached Rancher Reservoir Management Proposal).

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

☒ a. Existing Water Right ☐ b. Groundwater ☒ c. Surface Water ☐ d. Other

See attached trust water rights memo from Aspect Consulting dated September 13, 2017 (Aspect memo).

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

Approximately 1,160 a/f of consumptive use associated with beneficial use attributable to irrigation water rights and claims. See Aspect memo.

b. Timeframe(s) or Season of Use:

Subject to change to optimize steelhead passage, production, and survival.

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Antoine Creek.

12. Estimated Time Frame to Implement Project?
Could be implemented immediately or within six to twelve months based on sources of funding for acquisition and related requirements (appraisals, deed restrictions, etc.).

Could be implemented immediately or within six to twelve months based on sources of funding for acquisition and related requirements (appraisals, deed restrictions, etc.).

b. Timeframe(s) or Season of Use:
c. Tributary (name) or Mainstem Okanogan River and Location(s):
6. Net Ecological Benefit: <i>Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)</i>
This project would contribute to fish passage restoration (upstream access to existing isolated habitat); channel condition (sediment and temperature), and floodplain restoration.
7. Data Gaps: <i>Describe major unknowns or studies that would need to be completed.</i>
The Colville Tribes are currently conducting a study of fish usage within the relict channel. The project is actively supported by the City of Okanogan. Expansion of the study would likely be needed to evaluate potential benefits from additional flows to water quality (sediment and temperature) and water quantity (increased flows).
8. Cost Estimates: <i>Provide known and estimated costs to develop and implement the project.</i>
a. Project Development and Design: \$150K - Preferred alternatives development, permitting and public engagement
b. Project Construction: \$700K +/-Removal and replacement of culverts, road repairs, etc.
c. Project Annual O&M: TBD
8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i>
TBD
9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i>
No
10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i>
In addition to habitat objectives, the project may increase flood resiliency at the highway crossing and at the access road to the sewage treatment plant
11. Potential Project Barriers: <i>Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)</i>

Johnson Creek Fish Passage

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:

**Johnson Creek Fish Passage
Improvement**

2. Proposal Preparer(s):

Jacquelyn Wallace, Trout Unlimited

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

In August 2018, Trout Unlimited signed a funding contract with the WA Recreation & Conservation Office to remove a fish passage barrier near the mouth of Johnson Creek underneath Cooper Street in the Town of Riverside.

In August 2019, Trout Unlimited signed funding contracts with the WA Recreation & Conservation Office to remove three additional significant fish passage barriers on Johnson Creek: 1) an undersized culvert beneath State Highway 97 and associated trash rack, 2) a perched and undersized culvert below Green Acres Road, and 3) an undersized culvert and associated headcut below State Street in the Town of Riverside.

These four fish passage improvement projects build upon a multi-year, multi-phase effort that has been ongoing since 2015 to replace eight barriers currently blocking fish passage in the lower mile of Johnson Creek. Once these four barriers are removed, this effort will have replaced five undersized barrier culverts with appropriately sized box culverts, and removed three other in-channel barriers.

Completion of these projects will reconnect the lower section of Johnson Creek with high quality habitat above Green Acres Rad, restoring over nine miles of prime spawning and rearing habitat.

In addition to increasing access to ideal habitat for summer steelhead and chinook, this effort is providing appropriately sized, low-maintenance infrastructure for the Town of Riverside, and reducing flood risk to local property owners.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

☐ a. Existing Water Right ☐ b. Groundwater ☐ c. Surface Water ☒ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

b. Timeframe(s) or Season of Use:

12. Estimated Time Frame to Implement Project?

These barriers are slated to be removed by December 2021.

in future phases of the project (not in Phase I) once agreements between the parties regarding water source and implementation of the project are reached.
b. Timeframe(s) or Season of Use: All waters of Loup Loup Creek and its tributaries within the time periods allowed by existing water rights. There is potential for year-round flow improvements.
c. Tributary (name) or Mainstem Okanogan River and Location(s): Loup Loup Creek and its tributaries (Sweat and Little Loup Loup Creeks) Little Loup Loup Creek and Sweat Creek (tributaries to Loup Loup Creek)
6. Net Ecological Benefit: <i>Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)</i>
<p>This project is occurring in close coordination with biological recommendations for Loup Loup Creek, with the goal of providing adequate flows for Upper Columbia Steelhead spawning and rearing, as well as potential cool water refugia at its confluence with the Okanogan River. Loup Loup Creek is listed as a priority tributary by the Upper Columbia Steelhead ESU Recovery Plan, and this proposed project would enhance an existing project WWT and CCT completed on Loup Loup Creek in 2010, which adds 3.21 cfs and 665 acre-feet of annual flows through 2030.</p>
7. Data Gaps: <i>Describe major unknowns or studies that would need to be completed.</i>
<p>This project proposal encompasses the confirmation of previous analysis of water production from sub-watersheds. If these sub-watersheds provide a sufficient amount of water for existing agricultural production, this project will direct efforts towards design and implementation of irrigation delivery efficiencies upgrades for the long-term. As part of the project development Phase I, WWT would contract an independent engineering and hydrologic assessment of efficiency impacts and hydrological conditions to determine feasibility of the project.</p>
8. Cost Estimates: <i>Provide known and estimated costs to develop and implement the project.</i>
a. Project Development and Design: Phase I: Feasibility and Pre-design: \$50,000, Phase II: Design: \$125,000.
b. Project Construction: Phase \$1.5 Million.
c. Project Annual O&M: <i>To be determined by feasibility and pre-design study. (italics indicated future phases)</i>
8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i>
9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i>
<p>This project is not tied to mandated mitigation requirements. It would be a voluntary agreement. However, the impacts of the project would address recovery actions identified in the BiOp.</p>
10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i>

OTID Tributary Supplementation

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:
**Oroville-Tonasket Irrigation District
(OTID) – Tributary Supplementation**

2. Proposal Preparer(s):
Jay O'Brien

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

Using existing infrastructure and with minor modifications, OTID has the ability to supplement flows in select tributaries to the Okanogan River. Supplementation will help increase flow and reduce temperatures in the following tributaries.

1. Bonaparte Creek - 75 GPM located 2095 ft from the mouth of the creek the source of the water would come from the Bonaparte Station.
2. Siwash Creek - 75 GPM located 500 ft from the mouth of the creek water would come from the Tonasket Station.
3. White Stone Creek - 75 GPM located 650 ft and 3100ft from the mouth of the creek for a total of 150 GPM water would come from the Ellisforde Station.
4. Nine Mile Creek - 75 GPM located 1740 ft from the mouth of the creek water would come from the Osoyoos Station.
5. Antoine Creek - 100 GPM at 2324 ft and 50 GPM at 940 ft from the mouth of the creek water would come from the Ellisforde station.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

X a. Existing Water Right ☐ b. Groundwater X c. Surface Water ☐ d. Other

Water Right No. CS4-ADJ01P2@13 or new non-consumptive water right from Ecology.

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:
See above.

b. Timeframe(s) or Season of Use:
April 1 through October 15

c. Tributary (name) or Mainstem Okanogan River and Location(s):
see above.

Pine Creek Water Right Acquisition

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:
Pine Creek Water Right Purchase

2. Proposal Preparer(s):
Tyson Carlson

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

Water Right purchase of the Pine Creek water right, currently held in the State's Trust Water Right Program by Washington State Department of Ecology, Office of Columbia River (OCR).

Email correspondence with Tyler Roberts indicates:

The Pine Creek Trust Water Right (CG4-23992(A)C), has 625.7 acre-feet of consumptive use available for mitigation downstream of Janis Rapids (RM 51), of which 225.7 acre-feet are only available for mitigation near the mainstem Okanogan River within Okanogan County. The remaining 400 acre-feet of consumptive use may be used further downstream out of the County, but I've not been informed of any other OCR commitments to this mitigation bucket. As such, if the County wants to start with the 625.7 number as an upper limit I think that is reasonable.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

X a. Existing Water Right ☐ b. Groundwater X c. Surface Water ☐ d. Other

See above.

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

Up to 625.7 acre-feet (CU)

b. Timeframe(s) or Season of Use:

April 1 to October 1

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Pine Creek and Okanogan River

Salmon Creek Source Substitution

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

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1. Title: Salmon Creek – City of Okanogan Water right claim transfer

2. Proposal Preparer(s):
Chris Johnson _ City of Okanogan

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

The City of Okanogan has a municipal water right claim to divert waters from Salmon Creek for municipal uses. The claim has a 1908 priority date. The City maintains a collections system, reservoir and delivery pipeline for the use of the right. The City has maintained the water source as a future untended source to meet municipal needs.

The City is proposing to transfer the water right from Salmon Creek to an existing or new groundwater well in continuity with the Okanogan River. The project would need to provide funding to mitigate any existing facilities on Salmon Creek that would impact habitat projects and would need to provide adequate funding to improve the new or existing groundwater well to meet state requirements.

The project would benefit in-stream flows in Salmon Creek by eliminating the diversion right to 300 gpm.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

X a. Existing Water Right ☐ b. Groundwater X c. Surface Water ☐ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

484 acre feet/year, 300 gpm

b. Timeframe(s) or Season of Use:

Continuous

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Salmon Creek is a tributary to the Okanogan River

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

Salmon Lake Storage

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:

Relocate or change septic systems at residences surrounding Salmon Lake allowing increased storage

2. Proposal Preparer(s):

Bureau of Reclamation

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

During 2004 a draft Environmental Impact Statement (DEIS) was developed to restore perennial flow in Salmon Creek. One alternative identified in the DEIS that was considered but not pursued was raising the height of Salmon Lake Dam. Due to the number of cabins and associated septic systems this alternative was eliminated though if the leases of cabins were eliminated this alternative could be reevaluated.

Recent information suggests that it wouldn't be necessary to alter the height of the dam to increase water storage but structures and infrastructure would need to be relocated to prevent inundation. According to the DEIS, twelve cabins would need to be relocated. Also, approximately 2,000 feet of septic pipe and 8 septic tanks would need to be moved.

There may be an opportunity, if cabin lease agreements have expired and the Bureau of Reclamation would be willing to dismantle or demolish the cabins, not to relocate but remove the cabins completely. The option to remove the infrastructure rather than relocate would be less expensive.

The additional volume as a product of the implementation of this project would contribute to the 3,600 ac-ft. dedicated to provide perennial flow downstream of the Okanogan Irrigation District diversion dam. This additional volume would augment or extend the duration of elevated flow during migration or augment winter-time flow to increase over-winter survival. Since this project would result in a long-term (life of Salmon Lake dam), reliable (dependent upon snowpack) source of water to benefit summer steelhead in the most productive tributary in the Okanogan River subbasin, the cost for this project, for either option (see below: relocation, removal) seem worthy of serious consideration.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

☐ a. Existing Water Right ☐ b. Groundwater ☐ c. Surface Water ☐ d. Other

This water could be captured during snow melt and spring run-off when stream flow conditions are robust and could be released downstream when stream flow conditions are minima, during the summer or over-winter. This would result in an increased production of steelhead in Salmon Creek.

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

Not applicable.
8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i>
Unknown at this time.
9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i>
No. This proposed project would contribute to water flow that has been reestablished from contributions by Bonneville Power Administration and Bureau of Reclamation.
10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i>
The implementation of this project would benefit the local economy by providing a construction project for local contractors. This water would contribute water to Salmon Creek for the recovery of summer steelhead. Worth noting Salmon Creek currently produces 2/3 of the total smolt production of all tributaries in the U.S. portion of the Okanogan River basin.
11. Potential Project Barriers: <i>Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)</i>
Not knowing the disposition of lakeside residents, it is unpredictable to gage support. One benefit there is expected to be increased waterfront, but consequently each landowner may lose some available land due to the increased inundation. Naturally permits would be required to construct this project. It is anticipated that review process may be less complicated since this proposed project is in a closed system, with no federally-listed species. However, the outcome of the project would benefit listed species. However, local jurisdiction (Town of Conconully, Okanogan County Shoreline, etc.) may cause delay depending upon public feedback.
12. Estimated Time Frame to Implement Project?
Once agreements are established between landowners, Bureau of Reclamation and others, as well as required permits are secured. The proposed project could be completed during one summer/fall. The increased water elevation/storage would be realized the following year.

Improved river flow, decreased water temperatures, and the new reservoir would create new habitat areas in a location that is currently limited. This could also effect or improve water volume in Whitestone Creek if desired.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

Ability to use reservoir (state land), continuity of reservoir with surrounding likes, cost of pipe project, winter time use of pipeline from Toats Coulee diversion, and related costs to ensure safe operation.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: There are numerous avenues to explore that can create multiple effects on the Upper Okanogan River Basin.

b. Project Construction: These improvements would need to be engineered and then priced accordingly.

c. Project Annual O&M: Minimal due to the fact that this system would be able to operate off of gravity.

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Possible USBR funding for piping of canals

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No known requirements.

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Reduced water loss through canal leakage, ability to change pumps to VFD, a percentage of farmer pumps could be removed, water would be maintained in a cleaner environment, thus improving food safety. Wildlife would have an easier movement in the valley and less death loss due to being barricaded by canals, and a resurrection of the new reservoir would make a new riparian and habitat area, and an open wasteland of sagebrush.

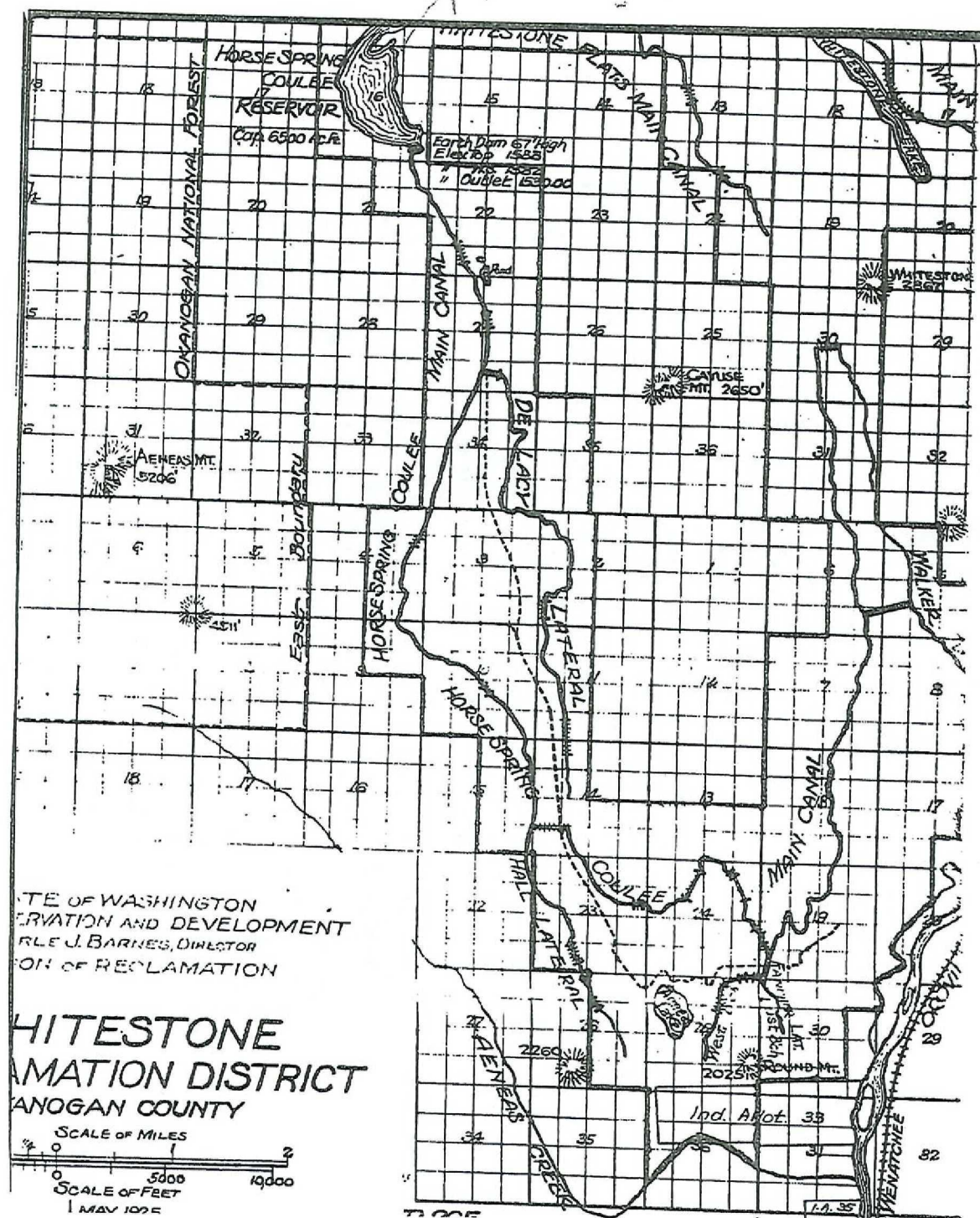
Dredging of the lakes, and enclosing of canals will decrease water temperature, thus lowering lake discharge temperatures, which should result in a positive effect in Whitestone Creek, and the Okanogan River, not to mention the numerous leaks, water loss, and evaporation associated with open ditches.

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

State holdups on land use, pipeline easement, weather rising existing pipeline structures.

12. Estimated Time Frame to Implement Project?

Best guess: 3-5 years, depending on scope of project.



Tier 2 Projects

Aeneas Lake Irrigation District Efficiencies

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

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1. Title:

**Aeneas Lake Irrigation District
Efficiencies**

2. Proposal Preparer(s):

Okanogan Conservation District

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

Aeneas Lake Irrigation District (ALID) is in the process of developing a plan to improve energy and water efficiency from a pumping station on the Okanogan River. ALID diverts up to 15.6 cubic feet per second (cfs) from the Okanogan River to irrigate 1425 acres of agriculture land. They have 2 – 600 hp turbine pumps with 1 – 50 hp supplemental centrifugal pump. The pumps operate at full capacity during the irrigation season, even when water is required less the pumps operate at max capacity. Currently they pump excess water back to the river and they also have a permit that allows them to pump water into Aeneas Lake, about 1200 acre/ft.

This project would reduce the amount of excess water pumped from the River, but the amount has not been determined.

Potentially reducing the over-pumping and dumping back to the river will reduce turbidity in that location.

EDT Reach 16-31 Okanogan River, north of Rolling Hills Drive

Summer Chinook and steelhead redds (2014) have been documented in this part of the Okanogan River.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

X a. Existing Water Right ☐ b. Groundwater **X c. Surface Water** ☐ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

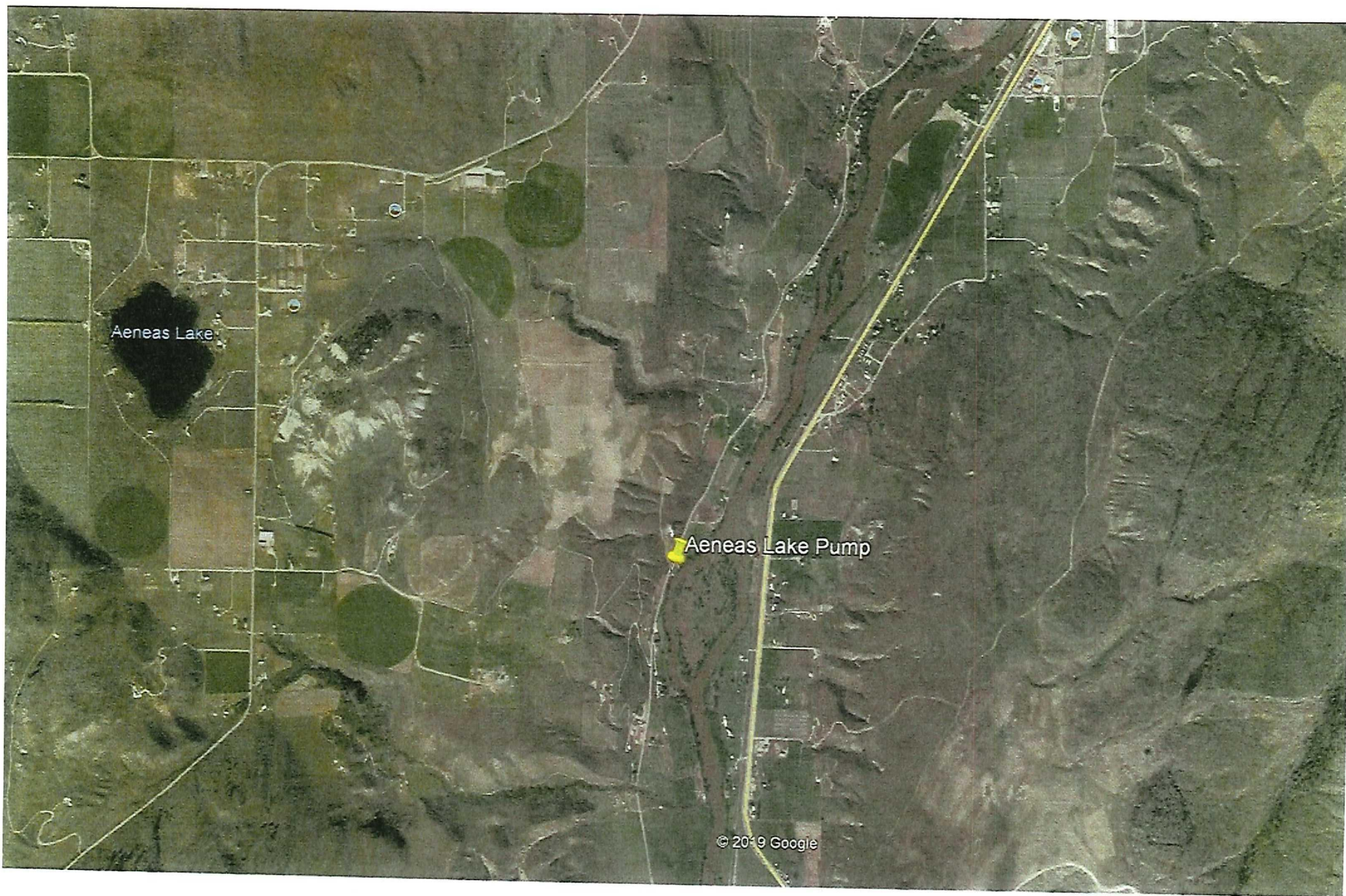
TBD

b. Timeframe(s) or Season of Use:

April-October

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Mainstem Okanogan



Aeneas Lake

Aeneas Lake Pump

© 2019 Google

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

In stream flow increase provided by the new storage capacity would meet needed habitat benefit for anadromous fish while keeping irrigated lands fully functional for growers

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

Actual site location and engineering associated with the site.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design:

No figures given at this time

b. Project Construction:

c. Project Annual O&M:

Not provided.

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

BOR is already engaged in the Conconully Reservoir project design phase which appears to be funded

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

Assessment of any impacts on local land owners

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Maintains viable agriculture with sufficient irrigation water while providing needed habitat for anadromous fish and water off sets down stream of habitat needs

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

None practically envisioned other than traditional government slowness.

12. Estimated Time Frame to Implement Project?

Initial project goal was initiating dam replacement within two years

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Upper reaches of: Mill Creek, Siwash Creek, Antoine Creek (2020).

Future years will also include: Upper reaches of Bonaparte Creek, Tonasket Creek

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

In the Okanogan Highlands cattle grazing is ubiquitous. Cattle and other animals drink from natural water sources including creeks, developed springs (those with troughs or other infrastructure), and undeveloped springs. When headwaters are not adequately protected, they are frequently trampled as they emerge from the ground, polluting the water with sediment and feces, limiting recreational enjoyment, and destroying critical habitat. All of the creeks in the project area are vulnerable to headwater degradation.

This proposal will result in:

- Repair and protection of degraded springs, seeps or other water resources.
- Protection of sensitive soils, native species, and ecosystems at springs, which support a multitude of life.
- Inventory and assessment of the condition of springs, seeps and water resources.
- Development of a system of annual spring assessment and repair that can be expanded for use throughout the Okanogan Highlands to ensure long-term protection of water resources.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

- NEPA to newly develop unprotected water resources on public lands (NEPA is not needed for repairs to developed springs);
- Development of agreements/contracts with landowners and range lessees
- Inventory of water resources on National Forest land and private land

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: in 2020, OHA estimates \$20,000 to develop and pilot systems of monitoring and repair work

b. Project Construction: Depends on repair needs at specific sites. USFS provides materials for repairs done on FS land, so costs are in staff/contractor labor.

c. Project Annual O&M: annual cost to monitor, repair and install new infrastructure, estimated cost: \$5,000-10,000, depending on sites selected and identified needs

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Potential: National Forest Foundation (applied for 1 year grant support, with the requirement of matching funds). Total project ~\$20,000.

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No. National Forest lessees are required to protect springs; OHA will be helping with this effort.

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

The project has the potential to:

1. Unite diverse stakeholders around the shared goal of ensuring that water resources are clean and sustainable.

Irrigation Efficiency Projects (1)

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE	
<i>The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020</i>	
1. Title: Irrigation Efficiencies Project Loup Loup-Swamp Sub-basin approximately, RM 19.1 Okanogan River	2. Proposal Preparer(s): Okanogan Conservation District
3. General Description of Proposal: <i>Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).</i> Objective: To reduce water and electrical use Infrastructure Requirements: Replace leaking wheel lines (55% efficient) with center pivot (90% efficient). Connection to other projects: Save Water-Save Energy to reduce electrical use. Also, landowner has expressed a desire to have a pump intake screen with a lifting boom. The screen could potentially reduce mortality of small fish. Other stakeholders: Colville Confederated Tribes Fisheries, NRCS Funding: Federal Farm Bill – NRCS; CCT Fisheries Columbia River BiOp; WSCC Irrigation Efficiencies Program Maintenance Requirements: Landowner is required to maintain installed conservation practices for their projected lifetime (NRCS standards)	
4. Water-for-Water Source (if applicable): <i>Mark all applicable and identify (water right number, stream name, source aquifer).</i> <input type="checkbox"/> a. Existing Water Right <input type="checkbox"/> b. Groundwater <input checked="" type="checkbox"/> c. Surface Water <input type="checkbox"/> d. Other Okanogan River	
5. Quantity/Timing/Location of Water Instream: <i>Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?</i> <u>a. Acre-feet and/or Cubic-feet-per-second:</u> unknown, but likely minimal	
<u>b. Timeframe(s) or Season of Use:</u> May through September	
<u>c. Tributary (name) or Mainstem Okanogan River and Location(s):</u> Mainstem Okanogan River at approximately river mile 19.1	

Irrigation Efficiency Projects (2)

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE	
<p><i>The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020</i></p>	
1. Title: Pivot and Pump upgrades Loup Loup-Swamp (Lower Okanogan) Sub-basin approximately, RM 33 Okanogan River	2. Proposal Preparer(s): Okanogan Conservation District
3. General Description of Proposal: <i>Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).</i>	
<p>Objective: To reduce water and electrical use to irrigate 44.89 acres Infrastructure Requirements: Replace wheel lines (at best, 65% efficient) with center pivot (90% efficient); replace aging, leaking pump. Connection to other projects: Save Water-Save Energy to reduce electrical use. Other stakeholders: Colville Confederated Tribes Fisheries, NRCS Funding: Federal Farm Bill – NRCS; CCT Fisheries Columbia River BiOp; WSCC Irrigation Efficiencies Program Maintenance Requirements: Landowner is required to maintain installed conservation practices for their projected lifetime (NRCS standards)</p>	
4. Water-for-Water Source (if applicable): <i>Mark all applicable and identify (water right number, stream name, source aquifer).</i>	
<input type="checkbox"/> a. Existing Water Right <input checked="" type="checkbox"/> b. Groundwater <input type="checkbox"/> c. Surface Water <input type="checkbox"/> d. Other Okanogan River	
5. Quantity/Timing/Location of Water Instream: <i>Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?</i>	
<p>a. Acre-feet and/or Cubic-feet-per-second: unknown, but likely minimal</p>	
<p>b. Timeframe(s) or Season of Use: May through September (typical irrigation season)</p>	
<p>c. Tributary (name) or Mainstem Okanogan River and Location(s): Mainstem Okanogan River at approximately river mile 33</p>	
6. Net Ecological Benefit: <i>Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)</i>	
<ul style="list-style-type: none"> • Retention of water in river to augment river flow • Reduced runoff and aquifer infiltration of fertilizers and pesticides 	

Loup Loup Creek Channel and Riparian Improvements

DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING PRELIMINARY PROJECT PROPOSAL TEMPLATE

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1. Title:
Loup Loup Creek Channel and Riparian Improvements

2. Proposal Preparer(s):
Okanogan CD

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

Okanogan CD is working with a landowner to improve instream habitat and riparian condition along 600 feet of Loup Loup Creek. The location is near the town of Malott. The project will improve spawning habitat for ESA steelhead. Redds are documented by Colville Tribes F&W on adjacent properties, however this property was not surveyed due to previous accessibility issues. Riparian buffers will be increased from 10 feet to 30-100 feet.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

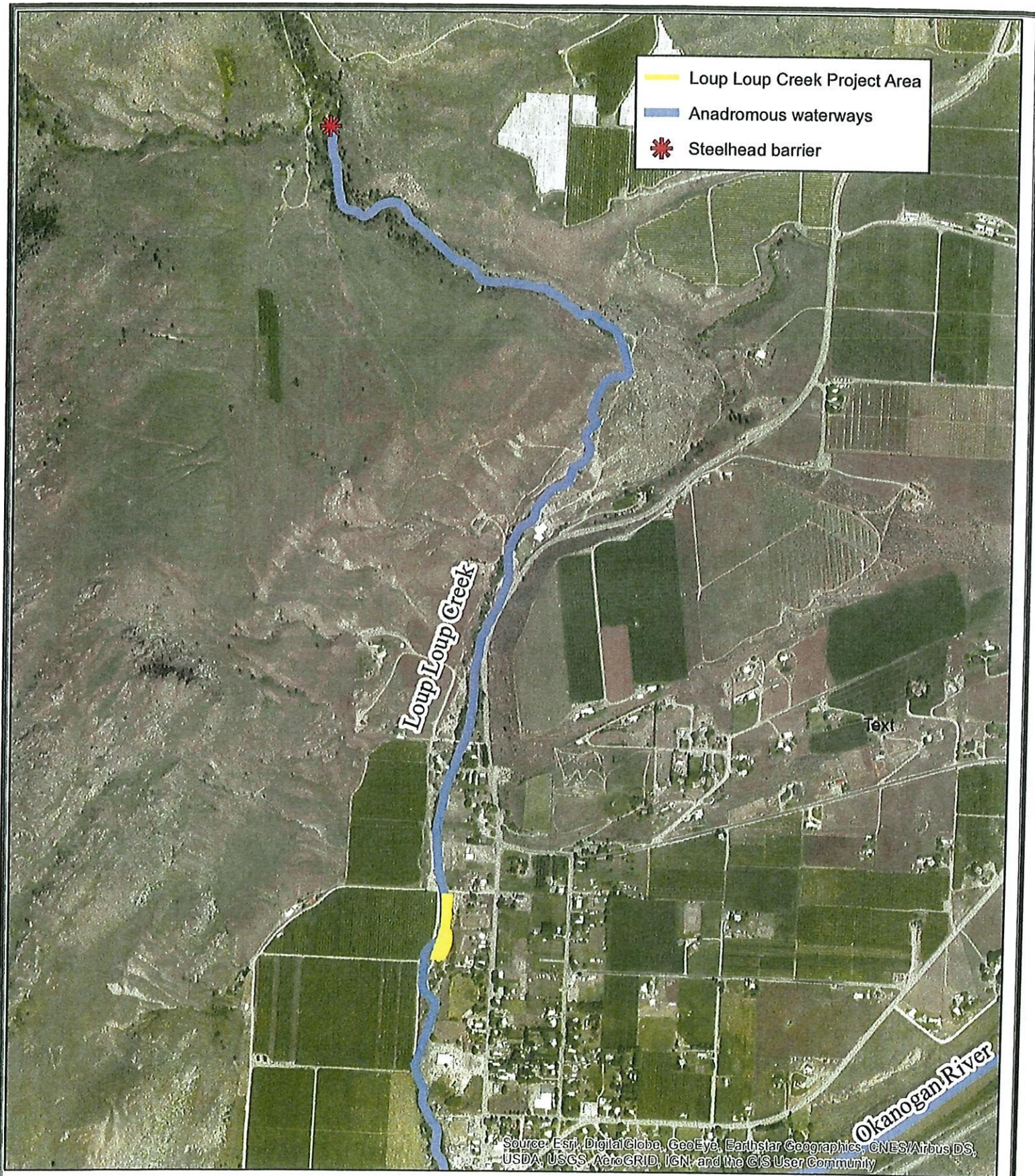
☐ a. Existing Water Right ☐ b. Groundwater ☐ c. Surface Water ☐ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

b. Timeframe(s) or Season of Use:

c. Tributary (name) or Mainstem Okanogan River and Location(s):



Loup Loup Creek is a tributary to the Okanogan River, supporting anadromous steelhead for approximately 2.5 miles, ending at a natural waterfall barrier.

The proposed project area is located within the natural anadromy segment of Loup Loup Creek.



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1:13,034

10/15/2019

Prepared by: HannahCoe

Methow Beaver Project

WDOE – Streamflow Restoration Grant Project Summary

Objective: Methow Beaver Project is preparing to submit an application to the WA Department of Ecology's (WDOE) Streamflow Restoration Competitive Grant Program. We are proposing to scale up effective and critically needed process-based restoration efforts in low order streams of the upper Methow and Okanogan watersheds. These actions would expedite the rebuilding of resilience and sustainability into ecosystem processes and services required for our watersheds and communities to function well. To assist WDOE in ranking our application, we are seeking letters of support from project partners that demonstrate the collaborative aspect of this effort.

Project Title: Restoring Streamflow and Water Quality Through Process Based Restoration of Wildfire and Human Impacted Streams in the Okanogan and Methow Watersheds of North Central Washington

Project Management: Methow Beaver Project, a project of Methow Salmon Recovery Foundation

Project Partners: Collaboration is key!!

Washington Department of Fish and Wildlife
(Methow & Scotch Creek Wildlife Areas)
Washington Department of Natural Resources
United States Forest Service
Okanogan Highlands Alliance
Chiliwist Creek Private Lands Partners



Project Timeline: Fall 2020 – Fall 2023

Proposal:

The Methow Beaver Project (MBP) proposes to restore streamflow in degraded and structure deficient low order stream channels impacted by fire and anthropogenic activities using process-based restoration (PBR) strategies in eight sub-basins of the Methow (5) and Okanogan (3) River watersheds (Figure 1). MBP believes that restoration actions can be developed and implemented within a three-year period in stream segments above the anadromous zone. These actions are to the intended benefit of groundwater recharge, extended streamflow, downstream salmonid habitat, and human communities through the restoration of natural processes and water quality improvement. Project development, planning, design and implementation would occur in Year one and two of the project timeline. Construction actions and monitoring would be implemented in Years one, two and three. Adaptive management would occur in Years two and three.

The goal of our project is to increase late season streamflow by restoring channel structure and floodplain connection with process-based restoration strategies that evolve with the environment over time and restore natural watershed functions and resilience to disturbance (Wheaton et al 2019). Reconnecting streams to their floodplains seasonally by adding structure to stream channels and repairing wetland habitat is a restoration strategy recommended in all current Methow watershed reach assessments as well as the Okanogan Watershed Plan. Process based restoration strategies, made up of a variety of potential actions, results in longer water residency time in upper watersheds leading to moderated annual flows, increased late season flows, significant riparian and aquatic habitat and water quality improvements, and increased channel complexity (Cluer & Thorne 2014, Wheaton et al. 2019).



Figure 5. Example of low-tech beaver dam repair in unoccupied historic beaver complex, photos 1-3 taken August 23, 2019, photo 4 taken October 13, 2019 (Methow Beaver Project).



Figure 6. Example of 2014 post-fire/flood channel incision and October 2019 local wood recruitment treatment (Methow Beaver Project).



Figure 7. Beavers move into BDA complex within days of installation on Myers Creek, Chesaw (Okanogan Highlands Alliance).

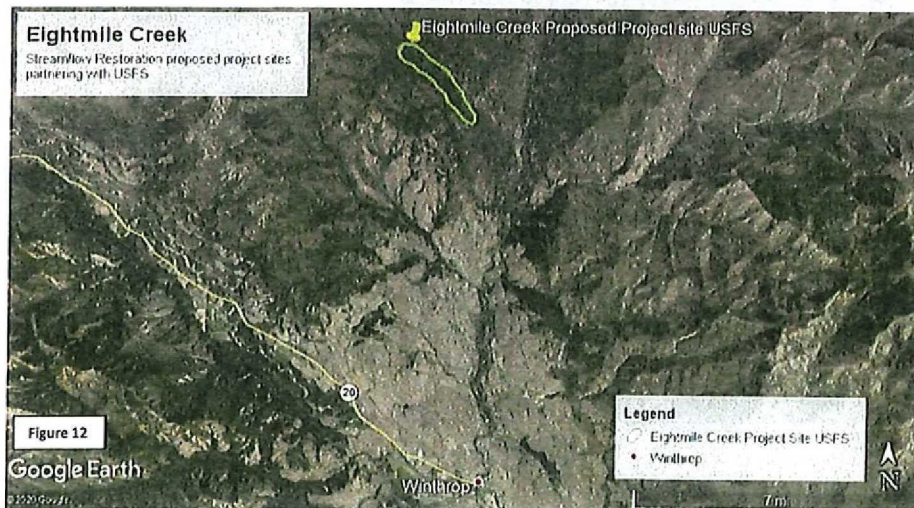
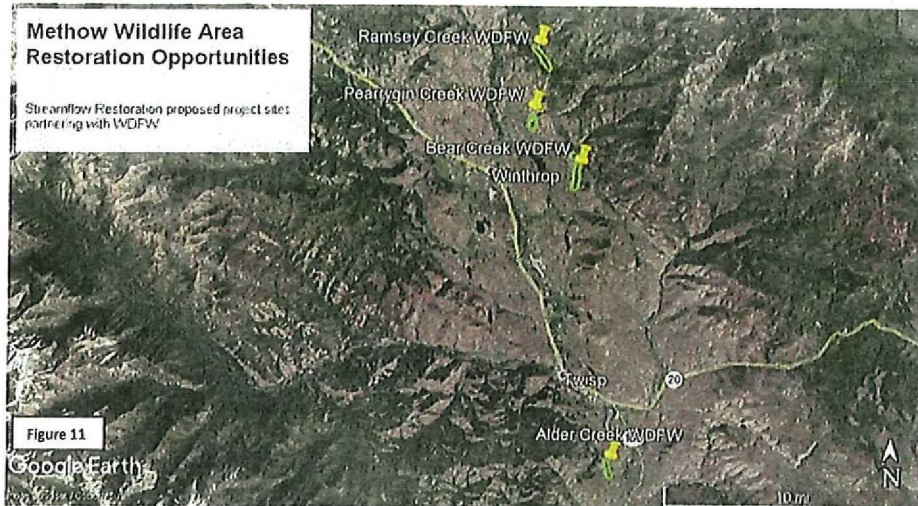


Figure 8. Beaver translocation in the Methow Watershed 2016 (Methow Beaver Project).

Project Need:

WRIA 48 (Methow River Watershed) and WRIA 49 (Okanogan River Watershed) have experienced severe wildfire impacts in the last 20 years (Figure 9). Large scale, uncontrolled fire followed by climate intensified precipitation events has led to widespread sediment transport, channel scouring debris flows and severe channel incision and disconnection from floodplains (Figure 2). These events are compounded by the legacy of institutional fire suppression and anthropogenic resource extraction in both watersheds including beaver trapping, mining, timber harvest, water abstraction, road infrastructure, wood and riparian vegetation removal, and livestock grazing. In sum, human activities and climate intensified events have severely compromised natural ecosystem processes. Historically, and in a properly functioning ecosystem, natural processes such as wood recruitment and beaver dam building would ensure that streams were connected to their riparian zones when seasonal or disturbance induced high flows topped channel banks and inundated adjacent floodplains. Floodplains naturally spread high stream flows or excess water onto the landscape, decreasing stream power, and

7. Frazer Creek (USFS) (Figure 14)
8. Cow Creek (WDNR & Private) (Figure 15)

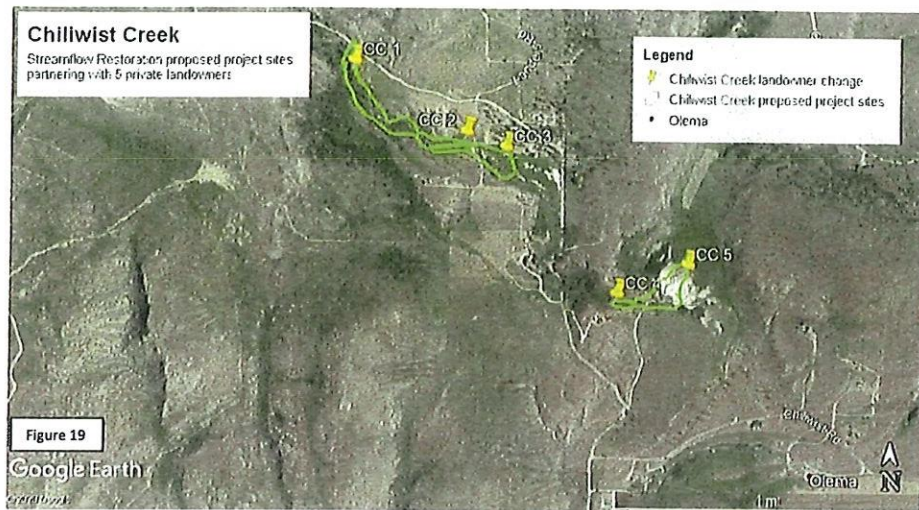




Okanogan Watershed

1. Tunk Creek (WDFW) (Figure 16)
2. Loup Loup Creek (WDNR) (Figure 17)
3. Tonasket Creek (WDFW & Private) (Figure 18)
4. Chilliwig Creek (Private) (Figure 19)





Spring meltwater to be slowed down/captured high in the watershed, stored and naturally released slowly throughout the spring/summer/fall, while supporting healthy plant communities throughout the growing season.

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Upper reaches of: Bonaparte Creek, Siwash Creek, Antoine Creek, Tonasket Creek

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

- Riparian habitat restoration and protection
- Floodplain restoration and protection
- Instream habitat restoration and protection
- Water quality improvements
- Water quantity improvements
- Re-timing of water in creeks to increase later-season flow
- Erosion reduction

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

- Feasibility of re-routing drainages, stormwater/meltwater ditches, to be assessed on a site-by-site basis
- Analysis of sites to determine best practices, restoration techniques

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. **Project Development and Design:** Site dependent, estimated \$5,000-\$15,000 per site

b. **Project Construction:** Site dependent, estimated \$5,000-50,000 per site

c. **Project Annual O&M:** Site dependent, estimated \$1,000-\$15,000 per year per site.

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Potential: DOE's streamflow restoration funding.

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No.

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

- Maximize the benefit of natural flooding and reduce damage to infrastructure during spring melt and storms.
- Reduce fire danger by increasing surface water storage and wetland vegetation high in the watershed.
- Potentially benefit junior water right holders by increasing water available instream later in the season.

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

No none data gaps. No studies need to be completed.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design:

b. Project Construction: \$54,116

c. Project Annual O&M: \$1,500

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Washington State Department of Ecology

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Stabilization of floodplain areas

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

No known barriers

12. Estimated Time Frame to Implement Project?

10/01/2019 – 9/30/2024

<p>7. Data Gaps: <i>Describe major unknowns or studies that would need to be completed.</i></p> <p>No none data gaps. No studies need to be completed.</p>
<p>8. Cost Estimates: <i>Provide known and estimated costs to develop and implement the project.</i></p> <p>a. <u>Project Development and Design:</u></p> <p>b. <u>Project Construction:</u> \$54,116</p> <p>c. <u>Project Annual O&M:</u> \$1,500</p>
<p>8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i></p> <p>Washington State Department of Ecology</p>
<p>9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i></p> <p>No</p>
<p>10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i></p> <p>Stabilization of floodplain areas</p>
<p>11. Potential Project Barriers: <i>Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)</i></p> <p>No known barriers</p>
<p>12. Estimated Time Frame to Implement Project?</p> <p>10/01/2019 – 9/30/2024</p>

<p>6. Net Ecological Benefit: <i>Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)</i></p> <p>Channel and riparian restoration and protection will reduce water quality impacts. Weed control will increase native plant diversity.</p>
<p>7. Data Gaps: <i>Describe major unknowns or studies that would need to be completed.</i></p> <p>This project is part of a study to determine the effectiveness of jackstraw barriers as an alternative to traditional livestock exclusion fencing for use in remote locations.</p>
<p>8. Cost Estimates: <i>Provide known and estimated costs to develop and implement the project.</i></p> <p>a. <u>Project Development and Design:</u> \$27,295 (total of all 3 jackstraw projects)</p> <p>b. <u>Project Construction:</u> \$92,455 (total of all 3 jackstraw projects)</p> <p>c. <u>Project Annual O&M:</u> \$2,000 (total of all 3 jackstraw projects)</p>
<p>8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i></p> <p>Washington State Department of Ecology, Landowners (cost share) Final project cost is subject to final implementation costs.</p>
<p>9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i></p> <p>No</p>
<p>10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i></p> <p>This project, in conjunction with two other sites (to have an adequate sample of variety), will determine the effectiveness of jackstraw barriers as an alternative to traditional livestock exclusion fencing for use in remote locations.</p>
<p>11. Potential Project Barriers: <i>Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)</i></p> <p>No perceived project barriers</p>
<p>12. Estimated Time Frame to Implement Project?</p> <p>10/01/2019 – 9/30/2023</p>

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

The combined streambank stabilization/CREP project will help reduce sedimentation, contribute to stream complexity and fish habitat enhancement, and maintain cooler stream temperatures. Noxious weeds will also be removed and controlled, possibly being replaced by pollinator plants.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

Design of streambank stabilization will lead to accurate cost estimates. CREP plans will delineate project costs.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: Streambank stabilization - \$ 11,500; CREP - \$2,200

b. Project Construction: Streambank stabilization - \$16,000; CREP - \$10,500

c. Project Annual O&M: Streambank stabilization - \$3,000 for 3 years; CREP - \$900/year average for first five years, none thereafter

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Streambank Stabilization

Colville Tribal Fisheries (through BPA Columbia River BiOp) \$19,250

CREP

Installation: FSA \$10,800 (90% - 50% cost share & 40% practice incentive payment); Washington State Conservation Commission (WSCC) - \$1,200 (10% cost share)

O & M: FSA annual soil rental payments (unknown, but minimal); WSCC - \$3,750 (first 5 years)

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No. Landowner generated voluntary project, funding for streambank stabilization

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Reduced stream sedimentation, enhancement of endangered fish species habitat

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

Landowner willingness

12. Estimated Time Frame to Implement Project?

4 years: allow 2-1/2 years for development of design, implementation, and verification of establishment of streambank protection features plus 1-1/2 years for installation and establishment of CREP vegetative features and installation of fence

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

The combined streambank stabilization/CREP project will help reduce sedimentation, contribute to stream complexity and fish habitat enhancement, and maintain cooler stream temperatures.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

Design of streambank stabilization will lead to accurate cost estimates. CREP plans will delineate project costs.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: Streambank stabilization - \$ 9,500; CREP - \$1,600

b. Project Construction: Streambank stabilization - \$12,000; CREP - \$8,500

c. Project Annual O&M: Streambank stabilization - \$2,000 for 3 years; CREP - \$750/year average for first five years, none thereafter

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Streambank Stabilization

Colville Tribal Fisheries (through BPA Columbia River BiOp) \$19,250

CREP

Installation: FSA \$10,800 (90% - 50% cost share & 40% practice incentive payment); Washington State Conservation Commission (WSCC) - \$1,200 (10% cost share)

O & M: FSA annual soil rental payments (unknown, but minimal); WSCC - \$3,750 (first 5 years)

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No. Landowner generated voluntary project, funding for streambank stabilization

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Reduced stream sedimentation, enhancement of endangered fish species habitat

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

Landowner willingness

12. Estimated Time Frame to Implement Project?

4 years: allow 2-1/2 years for development of design, implementation, and verification of establishment of streambank protection features plus 1-1/2 years for installation and establishment of CREP vegetative features and installation of fence

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

Increase stream flow later in the year with decreased water temperatures benefitting fish species (kokanee, rainbow trout, redband trout).

Improve fish passage with updating water control structures at each impoundment

Reduced sedimentation into Sinlahekin Creek due to annual road damage and erosion as a result of diversion.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

Capacity limits and risk assessment on each of the impoundments. DOE may have some info already.

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: \$250,000

b. Project Construction: \$500,000

c. Project Annual O&M: None. Existing DFW O&M used to manage water.

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

Some Capital Funds may be available for this project. \$250,000 asked for in 2018.

Potential funding partners: Western Native Trout Initiative, in-kind donations from private interests.

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Improvements to control structures will decrease staff time needed to raise/lower water levels throughout the valley. Safety concerns will also be addressed by modernizing these structures. County road maintenance costs could be significantly reduced.

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

Coordination between state, federal and private entities may provide some challenges. Closely working with existing water right holders and DOE will be paramount.

12. Estimated Time Frame to Implement Project?

Fall 2022

<p>7. Data Gaps: <i>Describe major unknowns or studies that would need to be completed.</i></p> <p>Adaptive management will be utilized to assess effectiveness of various treatments and to change timber stand management activities as appropriate.</p>
<p>8. Cost Estimates: <i>Provide known and estimated costs to develop and implement the project.</i></p> <p>a. <u>Project Development and Design:</u> Unknown</p> <p>b. <u>Project Construction:</u> Unknown</p> <p>c. <u>Project Annual O&M:</u> Unknown</p>
<p>8. Existing or Potential Funding: <i>List sources and approximate amounts if known.</i></p> <p>WA DNR Small Forest Landowners</p>
<p>9. Mitigation Requirements: <i>Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?</i></p> <p>No</p>
<p>10. Project Advantages: <i>In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)</i></p> <ul style="list-style-type: none"> • Reduced wildland fire potential, thereby greatly reducing fire suppression costs • Reduced management cost in the long-term • More open canopy will allow snow to reach the ground thereby lessening water lost to sublimation
<p>11. Potential Project Barriers: <i>Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)</i></p> <ul style="list-style-type: none"> • Permitting requirements (especially when regarding prescribed burning) • Short to mid-term implementation costs • Liability insurance for prescribed burning
<p>12. Estimated Time Frame to Implement Project?</p> <p>Major activities will be conducted over the next 10 to 20 years beyond which low level maintenance activities will be required.</p>

**DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING
PRELIMINARY PROJECT PROPOSAL TEMPLATE**

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:

Kermel Drainage

2. Proposal Preparer(s):

Todd McDaniel

City of Omak

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

The area just west of Omak's incorporated limits has numerous areas of springs and intermittent surface water. These were diverted in the late 1800's for irrigation and potable source along the adjacent properties and piped to the lower reaches of the valley. It provided water to Omak Townsite prior to the city's incorporation. Over the years land uses have changed as well as the methods of water conveyance. The original diversions have gone unmaintained, underutilized, or unutilized. This has caused unintended flooding and ground saturations that affect existing structures and unpredictable run off.

This project would consolidate and place the surface water produced by the springs into a predictable channel that would interact better with current land use activities. Produce a stream bed that could support fish habitat. Improve water quality by directing, limiting and protecting the water sources from contact with polluted areas.

Existing water right holders are aware of the need to solve the condition that exist. There are over 50 water rights or certificates associated with the springs and surface waters in this area. It appears these rights may be over allocated and underutilized. This project would identify the actual need of the water right/certificate holders. Once this is established rights'/certificates would be retired, bought, or exchanged for project value.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

X a. Existing Water Right X b. Groundwater X c. Surface Water ☐ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

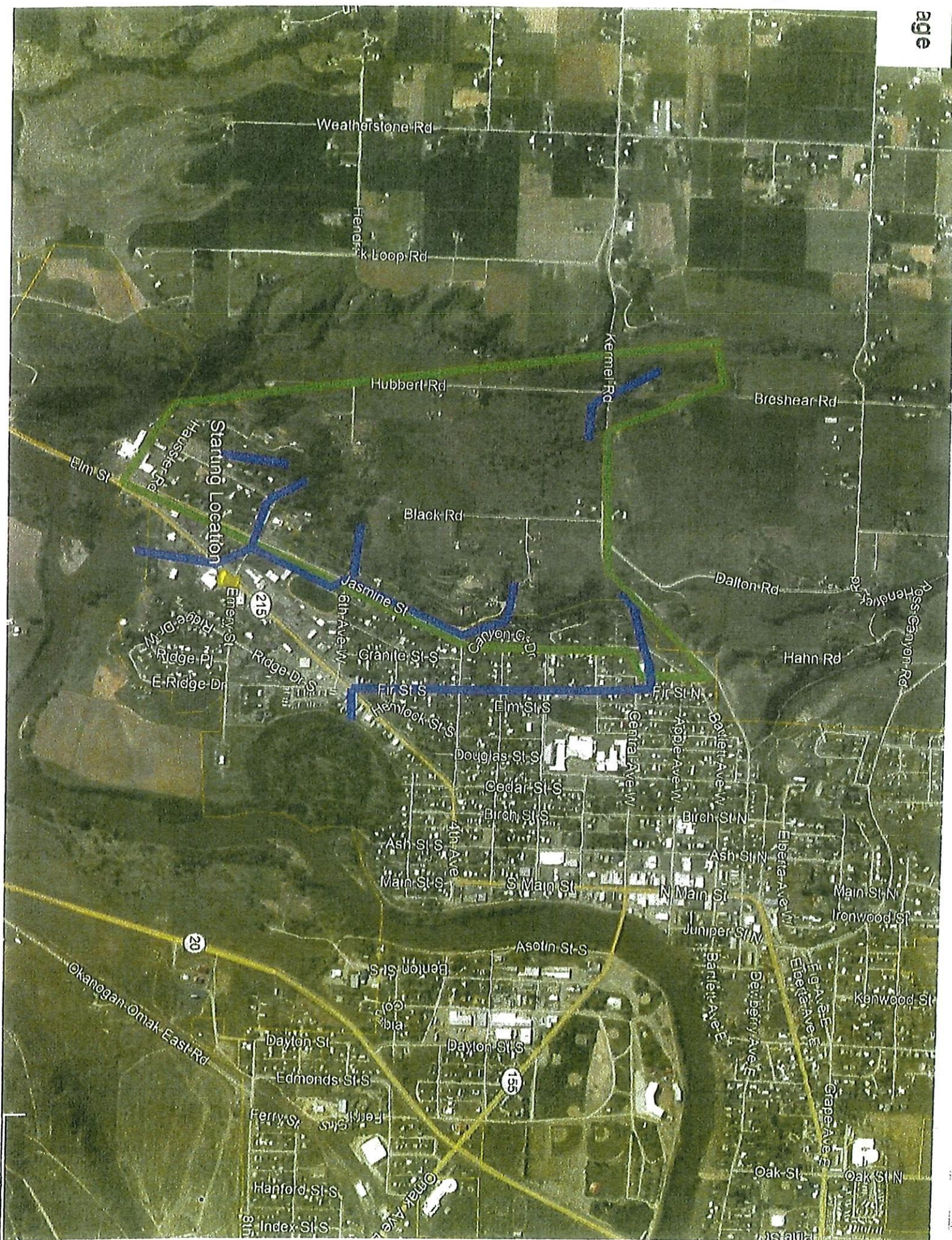
a. Acre-feet and/or Cubic-feet-per-second:

Lots

b. Timeframe(s) or Season of Use:

Annual

12. Estimated Time Frame to Implement Project?
? Funding 1-year research and planning study 1-year water right/land acquisition 6 month -design 6 month construction



6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

N/A

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

The water right is currently in the TWRP

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design: N/A

b. Project Construction: N/A

c. Project Annual O&M: N/A

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

N/A

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

No.

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Water-for-water project in the mainstem Similkameen and Okanogan Rivers.

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

Permitting complete.

12. Estimated Time Frame to Implement Project?

Immediately.

6. Net Ecological Benefit: *Describe the factors that may contribute to Net Ecological Benefit (i.e., fish passage restoration; channel, riparian, and/or floodplain restoration and/or protection; upland improvements)*

Water for water off-set for Okanogan basin. This could be important as most economic development and municipal use in Okanogan county would occur along highway 97. Could also provide water temperature and flow benefits that are not maintained due to lower summer flows from Lake Osoyoos.

7. Data Gaps: *Describe major unknowns or studies that would need to be completed.*

There may be engineering estimates by CH2M Hill or the Columbia River Engineering Board

8. Cost Estimates: *Provide known and estimated costs to develop and implement the project.*

a. Project Development and Design:

None provided

b. Project Construction:

None provided

c. Project Annual O&M: None provided Not known

8. Existing or Potential Funding: *List sources and approximate amounts if known.*

No research available on this question but Army Corp of Engineers or Bureau of Reclamation may be a source as well as Office of the Columbia River.

9. Mitigation Requirements: *Is any part of the project associated with other federal or state mitigation requirements (i.e., FERC, BiOp, etc)?*

None discussed

10. Project Advantages: *In addition to helping address RCW 90.94 requirements, briefly explain other potential benefits (e.g. reduced O&M costs, cropping flexibility, etc)*

Creates "new" water which can be appropriated for out of stream uses as well as exempt uses. Could also provide water temperature and flow benefits that are not maintained due to lower summer flows from Lake Osoyoos.

11. Potential Project Barriers: *Briefly explain potential barriers to completing the project (e.g. landowner willingness, site access, permitting requirements, increased O&M costs, legal implications)*

Project is reported as having very little impact as it would often operate within natural flood stage occurrences which also means private land ownership has already adjusted to fluctuating lake levels.

**DRAFT WRIA 49 STREAMFLOW RESTORATION PLANNING
PRELIMINARY PROJECT PROPOSAL TEMPLATE**

The purpose of this document is to provide project background and to summarize characteristics that contribute toward offset of future permit-exempt domestic use for evaluation under RCW 90.94. When complete, please submit to Bill Sullivan (bsullivan@aspectconsulting.com) by January 3, 2020

1. Title:
Shanker's Bend

2. Proposal Preparer(s):
US Army Corps of Engineers

3. General Description of Proposal: *Briefly explain the proposed project (project objective, infrastructure requirements, connection to other new, ongoing or past projects and/or funding, other stakeholders, maintenance requirements, various sizing or phasing, etc.).*

This site was studied first in 1948 in a study of major storage and hydro projects on the Columbia River and its tributaries. Proposed dam heights range from 90 feet to 260 feet. The higher dam height would provide international benefits to Canada while lower dam heights would not back up water into Canada but just to Nighthawk. The project could be regional in nature and provide appropriable water as well as 84 MW of power and needed flood control.

4. Water-for-Water Source (if applicable): *Mark all applicable and identify (water right number, stream name, source aquifer).*

☐ a. Existing Water Right ☐ b. Groundwater ☐ c. Surface Water ☐ d. Other

5. Quantity/Timing/Location of Water Instream: *Estimate average amount of water, when and where. Can project be considered at various sizes (flow outputs) and/or considered in phases?*

a. Acre-feet and/or Cubic-feet-per-second:

1.3M acre-feet of storage with a minimum flow of 1000 cfs

b. Timeframe(s) or Season of Use:

Spring through late fall/early winter

c. Tributary (name) or Mainstem Okanogan River and Location(s):

Similkameen

APPENDIX C

Summary NEB

Analysis Tech

Memo

The Ecology (2019) guidance further stipulates that the NEB evaluation must consider the extent of aquatic habitat affected; the presence, distribution, and life stage requirements of important fish species; and ecosystem structure, function, and composition. The guidance places emphasis on improving conditions for Pacific salmonid populations listed under the ESA, followed by other native anadromous and resident fish species. Elements of the NEB analysis may be conducted at the individual subbasin level, but the final determination is made based on the net effect of all proposed actions at the WRIA scale.

The Okanogan EDT model is an ideal tool for conducting the WRIA 49 NEB analysis because:

- EDT is a life cycle-based habitat model with a spatial and temporal dispersal component that represents the full range life history expression for the target species;
- The Okanogan model includes over 180 miles of stream reaches in WRIA 49, covering all currently accessible anadromous habitat and nearly all tributaries likely to be affected by future consumptive use demand;
- It characterizes the environment using over 40 environmental attributes with unique values assigned to each reach in the model network, and;
- It is based on over 15 years of habitat data collected by OBMEP for long-term salmon habitat status and trends monitoring.

Okanogan EDT currently includes model populations for summer steelhead and summer-fall Chinook salmon. The Planning Unit selected Okanogan steelhead as the primary indicator species for the WRIA 49 NEB analysis because this summer run population is ESA-listed, and its distribution includes most of tributary streams likely to be affected by future water demand. We used Chinook salmon to evaluate the benefits of NEB project proposals on the Okanogan mainstem. While not ESA-listed, Okanogan Chinook salmon are an important anadromous species in WRIA 49 that rely on mainstem Okanogan river habitats.

The EDT model generates an array of results useful for describing habitat potential for salmon and steelhead and identifying protection and restoration priorities. For the NEB analysis we are relying on a single reporting metric, equilibrium abundance, also referred to as *Neq*. *Neq* is the theoretical population size that a given quantity and quality of habitat can support over time. We are evaluating NEB using the projected effect of proposed actions on adult and juvenile *Neq*. These metrics usefully represent the effect of our water use and NEB scenarios on habitat performance. Consistent with NEB guidance (Ecology 2019), we evaluated the projected impacts of future water demand on adult and juvenile *Neq* combined with the effects of Tier 1 non-water offset (i.e. NEB-contributing) projects that were advanced for consideration by the WRIA 49 Watershed Planning Unit. The EDT scenario used to conduct the impact analysis is described in Section 3. The parameters used in the NEB analysis scenario are described in

required to produce a 1%, 2.5%, and 5% reduction in baseflow channel width. The result of the extended Loup Loup Creek analysis are presented in Table 3-1. As shown, the streamflow reduction required to produce these width effects range from tens to hundreds of times the projected demand effect at the watershed level. When modeled in EDT, the 5% sensitivity scenario reduces adult steelhead Neq by 1 and juvenile steelhead Neq by 32 (Table 3-1).

Table 3-1. Comparison of EDT sensitivity analysis assumptions to projected future water demand effects on streamflow in the Loup Loup Creek watershed.

Month/Neq Parameter	Change in cfs Required to Achieve Stated % Reduction in Wetted Channel Width (multiple of -0.0044 cfs demand effect)			
	0.5%	1%	2.5%	5%
Jan	-0.23 (52 X)	-0.48 (109 X)	-1.1 (250 X)	-1.8 (409 X)
Feb	-0.43 (98 X)	-0.76 (173 X)	-1.65 (375 X)	-2.68 (609 X)
Mar	0	0	0	0
Apr	0	0	0	0
May	0	0	0	0
June	-0.56 (127 X)	-1.13 (257 X)	-2.66 (605 X)	-4.73 (1,075 X)
July	-0.4 (91 X)	-0.69 (157 X)	-1.51 (343 X)	-2.48 (564 X)
Aug	-0.25 (57 X)	-0.32 (73 X)	-0.91 (207 X)	-1.48 (336 X)
Sept	-0.19 (43 X)	-0.38 (86 X)	-0.83 (189 X)	-1.42 (323 X)
Oct	-0.22 (50 X)	-0.41 (93 X)	-0.92 (209 X)	-1.51 (343 X)
Nov	-0.38 (86 X)	-0.69 (157 X)	-1.48 (336 X)	-2.45 (557 X)
Dec	-0.37 (84 X)	-0.69 (157 X)	-1.48 (336 X)	-2.45 (557 X)
Change in Adult Neq	0	0	n/a	-1
Change in Juvenile Neq	-3	-6	n/a	-32

The progressive increase in effect on steelhead Neq across these scenarios demonstrate that 1) the EDT model captures the effect of small changes in streamflow on habitat potential, and; 2) the effects of future water demand on steelhead habitat are likely to be small under typical water year conditions.

4.0 NEB ANALYSIS SCENARIO

We developed the NEB analysis scenario for EDT modeling from the suite of proposed streamflow and habitat restoration projects advanced by the WRIA 49 Planning Unit and stakeholders for consideration in the watershed plan. NEB-contributing project proposals were designated as Tier 1 or Tier 2 based on the following criteria:

1. The projects are 90.94 eligible, meaning they were proposed, contracted, and/or funded for construction after January 2018;
2. The project is likely to result in a measurable effect on aquatic habitat conditions within the WRIA 49 anadromous zone, and;
3. The project description and available supporting information are sufficient to characterize the potential effect of the proposed action using Okanogan EDT model environmental input parameters

Projects designated Tier 1 project meet all three of these criteria and were evaluated using the advanced for EDT modeling. Tier 1 NEB-contributing projects and the ecological parameters used to model these projects in EDT are described by tributary watershed in the following sections.

Several of the submitted NEB-contributing project proposals meet condition 1 (i.e. they are 90.94 eligible) but do not meet conditions 2 or 3 and are therefore designated as Tier 2. These projects are likely to contribute to positive NEB but insufficient information is available to quantify their effect on the environment. EDT modeling clearly demonstrates that the proposed Tier 1 projects will achieve NEB. The Tier 2 projects provide additional ecological benefits that build on the Tier 1 NEB determination and provide a factor of safety in case a Tier 1 project cannot be implemented as planned.

All modeled Tier 1 projects are described below, ordered by the geographic position of the affected tributary stream or mainstem reach within WRIA 49.

4.1 Loup Loup Creek

Loup Loup Creek Irrigation Efficiency - One Tier 1 project in the Loup Loup-Swamp Creek subbasin, Loup Loup Creek Irrigation Efficiency, was advanced for consideration in the NEB analysis.

The CTCR Okanogan Subbasin Habitat Implementation Program (OSHIP) and Washington Water Trust (WWT) are proposing an irrigation conveyance system efficiency improvement

Irrigation Conveyance Efficiency project, and the total estimated flows used for the NEB analysis are shown in Table 4-2.

Aspect estimated the monthly average channel widths in EDT model reaches Loup Loup 16-1 and 16-2 under existing and proposed flow conditions using a customized hydraulic modeling tool (Aspect 2020b). These results were used to calculate the proportional change in average monthly channel width resulting from the proposed NEB-contributing project. We used EDT BASE scenario channel widths and these proportional multipliers to develop the NEB scenario dimensions used in the EDT model analysis (Table 4-3).

Initial test runs using the modified channel widths shown in Table 4-3 produced a minimal beneficial effect on steelhead equilibrium abundance. The lack of effect is attributable to degraded habitat conditions, specifically reduced habitat complexity and increased substrate fines, resulting from repeated high intensity fires in the headwaters. For the NEB analysis we assumed that habitat conditions would recover to OBMEP 2013 scenario conditions within the 20-year 90.94 implementation period through natural sediment transport processes supported by additional habitat restoration. The 2017 scenario habitat attribute ratings in Loup Loup Creek (i.e. sediment conditions, habitat composition, large woody debris density, etc.) were replaced with 2013 scenario conditions to reflect this assumption for NEB modeling purposes.

Table 4-1. Loup Loup Creek Diversion Rates and Estimated Streamflow Losses in 2015 (Source: Kistler et al. 2015).

Measurement Location	Units	Diversion Rate and Flow Losses by Date			
		3/3/2015	4/16/2015	6/24/2015	10/27/2015
Sweat Creek diversion	cfs	2.09	4.91	2.02	2.41
Little Loup Creek diversion	cfs	1.56	3.12	0.8	0.13
Loup Loup Creek diversion	cfs	16.92	8.97	0	0.81
Total withdrawals into canal	cfs	20.56	16.99	2.82	3.35
Canal discharge into Leader Lake	cfs	9.85	8.52	1.28	2.05
Estimated streamflow loss from canal leakage	cfs	10.71	8.47	1.54	1.29
	acre ft/day	21.25	16.8	3.06	2.57
	% of diverted flow	52.10%	49.80%	54.60%	38.70%

Table 4-3. Estimated change in average monthly wetted channel width in Loup Loup Creek under current and proposed NEB flow conditions.

EDT Reach	Month	100% Flow Return Scenario			23% Flow Return Scenario	
		Existing Wetted Width (meters)	Proposed Wetted Width (meters)	Proportional Change	Proposed Wetted Width (meters)	Proportional Change
Loup Loup 16-1	Jan	1.89	2.08	+10%	1.93	+2%
	Feb	1.98	2.28	+15%	2.07	+4%
	Mar	2.53	2.68	+6%	2.57	+2%
	Apr	4.05	4.09	+1%	4.06	+0%
	May	2.87	2.94	+3%	2.88	+0%
	Jun	2.16	2.23	+3%	2.18	+1%
	Jul	1.96	2.02	+3%	1.97	+1%
	Aug	1.88	1.98	+5%	1.91	+1%
	Sep	1.87	1.97	+6%	1.91	+2%
	Oct	1.88	1.96	+4%	1.90	+1%
	Nov	1.95	2.01	+3%	1.97	+1%
	Dec	1.98	2.05	+3%	2.00	+1%
Loup Loup 16-2	Jan	3.65	4.21	+15%	3.79	+4%
	Feb	3.72	4.47	+20%	3.93	+5%
	Mar	4.17	4.49	+8%	4.25	+2%
	Apr	5.41	5.50	+2%	5.43	+0%
	May	4.45	4.57	+3%	4.47	+0%
	Jun	3.87	4.03	+4%	3.91	+1%
	Jul	3.70	3.92	+6%	3.77	+2%
	Aug	3.64	3.91	+7%	3.71	+2%
	Sep	3.63	3.90	+7%	3.70	+2%
	Oct	3.64	3.88	+7%	3.70	+2%
	Nov	3.70	3.90	+5%	3.76	+2%
	Dec	3.72	3.94	+6%	3.79	+2%
Loup Loup 16-3	Jan	2.49	2.74	+10%	2.54	+2%
	Feb	2.52	2.90	+15%	2.63	+4%
	Mar	2.71	2.88	+6%	2.76	+2%
	Apr	3.25	3.29	+1%	3.26	+0%
	May	2.83	2.91	+3%	2.85	+1%
	Jun	2.58	2.66	+3%	2.60	+1%
	Jul	2.51	2.60	+3%	2.53	+1%
	Aug	2.48	2.62	+5%	2.52	+2%
	Sep	2.48	2.62	+6%	2.53	+2%
	Oct	2.48	2.59	+4%	2.51	+1%
	Nov	2.51	2.59	+3%	2.53	+1%
	Dec	2.52	2.60	+3%	2.54	+1%

NEB scenario reach widths in Salmon Creek were estimated from the geometric mean of monthly synthetic streamflows using the transect-based inundation model developed by Aspect (2020b). NEB scenario channel widths and change relative to the BASE scenario are shown by EDT reach and month in Table 4-6.

Table 4-4. Annual Salmon Creek flow augmentation under the NEB scenario.

Year	Allocated Use (af)	Balance (af)	Proportion of Available Flow
2015	1546	-546	155%
2016	849	151	85%
2017	212	788	21%
2018	352	648	35%
2019	944	56	94%
Average	781	219	78%

Table 4-5. Average proportion of days under fish passage flow thresholds in lower Salmon Creek and revised EDT fish passage ratings under the BASE and NEB scenarios.

Month	BASE Scenario				NEB Scenario			
	Days <15 cfs	Days <4 cfs	Adult Passage Rating	Juvenile Passage Rating	Days <15 cfs	Days <4 cfs	Adult Passage Rating ¹	Juvenile Passage Rating ¹
1	94%	94%	0.06	0.06	94%	54%	0.06	0.46
2	82%	71%	0.18	0.29	82%	35%	0.18	0.65
3	50%	14%	0.50	0.86	50%	13%	0.50	0.87
4	27%	0%	0.73	1.00	3%	0%	0.97	1.00
5	35%	0%	0.65	1.00	35%	0%	0.65	1.00
6	59%	37%	0.41	0.63	59%	37%	0.41	0.63
7	99%	72%	0.01	0.28	99%	72%	0.01	0.28
8	98%	75%	0.02	0.25	98%	75%	0.02	0.25
9	99%	73%	0.01	0.27	99%	65%	0.01	0.35
10	91%	73%	0.09	0.27	91%	41%	0.09	0.59
11	86%	79%	0.14	0.21	86%	52%	0.14	0.48
12	100%	99%	0.00	0.01	100%	51%	0.00	0.49

¹ Improved ratings relative to BASE scenario highlighted in bold.

4.3 Okanogan River

Conservancy Island Side Channel - One Tier 1 project in the mainstem Okanogan River was advanced for NEB modeling. The City of Okanogan is proposing to replace a culvert under Island Avenue SW and make additional improvements to restore hydraulic connectivity between the mainstem Okanogan River and a relict side channel that encircles Conservancy Island, also known as Roundup Park. The proposed NEB-contributing project would reactivate the side channel, providing flushing flows that would both improve fish access and habitat conditions. This project would primarily benefit Chinook salmon, specifically by increasing the amount of low-velocity off-channel habitat available for spawning and fry recruitment. This project would necessarily be paired with the replacement of a Washington State Department of Transportation (WSDOT) owned culvert under the State Route (SR-) 20 connector road between SR-215 and SR-97. Responsibility for the latter project falls to WSDOT. The projected benefits of this project assume that both projects are implemented with the same design objectives.

The NEB scenario for this project was developed using side channel width and depth measurements collected by the Okanogan Subbasin Habitat Implementation Plan (OSHIP) and their partners (OSHIP 2020). These measurements were used to estimate the dimensions of the reactivated side channel. The proposed habitat improvements are assigned to mainstem EDT reach Okanogan 16-14. Current and revised channel widths and the proportional contribution of the reactivated side channel to reach-level habitat composition are summarized in Table 4-7. We estimated rating conditions for the EDT Riparian Function and Woody Debris attributes from features visible in aerial imagery, including Google Earth™ and National Agricultural Imagery Program (USDA 2016). Woody debris and riparian function attributes were rated following the EDT Attribute Rating Guidelines (Lestelle 2005).

4.4 Johnson Creek

Johnson Creek Fish Passage - One Tier 1 suite of projects was advanced in Johnson Creek. Trout Unlimited is working with funding from the Brian Abbot Fish Barrier Removal Board, administered by the Washington Recreation and Conservation Office, to address several existing fish passage obstructions. This package of projects is collectively referred to as the Johnson Creek Fish Passage project. Three of these barrier removal projects were proposed and/or funded after January 2018 and are therefore 90.94 eligible. The eligible fish passage barrier projects are identified below by their reach designations in the Okanogan EDT model:

- Johnson 16-1.1 (culvert): Culvert under Cooper St., funded for removal in 2018, removed 2019
- Johnson 16-1.3 (culvert): Culvert under State St., funded for removal in 2019, to be removed in 2020
- Johnson 16-3.1 (culvert): Culvert under Greenacres Rd., funded for removal in 2019, to be removed in 2020

The steelhead passage ratings for these obstructions were updated to 100 percent passable in the NEB analysis scenario. BASE scenario obstruction ratings were updated for two passage projects that were completed prior to January 2018. Monthly EDT passage ratings by life stage for the BASE scenario are shown in Table 4-8. The ratings represent the estimated proportional passage success for fish of each life stage by month. A rating of 1 = 100% passable, while a rating of 0.01 = 1% passage, or effectively impassable. Under the NEB scenario, these life stage ratings are all increased to a value of 1 across all months.

An additional Johnson Creek fish passage project was advanced for consideration but was ultimately determined to be 90.94 ineligible. The Johnson Creek culvert under SR-97 and associated trash rack immediately upstream, represented by EDT reach Johnson 16-2.1 (culvert), are being replaced with a bridge in 2020. However, this project is 90.94 ineligible because it is being implemented by the Washington State Department of Transportation under separate legal requirement. EDT obstruction ratings for these features were updated to 100 percent passable in both the BASE and the NEB analysis scenarios.

4.5 Whitestone Creek

Two Tier 1 projects in Whitestone Creek were advanced for the NEB analysis.

Okanogan-Tonasket Irrigation District (OTID) Flow Augmentation – OTID has proposed to augment streamflows in selected Okanogan River tributaries using releases from their irrigation water distribution system. The OTID proposal for Whitestone Creek would provide up to 150 gpm (0.5 cfs) of flow augmentation from April 1 through October 15, with the release points located between 650 and 3,100 feet upstream from the confluence with the Okanogan River.

Whitestone Reclamation District (WID) Flow and Temperature Augmentation – WID has proposed to augment instream flows in Whitestone Creek to provide thermal benefits as part of a larger irrigation system storage and conveyance improvement project.² The proposal includes piping an existing 7.9 miles of open ditch, extending the conveyance pipe network to improve the service area and support instream flow augmentation, and Spectacle and Whitestone Lake improvements. Current canal losses leak directly to the lakes and is used for irrigation. The proposed project would provide sufficient flow efficiencies to support 1 to 1.5 cfs of direct flow augmentation in all anadromous-accessible reaches of Whitestone Creek from April through October in addition to any leakage benefit.

The project scenario for Whitestone Creek considers increasing the instream flow in EDT reaches Whitestone 16-1, 16-2 and 16-3 by 1.5 cfs from April 1 through May 30 to support steelhead spawning and incubation, and by 1 cfs from June 1 through October 30 for juvenile steelhead emigration. OTID supplementation provides an additional 0.5 cfs of flow augmentation in EDT reach Whitestone 16-1. The primary intent of the WID flow augmentation is to provide cool water inflow to reduce water temperatures during April and May. OBMEP has observed steelhead spawning in Whitestone Creek but has concluded that incubation success is likely to be low due to elevated water temperatures during these critical months. We estimated the effect of the proposed flow augmentation on Whitestone Creek temperatures using a volumetric mixing equation and on wetted channel width using the methods described previously (Aspect 2020b). The following sources of information were used in this analysis:

- OBMEP water temperature data for Whitestone Creek, October 2015 through December 2017³
- OBMEP channel cross section measurements in Whitestone 16-1⁴

² Future project phases may include improving an abandoned historical reservoir site to provide up to 5,000 acre feet of storage for irrigation water from the Toats Coulee diversion.

³ Hourly measurements collected at monitoring location OBMEP-1704.

⁴ Transect cross section measurements collected in 2008 at monitoring location OBMEP-055.

for August and September. The BASE scenario uses a width assumption of effectively zero during those months, used in the EDT model to represent the population sink effect of Whitestone Creek on steelhead habitat. Aspect (2020b) estimated the effect of flow augmentation on baseflow width during those months using available transect data for Whitestone 16-1. BASE and NEB scenario widths are shown in Table 4-10.

Table 4-9. Monthly average of estimated BASE and NEB scenario temperature inputs for Whitestone Creek.

Month	Average Whitestone Creek Temperature TUS (°C)	Average Augmentation Flow Temperature TGW (°C)	Average of ΔT	Average of NEB Scenario Temperature TDS (°C)
1	1.66	--	--	1.66
2	3.13	--	--	3.13
3	6.46	--	--	6.46
4	12.23	6.97	-1.75	10.48
5	17.08	10.20	-2.29	14.79
6	20.09	13.31	-1.69	18.39
7	22.93	16.07	-1.71	21.22
8	21.61	17.30	-1.08	20.53
9	17.18	14.92	-0.56	16.61
10	10.45	10.62	0.04	10.49
11	5.73	--	--	5.73
12	1.42	--	--	1.42
Temperature data for Antoine Creek were obtained from two sources, OBMEP 2015-2017 temperature monitoring data for location OBMEP-1704, and data collected over 4 days during an August 2019 flow augmentation experiment conducted by OBMEP and OTID.				

- AVR @203 scenario: Monthly stream width based on an estimated annual water budget of 1,696 acre feet (2,787 total acre feet minus 1,091 acre feet for irrigation and related uses, 203 acre feet dedicated to instream flows)
- AVR @1,294 scenario: Monthly stream width based on an estimated annual water budget of 2,787 acre feet (total available water budget dedicated to instream flows)

We used the observed hydrologic pattern in Antoine Creek for the period from 2014 to 2017, recorded at USGS flow gage 12444290 Antoine Creek at SR 97, to estimate the average daily flow in Antoine Creek based on the available water budget. The AVR @203 and AVR @1294 scenarios considered storage and retiming of a portion of the available annual water budget to increase summer baseflows and provide a thermal benefit following guidance provided by OBMEP (2020). The daily flow hydrograph for the BASE scenario is displayed in Figure 4-1. NEB scenario hydrographs for the AVR @203 and AVR @1,294 are displayed in Figures 4-2 and 4-3, respectively. The latter two figures display projected streamflows with and without the proposed flow retiming.

Combined Tier 1 project effect in Antoine Creek - Monthly reach widths in Antoine Creek under the BASE and NEB scenarios were estimated by calculating the geometric mean of daily synthetic streamflows and entering those values in the transect-based inundation model developed by Aspect (2020b). Modeled streamflows in Antoine 16-1 include an additional 0.5 cfs from April 1 through October 15 representing OTID supplementation. Estimated channel widths by month for the BASE and NEB scenarios are shown by EDT reach in Table 4-11. Monthly widths were modeled based on transect dimensions measured by OBMEP in reaches Antoine 16-1, 16-2, 16-4, and 16-5. Monthly widths in reaches Antoine 16-3 and 16-6 were extrapolated from geomorphically similar neighboring reaches.

The proposed streamflow augmentation and flow retiming under the AVR and OTID supplementation projects would measurably increase streamflows during the summer baseflow period extending from July 1 through October 30. Increased flows are expected to beneficially reduce peak temperatures. We estimated the projected change in peak daily temperatures using a mass-based energy balance equation to generate a monthly average reduction in peak daily temperature, or ΔT during critical months. The ΔT values shown in Table 4-12 were subtracted from the hourly peak temperature records in the available temperature data set for Antoine Creek and used to develop revised EDT Temperature: Daily Maximum attribute ratings for the NEB effects analysis.

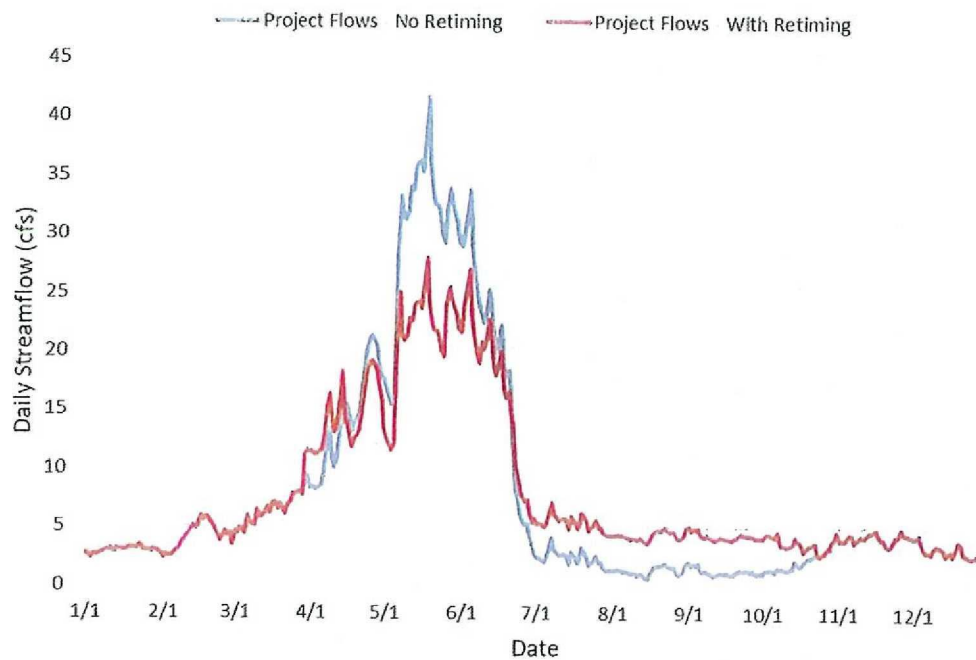


Figure 4-3. Projected daily flows in Antoine Creek under the AVR @1,294 scenario, assuming 2,784 acre feet/year available for instream flow with proposed flow retiming.

5.0 NEB SCENARIO RESULTS

Okanogan EDT model results for the NEB analysis are presented in the following tables:

- Table 5-1: Projected consumptive water use estimates (Aspect 2020a) and EDT model results demonstrating the effect of the 0.5% sensitivity analysis scenario on adult and juvenile steelhead Neq by analysis subbasin
- Table 5-2: EDT model results for the revised BASE and NEB-contributing project scenarios by analysis subbasin, and net effect of Tier 1 NEB-contributing projects on adult and juvenile steelhead and Chinook salmon Neq at the WRIA 49 level
- Table 5-3: NEB analysis results summary, including water-for-water ledger balance and estimated beneficial effect of Tier 1 streamflow and habitat restoration projects on salmon and steelhead resources in WRIA 49

As shown in Tables 4-2 and 4-3, the proposed Tier 1 ledger offset and streamflow and habitat restoration projects are capable of achieving NEB at the WRIA level with a wide factor of safety. This demonstrates that these proposed plan elements provide sufficient adaptive management capacity for the WRIA 49 planning unit to flexibly accommodate future water demand. The WRIA 49 Plan Addendum will detail the adaptive management decision matrix that will be used to achieve 90.94 compliance.

Table 5-1. Projected consumptive water use and EDT sensitivity analysis results by WRIA 49 analysis subbasin.

NEB Subbasin	Consumptive Use Impact			
	Acre feet/yr (afy)	Cubic feet/sec (cfs)	Adult Steelhead Neq*	Juvenile Steelhead Neq*
Loup Loup-Swamp (Lower Okanogan)	37.3	-0.052	19 (0)	1,069 (-3)
Salmon Creek	11.3	-0.016	120 (-1)	8,941 (-39)
Bonaparte-Johnson (Middle Okanogan)	83.8	-0.116	32 (0)	1,909 (-4)
Antoine-Whitestone (Upper Okanogan)	60.9	-0.084	62 (0)	3,756 (-8)
Similkameen	10.2	-0.014	51 (0)	2,058 (+2)
WRIA 49 Total	203	-0.281	304 (-1)	18,874 (-53)
* Impact results for -0.5% sensitivity scenario, overestimates actual effect of reduced baseflow by 4-10x				

Table 5-3. WRIA 49 water ledger and NEB analysis results for proposed water-for-water offset and Tier 1 streamflow restoration projects.

NEB Subbasin	Water-for-Water Offset		Tributary Offset		Net Ecological Benefit			
	Net change (afy)	Net change (cfs) †	Net change (afy)	Net change (cfs) ‡	Adult Steelhead Neq	Juvenile Steelhead Neq	Adult Chinook Neq §	Juvenile Chinook Neq §
Loup Loup-Swamp (Lower Okanogan)	-- (-37)	-0.51	+275 (approx)	+0.38	+2	+118	+2	+2,357
Salmon Creek	1,000 (+988)	+1.36	+1,499	+2.07	+111	+5,539	--	--
Omak Creek	--	--			--	--	--	--
Bonaparte-Johnson (Middle Okanogan)	626 (+626) #	+0.86	+123	+0.17	+4	+83	+14	+1,999
Antoine-Whitestone (Upper Okanogan)	1,160 (+1,099)	+1.52	+2,371	+3.28	+2	+110	+1	+305
Similkameen	-- (-10)	-0.01	-	-	0	0	+1	+166
WRIA 49 Total	2,786 (+2,666)	+3.22	+6,753	+5.9	+119	+5,850	+18	+4,826

† Net change (cfs) values are average over 1 year. All non-water offset projects provide flow augmentation during specific periods (e.g. April through October) to optimize habitat benefits for steelhead.
Pine Creek, offset applies in mainstem Okanogan only (no measurable NEB effect)
§ Chinook benefits are mainstem only, Highway 20 Culvert Replacement (Conservancy Island side channel) project

OID (Okanogan Irrigation District). 2020. Salmon Creek diversion rate and flow release statistics 2015-2019. Unpublished data provided to Aspect Consulting by Brad Armstrong, March 26, 2020.

OSHIP (Okanogan Subbasin Habitat Improvement Program). 2020. Conservancy Island side channel habitat measurement data. Compiled spreadsheet data provided to Confluence Environmental Company by Chris Fisher, March 2, 2020.

USDA (U.S. Department of Agriculture). 2016. National Agriculture Imagery Program (NAIP) Information Sheet. Available at: https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/APFO/support-documents/pdfs/naip_infosheet_2016.pdf. Accessed: June 1, 2020.

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MEMORANDUM

Project No. 190259-01

October 1, 2020

To: Angela Hubbard, Okanogan County Office of Planning and Development

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**Re: Summary of Habitat Parameter Quantification
WRIA 49 Chapter 90.94 RCW Streamflow Restoration Plan Addendum**

The passage of Engrossed Substitute Senate Bill (ESSB) 6091, as codified by Chapter 90.94 Revised Code of Washington (RCW), requires that an update to the existing Watershed Plan for Water Resource Inventory Area (WRIA) 49, the Okanogan River Basin, be approved by the Washington Department of Ecology (Ecology) by February 1, 2021. Okanogan County Office of Planning & Development is serving as the lead agency for this process. The WRIA 49 Initiating Governments for the watershed planning process are Okanogan County, the City of Omak, and the Oroville-Tonasket Irrigation District. The process is supported by convening the WRIA 49 Planning Unit to review technical tasks and memorandums, policy decisions, and the pending watershed plan update. Aspect Consulting, LLC (Aspect), together with Confluence Environmental Company (Confluence) and ICF International (ICF), have been contracted by Okanogan County as technical lead, including attendance of planning unit meetings, conducting supporting technical tasks, and preparation of the Streamflow Restoration Plan Addendum.

The purpose of this memorandum is to provide: (a) a description of available habitat monitoring and other project-related data obtained and reviewed; (b) an overview of the approach and methodology used to quantify the effects of proposed Net Ecological Benefit (NEB) project restoration actions on specific habitat parameters, specifically baseflow wetted width; and (c) a summary of the habitat

Table 1 – Summary of Project Streams and EDT Study Reaches

Stream	Study Reach	Site	Year
Antoine	Antoine 16-1	OBMEP-551	2015
			2016
	Antoine 16-2	OBMEP-592	2014
	Antoine 16-4	OBMEP-1601	2017
	Antoine 16-5	OBMEP-1608	2017
Bonaparte	Bonaparte 16-1	OBMEP-388	2014
			2015
			2016
			2017
Loup Loup	Loup Loup 16-1	OBMEP-421	2014
			2015
			2016
			2017
	Loup Loup 16-2	OBMEP-1222	2017
Ninemile	Ninemile 16-1	OBMEP-1205	2014
			2015
			2016
			2017
	Ninemile 16-5	OBMEP-121	2017
Salmon	Salmon 16-1	OBMEP-517	2016
	Salmon 16-2	OBMEP-090	2016
	Salmon 16-3	OBMEP-488	2014
		OBMEP-1215	2016
	Salmon 16-4	OBMEP-424	2017
	Salmon 16-7	OBMEP-297	2014
			2015
			2016
			2017
	Salmon 16-10	OBMEP-312	2017
	Salmon 16-12	OBMEP-552	2014
			2015
			2016
			2017
Whitestone	Whitestone 16-1	OBMEP-055	2008

Topographic/LiDAR Information

Available LiDAR and topographic information were used to estimate a channel gradient value for each survey transect group. Channel gradient estimates were used in the calculation of wetted width as described below. The following provide a summary of the methodology developed.

Data sources

Based on review of the Washington DNR LiDAR Data Portal, the most current LiDAR data coverages for the project vicinity were acquired between June and July 2015 as part of the OLC Okanogan FEMA study (Quantum Spatial, 2016) and in July and October 2017 as part of the NE Washington LiDAR Production (GeoTerra, 2018). The 2015 LiDAR includes coverage of the mainstem Okanogan River and the Methow River, while the 2017 LiDAR includes coverage for the lower reaches of many of the tributaries to the Okanogan River. For stream reaches that were not completely covered by LiDAR data (Salmon 16-2 and Ninemile 16-12), the National Elevation Dataset (USGS 10-meter) Digital Elevation Model (NED DEM) was used as a surrogate, acquired through the ArcGIS Living Atlas Data Portal. Table 3 provides a summary of available topographic/LiDAR available for each stream reach.

Table 3 – Summary of Topographic/LiDAR Data by Stream Reach

Stream/Reach	Elevation Data Source(s)
Antoine (all reaches)	LiDAR: NE WA 2017
Bonaparte (16-1)	LiDAR: Okanogan FEMA 2015 or NE WA 2017
Loup-Loup (all reaches)	LiDAR: Okanogan FEMA 2015
Ninemile 16-1	LiDAR: Okanogan FEMA 2015
Ninemile 16-2	NED DEM
Salmon 16-1 through 16-10	LiDAR: Okanogan FEMA 2015
Salmon 16-12 (F & downstream of F)	LiDAR: Okanogan FEMA 2015
Salmon 16-12 (Upstream of F)	NED DEM
Whitestone (16-1)	LiDAR: Okanogan FEMA 2015 or NE WA 2017

Processing/analysis steps:

Available LiDAR elevation data was downloaded from Washington DNR LiDAR Data Portal. For the two stream reaches that were not completely covered by LiDAR data (Salmon 16-2 and Ninemile 16-12), the National Elevation Dataset (USGS 10-meter) Digital Elevation Model (NED DEM) was used as a surrogate.

Table 4 – Summary of Elevation Values and Estimated Channel Slope by Stream Reach

Stream	Reach	Elevation (ft, NAVD88)				Notes
		Downstream (75 m)	F- Transect	Upstream (75 m)	Channel Slope (ft/ft)	
Antoine	16-1	921	924	932	0.0224	
	16-2	1090	1100	1110	0.0406	
	16-4	1451	1455	1458	0.0142	
	16-5	1560	1563	1566	0.0122	
Bonaparte	16-1	941	951	954	0.0264	
Loup Loup	16-1	831	836	840	0.0183	
	16-2	877	881	884	0.0142	
Ninemile	16-1	971	978	984	0.0264	
	16-5	2013	2041	2064	0.1036	NED
Salmon	16-1	929	937	942	0.0264	
	16-2	1176	1183	1192	0.0325	
	16-3	1323	1325	1326	0.0061	OBMEP-488
	16-3	1344	1345	1346	0.0041	OBMEP-1215
	16-4	1387	1388	1389	0.0041	
	16-7	1489	1491	1493	0.0081	
	16-10	1754	1756	1759	0.0102	
	16-12	1901	1914	1926	0.0508	NED
	16-12	1906	1914	1926	0.0406	LIDAR
Whitestone	16-1	955	959	968	0.0264	

Channel gradient was obtained by dividing the difference in estimated elevation (upstream minus downstream elevation) by the survey transect length for each reach (150 meters). The resulting channel gradient values were used in the calculation of wetted width as described below.

Wetted Width Calculations

Utilizing the channel cross section and user input of the mean monthly flow values for both the existing and proposed condition, wetted width estimates are obtained utilizing the following approach. First, normal depth is calculated using Manning's equation for uniform flow to determine the depth of water in the channel assuming that uniform flow conditions exist (i.e., the slope of the water surface and channel bottom are the same). Second, the wetted top width of the channel is calculated for the resulting normal depth of water in the channel.

Normal depth and wetted width calculations for an irregular channel are performed using custom Microsoft Excel scripts. Note that the results were verified independently using Bentley FlowMaster (Version 8i) for irregular channels.

As a check, the maximum normal depth is compared to the channel cross section to confirm that the peak monthly flow is contained within the bankfull channel. If a calculation reveals that the normal depth to be greater than the available channel cross section geometry, then LiDAR data for the channel overbanks is required to supplement the cross-section geometry.

The normalized change in wetted width between the existing and proposed condition is provided for each transect on a monthly basis.

An example of the streamflow input component of wetted width estimation model is shown in Figure 3. Note that cells highlighted blue are user inputs of mean monthly streamflow for the existing and proposed condition scenarios.

Figure 3 – Existing/proposed streamflow input component to wetted width estimation model for estimation of normalized change in monthly wetted width

Analysis of Mean Monthly Discharge and Wetted Width Under Existing and Proposed Conditions												
Month	Existing Condition					Proposed Condition					Normalized Change in Wetted Width	
	Existing Cond Avg Flow (cfs)	Normal Depth (ft)	Normal Depth (m)	Wetted Width (ft)	Wetted Width (m)	Proposed Cond Average Flow (cfs)	Normal Depth (ft)	Normal Depth (m)	Wetted Width (ft)	Wetted Width (m)		
Jan	0.82	0.31	0.09	2.85	0.87	0.82	0.31	0.09	2.85	0.87	1.00	
Feb	0.79	0.30	0.09	2.79	0.85	0.79	0.30	0.09	2.79	0.85	1.00	
Mar	1.35	0.38	0.12	3.51	1.07	1.35	0.38	0.12	3.51	1.07	1.00	
Apr	3.32	0.54	0.17	5.50	1.66	3.58	0.55	0.17	5.52	1.68	1.00	
May	9.45	0.79	0.24	5.86	1.78	6.53	0.69	0.21	5.71	1.74	0.97	
June	4.99	0.62	0.19	5.61	1.71	4.46	0.60	0.18	5.58	1.70	0.99	
July	0.55	0.27	0.08	2.48	0.75	1.66	0.41	0.13	3.76	1.15	1.52	
Aug	0.42	0.22	0.07	2.12	0.65	1.43	0.39	0.12	3.58	1.09	1.69	
Sept	0.46	0.23	0.07	2.17	0.66	1.47	0.39	0.12	3.61	1.10	1.66	
Oct	0.75	0.29	0.09	2.71	0.83	0.99	0.33	0.10	3.15	0.96	1.16	
Nov	1.07	0.34	0.10	3.23	0.99	1.07	0.34	0.10	3.23	0.99	1.00	
Dec	0.77	0.30	0.09	2.76	0.84	0.77	0.30	0.09	2.76	0.84	1.00	

Max Flow Existing/Proposed (cfs)	9.45
Max Normal Depth Existing/Proposed (m)	0.24
Normal Depth within Bankfull Channel?	Yes

Influence of Stream Discharge on Wetted Width

Normal depth and wetted width are estimated for a range of stream flows to better understand the cumulative percent increase in wetted width for each channel cross section as a function of flow rate. A plot of normal depth versus streamflow and wetted width versus streamflow is included as a visual aid, as shown in Figure 4.

Table 5 – Summary of NEB Analysis Scenarios and EDT Reaches Selected for Channel Width Estimation

Stream	Proposed NEB Project / Scenario	EDT Reach
Antoine	Base Scenario	16-1, 16-2, 16-4, 16-5
	Antoine Valley Ranch (AVR) with Min Offset	16-2, 16-3, 16-5
	AVR with Min Offset + Okanogan-Tonasket Irr District Flow Augmentation (OTID-FA)	16-1
	AVR with Full Offset	16-2, 16-3, 16-5
	AVR with Full Offset plus OTID-FA	16-1
Loup Loup	Irrigation Conveyance Efficiency	16-1, 16-2
Salmon	Base Scenario	16-1, 16-2, 16-3, 16-4, 16-7, 16-10, 16-12
	Salmon Lake Storage	16-3, 16-4, 16-7, 16-10, 16-12
	Salmon Lake Storage + Okanogan Source Substitution (OSS)	16-1, 16-2

Sensitivity Analysis

A sensitivity analysis approach was used to evaluate the potential effects of projected future water demand on anadromous habitat, including streamflow and wetted channel width. Under this approach, the anticipated demand effect associated with the medium growth development scenario was used to estimate the reduction in streamflow required to produce targeted reductions in baseflow channel width. This was accomplished using a modified version of the wetted width estimator model and the Goal Seek function in Microsoft Excel. Calculated wetted width values were adjusted by applying a wetted width reduction factor (e.g., 5%). The Goal Seek function was then used to “seek” a flow value corresponding to the adjusted wetted width value.

This approach was first applied to the Loup Loup Creek subbasin for channel width reductions corresponding to 0.5%, 1%, 2.5%, and 5%. Additional sensitivity analyses were performed for Antoine Creek, Bonaparte Creek, Ninemile Creek, and Salmon Creek. However, due to budget limitations, the analyses were limited to the following: (1) the most downstream EDT study reach with the exception of Salmon Creek; (2) a single representative transect from each study reach; and (3) low-flow period extending from July through October. Table 6 provides a summary of the sensitivity analyses performed as part of this work.

Limitations

Work for this project was performed for the Okanogan County (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments

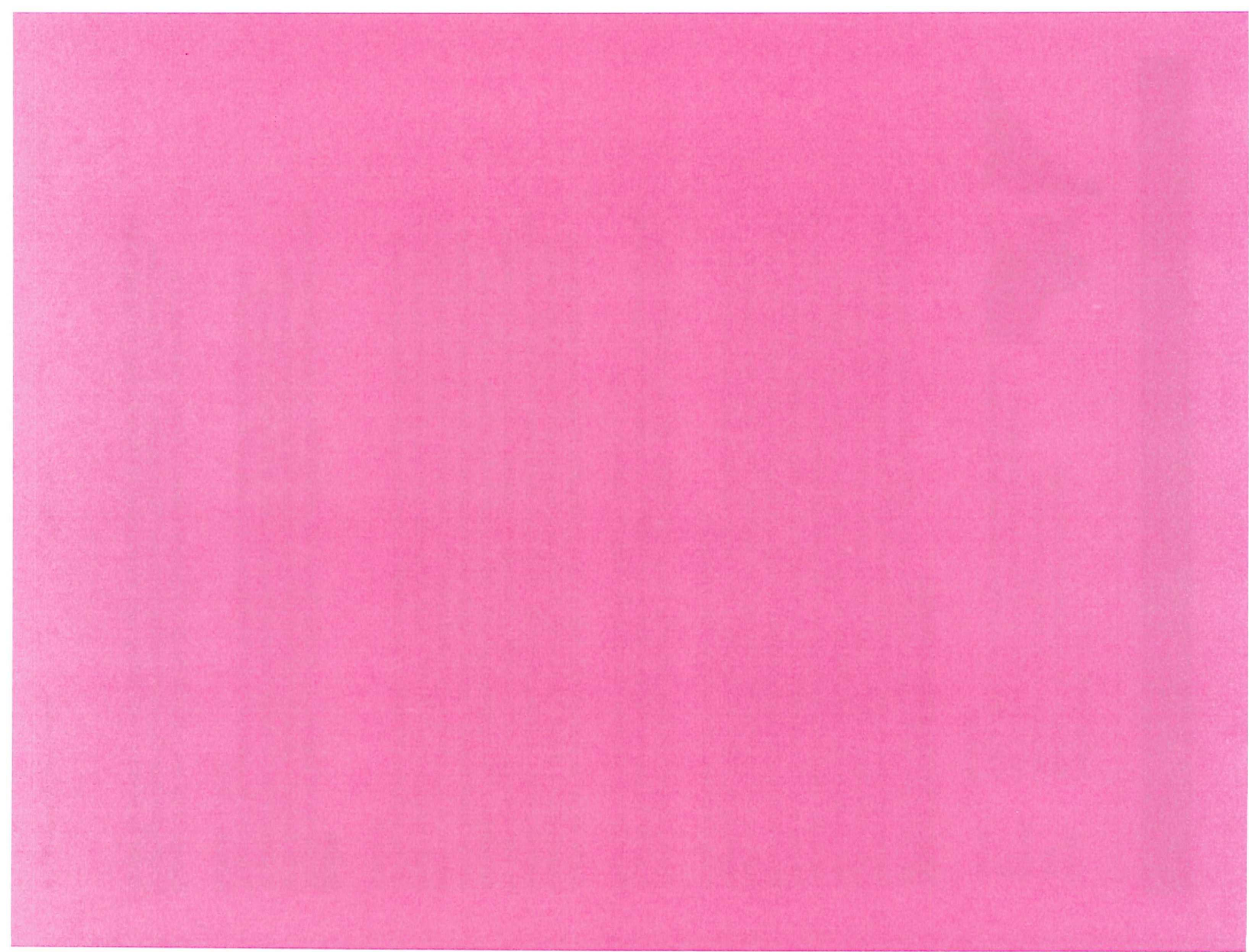
Attachment 1 – NED Project Channel Width Estimates by Tributary Watershed (provided as a separate digital file)

Attachment 2 – Results of Sensitivity Analyses (provided as a separate digital file)

V:\190259 WRIA 49 Watershed Planning Support\Deliverables\Watershed Plan Addendum\Final\Appendix D\WRIA 49 App D Habitat Parameter Quant.docx

ATTACHMENT 2

Results of Sensitivity Analyses
(provided as a separate digital file)



counties when approving development projects supplied by permit-exempt groundwater withdrawals under RCW 90.44.0502. The decision resulted in curtailment of rural development throughout much of the state.

For watersheds with existing instream flow rules and existing watershed plans, including WRIA 49, ESSB 6091 and Chapter 90.94 RCW allows for new permit-exempt wells to continue to be authorized by counties through their building permit process while a watershed plan update is developed to address future permit-exempt well use and associated streamflow restoration projects.

WRIA 49 has an instream flow rule in place governed by Washington Administrative Code (WAC) 173-549. This Watershed Plan Addendum (Plan Addendum) has been prepared to update the existing Watershed Management Plan (Watershed Plan) for WRIA 49 to address objectives of the 2018 Streamflow Restoration law(Chapter 90.94 RCW)3. The Watershed Plan was approved by the Okanogan Planning Unit (Planning Unit) in 2009 under the Watershed Planning Act (RCW 90.82).

This Plan Addendum was developed by the WRIA 49 Initiating Governments (IGs) and Planning Unit with facilitation assistance from the Okanogan Conservation District (OCD), and technical assistance from Aspect Consulting, LLC (Aspect) and their subconsultants Confluence Environmental Company (Confluence) and ICF International, Inc (ICF). The Plan Addendum was developed to meet the requirements of Chapter 90.94 RCW, with reference to Ecology's Streamflow Restoration Policy and Interpretive Statement (Ecology, 2019a) and Final Guidance for Determining Net Ecological Benefit (Ecology, 2019b). Ecology's Vanessa Brinkhuis also provided important guidance and served as liaison with the agency. In addition, periodic technical review and comment was provided by Ecology's Jim Pacheco, Tom Culhane, and Matt Rakow. This work was funded by an Ecology Water Resources Streamflow Restoration Project Planning Grant (Grant) No. WRSRPPG-2018-OkanPD-00038.

Plan Addendum Requirements

Section RCW 90.94.020 of the Streamflow Restoration Act authorizes new domestic groundwater permit-exempt withdrawals in certain WRIsAs, including WRIA 49, that have state-adopted instream flow rules and approved watershed plans. To support planning units in developing watershed plan updates, Ecology issued its Streamflow Restoration Policy and Interpretive Statement (Ecology, 2019a), which clarified that:

"A complete update of all the elements of the original watershed management plan is not required for WRIsAs planning under RCW 90.94.020. The requirement to update an existing watershed management plan applies specifically to the objectives of the Streamflow Restoration legislation."

Requirements of RCW 90.94.020 pertaining to the watershed plan update include:

☐ In RCW 90.94.020(2): *"the department shall work with the initiating governments and the planning units described in chapter 90.82 RCW to review existing watershed plans to identify the potential impacts of exempt well use, identify evidence-based conservation measures, and identify projects to improve watershed health"*

☐ In RCW 90.94.020(4)(a): *"In collaboration with the planning unit, the initiating*

to participate as a non-voting member of the Technical Committee only.

The Initiating Governments started the Chapter 90.94 RCW planning process with the organizations that were represented in the previous planning unit process, plus the addition of new members to broaden the Planning Unit's representation. Ultimately 27 seats were identified for the Planning Unit. Planning Unit membership is shown in Table 1. The Planning Unit designated a Technical Advisory group (TAG) to evaluate and recommend potential restoration projects to the Planning Unit. TAG membership is shown in Table 1 (attached).

The Planning Unit began meeting once per month in October 2018. During the winter of 2018/2019 the Planning Unit developed and approved operating rules, which incorporated making decisions by consensus where possible, but allowed for voting using Robert's Rules of Order if two attempts to discuss and reach consensus were to fail on given issues and decisions. This decision-making process was reconfirmed at the June 2, 2020 meeting. Agendas and minutes for Planning Unit meetings are available on Okanogan County's website:

https://www.okanogancounty.org/planning/wria_49_plannng_unit.html

Previous Watershed Planning in WRIA 49

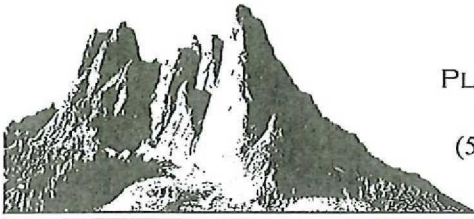
In 2005, the Initiating Governments selected the OCD as the lead entity to complete a watershed plan for WRIA 49 under the Watershed Planning Act (RCW 90.82). The initiating governments also selected the members of the Planning Unit, which at that time included 27 members and alternates.

The Planning Unit received technical assistance from ENTRIX, Inc. to support development of the Phase 2 Technical Report (Entrix, 2006) and associated appendices and technical documents. The watershed plan was drafted containing recommended actions in categories including water quantity, water quality, instream flows, habitat, and multi-purpose water storage. The Planning Unit unanimously adopted the WRIA 49 watershed plan in June 2009 (Okanogan Watershed Planning Unit 2009). The plan was subsequently approved by the IGs the same month and submitted to Ecology. Since approval of the watershed plan, efforts to study the hydrology and aquatic ecology of WRIA 49 have continued. The CTCR Okanogan Basin Monitoring and Evaluation Program (OBMEP) is a key contributor to these ongoing efforts. OBMEP has developed and maintained an extensive habitat status and trends monitoring network to track progress towards salmon and steelhead recovery under the Columbia Basin Fish Accords. As part of this effort, OBMEP has developed an Ecosystem Diagnosis and Treatment (EDT) Model for the Okanogan River and its tributaries, covering the majority of WRIA 49.

Along with other programs under CTCR and the State's Upper Columbia Salmon Recovery Board, the work completed since the 2009 watershed plan was adopted provided for greater opportunities to identify projects benefitting instream flow resources under this Chapter 90.94 RCW process than were previously available. The projects contemplated as recommendations in this Plan Addendum include proposals identified in the original watershed plan and new projects identified in subsequent work by others.

Attachment A
WRIA 49 Watershed Plan Addendum

Attachment B
SEPA Checklist



OKANOGAN COUNTY
OFFICE OF PLANNING AND DEVELOPMENT
PLANNING • GIS • NATURAL RESOURCES • OUTDOOR RECREATION
123 - 5th Ave. N. Suite 130 - Okanogan, WA 98840
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email: planning@co.okanogan.wa.us

From the Desk of the Director, (Stephanie) Pete Palmer

MEMORANDUM

DATE: Wednesday, September 30, 2020

TO: To the file of the WRIA 49 Plan Addendum

SUBJECT: Final Determination

The SEPA comments have been reviewed and no further review is needed, therefore the determination of non-significance is upheld.

3. Address and phone number of applicant and contact person:
Okanogan County Office of Planning and Development
Angela Hubbard, Natural Resource Planner II
123 5th Ave North Suite 130
Okanogan, WA 98840
(509) 422-7160
4. Date checklist prepared:
September 1, 2020
5. Agency requesting checklist:
Okanogan County Office of Planning and Development
6. Proposed timing or schedule (including phasing, if applicable):
Revised Code of Washington (RCW) 90.94 requires that an update to WRIA 49, Okanogan River Watershed, be approved by the Department of Ecology by February 1, 2021.
7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
Yes, RCW 90.94 requires that the update address future permit-exempt well use and associated stream flow restoration projects to achieve net ecological benefit.
8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
Evaluation of Future WRIA 49 Permit-Exempt Well Demand, Aspect Consulting, 2020
Technical Memorandum on Identified Projects and Subbasins, Aspect Consulting, 2020
Summary of Net Ecological Benefit Analysis Methods and Results used for WRIA 49 Watershed Planning Memorandum, Confluence, 2020
Hydrology and Hydraulics Input to EDT Modeling, Aspect Consulting, 2020
SEPA Checklist, September, 2020
9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.
Each project associated with this plan will require its own permitting authority prior to implementation of the project(s).
At this time, there are no pending applications waiting for government approval.
10. List any government approvals or permits that will be needed for your proposal, if known.
This plan addendum was developed by WRIA 49 Initiating Governments (I.G.'s) and Planning Unit members representing various stakeholders throughout the basin. Once they approve the plan they will make a recommendation to the Okanogan County Regional Planning Commission. If approved at that level, a recommendation will be made for approval by the Okanogan County Board of County Commissioners. A final approval as mandated by Revised Code of Washington (RCW) 90.94 will be needed by the Department of Ecology by February 1, 2021.

WRIA 49 lies within an ecologically diverse region that includes portions of three distinct Level III ecoregions and encompasses all or portions of five regionally unique Level IV ecoregions (USEPA 2010). The mainstem Okanogan River and surrounding valley (Okanogan Valley, Level IV ecoregion 10m) are part of the Columbia Plateau ecoregion while the surrounding highlands are ecologically distinct components of different mountain ranges. The western highlands are part of Level III ecoregion 10, the North Cascades, and encompass portions of Level IV ecoregions 77d and 77e, the Pasayten/Sawtooth Highlands and Okanogan Pine/Fir Hills, respectively. The eastern highlands are in Level III ecoregion 15, the Northern Rocky Mountains, and include Level IV ecoregions 15g and 15x, the Western Okanogan Semiarid Foothills and Okanogan Highland Dry Forest, respectively.

The municipalities within WRIA 49 include Oroville, Tonasket, Omak, Okanogan, Conconully, Pateros, Riverside, and Brewster. Agriculture consisting primarily of hay and tree fruit crops, commercial timber, and cattle comprise the majority of economic activity. Irrigated agriculture is the predominant land use on the valley floors of the Okanogan River and in several tributary drainages. Irrigation water is sourced under water right authorizations from groundwater and surface water sources by private entities and nine irrigation districts, reclamation districts, or canal companies. CTCR lands comprise the southeastern portion of WRIA 49 on the east side of the Okanogan River south of Riverside.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

(circle one): **Flat, rolling, hilly, steep slopes, mountainous**, other _____

b. What is the steepest slope on the site (approximate percent slope)?

WRIA 49 lies within an ecologically diverse region that includes portions of three distinct Level III ecoregions and encompasses all or portions of five regionally unique Level IV ecoregions (USEPA 2010). The mainstem Okanogan River and surrounding valley (Okanogan Valley, Level IV ecoregion 10m) are part of the Columbia Plateau ecoregion while the surrounding highlands are ecologically distinct components of different mountain ranges. The western highlands are part of Level III ecoregion 10, the North Cascades, and encompass portions of Level IV ecoregions 77d and 77e, the Pasayten/Sawtooth Highlands and Okanogan Pine/Fir Hills, respectively. The eastern highlands are in Level III ecoregion 15, the Northern Rocky Mountains, and include Level IV ecoregions 15g and 15x, the Western Okanogan Semiarid Foothills and Okanogan Highland Dry Forest, respectively

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Okanogan County contains all soil types published within the Natural Resource Conservation Service Soil Survey for Okanogan County.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

are protected through buffers established in section 14.12.630 or Mitigation plans if necessary.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The adoption of the Watershed Plan Addendum for WRIA 49 is a programmatic process that covers all of Okanogan County. Wetlands are classified under section 14.12.570 and are protected through buffers established in section 14.12.630 or Mitigation plans if necessary.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

The adoption of the Watershed Plan Addendum for WRIA 49 is a programmatic process that covers all of Okanogan County. Wetlands are classified under section 14.12.570 and are protected through buffers established in section 14.12.630 or Mitigation plans if necessary.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, this Agency action project will not require surface water withdrawals diversions.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The adoption of the Watershed Plan Addendum for WRIA 49 is a programmatic process that applies to all areas considered floodplain in the unincorporated areas and is regulated under section 14.12.340-360.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, there will be no waste generated or discharged as part of this Agency Action project.

b. Ground Water:

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No, there will be no groundwater withdrawals done as part of this Agency Action project.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

There will be no discharge associated with this Agency action project.

c. Water runoff (including stormwater):

There will be no water runoff resulting from this Agency Action project.

The adoption of the Watershed Plan Addendum for WRIA 49 is a programmatic process therefore, noxious weeds will not be affected by this Agency Action project.

5. Animals

- a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other _____

None of these will be affected by the adoption of this Agency Action project.

- b. List any threatened and endangered species known to be on or near the site.

Okanogan County contains Threatened and Endangered species including the following:

American White Pelican, Columbian Sharp-tailed Grouse, Greater Sage Grouse, Lynx, and Western Gray Squirrel. Summer Steelhead.

As required by RCW 90.94.020.4(b) and 4(c), this Plan Addendum must include actions sufficient to offset projected future water demand and provide habitat benefits sufficient to produce NEB. Ecology (2019b) established policy guidance for conducting NEB evaluations. The guidance states that the NEB analysis should consider the impacts of projected future water demand, identify projects and actions that provide additional benefits to instream resources above and beyond those provided by consumptive use offsets, and present a clear statement of findings that the proposed actions will or will not achieve NEB. The Ecology guidance further stipulates that the NEB evaluation must consider the extent of aquatic habitat affected; the presence, distribution, and life stage requirements of important fish species; and ecosystem structure, function, and composition. The guidance places emphasis on improving conditions for Pacific salmonid populations listed under ESA requirements, followed by other native anadromous and resident fish species. Elements of the NEB analysis may be conducted at the individual subbasin level, but the final determination is made on the net effect of all proposed actions at the WRIA scale

- c. Is the site part of a migration route? If so, explain.

Okanogan County contains Threatened and Endangered species including the following:

American White Pelican, Columbian Sharp-tailed Grouse, Greater Sage Grouse, Lynx, and Western Gray Squirrel. None of these will be affected by the adoption of this Watershed Plan Addendum for WRIA 49.

None associated with this Agency Action project

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None associated with this Agency Action project

- 4) Describe special emergency services that might be required.

None associated with this Agency Action project

- 5) Proposed measures to reduce or control environmental health hazards, if any:

The adoption of the Watershed Plan Addendum for WRIA 49 is a programmatic process that covers all areas of Okanogan County. The control of environmental health hazards will be review on a site specific basis.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There will be no affects of noise as a result of this Agency Action project.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

There will be no noise created as a result of this Agency Action project.

- 3) Proposed measures to reduce or control noise impacts, if any:

There will be no noise created as a result of this Agency Action project.

8. Land and Shoreline Use

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

This is an Agency Action project and no land uses will be affected.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

None. The Watershed Plan Addendum covers all areas of WRIA 49 but will not be displacing farm or forest lands as a result of the adoption of these amendments.

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, this is an Agency Action project that will not affect working farm or forest land normal business operations.

There is no housing associated with this Agency Action project.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

There is no housing associated with this Agency Action project.

- c. Proposed measures to reduce or control housing impacts, if any:

There is no housing associated with this Agency Action project.

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

There are no structures associated with this Agency Action project.

- b. What views in the immediate vicinity would be altered or obstructed?

There will be none associated with this Agency Action project.

- b. Proposed measures to reduce or control aesthetic impacts, if any:

There will be none associated with this Agency Action project.

11. Light and Glare

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None associated with this Agency Action project.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, not as a result of this Agency Action project.

- c. What existing off-site sources of light or glare may affect your proposal?

None associated with this Agency Action project.

- d. Proposed measures to reduce or control light and glare impacts, if any:

This is an Agency Action project that will not require any impact controls associated with lighting.

12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity?

This is an Agency Action project that will not associate or affect recreational opportunities.

- b. Would the proposed project displace any existing recreational uses? If so, describe.

This is an Agency Action project that will not associate or affect recreational opportunities.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No, this is an Agency Action project.

- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

None, this is an Agency Action project.

- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No, this is an Agency Action project.

- h. Proposed measures to reduce or control transportation impacts, if any:

There will be no transportation impacts as a result of this Agency Action project.

15. Public Services

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No, this is an Agency Action project that will not affect public services

- b. Proposed measures to reduce or control direct impacts on public services, if any.

None, this is an Agency Action project that will not have any impacts on public services.

16. Utilities

- a. Circle utilities currently available at the site:

This is an Agency Action project that does not require utilities.

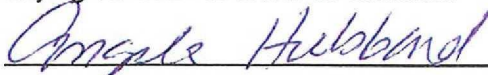
- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

This is an Agency Action project that does not require utilities.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature:



Name of signee: Angela Hubbard

Position and Agency/Organization: Planner II, Natural Resources, Okanogan County Planning and Development

Date Submitted: 09/01/2020

D. supplemental sheet for nonproject actions

4. Proposed measures to protect or conserve energy and natural resources are:
This is an Agency Action project that will not affect energy or natural resources.
Subsequent projects within the plan have been evaluated for consumptive use and net ecological benefits to enhance natural resources.
4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?
This is an Agency Action project that will not affect energy or natural resources.
Subsequent projects within the plan have been evaluated for consumptive use and net ecological benefits to enhance natural resources. The projects will enhance and protect threatened or endangered species habitat and provide net ecological benefits within WRIA 49.
5. Proposed measures to protect such resources or to avoid or reduce impacts are:
This is an Agency Action project that will not affect energy or natural resources.
Subsequent projects within the plan have been evaluated for consumptive use and net ecological benefits to enhance natural resources. The projects will enhance and protect threatened or endangered species habitat and provide net ecological benefits within WRIA 49.
5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?
The adoption of the Watershed Plan Addendum for WRIA 49 will further protect land and shoreline uses that are compatible with existing uses or plans.
6. How would the proposal be likely to increase demands on transportation or public services and utilities?
There will be no increased demands resulting from this Agency Action project.
7. Proposed measures to reduce or respond to such demand(s) are:
None, there will be no affects to transportation or public services and utilities resulting from this Agency Action project.
8. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.
The Watershed Plan Addendum is required by WAC 90.94 and is required to be consistent with local, state and federal laws.

Attachment C
Notices

Stephanie Palmer

From: Angela Hubbard
Sent: Monday, September 14, 2020 8:42 AM
To: OMK Legals
Cc: Stephanie Palmer
Subject: Public Hearing notice OWPA
Attachments: Newspaper.PH_OWPA.docx

Please publish the attached notice in your September 16th newspaper.

Thank you,

Angela Hubbard
Natural Resource Planner
Okanogan County Office of Planning & Development
509-422-7090
ahubbard@co.okanogan.wa.us

Stephanie Palmer

From: OMK Legals <omklegals@omakchronicle.com>
Sent: Tuesday, September 15, 2020 3:27 PM
To: Stephanie Palmer
Subject: RE: PH Notice for WRIA 49 Plan

So the correction will be for the legal that is on our website.
Does it need to be ran in next weeks paper Sept. 23?
julie

From: Stephanie Palmer <spalmer@co.okanogan.wa.us>
Sent: Tuesday, September 15, 2020 3:04 PM
To: OMK Legals <omklegals@omakchronicle.com>
Subject: FW: PH Notice for WRIA 49 Plan

Hello,
Thank you for making this correction to our legal notice on such short notice. The correction is actually an addition giving the date and time for the hearing as noted below highlighted in yellow. Thanks again.

(Stephanie) Pete Palmer,

Director Okanogan County Planning and Development
123 5th Ave N. Ste130
Okanogan, WA 98840
509-422-7218 (Desk)
509-422-7349 (Fax)
509-422-7214 (Secretary)

Draft Watershed Plan Addendum Okanogan River Basin WRIA 49 Notice of Public Hearing

Project Summary

The Planning Commission will hold a public hearing on the adoption of an addendum to Okanogan County's, Okanogan Basin Watershed Plan. The passage of Engrossed Substitute Senate Bill (ESSB) 6091 as codified by the Revised Code of Washington (RCW) 90.94 requires that an update to WRIA 49, Okanogan River Watershed, be approved by Washington Department of Ecology by February 1, 2021. RCW 90.94 requires the update to address future permit-exempt well use and associated streamflow restoration projects to achieve net ecological benefit. The plan addendum was developed by the WRIA 49 Initiating Governments (IG's) and Planning Unit members representing various stakeholders throughout the basin.

The public hearing will be held on September 28th at 7:00 p.m. over webex platform. The public can attend the public hearing one of the following ways:

1. Meeting number: 146 349 4912:
Password: YJfghXVP582

<https://okanoganwa.webex.com/okanoganwa/j.php?MTID=mdf06e80b8345027d20d183f5868e2daf>

Stephanie Palmer

From: Angela Hubbard
Sent: Tuesday, September 15, 2020 12:53 PM
To: lorraine_utt@icloud.com; 'kevin@washingtonwatertrust.org'; 'Amy Martin'; Angela Hubbard; Andy Hover; 'Bill Sullivan'; 'bobmcdaniel2014@gmail.com'; Okanogan Irrigation District; 'Carmen Andonaegui'; 'Charles Brushwood'; 'Cheryl Nelson'; 'Chester LaFontaine'; Chris Branch; 'Chris Fisher'; 'Chris Johnson'; 'Christa Levine'; 'Cindy Gagne'; 'Cindy Preston'; 'Clay Gebbers'; 'Craig Nelson'; 'Dan McCarthy'; 'Dick Ewing'; 'Earnie Rasmussen'; 'Eric Doyle'; 'George Brady'; 'George Thornton'; 'Iten, Constance (DFW)'; 'Jacquelyn Wallace'; 'Jason Hubbard'; 'Jennifer Weddle'; 'Jeri Timm'; 'Jerry Barnes'; Jim DeTro; 'Jim Freese'; 'Jim Soriano'; Jim Utt; 'John Culp'; 'Jon Neal'; 'Joseph Enzensperger'; 'Josh Crofoot'; 'Julie Vanderwal'; 'Kate Terrell'; 'Kathleen Johnson'; 'Kathy Paver'; 'Kristen Vanderhalf'; 'Kristina Ribellia'; 'Kurt Danison'; 'Lee Webster'; 'Lisa Pelly'; 'Lois Trevino'; 'Lorraine Utt'; 'Mariah Cornwoman'; 'Marnee Cleveland'; 'Matt Stevie'; 'Megan Kernan'; 'Melody Kreimes'; 'Mike Kaputa'; 'Mike Kelly'; 'Nancy Soriano'; 'Nicole Kuchenbuch'; 'OTID'; 'Pete Teigen'; 'Rachel McClure'; 'Ray Campbell'; 'Richard Lorz'; 'Rick Gillespie'; 'Rob Inlow'; 'Rocky DeVon'; 'Roni Holder-Diefenbach'; 'Sam Martin'; 'Sarah Walker'; 'Scott Verjaska'; 'Sharma Dickinson'; 'Shawn Davisson'; 'Stacy Shutts'; 'Susan Adams'; 'Ted Howard'; 'Todd McDaniel'; 'Tory Wulf'; 'Trinity Stucker'; 'Trish Rolfe'; 'Tyson Carlson'; Stephanie Palmer; Vanessa Brinkhuis (vanessa.brinkhuis@ecy.wa.gov); Cortney Ingle; jmayson@cwhba.org
Subject: PH Notice for WRIA 49 Plan

Draft Watershed Plan Addendum Okanogan River Basin WRIA 49 Notice of Public Hearing

Project Summary

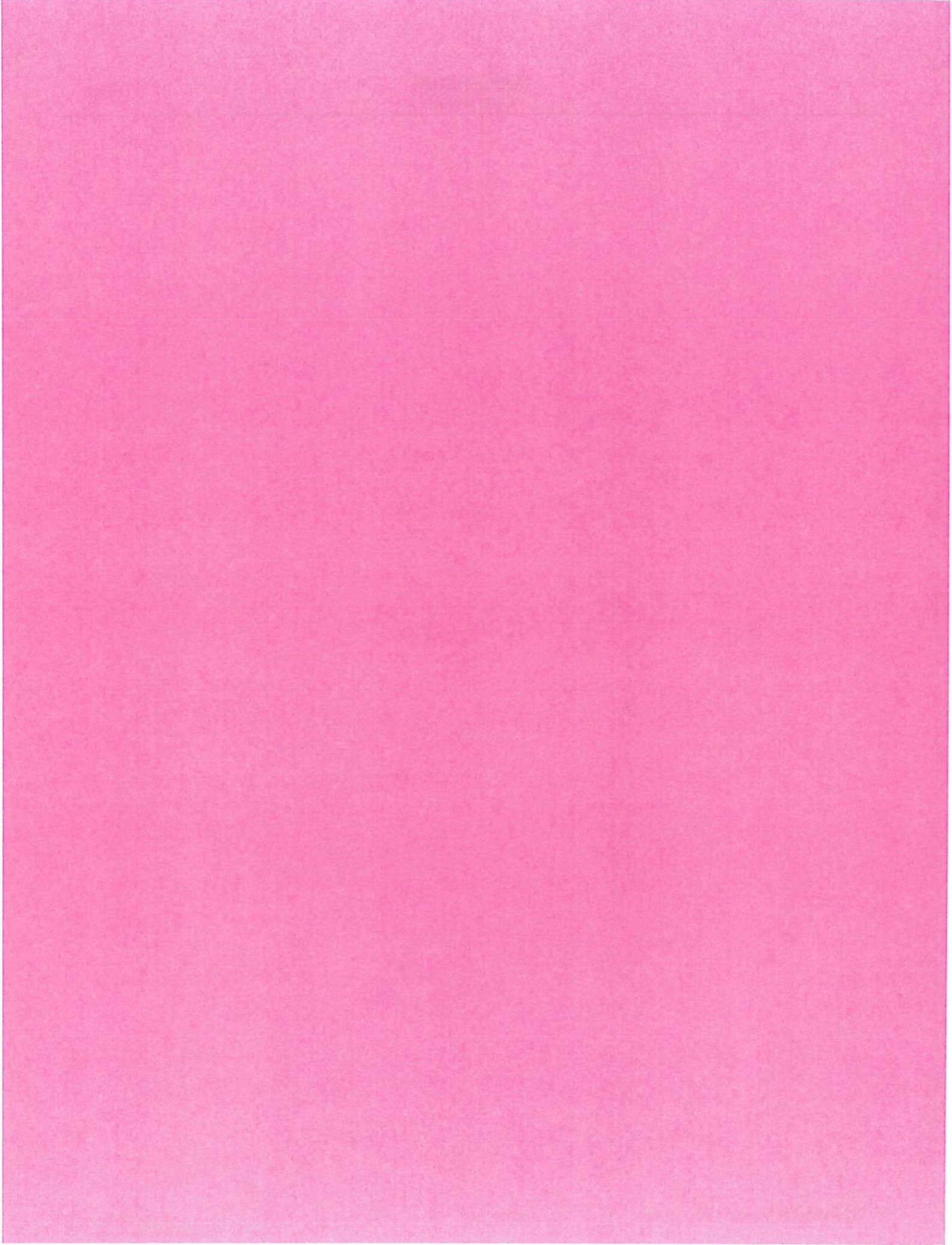
The Planning Commission will hold a public hearing on the adoption of an addendum to Okanogan County's, Okanogan Basin Watershed Plan. The passage of Engrossed Substitute Senate Bill (ESSB) 6091 as codified by the Revised Code of Washington (RCW) 90.94 requires that an update to WRIA 49, Okanogan River Watershed, be approved by Washington Department of Ecology by February 1, 2021. RCW 90.94 requires the update to address future permit-exempt well use and associated streamflow restoration projects to achieve net ecological benefit. The plan addendum was developed by the WRIA 49 Initiating Governments (IG's) and Planning Unit members representing various stakeholders throughout the basin.

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Password: YJfghXVP582
<https://okanoganwa.webex.com/okanoganwa/j.php?MTID=mdf06e80b8345027d20d183f5868e2daf>
2. Join by phone
1-844-992-4726 United States Toll Free
+1-408-418-9388 United States Toll
Access code: 146 349 4912

Comments must be submitted in writing to the Okanogan County Office of Planning & Development, 123 5th Ave North, Suite 130, Okanogan, WA 98840. Comments can be submitted up to the hearing on September 28, 2020.

Information is available on our website www.okanogancounty.org/planning. Direct questions and comments to: Pete Palmer, Director of Planning, Okanogan County Office of Planning & Development, 123 5th Ave. N, Suite 130, Okanogan, WA 98840, (509) 422-7218 or spalmer@co.okanogan.wa.us.



Stephanie Palmer

From: Gina McCoy <tmc@methownet.com>
Sent: Friday, September 25, 2020 1:55 PM
To: Stephanie Palmer
Subject: FW: Comments of the WRIA 49 Draft Watershed Plan Addendum

Hello Pete. I got an 'Out of Office. Back on the 29th' message from Angela's email. I am submitting comments as a private interested individual. Would you please add these to the record?

Thank you,

Gina

From: Gina McCoy <tmc@methownet.com>
Sent: Friday, September 25, 2020 12:16 PM
To: 'Angela Hubbard' <ahubbard@co.okanogan.wa.us>
Subject: Comments of the WRIA 49 Draft Watershed Plan Addendum

Hello Angela. Would you please accept the comments below?

Thank you,

Gina

WRIA 49 Draft Watershed Plan Addendum comments

Thank you for the opportunity to comment on the WRIA 49 Draft Watershed Plan Addendum. There has clearly been much good work that has gone into this document, however, I feel that it is important to point out a few important shortcomings.

First, it is unclear what improvements are made by changing the drainage basin delineations. The delineations in the 2006 Watershed Plan (Sinlahekin, Osoyoos, Salmon, Omak and Joseph) group adjacent sub-basins that share similar climate and geology. Three of the six new delineations encompass sub-basins on both the west and east sides of the river, thus involving striking differences in climate, geology and landform. These factors are fundamental to the availability of water, which is central to watershed planning, as well as to salmonid habitat. The new delineations tend to efface these critical differences.

Future development simply must take water availability into account, so the assumption that the estimated 10% growth will occur across all areas of WRIA 49 is faulty. The technical documents underlying the 2006 Watershed Plan contain good information on the hydrology and water yield of the sub-basins. Some are already overallocated, with senior water users being impaired by newer permit exempt wells. For instance, the Tunk sub-basin is currently under a subdivision moratorium due to concerns over water availability. The information on sub-basin water yields in the WRIA 49 Technical Assessment should be incorporated into predictions of future development.

Next, in estimating water use, irrigation is clearly the dominant consumptive use. The estimates provided show outdoor consumptive use outweighing indoor consumptive use by 2,000%. Thus, getting that estimate as accurate as possible is critical to having a valid estimate of total consumptive use. The number provided for irrigation efficiency (75%) is reasonable, although it may be high in areas that are hot and windy. However, there is no information on how applied irrigation was deemed to be 80% consumptive. This is equivalent to estimating overwatering by 25%. The reasoning behind this number should be explained. If, for instance, the estimate was changed to 90% (i.e., 11% overwatering), the estimate for total consumptive use would increase by 12%.

Thank you again for the opportunity to comment on this important addendum.



PO Box 1387
Tonasket WA 98855
September 25, 2020

Pete Palmer
Director of Planning
Okanogan County Office of Planning & Development
123 5th Avenue North, Suite 130
Okanogan, WA 98840

RE: Planning Commission Hearing on the Adoption of the WRIA 49 Plan Addendum to the
Okanogan Basin Watershed Plan

Director Palmer:

Attached are additional comments on the WRIA 49 Plan Addendum for consideration during the hearing to recommend adoption of the Addendum to the County Commissioners.

Please pass these comments onto the Planning Commission for their consideration of adoption of the WRIA 49 Plan Addendum.

Sincerely,

Dick Ewing
President
Okanogan County Farm Bureau

5. Page ES-3, Net Ecological Benefit Summary and Conclusions

The summary over simplifies the results of the water and non-water offset projects in the Plan Addendum. The projects will result in *significant* water surplus with no plan to preserve that water for other beneficial uses. There is no supporting data to suggest a 10x safety factor is necessary to meet NEB or the law. In our opinion, any water in excess of 203 acre-feet, plus a safety factor, should be preserved for future beneficial use within WRIA 49.

6. Page 2, Introduction, 4th Paragraph

From the beginning of this update process, we have asked for a review of the projects and action items contained in the 2009 WRIA Watershed Plan. At one point we were told the 2009 Watershed Plan was never approved by the Department of Ecology, making the projects and action items moot for purposes of this Plan Addendum. We agree with the language contained in the Plan Addendum, but the sudden acknowledgment of a valid 2009 Watershed Plan Update concerns us. We renew our assertion that the projects and action items within the 2009 Plan Update should be considered and evaluated for NEB before putting forward any new or additional projects within this Plan Addendum.

7. Page 3, Overview of Plan Addendum Requirements

The first bulleted statement correctly identifies the requirements of RCW 90.94.020(2); however, as previously discussed, the Planning Unit was told the projects and action items contained in the 2009 WRIA 49 Watershed Plan Update would not be considered because the Department of Ecology never approved the update. As noted above, we are now being told this process will result in a Plan Addendum to the 2009 WRIA 49 Watershed Plan Update. We do not believe the 2009 Watershed Plan Update was ever fully considered in this process as required by the law.

The second bulleted statement also correctly cites RCW 90.94.020(4)(a). The final sentence in this subsection states:

"Qualifying projects must be specifically designed to enhance streamflows and not result in negative impacts to ecological functions or critical habitat."

Including a series of Tier 1 and 2 projects which result in 10x water offset for the projected consumptive use from permit exempt wells goes well beyond the mitigation required by law. We have long taken issue with Ecology's "single molecule" policy as it relates to surface/groundwater continuity and the policies/regulations/decisions which have stemmed from this flawed agency policy. In order to provide consistent policy and regulatory decisions, we believe the same policy should be applied in determining net ecological benefit. If a single molecule

"The projects are eligible to be counted towards NEB under RCW 90.94, meaning they were proposed, contracted, and/or funded for construction after January 2018."

We don't recall ever being provided a list of projects that have been "proposed, contracted, and/or funded for construction after January 2018" over the past 20 months which could be considered as part of the required offset. How much of the 203 acre-feet of consumptive use has already been mitigated through these projects?

Ecology's own NEB Guidance document says:

"Sound watershed planning also properly recognizes past related and relevant planning processes and conclusions. Therefore, planning groups will describe how their watershed plan, including the projects, is linked or coordinated with other existing plans such as local salmon recovery plans or other recovery plans underway in the WRIA. See POL 2094 for additional information."

We agree with this statement; unfortunately, throughout this process Ecology has been unwilling to consider "past related and relevant planning processes and conclusions" (i.e. land purchases, retired water, projects identified in existing plans not implemented, local land use controls which limit density/development, OFM population projections, etc.) as part of the Watershed Plan update in WRIA 49. Over the past twenty years, public agencies have purchased thousands of acres of land within Okanogan County, much of which had water rights associated with it. The department has thus far not recognized the "net ecological benefit" that has been provided through these land purchases as a credit against future exempt well water use.

11. Page 20, Water Offset Projects

The Plan Addendum correctly states the Tier 1 and 2 projects result in sufficient water offset to meet 90.94 RCW requirements. Unfortunately, this statement significantly understates the anticipated water offset. As previously discussed herein, the water offsets from Tier 1 and 2 projects could result in 2,666 acre-feet surplus of water. It is imperative that the Plan Addendum include action items to preserve/reserve this excess water for other beneficial uses. These action items could include, but are not limited to, the establishment of a water bank, the establishment of a water reserve, and/or simply holding this water in the trust for future beneficial uses. The Plan Addendum must include a discussion of sufficient detail to enable the Initiating Governments and the Department of Ecology options to consider. In addition, the Plan Addendum must include assurances that the excess water will in fact be available for new beneficial uses.

12. Page 20, Streamflow and Habitat Restoration Projects Contributing to Net Ecological Benefit

funding on the basis it would be used for “ongoing implementation and offset project operations and maintenance.”

14. Page 30, Policy Discussions

The Plan Addendum indicates “the Planning Unit reached concurrence that no recommendations under RCW 90.94.020(4)(d) should be recommended or included in this Plan Addendum.”

We completely disagree on this issue. By not including a recommendation in the Plan Addendum, the Planning Unit has given the Department of Ecology carte blanche authority to adopt fees through their rule writing process. The Plan Addendum clearly shows there is no need for fees given the fact that the Tier 1 and 2 Projects will result in a significant offset surplus. In addition, leaving the issue of fees to the Department of Ecology eliminates any discussion related to rough proportionality in regards to the fee amount in relation to the actual impact. Finally, asking property owners to pay for projects that provide a “public benefit” is questionable constitutionally. Section 304 of ESSB 6091 includes ample funding for the implementation of this Plan Addendum and no additional fees should be required.

15. Page 32, EDT Model Analysis Approach

According to the Plan Addendum, the “BASE scenario conditions were modified in specific tributaries to reflect habitat actions that occurred after 2017 but are RCW 90.94 ineligible.” This statement is internally inconsistent. Page 19 of the Plan Addendum states:

*“The projects are eligible to be counted towards NEB under RCW 90.94, meaning they were proposed, contracted, and/or funded for construction **after January 2018.**”*
(emphasis added)

Automatically eliminating all habitat actions that have occurred since 2017 results in an overestimation of necessary mitigation and offsets. At a minimum, habitat actions that occurred after January 2018 must be considered.



PO Box 1387, Tonasket WA 98855

September 21, 2020

Okanogan County Office of Planning & Development
123 5th Ave North, Suite 130
Okanogan, WA 98840

RE: Draft Watershed Plan Addendum Okanogan River Basin WRIA 49 SEPA Determination

Dear: Pete Palmer

On behalf of the Okanogan County Farm Bureau, please accept these SEPA comments for the WRIA 49 Watershed Plan Addendum under consideration. We appreciate the opportunity to comment and acknowledge the WRIA 49 Watershed Plan Addendum is, for all practicable purposes, a "mitigation" document. However, we believe there is a key misrepresentation within the SEPA Checklist that needs to be addressed.

Page 15, Number 2: - The SEPA Checklist suggests the Net Ecological Benefit guidance adopted by the Department of Ecology must be followed and relied upon in developing the components of the WRIA 49 Plan Addendum. Unfortunately, that is not the case.

As a matter of law, the Planning Unit and Initiating Governments must consider Ecology's guidance, but may deviate from the guidance based on local circumstances, when supported by the record. Guidance documents adopted by agencies have no force of law and the Legislature's Joint Administrative Rules Review Committee has refused to accept review of guidance documents on the grounds they are not agency rules.

While Ecology's NEB Guidance may state the NEB analysis should "identify projects and actions that provide additional benefits to instream resources above and beyond those provided by consumptive use offsets" there is nothing in the law or the Legislative record supporting that statement. In fact, RCW 90.94.020(4)(a) specifically states, "Qualifying projects must be specifically designed to enhance streamflows and not result in negative impacts to ecological functions or critical habitat." Furthermore, RCW 90.94.020(4)(b) states, "At a minimum, the watershed plan must include those actions that the planning units determine to be necessary to

Stephanie Palmer

From: fawncreek@methow.com
Sent: Friday, September 25, 2020 7:35 PM
To: Stephanie Palmer
Subject: Comments for Planning Commission consideration of WRIA 49 Plan Addendum Adoption
Attachments: MINORITY REPORT FOR WRIA 49 WATERSHED PLAN ADDENDUM.pdf

Pete:

Attached is the PDF for the Minority Report to be considered regarding the adoption of the WRIA 49 Watershed Plan Addendum. It is my understanding that comments can be received through September 28th for the Planning Commission public hearing on the adoption of the addendum to the Okanogan County's Okanogan Basin Watershed plan. A hard copy of this same document was delivered to Courtney on Friday the 25th. This is to provide the convenience of being able to transmit the document electronically as needed.

Respectfully submitted on behalf of planning unit members who signed the Minority Report,

Dick Ewing

Minority Report for WRIA 49 Plan Update Under RCW 90.94.020

On behalf of the undersigned organizations, we offer this Minority Report for consideration by the Initiating Governments.

During the course of this process, we have worked diligently to represent our respective organizations, while taking into consideration the legislative intent of Chapter 90.94 RCW. We have identified several issues that remain unresolved, which create significant doubt as to whether the WRIA 49 Watershed Plan Addendum can be implemented in harmony with the customs and cultures of Okanogan County and consistent with the Okanogan County Comprehensive Plan. An important concern is the future impacts of domestic permit exempt wells. The Plan Addendum creates significant excess water over and above the consumptive use impacts predicted over the 20-year time frame. Failure to preserve this water for future out of stream uses essentially precludes the County's ability to provide water offsets after the 20-year planning horizon. This means the Plan Addendum does not account for this consequence and the impact on maintaining the environment and the balance between human and listed fish needs.

Confusion of RCW 90.94.020 with RCW 90.94.030

According to RCW 90.94.020, Okanogan County, along with other initiating governments and planning unit members, completed a watershed plan under RCW 90.82 Watershed Planning Act for WRIA 49. However, Department of Ecology, along with Okanogan County, proceeded to organize the planning update workgroup according to RCW 90.94.030. Input from members of the original watershed planning unit corrected this misstep. RCW 90.94.020 intended to reconvene the original planning unit under RCW 90.82. The terms "planning unit" and "watershed plan" in RCW 90.82 are in RCW 90.94.020 and, according to the legislative record, the Legislature intended for the Planning Unit to operate in accordance with Chapter 90.82 RCW.

This issue began in October of 2018. It took until March 2019 to resolve the proper organization of the workgroup. During this time, Ecology spent the time lecturing the workgroup on plan update requirements and how to obtain funding. By April 2019, the workgroup began the first aspect of the required work, the analysis of buildable lands. This period and its use of time have significant impacts on the outcomes of the workgroup:

- 1) The workgroup lost up to six months of productive time,
- 2) Ecology along with the initiating governments has not worked with the workgroup to review the 2009 Watershed Plan to identify projects and measures that will offset exempt groundwater well use and improve watershed function, and
- 3) Points 1 & 2 are impacting the allowed time left to complete the plan update by February 2021.

A written review of the watershed plan early in the process would have provided a clear focus for the workgroup. Contributions from the watershed plan and identification of its deficiencies are necessary for a realistic portrayal of the scope of the update. Since this is not available to date, the workgroup has an unclear mission and understanding of its task as it applies to the problem it seeks to resolve.

Since March 2020, we have been unable to meet in person due to restrictions put in place in response to COVID-19. Video conferencing has been utilized to continue Planning Unit meetings;

Minority Report for WRIA 49 Plan Update Under RCW 90.94.020

<p>The update is to include recommendations for</p> <ul style="list-style-type: none"> • Projects and actions that will measure, protect and enhance instream resources and improve watershed function supporting the recovery of threatened and endangered species • Recommendations may include but not limited to acquiring senior water rights, water conservation, water reuse, stream gauging, groundwater monitoring, and natural and constructed infrastructure • Qualifying projects must be specifically designed to enhance stream flows and not result in negative impacts on ecological functions or critical habitat 	<p>3(a)The watershed restoration and enhancement plan should include recommendations for</p> <ul style="list-style-type: none"> • Projects and actions that will measure, protect and enhance instream resources and improve watershed function supporting the recovery of threatened and endangered species • Recommendations may include but not limited to acquiring senior water rights, water conservation, water reuse, stream gauging, groundwater monitoring, and natural and constructed infrastructure • Qualifying projects must be specifically designed to enhance stream flows and not result in negative impacts on ecological functions or critical habitat
<p>4(b) At a minimum the watershed plan must include those actions that the planning units determine to be necessary to offset potential impacts to instream flows associated with permit-exempt domestic water use</p> <ul style="list-style-type: none"> • The highest priority recommendations must include replacing the quantity of consumptive water use during the same time as the impact and in the same basin or tributary. • Lower priority projects include those that are not in the same basin or tributary, replace consumptive water supply impacts only during critical flow periods • The watershed plan may include projects that protect or improve instream resources without replacing the consumptive quantity of water where such projects are in addition to those actions that the planning unit determines to be necessary to offset consumptive impacts to stream flows associated with domestic exempt water use 	<p>3(b) At a minimum the watershed plan must include those actions that committee determines to be necessary to offset potential impacts to instream flows associated with permit-exempt domestic water use</p> <ul style="list-style-type: none"> • The highest priority recommendations must include replacing the quantity of consumptive water use during the same time as the impact and in the same basin or tributary • Lower priority projects include those that are not in the same basin or tributary, replace consumptive water supply impacts only during critical flow periods • The watershed plan may include projects that protect or improve instream resources without replacing the consumptive quantity of water where such projects are in addition to those actions that the planning unit determines to be necessary to offset consumptive impacts to stream flows associated with domestic exempt water use

Ecology has added a burdensome requirement not supported by RCW 90.94.020:

RCW 90.94.020 (8) states: "This section only applies to new domestic groundwater withdrawals exempt from permitting under RCW 90.44.050 in the following water resource inventory areas with instream flow rules adopted under chapters 90.22 and 90.54 that do not explicitly regulate permit-exempt groundwater withdrawals: 1 (Nooksack); 11 (Nisqually); 22 (Lower Chehalis); 23 (Upper Chehalis); 49 (Okanogan); 55 (Little Spokane) and 59 (Colville) **and does not restrict the withdrawal of groundwater for other uses that are exempt from permitting under RCW 90.44.050.**" (emphasis added)

A clear reading of this section requires the update to address the indoor use of domestic groundwater withdrawals, limited to 5000 gallons per day but not exceeding 3000 gallons per day annually (RCW 90.94.020 (5) (f) (ii)). The other exempt uses stated separately in 90.44.050 are:

- 1) stock water (no limitation per day)
- 2) irrigation of up to 1/2 acre of lawn or non-commercial garden (No limitation per day)
- 3) Industrial (including commercial²) purposes not to exceed 5000 gallons per day.

Furthermore, the Washington State Supreme Court ruled in the Five Corners case³:

"Accordingly, that interpretation is the plain meaning of the statute. Under this interpretation, the exemption clause breaks down into four categories as follows:

[A]ny withdrawal of public groundwaters

[(1)] for stock-watering purposes, or

[(2)] for the watering of a lawn or of a noncommercial garden not exceeding one-half acre in area, or

[(3)] for single or group domestic uses in an amount not exceeding five thousand gallons a day, or as provided in RCW 90.44.052 or

[(4)] for an industrial purpose in an amount not exceeding five thousand gallons a day,

is and shall be exempt from the provisions of this section. "

RCW 90.94.020 simply does not require mitigation in the plan update for these other three uses.

² See Court of Appeals, Division 2, Joo II and Keum Ja KIM, Appellants, v. POLLUTION CONTROL HEARING BOARD, et al, Respondents. No. 27804-9-II

³ See Five Corners Family Farmers v. State No.84632-4

Minority Report for WRIA 49 Plan Update Under RCW 90.94.020

The argument for including both indoor and outdoor use in the definition of domestic use follows this trend of thought:

- 1) The quantities in RCW 90.94.030 of 950 gpd and in RCW 90.94.020 of 3000 gpd Maximum Annual Average implies that outdoor use must be included in domestic use;
- 2) Drought restrictions restrict withdrawals to no more than 350 gpd for indoor use only but outdoor watering is permitted for a fire buffer. Therefore, domestic use must by definition include outdoor use;
- 3) Campbell-Gwinn v. Ecology decision restricts all uses indoor and outdoor to 5000 gpd collectively for all homes under the single 5000 gpd exemption. Therefore, domestic use is defined in this decision to include indoor and outdoor use.

Ecology states in Policy 2094⁵ that domestic use is not defined in the law. In reference to 90.94.020 and 90.94.030 domestic use must include indoor and outdoor use in the Maximum Annual Average because:

- The limits for MAA are 950 gpd in .030 basins and 3000 gpd in .020 basins;
- In .030 basins domestic use is limited to 350 gpd for indoor use only, excluding any outdoor use except for a fire buffer;
- The conclusion: since the MAA is restricted in the .030 basins to indoor use only, outdoor use for watering up to a ½ acre lawn or noncommercial garden must be included in the larger MAA quantities. Otherwise, there would be no need for the legislature to confine drought use to indoor use only;
- The conclusion: limits of 3000 gpd MAA per connection would rarely be exceeded because the per capita use is 60 gpd. Therefore, outdoor use must be included;
- Because the Campbell-Gwinn v. Ecology decision defines 5000 gallons per day collectively for all homes in the project and irrigation of up to ½ acre, this restriction supports domestic use includes outdoor use.

Ecology in these arguments has sought to harmonize separate legislation to arrive at a universal definition of domestic use.

The minority members of the planning unit believe the arguments are not satisfactory or conclusive. Both RCW 90.94.020 (8) and RCW 90.94.030 (6) state: "This section only applies to new domestic groundwater withdrawals exempt from permitting under RCW 90.44.050 in the following water resource inventory areas with instream flow rules adopted under chapters 90.22 and 90.54 that do not explicitly regulate permit-exempt groundwater withdrawals: (WRIAs are listed for each section) and does not restrict the withdrawal of groundwater for other uses that are exempt from permitting under RCW 90.4.050." The phrase "This section only" indicates an exception that applies to each RCWs, that exception being new domestic groundwater withdrawals exempt from permitting. Harmonizing various aspects from other RCW's with RCW 90.94.020 & RCW 90.94.030 is disregarding the stated exception. Outdoor use for a garden or lawn up to ½ acre is not included.

The stated exception is based on the understanding that RCW 90.44.050 lists 4 separate uses exempt from permitting. The sentence construction, for....or for....or foror for, clearly

⁵ Stream flow Restoration Policy and Interpretive Statement, July 31, 2019

"New consumptive water use in this document addresses new homes connected to permit-exempt domestic wells. Generally such new homes will be associated with wells that are yet to be drilled during the planning horizon. However, new uses could also occur where new homes are added to existing wells on group systems relying on permit-exempt wells. In this document the well use discussed refers to both these types of new well use."

We remain deeply concerned with these statements. There is nothing in the law remotely suggesting Ecology has the authority to require mitigation for existing wells. Group B water systems utilize permit exempt wells under 90.44.050. These systems were designed and approved, subject to the 5,000 gpd limit established in RCW 90.44.050. Development activities associated with existing Group B wells are subject to the 5,000 gpd limitation. If a Group B well was approved to serve eight homes, it can serve eight homes regardless of when the homes are built. These simply are not new consumptive uses.

Furthermore, RCW 19.27.097(5) states "Any permit-exempt groundwater withdrawal authorized under RCW 90.44.050 associated with a water well constructed in accordance with the provisions of chapter 18.104 RCW before the effective date of this section is deemed to be evidence of adequate water supply under this section." Clearly the Legislature intended to "grandfather" existing single and group domestic uses. The addition of a home onto an existing Group B water system is not a new consumptive use and should not be subject to the provisions of RCW 90.94 in any way.

We have long held past planning efforts should be considered and factored into the WRIA 49 Watershed Plan Addendum. In fact, Ecology's NEB states:

"Sound watershed planning also properly recognizes past related and relevant planning processes and conclusions. Therefore, planning groups will describe how their watershed plan, including the projects, is linked or coordinated with other existing plans such as local salmon recovery plans or other recovery plans underway in the WRIA. See POL 2094 for additional information."

Unfortunately, throughout the Planning Unit's work to prepare the WRIA 49 Watershed Plan Addendum Ecology has been unwilling to consider "past related and relevant planning processes and conclusions" (i.e. land purchases, retired water, projects identified in existing plans not implemented, local land use controls which limit density/development, OFM population projections, etc.). Over the past twenty years, public agencies have purchased thousands of acres of land within Okanogan County, much of which had water rights associated with it. The department has thus far not recognized the "net ecological benefit" that has been provided through these land purchases as a credit against future exempt well water use.

In addition, Okanogan County is currently updating its Comprehensive Plan. The Planning Unit has not seen any analysis of the internal consistency between the existing Comprehensive Plan, the updated Comprehensive Plan, and the proposed WRIA 49 Watershed Plan Addendum. Furthermore, Ecology has not clarified how interfacing or coordinating with other planning efforts can result in providing credit toward the plan update and mitigation for exempt domestic use.

necessary to improve endangered fish productivity beyond the potential impact of exempt well use.

The second contribution to changing the definition of NEB relates to the use of Ecosystem Diagnostic Tool modeling. Ecology and the representative of the Colville Confederated Tribes presented the EDT modeling to the planning unit. It was understood by the planning unit that this is a tool developed in the Okanogan Basin and it would be advisable to incorporate this tool in the process of determining NEB. EDT modeling would provide a layer of scientific certainty to our project decisions. According to the proposed Plan Addendum, and Appendix C it is clear that the EDT modeling is the exclusive means for determining NEB. This represents a change from the NEB Guidance which uses a Qualitative approach rather than the Quantitative EDT approach. Reviewing the minutes associated with the acceptance of the EDT model, it is not noted that this is the sole approach the planning unit adopted. Discussion with members of this minority report revealed there is not the understanding that this is the commitment made. It is understood that the EDT would be a tool to be used with the NEB Guidance approach.

Utilization of the EDT modeling due to its focus on promoting the conservation and recovery of salmon and steelhead populations in the Okanogan explains why the Plan Addendum results in water offsets of 2,666 afy in excess of the required 203 afy projected consumptive use. If the NEB Guidance provided by Ecology was also used it would allow matching water offsets and NEB to offset the potential impacts to instream flows due to the 203 afy consumptive use prediction. Assuming that the EDT modeling would be the only criteria for determining NEB, creates the higher offset of 2666 afy, which requires the responsibility on part of Ecology to preserve this excess for future uses in the County.

Efforts to update the watershed plan exclude comprehensive analysis of water management issues affecting future water availability:

The plan focus is on the required water offset for permit-exempt consumptive use over the next 20 years and attaining the required Net Ecological Benefit. Ecology has repeatedly stated that the Legislature did not provide policy guidance beyond the 20 years. Yet Ecology does have other tools in the RCWs that the Legislature has provided that could fill this gap. Or more directly, the Legislature did not see a necessity to answer certain questions because answers already exist if Ecology is willing to use common sense to employ them.

The critical issue is what to do with water that is more than the projected domestic permit-exempt consumptive use for the estimated growth in Okanogan County due to the assumed need for certain projects to attain NEB based upon the EDT modeling. According to Ecology and Aspect Consulting, Salmon Creek will provide up 1000-acre feet per year of consumptive use offset. Similarly, Antoine Creek Ranch purchase will provide up to 1260 afy of consumptive use offset. Technically these offsets at present could provide mitigation for 10 times the number of homes if we have that growth potential. Somehow after the 20 years, these offsets disappear if not used, nor can they be put into a water bank to reserve for the future growth in Okanogan County. The plan pays too high a price for the 203 afy consumptive use offsets. Additionally, it robs the county

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of NEB, Flaws in NEB Guidance and Failure to manage excess water offsets of 2,666 afy: These topics are interconnected and together result in the excess water offset of 2,666 afy. There are several choices here. The first is to utilize a combination of EDT modeling where applicable and the Qualitative NEB determination from the NEB Guidance to determine NEB. This enables the matching of water offsets and other projects together to determine the NEB necessary to offset potential impacts of the 203 afy consumptive use from permit-exempt domestic water use to instream flows and improve watershed functions.

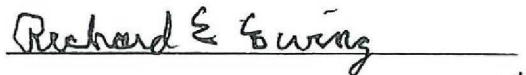
The second option depends on the insistence of only using the EDT modeling. Since this approach results in a WRIA wide benefit for listed species this pushes the Plan Addendum to the Stream Restoration and Enhancement of RCW 90.94.030 to obtain NEB. As noted above the NEB results are way out of scale for the de minimis consumptive use offset of 203 afy. Requiring the county to pay the associated NEB and 2,666 afy of CU offset to allow new permit-exempt wells is too costly. It robs the county of future water resources after the 20-year period. This means that Ecology should obligate itself to initiate in and participate in the necessary process to place this excess water in a water bank or reserve on behalf of the people in Okanogan County for future out of stream uses.

Additional Planning Time: There is sufficient reason to request from Governor Inslee the necessary extension of the time frame if needed to resolve the above issues under his emergency orders.

We the undersigned respectfully submit this Minority Report to the Initiating Governments for consideration and inclusion in the record of decision.



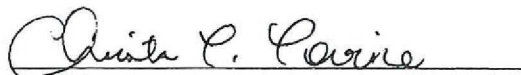
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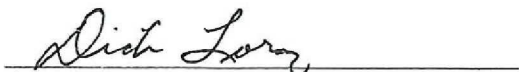
Dick Ewing, Okanogan County Farm Bureau X



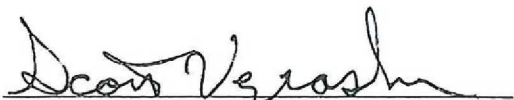
Trinity Stucker, Landowner North



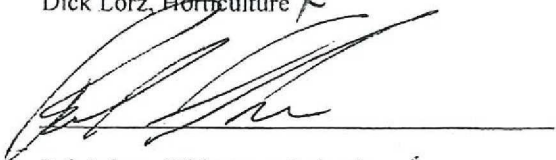
Christa Levine, City of Tonasket X



Dick Lorz, Horticulture X



Scott Vejraska, PUD X



Rob Inlow, Whitestone Irrigation X