PRCC Habitat Subcommittee Meeting

Thursday, February 12, 2015
1:00 – 4:00
Grant PUD Wenatchee Office

PRCC Habitat Subcommittee Representatives

Kate Terrell, USFWS
Dave Duvall, GCPUD
Carl Merkle, CTUIR
Dale Bambrick, Justin Yeager (alt), NMFS
Denny Rohr, Facilitator
Chris Fisher, CCT
Lee Carlson, YN
Jeremy Cram, Carmen Andonaegui (alt), WDFW
Debbie Williams, GCPUD, Administrative Assistant

Meeting Agenda

I. Agenda Review

II. Action Items Review

III. Meeting Minutes Approval – January 15, 2014

IV. Habitat Funds Report – (D. Rohr)

V. 1:30 pm, Mickey Fleming, CDLT, Discussion of Stewardship Funding Determination and Process (D. Rohr)

VI. Discussion of McCarty Property (Lower Nason Side Channel RM 2.4) and Grant PUD Property

VII. Review/Update of "Entiat Restoration Projects" (D. Rohr)

VIII. Newby Narrows Property Acquisition (L. Carlson; D. Duvall)

IX. White River Staff Gage (D. Duvall)

X. Red Shirt Mill Pre-proposal (K. Terrell)

XI. Similkameen Sediment Study Pre-proposal (C. Fisher)

XII. Discussion of Scheduling a Combined Meeting of PRCC and PRCC Habitat Subcommittee (D. Rohr)

XIII. Project Updates

A. McIntyre Dam – Improving Fish Jumping Efficiency (C. Fisher)

B. Icicle Creek Boulder Field Assessment Project (K. Terrell)

C. Shuttleworth Creek Project (C. Fisher)

D. Roaring Creek Flow Restoration and Diversion Removal Project (K. Terrell)

E. Bremer Property, Phase 3 (D. Duvall, D. Rohr)

F. Barkley Irrigation Company, 2012 – 2014 Diversion Change (J. Yeager)

1. Update of PRCC discussion, New Spec Sheet, PRCC Questions/Answers
2. Inclusion of Project Sponsor in PRCC meetings

G. Peshastin and Icicle Irrigation Districts Pump-back System Options Feasibility Study (K. Terrell)

H. Icicle Creek Boulder Field PIT Tag Array (J. Cram)

I. Penticton Spawning Platforms (C. Fisher)

J. Trout Unlimited – Lower Wenatchee Instream Flow Enhancement Project, Phase II (J. Cram)

K. Lower Nason Side Channel RM 2.4 Development on the McCarty Property (D. Duvall)

L. MVID – Methow Valley Irrigation District (K. Terrell)

M. Silver Side Channel PIT Tag Array (J. Cram)

N. Icicle Work Group – Leavenworth National Fish Hatchery Groundwater Investigations (K. Terrell)

XIV. Next Meeting: March 12, 2015, 1:00 pm, Grant PUD Wenatchee Office

Grant County
PUBLIC UTILITY DISTRICT

PRCC Habitat Subcommittee Meeting

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PRCC Habitat Subcommittee Administration

Denny Rohr, Facilitator
Debbie Williams, GCPUD, Administrative Assistant

Attendees

Kate Terrell, USFWS
Dave Duvall, GCPUD
Justin Yeager, NMFS
Denny Rohr, Facilitator
Chris Fisher, CCT
Lee Carlson, YN
Mickey Fleming, David Morgan, CDLT (1:30 – 2:00)
Debbie Williams, GCPUD (via telephone)

Distributed Items:

1. PRCC HSC Agenda February 12, 2015
2. Barkley Irrigation Company Permanent Point of Diversion Change and Pressurization – Construction – with answers provided by Yeager
3. Stewardship Calculator Lower Nason McCarty & Grant PUD
4. Lower Nason McCarty Specification Sheet
5. Lower Nason McCarty-Grant Budget
6. Design Review Plan Entiat Gray/Stormy Project
7. Entiat River Gray and Stormy Reaches – Concept Design Comments 6-Jan-15
8. Trash Rack at Wanapum Left-Bank Fishway Exit

Decision Summary:

1. HSC members agreed to fund $60,000 to the Washington State Department of Ecology for five years of White River Staff Gage operations from Fund 602, subject to approval of Cram.

Action Items:

1. Duvall will ask if Grant PUD is willing to fund stewardship costs on the Nason Creek property owned by Grant PUD that is adjacent to the McCarty property.
2. Fleming will send the McCarty appraisal to Rohr, who will then distribute to HSC members.
3. Duvall will order the McCarty property review appraisal.
4. Rohr will ask Fleming to determine stewardship costs on the McCarty properties projected future taxes.
5. HSC members will update the Habitat Projects Master List, and Rohr will have further discussions with the PRCC regarding a combined meeting in May.
6. Rohr will send Icicle Creek Boulder Field PIT Tag Array project updates provided by Cram to Williams.

Final Meeting Minutes

I. Agenda Review – No additions were made to the agenda.

II. Action Items Review – Listed actions are ongoing or completed.

III. Meeting Minutes Approval – January 15, 2015 – Minutes to be approved at next month's meeting.

IV. Habitat Funds Report – (D. Rohr) – On February 15th, annual funds will be deposited into all of the Habitat Funds. NNI Fund 601 - $1,944,780.95, Habitat Supplemental Fund 602 - $1,029,110.58, and Habitat BiOp Fund 603 - $367,582.44.

V. 1:30 pm, Mickey Fleming, Chelan Douglas Land Trust (CDLT), Discussion of Stewardship Funding Determination and Process – Mickey Fleming and David Morgan, CDLT, joined today's meeting to explain how the Stewardship Calculator (Excel spreadsheet) determines the amount of stewardship money a property requires if it is being donated to the CDLT. Required funds are then deposited into a Stewardship Endowment Fund that has an expected 4% rate of return. Fleming noted that estimates tend to be very conservative after the CDLT compares actual expenses to assumptions for each property.

VI. Discussion of Lower Nason Side Channel RM 2.4 (McCarty Property and Grant PUD Property) – On February 3, 2015, HSC members received the spec sheet for this project. In 2007 Grant PUD acquired 62.71 acres for $454,559.73 from Fund 602-01H, for conservation and habitat recovery purposes, but retained ownership. Under this proposal CDLT would take ownership. The Grant PUD property includes a historic side channel that connects to 10 acres at the rear of the property owned by the McCarty's, who are willing to sell for the appraised price of $105,000. Fleming will send the McCarty appraisal to Rohr, who will then distribute to HSC members. (Note: The appraisal was conducted by a HSC approved appraiser, and therefore the HSC decided it was not necessary to do an additional HSC sponsored appraisal; the property has increased approximately $3000 per acre since 2007. The McCarty's own 20 acres, including a B&B [Blue Grouse Lodge] located near the highway, and all is up for sale. When the B&B sells they will move out of the area. This proposal would split the property and CDLT would buy only the lower 10 acres). By unifying these parcels in ownership of CDLT, they can be managed together with significant potential for habitat restoration.

Fleming, CDLT, explained that in addition to the $105,000 purchase price, an additional $47,000 is being requested as a stewardship contribution for the McCarty and Grant PUD property. The McCarty's agreed to contribute $8000 for stewardship and Grant PUD is being

asked to fund $39,000. Terrell questioned the significant difference in cost per acre between the properties. Fleming said that larger parcels have increased insurance costs, take additional time to monitor the acreage, and have higher taxes (Grant PUD is tax exempt, CDLT is not, thus taxes are considerably more). Properties with a conservation easement that will be used for fish habitat and that are contiguous to public land; receive points for the fish habitat. Total valuation of the property is reduced by a percentage that is based on how many points received. Fleming said these types of properties typically receive a 75-80% reduction. Duvall will ask if Grant PUD is willing to fund stewardship costs on the Nason Creek property owned by Grant PUD that is adjacent to the McCarty property. Stewardship wasn't calculated separately because CDLT is treating the McCarty & Grant PUD properties as a single management unit. As an alternative to transferring title to CDLT, Fleming stated another option is to have Grant PUD give CDLT a conservation easement on the property. HSC members voiced concern with the high cost of stewardship. Fleming explained that the $10,000 provided by the HSC for development cost was overspent on the appraisal and that total project cost without stewardship would be $148,000. Fleming said the budget was built based on experience and she believes it is accurate. HSC members are concerned with setting precedence by providing stewardship funds for purchased properties.

HSC members agreed to have a review appraisal conducted. Reconnection of the side channel is the benefit of purchasing this property. HSC members discussed offering $105,000 plus 25 times the property's projected future taxes, or stripping stewardship funds from the entire proposal. Rohr will ask Fleming to send him cost figures regarding McCarty properties projected future taxes.

VII. Review/Update of "Entiat Restoration Projects" (D. Rohr) – Update provided by Stephen Kolk, USBR: *The Middle Entiat Design Team is currently working towards completion of 30% plans for the 2016/2017 Middle Entiat IMW Habitat project. Attached are the comments received by December 12 and the Design Team responses. The final concepts have been updated to the SharePoint site (too large to email). Additional comments received after December 12 are being considered during the development of the 30% plans. Also attached is the revised review schedule for the project, subject to final approval. Please contact me if you have any questions regarding the responses to your group's comments or the review schedule, or anything else you may need regarding this project. If there are significant concerns regarding how comments have been addressed, representatives of the Design Team are willing to meet to discuss.*

VIII. Newby Narrows Property Acquisition (L. Carlson; D. Duvall) – Potential sale agreement has been developed and is awaiting signature of the YN Chairman; which is expected at any time.

IX. White River Staff Gage (D. Duvall) – Duvall talked with WDOE regarding the HSC offer of 5 years of White River staff gage operations for $50,000. WDOE countered with 5 years operations for $60,000, and to include a termination clause to cease operations if additional future funding is not received. Duvall reported that USGS could do the same work for a little more than double what WDOE would charge. HSC members agreed to fund $60,000 for five years of White River Staff Gage operations from Fund 602, subject to approval of Cram.

X. Red Shirt Mill Pre-proposal (K. Terrell) – Terrell stated that an outside funding source was found for this project, so it should be removed from the agenda.

XI. Similkameen Sediment Study Pre-proposal – Ongoing

XII. Discussion of Scheduling a Combined Meeting of PRCC and PRCC Habitat Subcommittee – Rohr explained that the PRCC would like to hold a joint meeting to review

future projects and related NNI Funding. HSC members asked that PRCC members bring forth projects of interest to them, as well as mentioning projects that they might not agree to fund. Likewise, HSC members will update the Habitat Projects Master List. HSC members agreed to have a combined meeting and asked that the meeting be held in Wenatchee. Rohr suggested that the meeting be held in May, at Wanapum Dam, when the PRCC holds their annual project tour, and the HSC concurred. Rohr will pursue scheduling of a combined PRCC-HSC meeting in May at Wanapum Dam.

XIII. Project Updates

A. McIntyre Dam – Improving Fish Jumping Efficiency (C. Fisher) – No update

B. Icicle Creek Boulder Field Assessment Project (K. Terrell) – This project is moving onto the design phase.

C. Shuttleworth Creek Project (C. Fisher) – Duvall explained that Grant PUD received a December 2014 invoice from Okanagan Nation Alliance (ONA) in the amount of $12,253.96. His concern is that it was issued after the HSC notified ONA that the project would receive no further funding. Duvall has a call into Kari Alex, ONA, for clarification.

D. Roaring Creek Flow Restoration and Diversion Removal Project (K. Terrell) – A request for an easement on USFSW property has been submitted and is expected by April 30th. The project will be put out for bid by June, with construction occurring in the fall.

E. Bremer Property, Phase 3 (D. Duvall, D. Rohr) – Mickey Fleming, CDLT, provided the final cost breakdown for the purchase of this property. Net proceeds of the sale were $68,173.34, which was returned to Habitat Fund 602. Remove from agenda.

F. Barkley Irrigation Company, 2012 – 2014 Diversion Change (J. Yeager) – Update provided by Kate Terrell, USFWS: *In January, we [TU] worked with surveys and the engineers to rectify the survey data, outline specs for the mainline and coordinated design process. TU concentrated our efforts on the 30% Design plans for the pump station. This included a coordination meeting with the engineers, the BOR and permitting agencies. The 30% design was delivered on the 23rd of February and TU met with the Barkley Directors. TU also prepared a memo for the directors that laid out information on their water rights and the water right process. Barkley direct TU to initiate the water right change process, TU intends to move forward on this piece of the project immediately. TU prepared multiple proposals for funding in January and presented the project to the PRCC. We expect the full 30% design package will be complete and ready for permit submittal in March. A cultural Resource RFP was developed and will be sent out to start the process of contract for a survey to start when the snow comes off in the spring. We are working hard to develop all aspects of the project and in hopes that everything aligns for a fall 2015 construction.*

1. Update of PRCC discussion, New Spec Sheet, PRCC Questions/Answers – Yeager presented this proposal to the PRCC on January 28, 2015. The PRCC posed questions that Yeager was unable to answer at the time. Subsequent to the meeting, Yeager emailed the answers to Rohr for distribution to the PRCC members. The PRCC will discuss this as an agenda item at their February 25, 2015. Rohr encouraged HSC members to continue discussing this project with their PRCC reps.

2. Inclusion of Project Sponsor in PRCC meetings - Yeager stated that it would have been beneficial to have the project sponsor attend the PRCC meeting to answer questions posed by PRCC members. Rohr assured him that the PRCC would not

object to a project sponsor attending the PRCC meeting, either in person or via conference call.

G. Peshastin and Icicle Irrigation Districts Pump-back System Options Feasibility Study (K. Terrell) - Ongoing

H. Icicle Creek Boulder Field PIT Tag Array (J. Cram) –Ongoing

I. Penticton Spawning Platforms No. 3 (C. Fisher) – Fisher reported that a design request for proposal (RFP) was sent to four contractors, and that Mould Engineering was selected, the same engineering firm that did the previous spawning platform work. Designs are expected to be complete by April, with completion September 15, 2015.

J. Trout Unlimited – Lower Wenatchee Instream Flow Enhancement Project, Phase II (J. Cram) – Update provided by Kate Terrell, USFWS: *Trout Unlimited-Washington Water Project (TU-WWP) made significant progress on the Lower Wenatchee Instream Flow Enhancement Phase II in January 2015. A Request for Proposal (RFP) was prepared and submitted to a number of firms experienced with water systems engineering. Proposals will be received by TU-WWP in late February. Meetings were held with the Jones Shotwell Ditch Company (JSDC) board and shareholders to answer questions and receive input regarding system specifications. A protocol for surveying the ditch to collect measurements on ditch vegetation, ditch width, and access road witch was prepared. In February 2015, TU-WWP and the JSDC will review engineering proposals, conduct the ditch vegetation and infrastructure survey, and continue working with Ecology on due diligence for the water right change.*

The Jones Shotwell portion of this project was partially funded with NNI Funds.

K. Methow Valley Irrigation District (MVID) (K. Terrell) - Update provided by Kate Terrell, USFWS: *Trout Unlimited- Washington Water Project (TU-WWP) has made good progress in the MVID instream flow improvement project in the month of January. Tapani contracting has 80% of the East side piping project completed, though they have pulled off the project until spring. They are planning to return the first part of March to install the services connections and to do the final clean up. Bach Drilling has completed drilling the production wells and has also pulled out until spring. They are currently working on the pump screens in their shop and plan on returning the first of March to install the screens and to develop the wells along with doing the pump testing. They also continue to work on submittals for the pump station for the engineer's approval. The E-1 lateral mandatory bids were flown and we expect a strong turnout. Bid opening will be held March 3, construction to start soon after. The Lower East lateral bid walk will be held February 17th with the bid opening in the middle of March. TU continues to make good progress on individual wells and have developed a strong plan to have all them in at the appropriate time. We have received 5 different well driller's estimates for the individual wells along with making contract with several landowners. TU is in the process of setting up site visits with well drillers and land owners to set up dates for wells to be constructed. TU's plan is to have 22 wells installed before the MVID West side ditch is to start diverting water May 1st.*

L. Silver Side Channel PIT Tag Array (J. Cram) – Update provided by Jeremy Cram, WDFW: *The array was down for about 3 weeks around Christmas due to low availability of solar power and some settings on the machine. Fortunately, not much fish movement occurs during that time of year. We have detected a few new fish moving in, including 2 coho that had previously left the channel and one spring Chinook juvenile that was tagged at km 24 on the Twisp River.*

M. Icicle Work Group – Leavenworth National Fish Hatchery Groundwater Investigations (K. Terrell) – USFWS funded a request for a production well on the island.

XIV. Next Meeting: March 12, 2015, 1:00 pm, Grant PUD Wenatchee Office.

Grant County
PUBLIC UTILITY DISTRICT

Connecting Generations
Since 1938

VIA ELECTRONIC FILING

January 30, 2015

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, D.C. 20426

RE: P-2114-266 - Priest Rapids Hydroelectric Project - Request to end implementation of Interim Fish Passage Operations Plan and complete emergency ESA Consultation

Dear Ms. Bose,

As you are aware, the Wanapum Dam Reservoir was drawndown below its normal operating range from February through November, 2014 due a fracture that was discovered on Monolith 4 of the dam. On March 19, 2014, the Federal Energy Regulatory Commission (FERC) designated the Public Utility District No. 2 of Grant County, Washington (Grant PUD) as its non-federal representative for emergency consultation under Section 7 of the Endangered Species Act (ESA) and 50 CFR § 402.05 with the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS). This consultation was in regards to potential effects to federally-listed species during the emergency drawdown of the Wanapum Dam Reservoir.

On March 21, 2014, Grant PUD filed with FERC an Interim Fish Passage Operations Plan (IFPOP) for the Priest Rapids Project[1] in response to the emergency drawdown at Wanapum Dam. The IFPOP was developed in consultation with the Priest Rapids Coordinating Committee[2] and was approved by FERC on March 26, 2014.

Ordering paragraph (A) of FERC's March 26, 2014 approval of the IFPOP states:

> "*The Interim Fish Passage Operations Plan filed by the Public Utility District No. 2 of Grant County, Washington (licensee) on March 21, 2014 is approved, as modified by ordering paragraph (B) below. The approved plan shall remain in effect until further order of the Commission*".

[1] Order Issuing New License, issued April 17, 2008 (123 FERC ¶ 61,049).

[2] Priest Rapids Coordinating Committee includes National Marine Fisheries Service, US Fish and Wildlife Service, Yakama nation, Washington Department of Fish and Wildlife, Colville Confederated Tribes and Umatilla Confederated Tribe

ADDRESS PO Box 878
Ephrata, WA 98823
PHONE 509 766 2505
FAX 509 754 6770
grantpud.org

Throughout the emergency drawdown, Grant PUD conducted informal and expedited consultation under the emergency provisions of Section 7 of the ESA and adaptively managed the refinement and implementation of IFPOP in consultation with the NMFS, USFWS and PRCC throughout 2014 and the first quarter 2015. Specific details on the consultation, temporary fish ladder modifications, and implementation of the IFPOP can be reviewed in the status updates that were provided to FERC on May 1, June 5, September 12, and November 21 of 2014 in accordance with ordering paragraph (B) of the March 26, 2014 Order approving the IFPOP.

On November 25, 2015, Grant PUD initiated a partial refill of the Wanapum Reservoir, and reached the target elevation of 562' above mean sea level (msl) on December 1, 2014. The current operational range of Wanapum Reservoir is 558'-562' msl, while repairs to the Wanapum Spillway continue. In anticipation of the partial refill, Grant PUD removed the temporary Wanapum Fishway Exit Passage Systems (WFEPS) from both the left (LB) and right bank (RB) fish ladder of Wanapum Dam.

Currently, both the LB and RB adult fish ladders at Wanapum Dam are fully operational and provide unimpeded fish passage at Wanapum Dam, and all the temporary modifications from the Interim FFP have been removed. In accordance with requirements in the Priest Rapids Project License Biological Opinions from both USFWS and NOAA Fisheries, Grant PUD is able to maintain at least one fishway in operation year-round to provide fish passage. In addition, temporary modifications implemented to support the trap and transport program for adult salmonids and steelhead at the Priest Rapids Dam Off Ladder Adult Fish Trap (OLAFT) have been removed and the OLAFT has been returned to normal operation.

Based on the most current information available, Grant PUD believes that the emergency response that occurred throughout 2014 and in the first quarter of 2015 will pass by May 1, 2015, and therefore respectfully requests that FERC determine that the emergency response will be under control as May 1, 2015 and is ready for ESA analysis, and subsequently that Grant PUD end implementation of the IFPOP on May 1, 2015 and resume normal operation of its fish passage facilities. Grant PUD is providing the proposed timeline for ending implementation of the IFPOP and completing the necessary ESA analysis for your consideration in Table 1 below.

Table 1 Proposed timeline for ending implementation of the IFPOP and emergency ESA consultation

Proposed Action	Proposed Date
End implementation of the Interim Fish Passage Operations Plan (Interim FFP). The full extent of the response to correct the Wanapum Dam safety incident is determined and thus potential effects to ESA listed fish can be estimated, and the situation is sufficiently stable to allow preparation of a biological assessment (BA). Thus Grant PUD proposes a conclusion of necessary Emergency ESA consultation as normal adult fish passage has been restored at Wanapum Dam and all temporary modifications installed in the fish ladders and at Priest Rapids Dam OLAFT have been removed.	May 1, 2015
Grant PUD provides draft Biological Assessment to FERC for review.	June 12, 2015

FERC staff with any questions can contact me at 509-793-1468 or rhendr1@gcpud.org

Sincerely,

Ross Hendrick
License Compliance Manager

CC: PRCC
Jeff Krupka – USFWS
Scott Carlon – NOAA

ADDRESS PO Box 878
Ephrata, WA 98823
PHONE 509 766 2505
FAX 509 754 6770
grantpud.org

Fee Land Stewardship Calculator

acres=	73			
Activity	**Hrs**	**Estimate**	**One Time Costs**	**Annual Costs**
Transaction Costs				
Number of staff hours for site visits, negotiation, drafting legal documents, at $35/hour			$0.00	
Transaction fee				
Legal review of documents at $35/hr			$0.00	
Appraisal				
Level 1 ESA				
Title Research at $35/hr			$0.00	
Title Insurance				
Stewardship Costs				
Management Plan				
Number of staff hours for baseline site visit, mapping, and photodocumentation, at $35/hour				
Cost of materials/copies				
Number of staff hours for Site Management Plan preparation, at $35/hour	20			
Site Management Plan revisions (once/10 years) at $35/hr				$0.00
Forestry Consultant: inventory and forest management planning			$0.00	
Recreation Consultation			$0.00	
Number of staff hours for review and revisions, at $35/hour	5			
Ongoing Landowner Outreach				
Number of staff hours spent on outreach to neighboring landowners and community, at $35/hour	1			$35.00
Annual Liability Insurance and Taxes				
Annual liability				$47.45
LTA Insurance				$55.00
Annual taxes (estimated)				$1,250.00
First year taxes			$1,000.00	
Monitoring and reporting				
Number of staff person hours per year spent monitoring, including site visit, mapping, photodocumentation, etc, at $25/hour; No. visits/year; No. hours/visit+office=	8			$200.00
Travel costs				$50.00
Cost of materials/copies				$5.00
Number of staff hours spent on report preparation, at $35/hour, including annual tax exemption forms	4			$140.00
Site Management				
Capital Improvement Projects (staff time, materials, contractors, etc) - one-time costs and annual maintenance of improvements				$0.00
Annual Maintenance (Site perimeter signs, garbage removal as necessary, etc.)		$50.00		$50.00
Annual habitat restoration (staff time, materials, volunteer management, crew time, etc)				$0.00
Grant applications at $35/hr.			$0.00	
Emergency Stewardship Action (Assume 1 problem per 10 years)				
Estimate of total cost of major stewardship emergency action (surface water issues, fire, major dumping etc.)		$250.00		
Annual stewardship emergency cost, total cost divided by 10				$25.00
TOTAL ONE TIME COSTS			$1,000.00	
TOTAL ANNUAL COSTS				$1,762.55
5% CONTINGENCY RESERVE				$88.13
				$1,850.68

SUMMA
One time costs:
Total Annual Costs
Endowment Necessary to fulfill annual costs (cost/.04)
Total due

ASSUMPTIONS:

1) Expected rate of return =4%

McCarty current land value $201,000, Improvements $498,000, tax total $6930

Fee Land Stewardship Calculator

ARY:

$1,000.00
$1,850.68
$46,266.94
$47,266.94

Design Review Plan
Entiat Gray/Stormy Project

January 16, 2015

Identify Project:

- Tributary Assessment = Prioritized Gray and Stormy Reaches
    - Developed by Reclamation
    - Reviewed by Reclamation and local project partners
- Reach Assessment (Gray and Stormy) = Identified historic, existing, and target conditions
    - Developed by Reclamation
    - Reviewed by Reclamation and local project partners
- Map Books
    - Developed by Reclamation with guidance from: Yakama Nation and their consultants (Interfluve), USFWS, BPA, UCSRB, NRCS.
    - Reviewed by Reclamation, RTT and local project partners
    - Revised by Gray/Stormy Tech Team = Incorporated general and specific technical goals and objectives

Design:

- Concepts = High-level, low-detail drawings used to gain project understanding and buy-in
    - Based on Tech Team Map Books; Developed by Reclamation and its consultants (ICF, NSD, CH2M-Hill) with ongoing feedback from the Design Team.
    - Reviewed by Design Team, Tech Team (including BPA), project sponsors, RTT, RRT, PRCC and Trib Comm.
    - Project feedback provided by permitting agencies and other project stakeholders based on site visit(s) and meetings requested by the Design Team.
    - Approved by Executive Team via Tech Team recommendation (regarding technical objectives - efficacy) and project sponsors recommendation (regarding stakeholder/landowner objectives)
- 30% Design = Plans and minimal specifications suitable for developing cost estimates and providing additional project understanding and detail for stakeholders.
    - Developed by Reclamation and its consultants (ICF, NSD, CH2M-Hill) with ongoing feedback from the Design Team.
    - Reviewed by Design Team, Tech Team (including BPA), project sponsors, RTT, RRT, PRCC and Trib Comm.

    - Project feedback provided by permitting agencies and other project stakeholders based on site visit(s) and meetings requested by the Design Team.
    - Approved by Executive Team via Tech Team recommendation (regarding technical objectives - efficacy) and project sponsors recommendation (regarding stakeholder/landowner criteria)
- 60% Design = Plans, specifications, and cost estimates suitable for permitting
    - Developed by Reclamation and its consultants (ICF, NSD, CH2M-Hill) with ongoing feedback from the Design Team.
    - Reviewed by Design Team, Tech Team (including BPA), project sponsors, RTT, RRT, PRCC, Trib Comm, and permitting agencies.
        - Official RTT review and scoring provided at this time, based on written proposal and 60% design plans
    - Project feedback provided by other project stakeholders on a case-by-case basis during Project Team meetings and/or specific stakeholder outreach meetings.
    - Approved by each permitting agency and the Executive Team via Tech Team recommendation (regarding technical objectives - efficacy) and project sponsors recommendation (regarding stakeholder/landowner criteria)
- 90% Design = Plans, specifications, bid package and cost estimates suitable for bid
    - Developed by Reclamation and its consultants (ICF, NSD, CH2M-Hill) with ongoing feedback from the Design Team.
    - Reviewed by Design Team, Tech Team (including BPA), project sponsors.
    - Project feedback provided by other project stakeholders on a case-by-case basis during Project Team meetings and/or specific stakeholder outreach meetings.
    - Approved by Executive Team via Tech Team recommendation (regarding technical objectives) and project sponsors recommendation (regarding stakeholder/landowner criteria)
- Final Design = Plans, specifications, construction documents suitable for construction
    - Incorporates recommendations/changes from 90% Design review.
    - Developed by Reclamation and its consultants (ICF, NSD, CH2M-Hill) with ongoing feedback from the Design Team.
    - Approved by Executive Team via Tech Team recommendation (regarding technical objectives) and project sponsors recommendation (regarding stakeholder/landowner criteria).

Review Process (Figure 1):

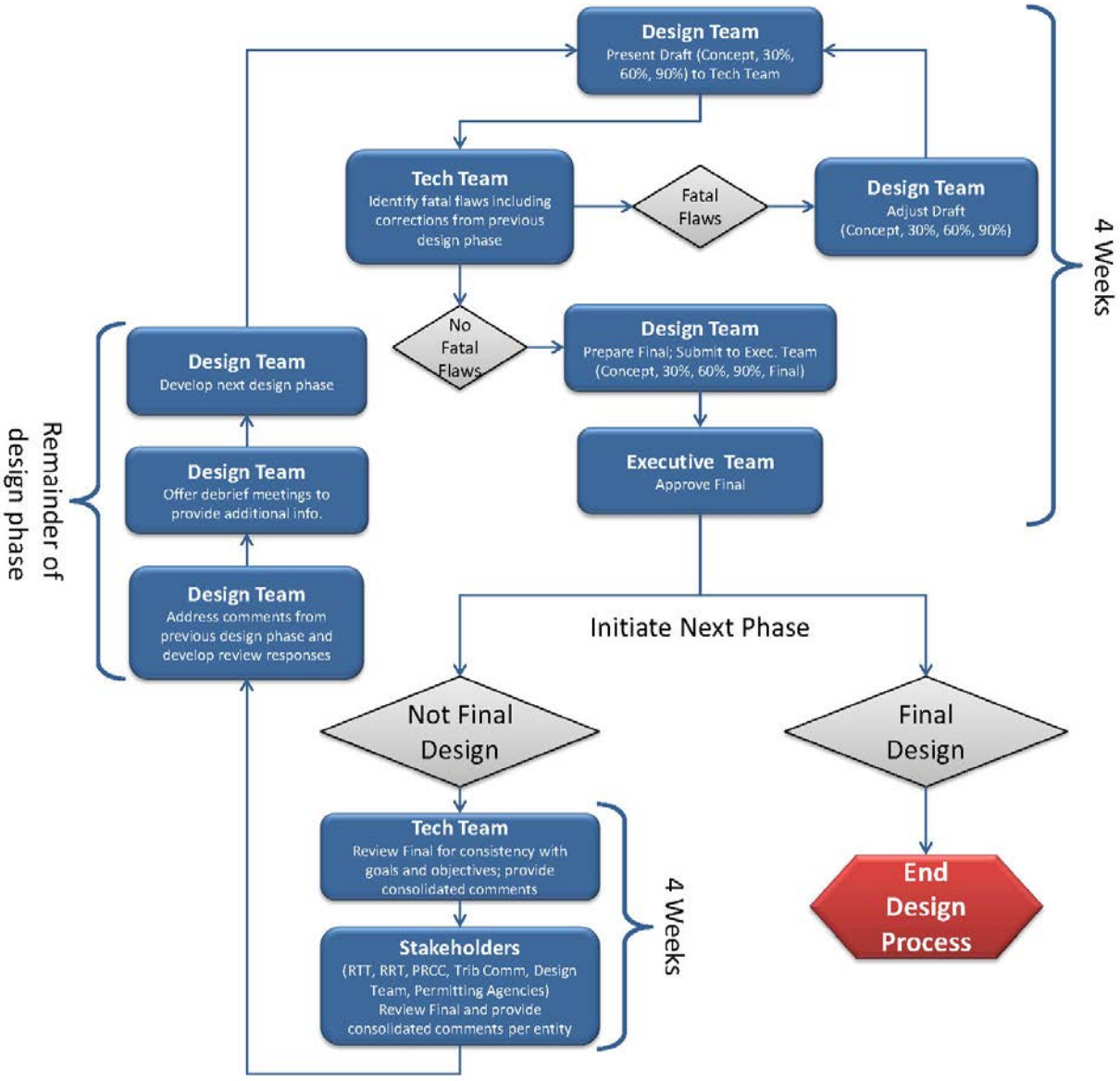
- DRAFT deliverable will be presented to the Tech Team by select members of the Design Team. The Tech Team will identify fatal flaws including appropriate responses and corrections from the previous phase of design. Design Team will correct fatal flaws and present corrections to the Tech Team. This process shall be repeated as necessary to address all fatal flaws within a 4 week period.

- Tech Team confirms fatal flaw corrections and provides recommendation to Executive Team to proceed.
- Executive Team approves FINAL deliverable.
- FINAL deliverable provided to all reviewing parties in digital format with an associated official review form including columns for comments and associated responses.
- **Next design phase begins.**
- All reviewing parties will have 4 weeks to provide their consolidated review comments on the appropriate review form. Comments will not be accepted after 4 weeks in order to maintain project schedule.
    - Each reviewing entity/team will provide one consolidated comment form. Multiple individual comments will not be accepted from a single entity/team to ensure comments are representative of entity/team consensus opinion.
    - Members of the Design Team are encouraged to provide official comments during any of the scheduled monthly Design Team meetings to reduce the number of comments received during the 4-week comment period. Official comments submitted from the Design Team during Design Team meetings or during the 4-week comment period should be presented on a standard comment form in order to be easily consolidated with other comments.
- All review comments will be addressed in the subsequent phase of design including appropriate comment responses consolidated into a single form by the Design Team (or delegate).
- The Design Team will offer debrief meetings to stakeholders on a case-by-case basis in order to provide additional explanation and answer lingering questions to ensure comments have been appropriately addressed.
- Repeat.

Entiat Gray/Stormy Tentative Design Review Schedule:

Design Benchmark	DRAFT Deliverable Released	Design Team Meeting	DT presents DRAFT to TT for Fatal Flaws Analysis	FINAL Deliverable; Responses from Previous Phase	Exec. Team Approval; Initiate Next Phase	Stakeholder Review Period	RTT Meeting	PRCC/TRIB Meeting	CDLT Stewardship Committee	CDLT Lands Committee/CDLT Board Meeting	Comments Due
Concept	11/12/2014	11/13/2014	--	1/7/2015	1/23/2015	11/12/14 - 1/7/15	12/12/2014	11/13/2014	12/3/2014	12/9/2014	1/6/2015
30%	4/27/2015	5/5/2015	5/7/2015	6/3/2015	6/3/2015	6/3/15 - 7/1/15	6/10/2015	6/11/2015	6/3/2015	6/9/2015	7/1/2015
60%	9/28/2015	10/6/2015	10/8/2015	11/4/2015	11/4/2015	11/4/15 - 11/30/15	TBD	11/12/2015	11/4/2015	11/10/2015	11/30/2015
90% Phase 1	12/30/2015	12/8/2015	12/10/2015	12/30/2015	12/30/2015						
Final Phase 1	2/1/2016	2/9/2016	2/10/2016	3/7/2016	3/7/2016						
90% Phase 2	11/28/2016	12/6/2016	12/8/2016	1/9/2017	1/9/2017						
Final Phase 2	1/30/2017	2/7/2017	2/9/2017	3/13/2017	3/13/2017						

Figure 1: Design Review Process Flowchart



Reviewing Parties:

- Project Tech Team
    - The Tech Team will provide review and approval recommendations at the concept, 30%, 60% and 90% design phases.
    - Select members of the Design Team will present the DRAFT design for any given phase to the Tech Team 4 weeks prior to the submittal date. The Tech Team will confirm acceptable response/resolution to comments from the previous phase (if any) and identify any new Fatal Flaws associated with the current phase. During the 4 week period prior to the submittal date, the Design Team will work with the Tech Team to correct fatal flaws. Once all fatal flaws have been corrected, the Tech Team will recommend advancement of the design to the Executive Team.
    - The Tech Team includes representatives from BPA who will follow BPA's guidance for design review summarized below:
        - Consistency with previous guidance (Tech Team and previous BPA comments)
        - Biological benefits = Design must provide substantial evidence supporting biological benefits required by the Columbia River Basin Habitat Improvement Program Biological Opinion.
        - Consistency with HIP-III Standards = if HIP-III is utilized for ESA coverage
        - Risk = Adherence to Reclamation's Large Woody Material – Risk-Based Guidelines (2014).
        - If HIP 3 is the resulting environmental compliance process for ESA coverage then BPA technical review will be performed through the BPA RRT process with alignment with Tech Team Review. This process will be coordinated directly between BPA and the Tech Team lead. If a formal consultation is pursued or an alternate programmatic used then BPA will conduct technical review in accordance with the *BPA Fish & Wildlife Program Habitat Design Review.*
    - It is the Tech Team's responsibility to verify that design comments meet the technical project objectives. If any element of the design only partially meets the technical objectives, it is up to the Tech Team to determine if the benefit of that project element still warrants the cost/risk associated with designing and building it. The Tech Team will provide recommendations to the Executive Team regarding which elements of the project should be advanced, modified, or dropped. The Executive Team will make the final determination.
    - Any negotiation between the Tech Team and the preparers of the document under review will be coordinated by the Tech Team lead and will be facilitated by the Project Manager.
- Project Sponsors
    - Project Sponsors and their landowner constituents have final authority (yes/no approval) for all design features.
    - Sponsors are an integral part of the Design Team and are encouraged to provide ongoing feedback and formal comments regarding the design and analyses during any

regularly scheduled Design Team meeting. Official comments should be presented on a standard comment form in order to be easily consolidated with all other comments. Sponsors are requested (not required) to limit their comments or refrain from commenting completely during the official comment period.
    - Sponsors may also provide official design feedback during the concept, 30%, 60% and 90% design phases.
- Regional Technical Team (RTT)
    - The RTT will be utilized as an advisory committee providing high-level review at key benchmarks (concept, 30% and 60% design) to ensure the design meets technical (especially biological) objectives.
    - RTT Review will follow the review process identified above.
- Permitting Agencies
    - The Design Team will engage informally with permitting agencies as it sees fit during concept development through 30% to seek informal feedback.
    - Permitting agencies will provide formal feedback through the official permitting process per each agency's specific permitting process. This will occur at the 60% design phase. Design changes necessary to meet permitting requirements will be folded into the 90% design package along with other 60% design comments.
- Consultants
    - When utilized, consultants will follow their own quality control review process understanding that the client and the product end-user must be satisfied with the results.
    - If the consultant is the engineer of record for the project, the consultant (engineer) is responsible and accountable for the final design of the project. The engineer of record must approve all phases of the design.
- Other Project Stakeholders
    - All other project stakeholders will be engaged during periodic Project Team meetings where feedback will be requested and encouraged.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
General Comments
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	10/28/2014	LWM	D Morgan- CDLT	Regarding wood placement, our comments assume that Risk Based Design Guidelines will be applied to all wood structures, and this additional analysis will help determine whether each element would proceed to next design phase. Therefore we will not mention risk here but we emphasize how important this topic is to CDLT, and we suggest that before the "next time" we are asked to review updated plans we are given more details about this subject. We request that BOR come to CDLT to present to the Board how this tool will be applied and to answer questions they may have.	Reclamation will coordinate with CDLT regarding presentation of Large Wood Guidelines and the Risk Evaluation. Reclamation will coordinate with CDLT regarding presentation of Large Wood Guidelines and the Risk Evaluation. Risk Based Design Guidelines will be applied in subsequent design phases for each structure, once concurrence is reached on the concept design (general size, location, and orientation from physical process and biological benefit perspectives).	Risk Based Design Guidelines will be applied by the ICF Team.
	2	10/28/2014	Side Channels	D Morgan- CDLT	Regarding side channel excavation, the schematics depict cross sections which appear trapezoidal and we hope this can be modified to create less uniform side slopes, bottoms, and less flume-like channels. Perhaps deeper pools connected to permanent groundwater can be added in the longer features to add vertical diversity. We would also like to see more wood placed in these side channels, partly for biological benefit but also for esthetics. Downed wood on the floodplain is abundant in many nearby areas and we should try to mimic this. The upstream end of Stormy floodplain above Shamel Creek is a particularly good place to look for a natural analog. As Tom D's memo recently described, local monitoring efforts suggest side channels with year round flow may be particularly important. Because there are probably few areas where this is possible (compared to alcoves and other types) we would like to encourage further consideration of permanent side channels when given the option to choose between types.	This comment appears to have two main parts, 1) a comment regarding complexity and 2) a suggestion to propose additional PS. In regards to these parts, 1) for concept design, the intent is to convey a general sense of the proposed elements (e.g., "15-foot top width side channel activated at a spring flow") to solicit concurrence from the various project partners. Once concurrence is reached on the concept design, side channel dimensions, profile, LWM, and revegetation will be evaluated, refined, and diversified to meet sediment transport and habitat complexity goals, drawing from existing reference areas (Preston/Yurt, Shamel Creek), Tom D's memo, and 2D hydraulic modeling results for proposed conditions. 2) Our recommendation of perennial vs. seasonal flow side channels is, at this time, based on several factors including field observations at multiple flows, interpretation of existing conditions model results, inlet location, predicted sustainability of the side channel inlet, and consideration of impacts and permitting considerations (e.g., depth of excavation to obtain perennial flow, potential disturbance to mature riparian vegetation, ability to off-haul spoils or spoil onsite, and the potential for avulsion.) To the extent these considerations may be balanced, our team will continue to prioritize PS opportunities.	1) Details showing side channel complexity in geometric shape and in wood loading will be incorporated at the 30% design step. 2) Perennial side channel creation where feasible has been given the priority over seasonal activation by the Design Team.
	3	10/28/2014	General	D Morgan- CDLT	Regarding access and disturbance, it is our understanding that at this time we are being asked to review concepts, rather than tactics, restoration, etc. Therefore we will not comment here on this important topic. We assume the next iteration will provide the additional details needed to provide meaningful input on that subject.	Yes; an opportunity to review and provide meaningful input regarding access and disturbance will be provided with more detailed designs (30%, 60% and 90%). In the meantime, designs will be advanced following objectives identified by the Tech Team (biological and physical) and by sponsors (stakeholder objectives). We encourage stakeholders to communicate design objectives with their respective sponsor(s).	Stakeholders will be provided opportunites to comment on design details through the Design Team process.
	4	10/28/2014	LWM	D Morgan- CDLT	Need to know estimated lifespan for jams installed in new channel; compare to time needed to establish mature trees on floodplain; decide whether buried jams needed in path of future lateral erosion	Functional lifespan of ELJs will vary between 25-50-yrs and is dependent on degree on interaction with the main channel (ie. logjams frequently/constantly engaged will have slower decay rates that wood located along the margins and floodplain). Logjams successfully planted with fast growing forest species (cottonwood and douglas fir) will offer the longest term permanence as stable hard points. Buried logjams located within floodplain can be considered but may conflict with BPA funding priorities for achieving immediate habitat benefit.	LWM structures are intended to have both short and long-term effects and lifetime.

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6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	5	10/28/2014	Side Channels	Richardson (USBR)	Side Channels – please attempt to limit disturbance for side channel excavations by connecting existing low points, using pilot channels, and excavating vertical banks where possible/appropriate. Please do not show trapezoidal channel cross sections; rather, show cut banks and point bars if/where appropriate.	Comment noted. Please see response to related comment above.	The ICF Team is taking a "light touch" approach to side channel and alcove design where feasible. Design complexity will be applied during the 30% design phase.
	6	11/11/2014	FEMA	Tech Team	Will project conform with FEMA no-rise?	The Design Team is currently coordinating with the Chelan County Community Development Department to determine how the project fits within floodplain regulations. Chelan County's Community Development Department is the administrator of FEMA floodplain regulations for all of the project sites. They will determine whether or not a zero-rise analysis is required and how to address flooplain regulations, conforming to FEMA requirements, if components of the project do not meet "zero-rise".	The Design Team will continue to coordinate with the Chelan County CDD.
	7	11/11/2014	General	Tech Team	Can we see the design matrix?	Yes, the design matrix will be sent to the Tech Team.	Matrix provided in Dec 2014.
	8	11/11/2014	LWM	Tech Team	Consider architecture other than driven piles (i.e. excavated piles with rootwads as anchors), possibly as a backup plan if problems encountered driving piles	Excavated posts are a viable alternative to driven piles however require more impactful construction techniques. In locations where colluvium is expected this type of architecture will likely be the preferred method. However, developing a bid/permitting package that has flexibility at the time of construction may be difficult due to differences in construction costs/in-water work/temporary impacts. This will be further evaluated/discussed with the permitting agencies as the project proceeds.	Additional LWM design approaches will be explored during the 30% design phase.
	9	11/11/2014	LWM	Tech Team	Construct ELJs higher than 1 yr flow WSE, higher piles	Explanation for this would be helpful. What is the basis for wanting to raise ELJ elevations? to what elevation? Concept ELJs are intended to be lower profile (than previous Entiat projects) to provide the most habitat/geomorphic benefit while appearing natural within the landscape.	LWM structures will maintain low profiles to meet function and aesthetic goals when feasible.
	10	11/11/2014	Side Channels	Tech Team	Favor steepest bank cuts possible for all side channels, minimize lateral footprint	Agreed. Side slopes will be a function of existing soils and root density. Test pits planned for spring 2015 should help to start informing this. For now, we have assumed side slopes of 2H:1V, unless noted otherwise, to illustrate the upper range of potential impact areas.	Steep side slopes will be applied to side channel design to minimize cut/disturbance while maintainig long-term function.
	11	12/5/2014	LWM	Tom Desgroseillier	Woody material placement proposed for habitat benefit should interact with water all flows as possible to maximize year round habitat potential.	Comment noted. The upcoming Risk Based Design exercise will inform the ability to aggressively place wood to interact with low summer flows, but it is the current intent of the team to maximize seasonal use.	Overall LWM goal is to maximize year-round aquatic use. Site specific adjustments may be necessary that reduce the period of flow interaction however.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
General Comments
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
General Comments	12	12/5/2014	LWM	Tom Desgroseillier	Complex structure, including root wad material that creates dense cover is preferred to allow concealment opportunities for winter parr and increased foraging opportunities for summer parr.	This design guidance will be incorporated into overall LWM design. We expect to include large amounts of racking material to accomplish this goal.	This design guidance will be incorporated into overall LWM design. We expect to include large amounts of racking material to accomplish this goal.
	13	12/5/2014	LWM	Tom Desgroseillier	Placement of wood in association with existing habitat features (pool, vegetation, undercut bank, wood, etc.) will serve to increase the overall complexity and availability of habitats in regards to varying conditions and biological requirements. Dense riparian plantings that would become inundated during spring flow events would provide additional cover for fry	Our current approach aims to improve cover and complexity of existing habitats.	Our current approach aims to improve cover and complexity of existing habitats.
	14	12/5/2014	LWM	Tom Desgroseillier	Log jam placement proposed for physical or habitat benefit should not be limited in size or function (i.e. ability to rack wood, increase stage, or redirect flow) at the concept level. There will be ample opportunities for this based upon input from the public, permitters, and others. Log jams intended to provide physical benefit at high flows may serve as important habitat features at low flows if available (i.e. wet).	LWM jams are intended to provide multiple benefits from hydraulic to biological.	LWM jam design is intended to maximize hydraulic and habitat function.
	15	12/5/2014	General	Tom Desgroseillier	An additional layer indicating historic spring Chinook spawning locations in relation to proposed ELJs would be beneficial to determine potential impacts.	This layer will be added to an updated set of 2D hydraulic modeling output figures that will also be updated to include the January 2015 final conceptual plans.	This layer will be added to the updated 2D model/concept plan graphics.
	16	12/5/2014	Side Channels	Mike Knutson	Side Channels – side channels should be excavated where necessary to get processes “kick-started”. Utilize LWM and minimal pilot channel excavation where possible to get side channel development.	Our current approach is to apply the lightest touch while still engaging the targeted habitat flows. This includes designing pilot channels and installing wood deflector structures that promote hydraulic scour to maintain channels over time.	Our current approach is to apply the lightest touch while still engaging the targeted habitat flows. This includes designing pilot channels and installing wood deflector structures that promote hydraulic scour to maintain channels over time.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
General Comments
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	17	12/5/2014	LWM	Mike Knutson	Deflector type groups of LWM structures such as B17 and A26. There are many instances of this structure type in which energy is ramped along parallel LWM structures and then deflected at end for scour pool development and channel steering. It appears that this type of structure is utilized too often and it would benefit the projects to have multiple types of these structures rather than this particular type repeated as often as shown. Also, when grouped, consider the hydraulic energy dissipation that occurs at each of these and space/locate according to development and capture of highest energy in lee of these successive structures. For bends, it seems as though these structures would be most effective at middle to end of meanders rather than at upstream in meander locations as they will likely alter meander hydraulics through energy dissipation.	Based upon comments received the number of meander jams locations has been reduced from 7 to 3 in the final conceptual plans and no locations are in successive sequence as was A26. Proposed meander structure type locations and intended effects were developed to mimic natural analog references within the Chiwawa river. Natural meander type analogs were observed to have a ramping effect from small pieces orientated parallel to flow progressing towards a larger deflector/channel steering element. The main intent of the larger meander series logjam type is to strongly encourage lateral migration and a reduction in the upstream radius bend (often much less developed than downstream bend). Natural analogs were also observed to be located with the lower ½ to 1/3 of the channel radius as are proposed ELJ locations (when considering the upstream meander bend. Final structure locations are intended to be optimized with results from initial proposed 2D model runs to ensure the effectiveness and hydraulic effect.	LWM deflector and meander jam design will progress and the ICF Team will adjust designs through the 30% design phase.
	18	12/10/2014	General	RTT	Conceptually, it appears that the proposed approach will address the primary ecological concerns that the RTT has identified in Appendix E of the biological strategy for this area of the Entiat River.	Comment Noted.	Comment noted.
	19	12/10/2014	General	RTT	Realizing that the drawings are preliminary and conceptual at this time, one reoccurring question we had was the many places where flow is proposed to be deflected into floodplain areas where side channels or alcoves are proposed. Many of the areas look like they will be excavated to become or connect to side channels or alcoves and we hope the intent would be to not excavate areas that will be avulsed by deflected flow. This would be a waste of resources.	Our overall goal is to apply the minumum effort to achieve the targeted habitat conditions. Our design group is taking the following heirarchal approach to the formation and maintenance of side channels and alcoves: 1) install LWM to deflect flows into existing or proposed alcoves to promote scour, formation, and maintenance of the feature; 2) excavate pilot channels to allow targeted habitat flows to scour, form, and maintain the feature; 3) excavate full channels to targeted habitat flows to scour, form, and maintain the feature.	The ICF intends to use the minimum action necessary to achieve the targeted hydraulic and habitat goals.
	20	12/10/2014	General	RTT	In general, the concepts support process-based restoration by encouraging floodplain reconnection and lateral movement of the channel. Addition of large structures to increase instream habitat complexity is also suggested.	Coment noted.	Comment noted.
	21	12/11/2014	General	D Morgan- CDLT	Regarding compliance with HB 1194, assuming the required designs provide equivalent biological benefit to lower Q designs, and equivalent consistency with geomorphic process, CDLT likely would lean in favor of designing to this standard. As we progress we would like to hear more about whether trade-offs between increased FOS versus other benefits will be required if we build to HB 1194.	Comment Noted.	Comment noted.

Entiat River Gray and Stormy Reaches - Concept Design Comments
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General Comments
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	22	12/11/2014	FEMA	D Morgan- CDLT	A few months ago I requested more info about FEMA mapping/ updating, Wsel, changing stage w/ jams, etc. Because CDLT properties will permanently be undeveloped, and, especially on the upper end of the project area, our neighbors have little infrastructure near the river, it is important to verify whether 2016 projects may have greater latitude to move water across floodplain than is usually the case. CDLT supports greater frequency and duration of inundation on our floodplain and hopes there may be flexibility to achieve that. This needs to be determined before designs are chosen.	The Design Team is currently coordinating with the Chelan County Community Development Department to determine how the project fits within floodplain regulations. Chelan County's Community Development Department is the administrator of FEMA floodplain regulations for all of the project sites and will determine how proposed projects must demostrate conformity with flooplain regulations, including FEMA requirements such as revisions to floodplain mapping.	The Design Team will continue to coordinate with the Chelan County CDD.
	23	12/1/2014	Revegetation	Gina McCoy - WDFW	I'd like to try to clarify the comments I made about modeling frequent high flows. From the standpoint of floodplain functioning and riparian ecology, it is the frequent overbank events that really matter, but these rarely receive enough attention when reach assessments are conducted. I believe that modeling the 3 - 5 years events gives the best indication of floodplain connectivity and the overall functioning status of the system. Obviously, if a floodplain is not inundated at the 10 year event, it is disconnected from the channel, but if overbank flow does not occur at the 5 year event, the system is in trouble. I believe the majority of natural riparian regeneration occurs on bar surfaces in the active channel on east-slope Cascade river systems. If floodplain connectivity is good, these bar surfaces approach the elevation of the top of the bank. This allows the bar surface to be protected from annual scour, because overbank flow limits energy concentration. However, these surfaces also must be low enough that the root development of seedlings can keep pace with the dropping water surface through the growing season. Incised channels tend to have too much fluctuation between high and low flow water surface elevations and too much energy concentration to allow for in-channel riparian regeneration. And, obviously, incised channels do not support riparian regeneration on their disconnected floodplain. If the system does not support riparian regeneration, there will be a long term downward trajectory of processes and habitat. I strongly believe that our process restoration efforts must incorporate this as a long term goal, even while perhaps including other shorter-term objectives.	This is a timely comment and likely gets to the question of why so little cottonwood regeneration is evidenced in the Gray and Stormy reaches. Topographic survey and 2D modeling show that much of both reaches are slightly incised. The installation of LWM structures is intended to help raise local WSE to engage floodplain surfaces and will also create velocity shadows in which riparian establishment is more likely than in the mid-channel bars.	Comment noted.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	10/28/2014	B7	D Morgan- CDLT	B7- must consider augmenting stable anchor tree already present, which likely resembles a pre-settlement reference tree, with similar sized material before moving ahead with EMJ as shown here; CDLT will consider looking at upland areas on CDLT for source; will need partners to look elsewhere too (USFS campgrounds with hazard trees?); this will require heavy lift helicopter; please start discussions about availability ASAP; please do not settle on Vertol until we have more time to consider ramifications; this is a site which could be used as a reference to compare a natural jam with huge stable anchor trees to EJs and we should not interfere with the process already underway here until we are certain we cannot airlift and add a couple more stable anchors	The design will consider augmenting the existing stable anchor tree with additional pieces of wood of appropriate size. Based on our multiple field recons this site offers access to traditional tracked equipment with little disturbance to riparian vegetation. The structures at B7 would likely be built with tracked equipment but may use a helicopter to stage LWM. The intent of this series of structures is to build stability into existing wood and to increase the LWM interaction with river flows. Use of the Vertol helicopter versus other aircraft will be taken into consideration as part of the larger project planning effort. In the end, aircraft availability and overall project needs and constraints will determine which aircraft will be used and, more generally, how structures are built. DMorgan: Is this true; I'm not certain about this? We have unusual opportunity to compare kits to true natural analog and lean heavily towards using huge trees if poss, esp at this site and perhaps elsewhere. With help from CCNRD, recently located several suitable natural analog stable anchors on or near Bremer and will keep looking for more; will follow up re: permission to remove.	B7 will utilize existing stable anchor trees as appropriate.
	2	10/28/2014	PS1c	D Morgan- CDLT	Regarding side channel excavation, the schematics depict cross sections which appear trapezoidal and we hope this can be modified to create less uniform side slopes, bottoms, and less flume-like channels. Perhaps deeper pools connected to permanent groundwater can be added in the longer features to add vertical diversity. We would also like to see more wood placed in these side channels, partly for biological benefit but also for esthetics. Downed wood on the floodplain is abundant in many nearby areas and we should try to mimic this. The upstream end of Stormy floodplain above Shamel Creek is a particularly good place to look for a natural analog. As Tom D's memo recently described, local monitoring efforts suggest side channels with year round flow may be particularly important. Because there are probably few areas where this is possible (compared to alcoves and other types) we would like to encourage further consideration of permanent side channels when given the option to choose between types.	The design team is aware of this potential risk and would welcome a discussion regarding the implications of an avulsion at this location. (For example, based on the Mapbook, an avulsion may be a desired outcome at this location to reduce high flows against Entiat River Road?) As part of the overall design process, analyses and 2D modeling results will be used to evaluate avulsion risk at this location. Options to reduce avulsion risk include converting the PS to a SS (based on observations from the October field visit, we recommend changing to a SS), placement of LWM on the right bank of the mainstem (both banks of the inlet) to manage flow into the inlet, and/or incorporation of FESL, wood cribs, or coarser substrate replacement to reduce the potential of the channel to erode and expand (similar to Tyee). However, several of these countermeasures would result in significant disturbance to the bank and existing vegetation (and be challenging to permit).	PS1c is proposed as a perennial flow channel.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	3	11/9/2014	B15.5	D Morgan- CDLT	DMorgan:Need to discuss future response in the event of avulsion; should we add EJs between B15 and B15.5 which looks like a place where, if avuslion happens in PS1, we'd expect accelerated lateral migration and eventually, a meander cut off just u/s of levee?	Additional wood structures will be added upstream of B15.5 to reduce the risk of avulsion through the meander neck at this locaitn.	Additional wood structure has been added upstream of B15.5.
	4	10/28/2014	PS2a	D Morgan- CDLT	PS2a mostly on CDLT	Noted. Matrix updated.	Matrix updated.
	5	10/28/2014	PS1c	D Morgan- CDLT	PS1c- will need vegetation survey data to assess potential excavation impacts	Based on an initial field reconnaissance of the proposed channel alignment, the majority of vegetation appears to be hawthorns and sapling trees. If this channel concept is moved forward, the larger cottonwood trees would be identified, and the alignment adjusted as possible to avoid them.	PS1c design will be refined at 30%.
	6	10/28/2014	General - A	Matt Wilberding (YNF)	No USFS (Landowner) participation as of yet (may change as communications are not final).	Comment Noted.	USFS has become a willing participant in design since this comment.
	7	10/28/2014	General - A	Matt Wilberding (YNF)	Conceptuals contain structures as "Catcher's Mits". YN cannot have these types of structures. Big liability and social constraint. The YN typically constructs our wood structures keyed into the bank and containing a bumper log to shed off major debris, rafters, etc.	The function of proposed logjams specific to racking additional wood has not determined or was not intended to be conveyed. Logjams shown are only meant to convey a specific size (width/length) with the specific log configuration to be determined during the conceptual design phase. DMorgan: Safety is important. In some locations rackling would be norrmal, even desirable I assumed that it would be an exception rather than a rule to make bumpers and that RBDG will be part of making this determation. CDLT is unlikey to support work that is not consistent with river process, and will consider in conjucntion with parterners on a case by case basis how to find right balance.	The ICF Team will adjust LWM designs within the Project Area A reach to address YN safety concerns. These design details will be incorporated at 30% design.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	8	10/28/2014	General - A	Matt Wilberding (YNF)	NSD discussed at DT meeting of having pile driven structures and logs placed b/w piles and allowed to float up/down during high/low flows. YN would like key members to be pinned in to not allow movement of logs.	This anchoring can be incorporated into Project Area A structures, however we must consult with BPA and the applicability of this anchoring method within the HIP III coverage. DMorgan: Prefer discussion about biol benefit, and do RBDG, before deciding. Can also see esthetic argument for lower profile/ cabled structures, but at this point assume these will be applied in specific locations (EX: near parkng area at Stormy).	LWM structures can be pinned to prevent movement of key members. These design details will be incorporated at 30% design.
	9	10/28/2014	General - A	Matt Wilberding (YNF)	Apex jams are possibly a concern. Their use will require a valid reason and must show benefit that is otherwise unachievable by a margin structure. Each structure will need to be designed to limit racking and must have bumper logs and adequate site lines.	The concern over apex structures is noted and will be considered during the conceptual design phase. A main purpose of apex structures is to split flow within the main channel creating a multi-channel network which cannot be easily achieved with a logjam inset into a bank or along the channel margin. The safety of apex structures can be improved by decreasing the porosity with less porous structures splitting the flow and causing floating objects to deflect away from the obstruction. DMorgan: Safety concerns are important but porosity is good fish habitat. If suveys and other datga collection methods indicate liminted recreation, and if RBDG is run, then perhaps this is less of a concern. Looking forward to working together to decide best appraoch.	Apex jam locations and orientations have been adjusted per meetings with YN.
	10	10/28/2014	A5	Matt Wilberding (YNF)	If USFS cooperation is a no-go, then can structure A5 be moved downriver to be on CDLT property?	Structure A5 is to work in conjunction with side channel PS2A. If PS2A is removed then structure A5 can be removed entirely from the designs.	A5 has been removed.
	11	10/28/2014	B3.4	Matt Wilberding (YNF)	Can structure B3.4 be a larger structure?	Yes. We can change that to a large habitat structure.	B3.4 has been enlarged to meet YN and TT goals.
	12	10/28/2014	B13.5	Matt Wilberding (YNF)	Is structure B13.5 engaged during low flow? How will that side channel look in low flow? Does it create an alcove during low flow? Completely dry? Can it be possible to add some roughness into the small side channel?	Yes, the apex logjam is intended to be engaged during low flows. The side/split channel shown is intended to activate at moderate to high flows initially following construction but may overtime become engaged during lower flows. The potential for added roughness/cover can be evaluated conceptual design phase.	Complexity has been added to the split channel on river left of B13.5.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	13	10/28/2014	A8/A9	Matt Wilberding (YNF)	Could it be possible to build A8 and A9 conservatively? As with all the other structures (margin wood, deflectors, etc.) they must shed debris.	Yes, these logjams can be designed to reduce the opportunity to rack wood during the conceptual design phase. The geometric orientation as shown will actually work reduce racking (as opposed to an inverted U or V that would trap debris/floating objects in the middle) as only pieces orientated closely parallel to the front face will tend to rack in front of the logjam.	A8 and A9 have been adjusted to reduce the potential for creating a channel-spanning jam.
	14	10/28/2014	A8/A9	Matt Wilberding (YNF)	How much flow would be through split flow between A8 and the road? Would it be possible to add some wood to the side channel? Is it connected at low flow?	The degree of the flow split will be further evaluated during the conceptual design phases using the 2D hydraulic model. Given current hydraulics and channel topography there is high likelihood of low flow channel engagement. Wood for roughness and cover can be considered during future design phases.	A8 and A9 have been adjusted to reduce the potential for creating a channel-spanning jam. Additional analysis of hydraulic effect will occur during the 30% design.
	15	10/28/2014	General - A	Matt Wilberding (YNF)	Per YN conversation with NSD, side channels have been taken off the table. For clarification here are our overarching thoughts: all side channels not entirely on CDLT property have been taken off the table due to lack of USFS participation. That appears to be all side channels on Sheet A2. Additionally, any off channel work (PS1C) that appears to be difficult to permit (due to disturbing wetlands, spoils disposal, etc) has also been taken off the table for now (only channel on Sheet A3). Last page for Stormy A (Sheet A4) has a proposed alcove. That is currently still on the table.	Comment noted.	Follow up meeting with YN indicated that side channels GS1 and PS2 are removed from consideration.
	16	11/20/2014	PS1c	Tech Team	PS1c-consider opening inlet (depth) just enough to encourage intermittent flushing	Assuming "intermittent flushing" means connecting to the 1-year flow, see profile in attached ppt which shows up to 3 feet of cut for 100 feet and less than 2 feet for 200 feet, limits impacts to downstream portion of PS1 (hand-crew excavation of high spots, if not beaver-felled trees appearing in LiDAR), and corresponds to an approximate volume of 450 CY. This appears to be a viable option, if the landowner decides the cost and impacts of a perennial side channel are not justified for the benefits (summer and winter habitat). (Recall, as of November 2014, PS1c was one of only four potential perennial side channels and the only perennial side channel in the Stormy Reach.) We are looking forward to hearing about David Morgan's field assessment of PS1c, which he was planning to do in November 2014.	Per Design Team guidance, PS1c is remaining a perennial flow channel.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Stormy Reach - Project Area A	17	11/20/2014	A7.4	Tech Team	A7.4-move up to increase influence at inlet and increase pool depth	Moving this LWM structure upstream would locate the jam immediately across from the existing right bank jam. This would create a channel constriction and a higher potential for racking and formation of a channel spanning jam. A7.4 will remain in the proposed location based on feedback from the Yakama Nation. B7.5 will be structured to provide continuous wood between the B7.5 location and the A7.4 jam.	A7.4 will remain as shown in conceptual plan.
	18	11/20/2014	B5/B6	Tech Team	Extend B5 and B6 treatment upstream, add roughness to bar	These treatments will be extended upstream but will be designed to avoid construction damage to existing vegetation and will incorporate existing LWM onsite.	B5 and B6 treatments will be extended upstream.
	19	11/20/2014	B3.4	Tech Team	Increase size/effect of B3.4	Agreed. The B3.4 habitat structure will be sized to provide additional cover and complexity at this pool location.	B3.4 has been enlarged to meet YN and TT goals.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	20	11/20/2014	PS2a	Tech Team	PS2-consider going deeper to access lower flow, ensure low impact approach to excavation	Our overall goal is to apply the minumum effort to achieve the targeted habitat conditions. Our design group is taking the following heirarchal approach to the formation and maintenance of side channels and alcoves: 1) install LWM to deflect flows into existing or proposed alcoves to promote scour, formation, and maintenance of the feature; 2) excavate pilot channels to allow targeted habitat flows to scour, form, and maintain the feature; 3) excavate full channels to targeted habitat flows to scour, form, and maintain the feature.	PS2 has been removed per USFS and YN request.
	21	12/5/2014	B3.4	Tom Desgroseillier	B3.4 – Recommend maximizing cover provided by woody material at this location.	We agree. A larger habitat structure will be designed for this location.	B3.4 has been enlarged to meet YN and TT goals.
	22	12/5/2014	B7.5	Tom Desgroseillier	B7.5 – Recommend additional wood be placed along bank upstream toward A7.4 (see Tech Team recommendation of moving A7.4 upstream).	A7.4 will remain in the proposed location based on feedback from the Yakama Nation. B7.5 will be structured to provide continuous wood between the B7.5 location and the A7.4 jam.	B7.4 will remain as shown in the conceptual plans.
	23	12/5/2014	PS1c	Tom Desgroseillier	PS1C – In addition to Tech Team comments, would recommend excavation of the lower channel to increase off-channel habitat available at base flow. Further recommend wood placement within excavated lower channel to provide cover.	As proposed PS1C will function as a perennial flow channel. This will require the excavation of the lower channel to improve hydraulic function, and the inclusion of wood within the channel to provide habitat complexity.	PS1c will function as a perennial flow channel per DT recommendations.
	24	12/10/2014	A3/A4	Tributary Committee	In general, reviewers support the concepts presented to the Committees. They recognize that lateral migration opportunities are limited and they support activation of side channels. That said, they questioned the benefits of the main channel jams as illustrated on Plan Drawing A1 (specific to project areas A3 and A4). Several jams are identified, but reviewers do not fully understand the intent of these structures.	Throughout the Stormy and Gray Reaches the mid-channel jams are typically apex jams that have the following objectives: Hard point to split flow as mid-channel jams and at the head of gravel bars; and in association with side channel and alcove elements; large/stable key members; integrate live plantings for long-term stability where appropriate. Locally raise WSEL, encourage and accectuate bend hydraulics where appropriate to induce scour and lateral migration; create pool habitat.	Comment Noted.
	25	12/10/2014	GS1	Yakama Nation	USFS has requested that GS1 be removed. YN supports this request. Please remove GS1 from consideration.	GS1 has been removed.	GS1 has been removed per USFS and YN request.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	26	12/10/2014	PS2	Yakama Nation	USFS has requested that PS2 be removed. YN supports this request. Please remove PS2 from consideration.	PS2 has been removed.	PS2 has been removed per USFS and YN request.
	27	12/10/2014	A.6	Yakama Nation	Move A.6 upstream per USFS request.	With the removal of GS1 structure A.6 has been repositioned upstream to function primarily as a local habitat enhancing wood jam.	A.6 has been moved upstream per USFS and YN request.
	28	12/10/2014	A.5	Yakama Nation	Move A.5 upstream per USFS request.	With the removal of GS1 structure A.5 has been repositioned upstream to function primarily as a local habitat enhancing wood jam.	A.5 has been moved upstream per USFS and YN request.
	29	12/10/2014	A5	Yakama Nation	Remove A5 to avoid forcing channel migration to river left and at ERR.	A5 has been removed downstream per YN request.	A5 has been removed downstream per YN request.
	30	12/10/2014	A2	Yakama Nation	Move A2 downstream to avoid construction impacts to vegetation.	Structure A2 has been moved downstream to a location with less mature riparian vegetation. With the Removal of side channel PS2, structure A2 no longer will function to deflect flows into the proposed side channel. This structure will primarily provide local habitat enhancement.	A2 has been moved downstream per USFS and YN request.
	31	12/10/2014	A2.5	Yakama Nation	At USFS request please remove A2.5 from consideration. The USFS is concerned that A2.5 could deflect flows to river right and into unstable banks towards the Entiat River Road.	A2.5 has been removed per USFS and YN request.	A2.5 has been removed per USFS and YN request.
	32	12/10/2014	A7.4	Yakama Nation	Do not move A7.4 upstream as requested by the TT. This TT recommendation would create a greater risk of channel spanning blockages.	A7.4 will remain as shown in conceptual plan per YN request.	A7.4 will remain as shown in conceptual plan per YN request.
	33	12/10/2014	B13.5	Yakama Nation	Add habitat logs in right channel split flow area.	Additional habitat logs will be added within the split flow channel to provide cover.	Additional habitat logs will be added to final concept plan.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	34	12/10/2014	A8/A9	Yakama Nation	Add habitat logs in right channel split flow area.	Additional habitat logs will be added within the split flow channel to provide cover.	Additional habitat logs will be added to the final concept plan.
	35	12/10/2014	General - A	Yakama Nation	Design LWM structures to 100-year flow event.	The ICF Team has agreed to use the 100-year flow event as the design standard.	The ICF Team has agreed to use the 100-year flow event as the design standard.
	36	12/10/2014	General - A	Yakama Nation	Minimize risk of LWM to recreational boaters. Include elements such as bumper logs, flat upstream faces, and adjusted structure orientation into the designs.	Risk minimization elements will be added to the LWM structures during the 30% design stage.	Risk minimization elements will be added to the LWM structures during the 30% design stage.
	37	12/10/2014	General - A	Yakama Nation	YN requests that structures be low-profile with low pile heights.	The ICF Team will incorporate this request into structure design while as feasible while retaining overall structure function and stability goals.	The ICF Team will incorporate this request into structure design while as feasible while retaining overall structure function and stability goals.
	38	12/10/2014	General - A	Yakama Nation	YN supports the goal of having LWM structures engaged at low summer flow.	Comment Noted.	Comment Noted.
	39	12/10/2014	General - A	USFS	Concerned about maintaning channel capacity given the expected increase in sediment load during high runoff due to the 2014 fires upstream of the project area.	Project area A features are located approximately 0.5- to 1.0-mile downstream from the Dill Creek alluvial fan and associated grade change from Valley Segment 2 and 3 (as defined by Entiat Tributary Assessement (BOR, 2009)). Sediment load associated with 2014 fires moving as bedload is expected to be deposited well upstream of Project area A and proximate to the change in channel slope due to the decreased channel transport capacity at this location (compared to Valley Segment 3). Sediment load associated with 2014 fires moving as washload is not expected to significantly affect channel capacity and will be transported through the reach over time.	Comment Noted.
	40	12/10/2014	A8/A9	Yakama Nation	reduce risk of these two strutures forming/racking channel spanning or strainer logs.	We will evaluate structue size and positioning to reduce the risk of racking channel-spanning wood.	A8 and A9 have been refined to reduce the potential for racking channel-spanning logs.
	41	12/10/2014	A2	RTT	Will deflector A2 split flow into proposed excavated side channel? Perhaps less excavation could take place and the top part of the side channel could naturally avulse?	Per the request from the YN and USFS, this structure has been relocated to minimize construction impacts to vegetation. Channel PS2 is also no longer part of the design plan.	A2 has been moved downstream per USFS and YN request.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area A
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	42	12/10/2014	PS3	RTT	Similar comment as above - deflector B17 will encourage avulsion towards PS3. Should less excavation of PS3 take place since the area will likely avulse?	B17 will only induce scour and migration through the PS3 connection. While excavation in the lower 100' of the alcove can be minimized due to this expected effect, the excavation in the upper PS3 will be necessary to improve fish access and use.	No changes to PS3.
	43	12/9/2014	PS1c	Design Team	General consensus to maintain perennial channel design (with fall back to intermittent) until permitting discussion w/ DOE	The ICF Team will move forward with the perennial channel design for PS1C.	PS1c will function as a perennial flow channel per DT recommendations.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	10/28/2014	Bremer Levee	D Morgan- CDLT	Would like to see more details about option to remove all levee material down to base elevation combined with not filling in the current channel, in order to allow natural process and habitat formation to occur on its own.	The option to only remove levee material and riprap were discussed during the December 9, 2014 Design Team meeting. David Morgan was present at the meeting and participated in the discussion. The conclusion of the discussion was to keep the channel relocation alternative (Alternative A) as the preferred alternative and further develop the design during the 30% design phase.	Alternative A - full levee removal and channel realignment is the preferred alternative per Design Team guidance.
	2	10/28/2014	Bremer Levee	D Morgan- CDLT	Need to know estimated lifespan for jams installed in new channel; compare to time needed to establish mature trees on floodplain; decide whether buried jams needed in path of future lateral erosion	Functional lifespan of ELJs will vary between 25-50-yrs and is dependent on degree on interaction with the main channel (ie. logjams frequently/constantly engaged will have slower decay rates that wood located along the margins and floodplain). Logjams successfully planted with fast growing forest species (cottonwood and douglas fir) will offer the longest term permanence as stable hard points. Buried logjams located within floodplain can be considered but may conflict with BPA funding priorities for achieving immediate habitat benefit. DMorgan: OK but we need analysis/ prediction about lateral migration rate in new channel, and must combine with planting plan incorporating where erosion will go and what'll happen when it gets there	Additional channel migration analysis below the Bremer levee will be conducted during the 30% design phase.
	3	12/11/2014	Bremer Levee	D Morgan- CDLT	May have found several stable anchor trees near Bremer which appear meet criteria Leif passed along in response to recent request. Let's discuss soon. Recent visit /w CCNRD reinforced need to discuss access, staging, and other issues at Bremer in greater detail very soon.	The ICF Team is planning on working closely with the all project sponsors to identify and acquire LWM for their projects.	The Design Team will lead the wood procurement process.
	4	10/28/2014	Bremer Levee	D Morgan- CDLT	Can new channel alignment preserve all large trees already on site (future LWD source)?	Yes, a modification of Alternative A was discussed in the field that preserves the majority of existing mature trees on the left bank of the new channel. This revised Alt A was presented at the December Design Team meeting for review. Note that it is not be possible to preserve all large trees, but the modification to Alt A would preserve most of the mature trees.	Alternative A - full levee removal and channel realignment is the preferred alternative per Design Team guidance.
	5	10/28/2014	Bremer Levee	D Morgan- CDLT	Will need more detail re: future channel response d/s of levee project; must ensure Jean and others won't someday feel like "CDLT's project caused my property to erode and they never asked me"	Need clarification on what is being requested regarding future channel response. Is the question regarding near term (e.g., 10 years or sooner) or very long term (100 years or longer). Channel response will take many years to progress to Jean's property. DMorgan: Can we use hydrograph (last 30 yrs) plus 2-D model to estimate channel responsee on Jean for two end dates: 2025 and 2050? Fully supportive of project objectives but want to have more to go on than conceptual blue wavy line. ICF Team: The ICF Team will work with Reclamation to assess future channel meander conditions.	Additional channel migration analysis below the Bremer levee will be conducted during the 30% design phase.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	6	10/28/2014	Bremer Levee	Kane	Consider placing (low) pilings into existing channel to facilitate aggradation, bar formation and seasonal side channel development (Paul Devries has used this with success on Skykomish River with Snohomish County.	The placement of the LWM structures at the head of the existing channel is intended to function similar to the “flood fence” designs that R2 has implemented with success on the Skykomish. The proposed LWM structures will also be pile based but will provide additional habitat complexity over a simpler pile solution. Additional LWM features will be added to the new side channel as the design progresses and some of these structures are likely to be similar to the “flood fence” configuration.	As part of the 30% design of Alternative A additional LWM will be incorporated into the existing channel to create the desired aggradation effects.
	7	10/28/2014	B19/B24	Kane	B19-24-Consider placing pilings and whole trees in field just east of existing vegetated bank of proposed new channel.	Structures B19-24 will be “woven” between existing mature trees with pile placement as needed to improve lateral stability. This treatment should prove adequate to ensure 10 -20 year stability of new left bank to protect riparian regeneration. If additional wood is desired to the east of these structures we should discuss the intent in association with any additional floodplain enhancement measures that may be designed (e.g. wetland swale development).	These structures will maintain existing vegetation and bank structure.
	8	10/28/2014	Bremer Levee	Kane	Consider leaving a portion of access road in historic channel location to encourage a tighter radius meander, provide existing vegetative cover and facilitate meander development on low right bank floodplain. This could also provide additional floodplain reveg to develop in field prior to migration into that area.	This approach has been applied to an updated version of Alternative A and was presented at the December Design Team meeting. DMorgan: Good point and can we consider ways to put more water on lower end of Bremer floodplain on d/s end (lower surface)? ICF Team: The 2D modeling of proposed conditions during the 30% design phase will inform the effort of improving floodplain flood activation.	Additional design refinement will occur during the 30% design process.
	9	10/28/2014	Bremer Levee	Kane	Proposed new alignment is probably more aggressive than permit agencies and others will want to consider.	This was confirmed during the permitting tour with Corps and Ecology representatives. The proposed over excavation and placement of fill within wetlands and waters of the U.S. associated with Alt A would not fit within an existing NWP, and may require mitigation for those impacts (which is anticipated to be onsite and part of the overall project, thus self mitigating). As this design element moves forward, the Design Team will continue to work with the resource agencies and address their concerns regarding impacts.	Comment Noted.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Stormy Reach - Project Area B	10	10/28/2014	B18/B18.5	Kane	Consider LWD structure to north of B18 and 18.5 as to how it would work with Alt A as this is an existing pool with an existing high flow side channel outlet.	Comment noted. As Alternative A evolves additional wood structures will be designed to ensure that the overall intent is met. The existing pool is directly related to the eddying that occurs when flow hits the riprapped levee. The future configuration will encourage flow to pass through the area with much less change in direction so the size of the scour pool at that location is likely to decrease even with LWM structures.	Refinement to LWM structure placement will occur during the 30% design process.
	11	10/28/2014	Bremer Levee	Kane	Alt A cross-section-see previous comment. Supportive of constructed channel as depicted. Planting riparian vegetation on levee remains and in existing channel will require thoughtful attention to avoid washing out plants or burying them. Consider using stinger to plant riparian type (Cose, salix, Poba) to ~4' depths and allowing for at least 2' above ground.	The design team fully supports the use of larger plant material and deep mechanical installation within riverine environments. As the Bremer alternative progresses in design we will apply this planting method where appropriate.	Additional design refinement will occur during the 30% design process.
	12	10/28/2014	A11/A11.5	Kane	A11-11.5. Consider standard type LWD construction in this location with access along left bank bars at low water with helicopter log delivery. Consider whole trees, small brush and tree tops as LWD components. Also large P. pine and D. fir on CDLT up land west of AL1 could be a source for large whole trees (would need excavator access from Jean). Smaller whole trees available from other adjacent CDLT property.	Construction feasibility and methods will be refined during conceptual design phases. Present access limited logjams are shown to be conservative regarding size and placement of structures to achieve the desired geomorphic/habitat effect. Noted wood sources to offer good potential for application as described.	Access and construction staging will be incorporated into the 30% design phase.
	13	10/28/2014	AL1	Kane	AL1. Appears to have high risk of sedimentation in proposed excavation area. Do not depict as trapezoidal shape for presentations to RTT unless that is what is intended to be built.	The design team would like to discuss in greater detail the concerns of potential sedimentation in the proposed constructed channel area. Comment re: RTT presentations noted. Will convey focus of current concept designs when presenting.	AL1 geometry will be refinded during 30% design process.
	14	10/28/2014	Bremer Levee	Kane	Consider including reforestation/terrascaping of field as part of 30% designs.	This will be part of the 30% design effort.	Additional design refinement will occur during the 30% design process.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	15	10/28/2014	Bremer Levee	NOAA comment on tour	Alt A-No fill allowed to be placed in existing channel according to HIP 3 and Sec. 7.	Noted. It's expected that HIP 3 will be used for this consultation as it allows for channel reconstruction activities. The ICF Team will work with BPA and the Services if HIP 3 restricts the amount of channel fill allowed and the designs will be adjusted accordingly and/or a variance to HIP 3 will be requested.	Comment Noted.
	16	10/28/2014	Bremer Levee	ACOE comments on permit tour	Alt A-Remove all human placed fill and haul off.	Most human-placed fill is native alluvial gravel previously excavated from the site and is expected good material to use in converting the main channel to a side channel. The angular quarry rock that makes up the riprap facing along the levee will be removed and hauled offsite. Disposal of excess native alluvial fill material on site above the 100yr floodplain and outside of wetlands should be considered for cost reduction.	Comment Noted.
	17	11/20/2014	Bremer Levee	Tech Team	Bremer levee-scratch in pilot channel in historic alignment in combo with levee removal and AGGRESSIVE roughness in existing channel (in lieu of fill), could use alluvium excavated material to create a riffle in existing alignment.	This alternative would include more risk regarding how the channel will evolve, and could be problematic for several years as the main channel is choked with wood but the new channel has not yet eroded to full size (e.g., what channel would boaters use in the interim). Additionally, this alternative includes the same construction requirements and many of the same permitting difficulties as Alternative A, so it would probably not be less expensive to design, permit, and construct than Alt A. Alternatve A is considered the most reliable approach to create the desired habitat at this location.	Alternative A - full levee removal and channel realignment is the preferred alternative per Design Team guidance.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	18	11/20/2014	AL1	Tech Team	AL1-could extend channel through 10 yr inundated area to provide an inlet? Seasonal connection for intermittent flushing? Could connect to existing 2yr inundated area? If doing work here, bolster natural jam in vicinity	This was an idea proposed early in the concept development process and was discarded based on the Design Team's lack of support for this option (September 2014 meeting) because the mainstem is already migrating in that direction and proposed LWM placement should continue that trend. That said, floodplain connectivity is limited through this reach, and we support consideration of a SS at this location (assuming doing so is consistent with the nearby Bremer Levee improvements). Based on the profile in the attached PPT file, a SS and even a PS may be viable at this location. An important consideration in assessing the viability of an upstream connection would be stranding potential in the floodplain pond if the inlet were dry and water levels in the pond receded below its proposed outlet. If it is determined that stranding potential in the pond is small, or the pond could support juvenile salmonids even if disconnected, and the landowner and sponsor concur anticipated benefits outweigh excavation impacts, further evaluation would be needed to assess sedimentation risk to the alignment and pond, avulsion risk, and impact (via flow split or avulsion) on Bremer Levee action.	AL1 will remain a backwater/groundwater fed alcove.
	19	12/5/2014	B17	Mike Knutson	B17 – Consider alteration or removal of this structure. In several instances, it appears that we are trying to force an already very mature meander bend with high tortuosity even more torturous by forcing the bend early in the meander. It would be preferred to see this type of forcing lower in the bottom of these mature meander bends to help stabilize them and burn hydraulic energy at the end rather than the beginning of the meander. There is an excellent pool and natural log jam on this meander now and the proposed action may nullify this. Consider another approach in which we work with the existing natural structure in the latter portion of this meander.	The B15.5-B17 and larger meander series logjam type are intended to strongly encourage lateral migration and not to stabilize current bend locations. Increased tortuosity (through lateral migration) is a major goal of the project to re-engage natural channel forming processes. Current structure locations are anticipated to cause north and westward channel migration that will affect the natural logjam in the lower bend over time. In this location lateral channel migration is anticipated to recruit intermediate to mature second growth riparian trees to the channel that will likely rack on natural logjam in the lower bend, creating a larger, deeper and more complex pool habitat. To ensure recruited wood will rack on the natural logjam, this location will be bolstered with driven piles and whole trees.	
	20	12/5/2014	Bremer Levee	Mike Knutson	Bremer Levee – Consider excavation to 1-yr or lower floodplain level within Bremer levee footprint to simulate more dynamic bar feature rather than floodplain. Also, consider adding large wood structures within this footprint area and into existing channel as this area is already being disturbed.	This will be considered as the design moves forward and will be included in the 30% design if it appears beneficial. Additional large wood structures are anticipated to be included as the design progresses. Specifics regarding site grading will be dependant on results of hydraulic modeling, potential morphological responses, and types of vegetation/habitats to be created.	Additional design refinement will occur during the 30% design process.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area B
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	21	12/10/2014	Bremer Levee	RTT	Prefer lightest handed approach (Alt C) - can't recall from presentation why the heavier handed approaches A and B are being considered.	Alternative B is no longer being considered, and Alternative C has been put on hold at this time. Alternative A is being advanced based on discussion at the December 9, 2014 Design Team meeting. The Design Team, including representatives from the land owner and project sponsor, prefer Alternative A because it immediately creates the habitat and channel planform desired for the site. The Alt C (light touch approach) is acknowledged as being less expensive to construct and would simplify the permitting process; however, after construction it could take many years for Alt C to evolve into productive habitat and there is a risk that the channel may not evolve into a desired planform. Alternative A requires more design effort and more construction expense, but it provides a more reliable finished project when considering improvement to aquatic habitat.	Alternative A - full levee removal and channel realignment is the preferred alternative per Design Team guidance.
	22	12/10/2014	AL1	RTT	Similar to comments above, it appears that deflector A10.4 will encourage flow into the AL1. (Note: The RTT is recommending a lighter touch on AL1 and encouraging that A10.4 provide the hydraulic forces needed to open AL1. instead of excavation (Soden)).	The construction of A10.4 alone will not improve overall use and function of AL1 as off-channel habitat. Structure A10.4 is intended to improve the flushing of fine sediments at the outlet of AL1. This will improve hydraulic connectivity to the main channel. In order to improve fish use and access to the greater AL1 alcove the ICF Team is proposing the excavation of the alcove bottom. This is intended to lower the alcove bottom to increase seasonal inundation while resulting in a minimal disturbance to the existing riparian vegetation.	AL1 will remain a backwater/groundwater fed alcove.
	23	12/9/2014	Bremer Levee	Design Team	CDLT lean towards big alternative with full channel design. CCNRD need to decide about fill in the channel...general consensus to agree. Flesh out channel design within concept.	The ICF Team will design Alternative A as the preferred alternative for 30% designs.	Alternative A - full levee removal and channel realignment is the preferred alternative per Design Team guidance.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Stormy Reach - Project Area C
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	11/20/2014	A14.6	Tech Team	A14.6-support	Noted.	A14.7 has been removed per CCFEG request.
	2	11/20/2014	A18	Tech Team	A18-move across river, don't encourage river to move towards road in this location	A18 can be moved across the river but this will increase construction impacts and feasibility due to flow depths. Alternate locations for structure will be evalauted as part of final concept plans.	A18 has been relocted to river left per TT and CDLT request.
	3	11/20/2014	PS5	Tech Team	PS5-support for concept, could also connect from PS5 to 2 year inundated floodplain just downstream	PS5-AL3 Connecting Channel – We agree PS5 could be connected to the Q2 inundated floodplain just downstream (as shown in the image below), but, unless the landowner, sponsor, and Tech Team feel strongly otherwise, we're more inclined to stick with our proposed PS5 alignment for the following reasons: • Existing 2D model results already show good floodplain connectivity through this area • Primary function of proposed PS5 is to provide more and longer duration access to great existing downstream habitat (lower portion of PS5 which will remain untouched) • Connecting channel would likely divert flow away from where we need it (PS5 outlet which is currently causing fish stranding) to where we don't need it (summer 2014 ground-truthing identified excellent existing habitat in AL1 [which we did not want impact directly or indirectly]) • Construction impacts (including spoils disposal) may outweigh any additional benefits (dense veg, muddy, etc) That said, if requested, we are willing to do additional field reconnaissance in 2015 to investigate the feasibility of the comment.	PS 5 has remained as proposed. No connection to AL3 is recommended.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	4	11/20/2014	PS5	Tech Team	Recommend no pilot channel (comment from meeting added to comments)	We would like to keep both options (pilot channel or no pilot channel) open at this stage of the process. We see several upsides to creating a pilot channel, including the following: • Right now, stranding is occurring in PS5 and pilot channel will help to maintain an open outlet. • Pilot channel would be a more sustainable approach to reconnect and maintain outlet of PS5 compared to excavating a backchannel/alcove in the existing low area between the bar and right bank (outlet of PS5). • Adding pilot channel should not be a permitting issue or a spoils issue (little veg, little volume). • Adding a pilot channel would create habitat sooner and help reduce risk of flow being diverted toward Entiat River Road once wood is added – and meet the primary goal of connecting to outlet and reducing stranding.	Pilot channel has been retained per Design Team recommendation.
	5	11/20/2014	B45/B47	Tech Team	B45-B47-consider moving downstream	Will be evalauted as part of final concept plan. Present structures located to minimize impact to existing riparian vegetation, reduce bank erosion along left bank, and increase construction feasibility (lower flow depths). Moving structures downstrean may result in more vegetation disturbance and the need for access limited ELJs assembled with a helicopter.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.
	6	12/5/2014	General - C	Mike Knutson	Add more roughness/wood to existing side channel along road toe to slow and provide lower velocity habitat.	We agree. This work can be accomplished with easy construction access.	Additional LWM has been added to the existing side channel at RM 18.95.
	7	12/5/2014	A18	Mike Knutson	A18 – consider moving both across river and downstream to bank being eroded currently.	A18 has been removed from this location due to stakeholder concerns about possible effects related to channel migration to river left and towards the Entiat River Road. B18 has been relocated downstream and to river left to improve pool complexity.	A18 has been relocted to river left per TT and CDLT request.
	8	12/5/2014	A16	Mike Knutson	A16 – Be aggressive with structure to encourage side channel development on right bank that leads into large side channel complex.	Comment Noted.	A16 has been adjusted in association with the removal of A14.6 upstream.
	9	12/5/2014	B45/B47	Mike Knutson	B45 through B47 – Consider moving downstream to encourage scour near downstream bend.	The position of this structure series has been retained as shown in the November concept plans in order to avoid the construction impacts to intact riparian vegetation that would likely result from moving these structures downstream.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	10	12/5/2014	A12/A14.5	Matt Shales	Structures A12 thru A14.5 and in general the entire reach: We like the overall objective along this straight reach and would like to have the following considered. Since this reach is access limited and we are in general not supportive of artificial ballasted log jams (cable, chain, bolted etc.) we would like to exhaust all efforts to include pile anchored jams or very large single trees that could be countersunk and ballasted with streambed material. We also have some hesitation with regard to the amount of structures proposed and wondering how dependent of one other each structure is. Please consider smaller habitat actions along plain banks and gravel bars. If the private landowner decides not to participate and therefore allow access or construction to take place on their property, we may need to scale back and consider what could be accomplished solely on WADNR property.	Both the installation of piles and the ballasting of large logs with streambed material require the use and access of large excavators. The ICF Team assumes that new access roads through the Jean or CDLT property that removes mature riparian vegetation is not allowed which has pushed our design decision towards structure types that can be built without excavators. The access limited jams have worked nicely in similar situations on both the Cle Elum and Nooksack Rivers in 2014 and we believe that they would provide the habitat and geomorphic benefits desired on the Entiat while meeting the construction restrictions. The structures are sized to create local scour and pool deflection which can cause minor bank migration as desired. We can work with the CDLT on the position and quantity of structures to best meet the desired post-project conditions from both the landowner and project sponsor.	Remote access structures A12 - A14.5 have been refined per CCFEG comments.
	11	12/5/2014	AL2	Matt Shales	AL2: A year round connection throughout the extent of the drawn feature is preferred. Would like to monitor temperatures next season.	The AL2 improvements are only to remove several high spots along the channel to improve drainage, access during flood events, and to prevent fish stranding. Based on the 2D modeling and the proposed soil removal, fish access will be greatly improved during a 1-year event.	AL2 design remains as shown in the concept plans.
	12	12/5/2014	B28/B29	Matt Shales	B28 thru 29: Would like to see more wood incorporated into this channel to provide velocity breaks. It sounded like Tom D. suggested high velocities were contributing to a lack of juvenile fish use.	Additional large wood will be added to this perennial channel.	Additional LWM has been added to the existing side channel at RM 18.95.
	13	12/5/2014	A14.6	Matt Shales	A14.6 and Avulsion: I cannot provide much support for this concept at this time. Between the landowner and the utility, I feel it is best left alone for this effort.	Based on CCFEG input this element and the proposed forced avulsion has been removed from the design plans.	A14.7 has been removed per CCFEG request.
	14	12/5/2014	B32/B34	Matt Shales	B32 thru 34: Would like to see some bank sloping along this vertical bank to relieve some pressure at bankfull and increase floodplain connection. Except if sloping of the bank presents an increased risk to potential avulsion.	We plan to design the wood structures along this bank to reduce the need for excavation of the bank. The deep pool along this bank would make the necessary site isolation and dewatering difficult for bank sloping. The wood elements constructed here will improve habitat cover and bank stability without the bank sloping.	B32-B34 remain as shown in the concept plans. Additional design detail will occur during the 30% design phase.
	15	12/5/2014	A15/A17	Matt Shales	A15 thru A17: Would really like to see these structures have an effect on right bank to encourage wood recruitment and floodplain interaction. Recreational safety concerns with the tight spacing.	The intent of these structures is to encourage lateral channel migration and improved floodpain activation.	A15/A16 have been adjusted with respect to the removal of A14.6.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Stormy Reach - Project Area C	16	12/5/2014	PS5	Matt Shales	PS5 Make sure it is sustainable even if wood structures are not present.	During field visits, water was observed flowing into PS5's inlet at 600 cfs and perhaps as low as 350 cfs, and the outlet appears to have a surface water connection down to about the same flow. With excavation only (no LWM structures), we anticipate a similar surface water connection duration at the upstream end (although with more flow in the side channel). The results of the 2D hydraulic model will be used to evaluate the sediment transport capacity of the mainstem and side channel.	PS5 is retained in the Final Concept Design as a seasonal side channel.
	17	12/5/2014	A18	Matt Shales	A18: It seems like the left bank opposing A18 already has erosional forces acting on it, so if the sole purpose of that structure is to increase erosion it might not be warranted. On left bank where erosion is occurring/proposed by A18 consider driving piles to anchor whole trees along top of bank and allowing the boles to provide structure/cover to eroding bank.	A18 has been removed from the location shown in the November plans. We will evaluate the potential for constructing a similar structure in the location that you have noted.	A18 has been relocted to river left per TT and CDLT request.
	18	12/5/2014	B37/B39	Matt Shales	B37 thru 39: Suggestion from above. Consider piles to anchor whole trees to the top of bank and extend bole of tree along eroding bank	The small habitat jams will be pile based.	B37-B39 will be pile based structures.
	19	12/5/2014	A18.5/A18.8	Matt Shales	A18.5 thru 18.8: Is outlet of PS5 sustainable without 18.7? Is proposed excavated channel along gravel bar sustainable without opposing structures? It appears the treatment would straighten this reach. Need more discussion about this.	A18.5. - A18.7 along with the pilot channel excavation will work together to 1) Scour the outlet of PS5, and 2) adjust the main channel alignment away from the Entiat River Road.	A18.5 - A18.7:no changes.
	20	12/5/2014	B42/B44	Matt Shales	B42 thru 44: Need clarification on the purpose of these.	These small habitat structures are intended to provide complexity along the tall outer bank immediately upstream of the Stormy Preserve. These will include the placement of full trees or tree tops to simulate large wood recruitment.	B42 - B44: no changes.
	21	12/5/2014	B45/B46	Matt Shales	B45 thru 46: Would like to hear more about the function of this bend. Would it provide better habitat if it was allowed to lengthen instead of protected. Is the sediment from this bend contributing to less of a connection to the downstream alcove?	The lack of woody riparian vegetation along this outside bend has led to bank slumping which is likely a source of the large sand deposition at the outlet of alcove AL3. The B45-B47 series of jams is intended to restore natural rates of erosion that will reduce sediment recruitment in AL3 while protecting the establishment of native woody riparian vegetation that will restore long term migration and recuitment processes at Stormy Preserve. It should also be noted that site topography and 2D modeling output shows that during a 2-year event that flows cross this meander neck. Based on past avulsion evidence elsewhere in the Stormy Reach, this is a potential location for future channel avulsion. The installation of LWM and the restoration of a riparian forest at this location will reduce this avulsion potential.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	22	12/5/2014	General - C	Matt Shales	*The above comments are solely from CCFEG staff and board members. It is understood that CDLT, BPA, WADNR will be commenting separately and that we did not need to duplicate efforts. Unfortunately the Jean's have not provided comments; however, several of my comments were influenced from a conversation with them.	Comment Noted.	Comment noted.
	23	12/10/2014	A13.5	RTT	It appears A13.5 and A14 are the same	This typo has been corrected.	Change has been made.
	24	12/10/2014	B28/B29	RTT	It is not clear from the drawing how or at what flow structures B28 and B29 will be engaged.	These will be single logs placed into and across the exisitng perennial side channel. They will be engaged year-round as cover habitat.	Additional LWM has been added to the existing side channel at RM 18.95.
	25	12/10/2014	A14.6	RTT	Structure A14.6 appears to be desired to avulse the main part of the channel sharply to the right. The drawing shows no excavation of a new channel. I assume then that A14.6 will be a massive structure?	This structure has been removed at the request of the project sponsor (CCFEG).	A14.7 has been removed per CCFEG request.
	26	12/10/2014	PS5	RTT	Structure A17 will deflect flow to the upper part of PS5. Should there be less excavation near the top of PS5 so the deflected flow could avulse into the side channel?	Proposed excavation at the PS5 inlet is anticipated to be mostly clearing of small wood accumulated at the inlet. Should comparison of the proposed side channel to a recent survey of the channel thalweg (it's suspected that the LiDAR intercepted small woody debris rather than the channel thalweg) indicate that "true" excavation would be required, 2D modeling results will be used to re-evaluate the preferred inlet elevation of PS5 to achieve project goals while reducing potential impacts.	PS5 is retained in the Final Concept Design as a seasonal side channel.
	27	12/10/2014	B47	RTT	Structures B45-47 appear to be used to deflect flow (primarily B47) to the right. Why is such a drastic deflection in this location desired?	The deflection caused by B47 is to promote the scour of sands that have accumulated at the outlet of alcove AL3. In addition to this desired scour of AL 3 The lack of woody riparian vegetation along this outside bend has led to bank slumping which is likely a source of the large sand deposition at the outlet of alcove AL3. The B45-B47 series of jams is intended to restore natural rates of erosion that will reduce sediment recruitment in AL3 while protecting the establishment of native woody riparian vegetation that will restore long term migration and recuitment processes at Stormy Preserve. It should also be noted that site topography and 2D modeling output shows that during a 2-year event that flows cross this meander neck. Based on past avulsion evidence elsewhere in the Stormy Reach, this is a potential location for future channel avulsion. The installation of LWM and the restoration of a riparian forest at this location will reduce this avulsion potential.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	28	12/10/2014	A18.5/A18.6	RTT	Structures A18.5 and A18.6 will split and deflect flow towards the right. However, there are two areas of excavation shown where the main flow is anticipated going. Why?	The ICF Team recommends the excavation of a pilot channel through gravel bar on river right to promote the desired new channel path. This will ensure that the main channel once deflected will adopt a path towards the PS5 outlet and towards B18.7 resulting in the desired pathway away from the Entiat River Road.	A18.5 - A18.7:no changes.
	29	12/11/2014	General - C	D Morgan - CDLT	Not opposed to forcing avulsion on Jean just upstream of CDLT property (which appears inevitable) but need details about expected channel changes immediately downstream such as PS5; alluvial fans at Stormy and Shamel Creeks just d/s presumably would limit channel response, ditto the dense mature riparian forest along PS5 esp on its R side (I need to ground truth this), but would like to know what you think; CDLT would consider discussions with Jeans regarding changing the property boundary if that would facilitate this component, but based upon feedback from CCFEG it appears Jeans are not interested at this time	This structure and subsequent forced avulsion has been removed at the request of the project sponsor (CCFEG).	A14.7 has been removed per CCFEG request.
	30	12/11/2014	PS5	D Morgan - CDLT	PS5- have not had chance to ground truth this alignment yet; there is an older floodplain forest in the area (probably it's mostly NW of here?) where excavation/ disturbance may not be appropriate; before proceeding we need to discuss	Proposed excavation at the PS5 inlet is anticipated to be mostly clearing of small wood accumulated at the inlet.	PS5 is retained in the Final Concept Design as a seasonal side channel.
	31	12/11/2014	B45	D Morgan - CDLT	In vicinity of B45 would like to consider approach used at yurt site (LWD, recontour, significant cuttings, irrigation); site histories and geomorph are similar; yurt results looks very good esp compared to other less than successful approaches elsewhere - possible copy and paste? Need to consider this is the only "official" public use area in vicinity. In addition to safety risk analysis, may also need to consider esthetics to a greater degree. Pile-based approach here might dictate lower profile in order to improve esthetics in this particular location.	These design details will be incorporated as the project moves towards 30%. The ICF Team will work directly with the CDLT to meet the landower goals of function, safety, and aethetics.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.
	32	12/11/2014	A14.6/B32	D Morgan - CDLT	If we cannot do avulsion on Jean, unless we are confident it will happen on its own very soon, then B32 – B34 may need more than just wood. It's a too-high vertical bank; will probably require recontouring and reveg a la Yurt site. Same applies just downstream on river L below A18/ above B37. This peninsula was likely cleared for haying before CDLT bought it and although pioneering woody veg has taken hold it is a potential narrow d/s avulsion path right against ERR; limited root strength and too high relative to wsel to prevent bank sloughing on both u/s and d/s river bends	Based on topography and 2D modeling outputs it is evident that there is an avulsion risk at the neck of this bend. Structures B32-B34 will be designed to reduce this avulsion risk and the ICF Team is currently considering moving A18 to the downstream end of this meander neck. Details will be developed during 30% design.	A14.6 has been removed per CCD request. B32-B34 details will be developed during 30% design. A18 has been moved downstream to river left as described by the CDLT.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	33	12/9/2014	A14.7	Design Team	CCFEG received feedback from landowner that avulsion would not be acceptable. Compromise to remove A14.7, recommend leaving in for now an working with landowner. General consensus ok w/ recommendation.	A14.7 has been removed from consideration.	A14.7 has been removed per CCFEG request.
	34	12/9/2014	B45	Design Team	CDLT ok w/ moving DS but would like to limit disturbance to riparian vegetation, may require access limited jam. Moving DS may also create good interaction w/ valley wall creating complex hydraulics. General consensus ok w/ recommendation.	The B45 - B47 series will be re-evaluated during 30% design through assessment of 2D modeling outputs representing proposed conditions.	B45-B47 have been adjusted to reduce the B47 hydraulic influence and to reduce risk to boaters.
	35	12/9/2014	PS5	Design Team	i. Group discussion: keep pilot channel in mainstem ii. Do not include Tech Team's recommendation to provide high flow connection from PS5 to AL3	Comment Noted.	Pilot channel has been retained per Design Team recommendation. No connection between PS5 to AL3 has been made per DT recommendation.

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Gray Reach - Project Area D
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	10/28/2014	General - D	D Morgan- CDLT	CONFIDENTIAL INFO YOU NEED TO KNOW: CLDT may be able to buy Crone; please consider 2 options: a- as-is; b- house removed. Regarding the bridge, we favor removing it and associated fill. However, because CDLT essentially shares the bridge with 2 other parties, and we are uncertain about their willingness to agree, for now, you will also need to proceed with 2 bridge options. Our question for you is: how long do we have to negotiate with the neighbors?	We must know how to proceed with the bridge no later than June 15, 2015 to incorporate plans into the 60% design for permitting.	Comment noted.
	2	10/28/2014	PS6	D Morgan- CDLT	PS6: avulsion risk; do we need to add LHJ at head end?	The design team is aware of this potential risk. Based on observations from the October field visit, we are comfortable with this remaining a perennial channel. The avulsion risk will continue to be evaluated during subsequent analyses, 2D modeling, and design. Given the relatively similar slopes of the mainstem and PS6 (similar lengths and similar upstream and downstream elevations), we consider this a lower avulsion risk than other perennial side channels. As with PS1c, a suite of countermeasures can be considered to manage avulsion risk, as appropriate.	Changes to the PS6 side channel alignment have been incorporated per Tech Team and Design Team recommendations.
	3	10/28/2014	PS6	D Morgan- CDLT	Please consider relocating portions of PS6 to the nearly area of road fill which runs parallel and will have to be disturbed anyway when removed	The PS6 alignment could be modified if necessary. The proposed location connects existing areas that would provide immediate, high-quality fish habitat and groundwater inputs (based on existing piezometers). The proposed alignment also reduces the potential for fish stranding, relative to existing conditions. In addition, relocation of PS6 alignment away from the valley wall may reduce the likelihood to sustain pools and the effective “straight-lining” across the floodplain (i.e., steeper slope) may increase avulsion risk compared to the proposed alignment. However, due to permitting constraints associated with the potential wetland impacts the current alignment, a change following the road fill excavation area may be necessary. The team will work with the permitting agencies to determine the best balance of geomorphic considerations and permitting constraints. PS6-S is a secondary side channel that also follows a topographical low area to provide seasonal high flow habitat. We will look at the possibility of this alignment following the road fill removal area, but remain concerned about ending up with a straight section of channel.	Changes to the PS6 side channel alignment have been incorporated per Tech Team and Design Team recommendations.
	4	10/28/2014	PS6	D Morgan- CDLT	We agree there are pros and cons about how to approach PS6. We would like more discussion about biological benefit before having to decide (see generic comment above).	Decisions are not final until the design is final, although we request a high degree of certainty early in the design process to economize our efforts and ensure schedule deadlines are met. We assume more discussions are forthcoming on all design elements.	Changes to the PS6 side channel alignment have been incorporated per Tech Team and Design Team recommendations.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	5	10/28/2014	B55.4	D Morgan- CDLT	BB55.4: need analysis of how proposed erosion may interact with failing erosion control structures on opposite bank	Detailed 2D hydraulic analysis will be performed in conceptual design phases of project. Analysis will evaluate change in hydraulic parameters (depth, velocity, shear) necessary to estimate channel response and effects on existing structures.	Design adjustments to the B55.4 series will be made during the 30% design effort.
	6	10/28/2014	Bridge	Kane	Concept Plan Overview-Consider two alternative concepts for this site: one with bridge removal and one without bridge removal. A third alternative could develop if upstream landowner sold to CDLT and plans included mobile home and fill removal on left bank upstream of bridge.	The current concept proposal (October 7) proposes the most aggressive and beneficial action with regards to enhancing/restoring geomorphic processes and habitat development. As continued feedback is provided per landowner requirements then design changes will be made.	Full bridge removal is shown in the final conceptual plans.
	7	10/28/2014	Bridge	Kane	Consider removing most human-placed fill within floodplain, including bridge abutments. Consider installing temp bridge downstream of existing bridge for contractor access.	The October 7 concept plan proposes all of these elements as recommended. Items like temp bridge for access and existing bridge removal are anticipated features that are considered too detailed for the conceptual designs. They will be shown in the 30% draft design plan set.	Design details will be shown in the 30% design set.
	8	10/28/2014	PS6	Kane	PS6-Consider inlet elevation be designed so that low flows are not diverted down side channel. The inlet location might be on CDLT property. Need survey clarification of this property line. Flows between 350-500 cfs would target inundation for 2-3 months during spring flows at inlet. Side channel would be perennially connected at downstream end and only seasonally connected at upstream. Reduces risk of avulsion, spawning impacts and maintains regulated temperatures in side channel. Consider targeting 5-10% of flow rather than 20%.	Perennial side channels will be pursued where feasible and appropriate as a first priority per the objectives identified by the Tech Team. If risk and/or benefit provide compelling evidence for seasonal side channels and/or alcoves, these will be considered as an alternative to perennial. Results from the 2D hydraulic model for proposed conditions (including LWM structures) will help to evaluate the recommendations proposed in this comment.	PS6 is designed as a perennial flow channel as recommended by the Design Team.
	9	10/28/2014	PS6	Kane	PS6 and PS6-S-Consider the focus be on removing artificially placed fill to enhance natural wetlands and flow patterns in existing low areas rather than cutting PS6 channel as shown in concept. Consider removing road fill (parallel to stream) and building channel in its place to connect existing low features. This minimizes impacts to existing wetlands and encourages natural processes.	These points were echoed by the Corps and Ecology during the field tour and will be implemented where feasible. See response to related PS6 comments above.	Changes to the PS6 side channel alignment have been incorporated per Tech Team and Design Team recommendations.
	10	10/28/2014	Bridge	NOAA	Remove bridge, abutments and road approach fill.	The October 7 concept plan proposes all of these elements as recommended.	Full bridge removal is shown in the final conceptual plans.

Entiat River Gray and Stormy Reaches - Concept Design Comments

Responses Prepared by Reclamation, ICF, NSD, CH2M HILL

Gray Reach - Project Area D

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Gray Reach - Project Area D	11	10/28/2014	B46.8/B52	Duncan/Crone (landowner)	B46.8-52-Not interested in large wood structures in front yard bank. Wood pilings with log wall would be considered instead of natural looking type jams.	Only structures with hydraulic and/or habitat benefit will be included in the design unless required for risk mitigation.	B46.8-52 are shown in the final concepts.
	12	10/28/2014	PS6	Duncan/Crone (landowner)	PS6-Landowner voiced concern about channel avulsion thru this location and loss of existing waterfront. Also mentioned some type of “wildlife easement” at inlet location.	See response to related PS6 comments above. The design team will need to better understand any restrictions per the “wildlife easement” and is depending on the project sponsor to provide those sideboards.	Changes to the PS6 side channel alignment have been incorporated per Tech Team and Design Team recommendations.
	13	10/28/2014	AL5	WDOE	AL5-No excavation in recommended in existing wetland so as to allow wetland to filter road runoff prior to entering river.	Must weigh the benefit of filtering road runoff versus alcove habitat, but based on WDOE comments this proposed action will be difficult to obtain permits for.	AL5 has remained in the concept plans.
	14	11/20/2014	General - D	Tech Team	Tech Team Recommend not advancing concepts at this point but instead performing additional analyses and developing additional concepts. This may be the most attractive opportunity in the entire project, and justifies putting development of this area on a separate schedule from the rest of the project. Among additional analyses requested:	See responses below.	Project Area D concepts will advance until directed otherwise by the Executive Team.
	15	11/20/2014	Bridge	Tech Team	Explore cost of removing abutments vs leaving in place or cutting off footer.	Leaving the abutments in place includes risk because the abutment foundations are higher than the channel thalweg. If left in place, at some point the abutment foundations would become undermined and the abutment would fall into the river. The left abutment is presently being undermined, but over time as the channel adjusts the right bank abutment could encounter the same problem in the future. The cost to remove entire abutment vs. removing only the vertical wall portion of the abutment is essentially equal if all aspects of the removal are considered. Obtaining permits, creating plans&specs, and mobilizing a contractor to the site will be the same for each option. The difference in construction work between the two options is negligible, removing the entire abutment will include a larger quantity of concrete removal; however, removing only the vertical portion of the abutment will require more time because a sawcut will need to be done between the wall and the footing.	Full bridge removal is shown in the final conceptual plans.
	16	11/20/2014	PS6	Tech Team	Explore groundwater development potential.	The Golder groundwater report provides hisotical groundwater data collected from the existing wells onsite. The CCNRD has resumed data collection in 2014 at several of the well sites. Currently the project is proposed to provide perennial flow connectivity and is not reliant on groundwater for sustaining flows. If the goals of this side channel are changed to focus on seasonal groundwater contributions then this data will be relied on for design.	PS6 is designed as a perennial flow channel as recommended by the Design Team.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Gray Reach - Project Area D
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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Gray Reach	17	11/20/2014	PS6	Tech Team	Consider routing PS6 along fill alignment,	Note that the existing fill is pretty linear so any meanders (like those drawn on TT Comments - JS notes.pdf) would likely extend beyond the existing fill (due to excavation extent offsets). Like the other alignments, tradeoffs will need to be made between impacting existing trees, shrubs, and depressions and achieving the desired plan and profile. Changes to the PS6 alignment to better match this recommendation will be incorporated into the final conceptual plans.	PS6 is designed as a perennial flow channel as recommended by the Design Team.
	18	11/20/2014	PS6/A20.6	Tech Team	can A20.6 and PS6 inlet be shifted downstream to lower bank?	Inlet location: • Based on our field observations of flow paths in early July and October, the proposed upstream location and orientation appear to be more sustainable for a perennial side channel inlet than the Mapbook location. We feel the downstream location would be more prone to plugging with wood and bedload. • Also, based on field observations, we don't feel the upstream location would require that much additional excavation (The right bank elevation at both locations seemed generally the same. Note that we have requested additional survey data in the vicinity of the proposed inlet.) • We will continue to evaluate the best location for the inlet as the left bank landownership decisions are made, overall PS6 alignment is refined, and ground survey data becomes available. The proposed conditions hydraulic modeling can help inform the selected of LWM and the inlet locations.	The PS6 inlet remains as shown in the concept plans.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Gray Reach - Project Area D
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	19	11/20/2014	General - D	Tech Team	Are there other ways to take advantage of the large floodplain and increase its interactions with the river?	Other ways to potentially take advantage of the site to increase river-floodplain interactions: • We feel the existing proposed alignments meet the original (current) project goals and landowners' and sponsor's objectives. That said, we are open to developing additional alternatives (such as those proposed by the Tech Team) which may help address permitting agency concerns. Here are some brainstormed suggestions for each bank. • Left bank (individual or combined options): • If house were removed, riparian vegetation could be planted on the terrace and LWM not be placed on the left bank (or the left bank could receive a "Yurt Site treatment"), thus facilitating long-term wood recruitment. • AL5 could be changed to a SS. • LWM could be added downstream of the existing left abutment, forcing mainstem migration into the higher elevation right bank gravels and cobbles. • Right bank (individual or combined options): • Remove all fill and associated high spots on the right bank floodplain • "Overexcavate" bridge approach fill to create new inlet channel (seasonal or perennial) connecting to existing depressions. • Excavate new inlet channel near RM 17.6 toward existing depressions.	The ICF Team will explore additional PS6 alternatives at the direction of the Executive Team.
	20	12/5/2014	A20.5.A20.6	Mike Knutson	A20.5 and A20.6 – Move downstream to encourage side channel in natural low –right bank area.	Response repeated from similar Tech Team comment concerning PS6 inlet: • Based on our field observations of flow paths in early July and October, the proposed upstream location and orientation appear to be more sustainable for a perennial side channel inlet than the Mapbook location. We feel the downstream location would be more prone to plugging with wood and bedload. • Also, based on field observations, we don't feel the upstream location would require that much additional excavation (The right bank elevation at both locations seemed generally the same. Note that we have requested additional survey data in the vicinity of the proposed inlet.) • We will continue to evaluate the best location for the inlet as the left bank landownership decisions are made, overall PS6 alignment is refined, and ground survey data becomes available. The proposed conditions hydraulic modeling can help inform the selected of LWM and the inlet locations.	The PS6 inlet remains as shown in the concept plans.

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Gray Reach - Project Area D
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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	21	12/5/2014	Bridge	Mike Knutson	Consider economics of removal versus leaving bridge abutment foundations as potential habitat elements or buttresses.	The cost savings associated with leaving the abutments in place is minimal if the bridge superstructure is removed. Once permitting for removal of the superstructure is completed, and the construction contractor improves site access and installs other work items necessary to remove the superstructure, the abutments could be removed with minimal additional cost and doing so would remove artificial items from the river channel and floodplain. If the bridge abutments, including approach fill, are not considered negative to aquatic habitat, then it would be useful to look into the costs of removing the bridge entirely vs. the cost to improve the bridge so it is usable (currently the bridge lacks a full deck, has scour at the left abutment, and lacks a load rating).	Full bridge removal is shown in the final conceptual plans.
	22	12/5/2014	A22.5	Mike Knutson	A22.5 – Extend this structure and consider crib-type structure along highway embankment near RM 17.57 to protect highway, develop riparian buffer and habitat margin.	Overall the ICF Team has aimed to avoid proposed actions within the Entiat River Road prism unless necessary to protect the road from possible erosion risk. This structure was intended to provide deflection into the seasonal side channel on river right, but has now been removed from consideration for the following reasons: 1)Large colluvium along the road prism, steep bank, and water depths (~8') create difficult conditions for construciton of a LWM structure; 2) Structure A22 will provide the desired flow defelction into the seasonal side channel; 3) Removal of the proposed A22.5 structure will remove the need to work within the Entiat River Road prism and right of way and will remove the need to work through Chelan County Public Works review and approval processes; 4) The secondary goal of riparian plant establishment will be difficult to achieve given the large colluvium and high velocities (6-7fps @ 2yr event) along road prism create a difficult location for plant establishment.	A22.5 has been removed from consideration.
	23	12/5/2014	PS6	Mike Knutson	In re-defining alternatives, consider split flow here upwards of 50-50 or other through Area.	Comment noted. Current concept is for at least 20-percent of the flow (year-round) to be routed into PS6. Exact amount will be determined in part through reviewing the 2D hydraulic model results and the implications of the flow split on the mainstem and in the side channel.	Final Concept Plan includes PS8.
	24	12/10/2014	PS6	Tributary Committee	Finally, regarding Plan Drawing D1, removal of the fill is appropriate for floodplain activation. Reviewers do not favor channel excavation for the proposed perennial side channel if a historic channel already exists. If a historic channel does not exist, reviewers suggest that you allow the area to flood and carve out its own channel. This is considerably cheaper than excavating a channel. In addition, if deposition occurs at the entrance, which may occur in 5 or 10 years, then the benefit is lost.	Reviewing photos of Cottonwood Flats following the original clearing of that land for the subdivision indicates the site was heavily impacted. The proposed PS6 alignment was revised based on review comments to follow more of the fill alignment (thus accomplishing two goals at once - providing off-channel, perennial flow while reducing impacts to existing vegetation). Expect for a small excavation to increase connectivity to the depressional area near the hillslope, the existing depression closest to the hillslope is proposed to be retained in its existing condition.	The revised alignment of PS6 endorsed by the Design Team is incorporated into the Final Concept Plan.
	25	12/10/2014	PS6	RTT	Can the removal of road fill for the segment that is parallel to flow (perpendicular to road coming from bridge) just be breached in a few spots instead of removing the whole thing?	See response to Comment #24.	See response to Comment #24.

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Gray Reach - Project Area D
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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	26	12/9/2014	General - D	Design Team	iii. For January, keep pushing ahead with schedule. Group is fine with location and justification for current inlet, but make sure to reconsider inlet location (as appropriate) when realigning side channel to follow straight road fill reaches (including retaining split flow). iv. Group discussion on percent split. Keep in the 10 to 25 percent range from bankfull down to low flow.	Comment noted. This design direction will be incorporated into the Final Conceptual Plans (January 2015).	PS6 is designed as a perennial flow channel as recommended by the Design Team.
	27	12/9/2014	General - D	Design Team	Due to complexities, this project area may get pulled out of set w/ additional alternatives developed. Current inlet located based on field observations also a location for additional survey. How would design change if CDLT purchased ppty? Reduced wood treatment along left bank.	Comment Noted. Additional alternatives will be developed at the request of the Executive Team.	Comment Noted. Additional alternatives will be developed at the request of the Executive Team.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Gray Reach - Project Area E
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	11/20/2014	A23.5	Tech Team	A23.5 could me moved upstream, eliminate B64.7 or move to left bank. Focus of area should be on right floodplain.	The A23.5 throough A23.6 structure series has been redesigned to address Tech Team and stakeholder input. An additional structure has been placed on river left in association with A23.5 to promote flow deflection to river right. The B64.5 - B64.7 series on river right has been removed to allow main channel flows to the right of A23.6.	A23.5 through A23.6 have been adjusted per Tech Team and Design Team recommendations.
	2	12/5/2014	AL6	Tom Desgroseillier	AL6 – Recommend increasing the amount of wood for juvenile cover.	The wood shown in AL6 on the concept plans (Nov 2014) did not reflect the quantity of wood to be added to the Alcove. A specific quantity of wood will be shown at 30% design.	Additional wood will be incorporated into the AL6 design during 30% design.
	3	12/5/2014	General - E	Mike Knutson	General Comment – It appears that central focus of concept is around existing side channel on river left, whereas low area and existing alcove on downstream river right may have better long term habitat potential. Consider moving focus of concept away from highway and towards opportunities on river right.	We have revised the focus within this reach to allow flow deflection and channel meander to river right while still maintaining the function of the proposed PS7.5 side channel.	A23.5 through A23.6 have been adjusted per Tech Team and Design Team recommendations.
	4	12/5/2014	General - E	Mike Cushman	Corbaley property- We have only discussed project with Mike Kane. At this time I feel the habitat improvement here is secondary to any effort related to the cottonwood flats project, as Corbaley is part owner of the bridge and a portion of the left bank approach. It is my understanding that Mr. Kane is still in the process of working with this landowner with our support. Otherwise I agree with adding some habitat complexity in the area shown.	Comment Noted.	Comment noted.
	5	12/5/2014	General - E	Mike Cushman	Deskin – After a brief meeting on the 18th of November, the Deskin family is now willing to listen to possible project opportunities. The relevance of this change to the upstream property area (as opposed to the newly acquired Price property downstream) is that if you have any project ideas here, which have not already been identified, they should be presented in the final concept plan to initiate those discussions. It was suggested by the family that they are planning to utilize or develop the right bank property area, so any proposed treatments should keep this in mind – if this was the case, then an excavated side channel would probably be a tough sell.	The concepts from November 2014 will be revised to reflect Tech Team and Design Team input from December which includes landowner input as provided by the CCD.	Comment noted.
	6	12/5/2014	General - E	Mike Cushman	See CDLT comments. We agree with such project treatments.	Comment Noted. These proposed treatments will be incorporated into the Final Conceptual Plans in January 2015.	Comment noted.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Gray Reach - Project Area E	7	12/5/2014	General - E	Mike Cushman	The Deskin Family, as described above, is now interested in listening to project opportunities. Specifically, they saw the benefit of the side channel enhancement proposed here and are interested. However, this is currently an access point to the property, which they plan to continue to use. Any improvement to the channel would need to include some form of ingress/egress to the property, perhaps utilizing a culvert. At this time, the LO's didn't have any specific comments about the proposed log structures. They will be interested in seeing further detail. See also general comment from CCD below.	The PS7.5 side channel will remain on the Final Concept Plans and we will include a note about maintaining access from the Entiat River Road to the river across this side channel. Details of this access route will be worked out with the landowner during 30% design.	A note will be added to the PS7.5 side channel indicating that access from the Entiat River Road to the river will be maintained.
	8	12/10/2014	PS7.5	Tributary Committee	With regard to Plan Drawing E1, the entrance to the proposed perennial side channel (E3) may be challenging to obtain and possibly more difficult to maintain. Reviewers recognize the importance of activating side channels, but it appears the river is migrating away from the side channel entrance. In addition, it appears that the jam proposed at the entrance may actually reduce velocities and accelerate sediment deposition.	Based on field observations in July 2014, wood is already accumulating in the area where additional LWM is proposed, and existing wood is causing a flow split. The proposed side channel and LWM are intended to enhance this existing condition and take advantage of the low topography on the left bank to create a new perennial side channel. Once the landowner grants access to the site, the ICF Team will take a closer look. The 2D hydraulic model results for the proposed conditions will also help assess the potential for sedimentation.	With support from the Design Team based on landowner discussions to date and discussions between the ICF Team and Design Team at the December 9, 2014, Design Team meeting, PS7.5 is included in the Final Concept Plan.
	9	12/10/2014	PS7.5/A23.4	RTT	Structure A23 appears located to split flow (as indicated by blue arrows). Is it anticipated that A23.4 will not split flow into PS7.5? If so, perhaps less excavation can take place.	A23.4 is also intended to split flows into the PS7.5 inlet. Even with the proposed A23.4 structure a minimum amount of excavation needed to achieve perennial flows will be applied at this side channel.	A23.4 has been adjusted to better split flows into PS7.5. Additional adjustments will be made as necessary during 30% design.
	10	12/10/2014	B64.7	RTT	Why is there such a drastic deflection proposed by B64.7 and A23.6 towards the road (which creates the need for B66 to deflect it back right).	B64.7 has been moved downstream to act as a local habitat forming structure.	B64.7 has been moved downstream to act as a local habitat forming structure.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	11	12/11/2014	AL6	D Morgan - CDLT	Pleased that prescription here uses light touch and does not undo what is already functioning; willing to consider adding more LWD if disturbance is minimal; suggest LWD include significant limbs and smaller material for dense overhead cover	Additional wood will be included during the 30% design phase.	Additional wood will be included during the 30% design phase.
	12	12/12/2014	PS7.5	M Cushman - CCD	show a “maintain access” call out at the PS7.5 Deskin ingress off of Entiat RR.	This note will be added to the Final Concept Plans.	This note will be added to the Final Concept Plans.
	13	12/9/2014	PS7.5	Design Team	Deskin open to side channel idea; just asked for preservation of driving access (culvert or bridge); OK to show open channel just add note for culvert. John reminded the group that funders/agencies may have concerns with placement of a permanent structure in the floodplain. Jason shared land is owned by a Trust but initial discussions suggest there is interest in the side channel and LWM projects. John also pointed out that it would be good to get our boots on the ground if the landowner is willing now.	Comments noted.	Comments noted.

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Gray Reach - Project Area F
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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	1	11/20/2014	AL7	Tech Team	What is rationale for location of inlet for PS7?	We assume this comment is in reference to Mapbook AL7 (no work is proposed for Mapbook PS7). The inlet to Mapbook AL7 (proposed as a seasonal side channel) was located and oriented to work in conjunction with LWM on the left bank and to follow an existing depression observed in the field and REM. If changes proposed for the left bank LWM will no longer be expected to raise the mainstem water surface elevation, the proposed inlet to AL7 may be less viable as currently proposed. A profile of the Tech Team's proposed alignment (green line on "TT Comments - JS notes.pdf") is included in the attached ppt file. Based on the profile, an inlet which activates between the Q1 and Q2 events appears to be a viable option. The constructed inlet requires approximately 3 feet of excavation for 50 feet and less than 2 feet for approximately 250 feet resulting in a net total excavation of approximately 300 CY. One habitat consideration would be stranding potential along unexcavated portions of the alcove (see notes on profile).	An additional inlet to AL7 has been included per recommendation by the Tech Team. The original AL7 inlet has remained unchanged.
	2	11/20/2014	AL7	Tech Team	AL7 – new inlet – evaluate inlet and connection to AL7	See response to Comment 1 above .	An additional inlet to AL7 has been included per recommendation by the Tech Team. The original AL7 inlet has remained unchanged.
	3	11/20/2014	A25	Tech Team	A25 eliminated or moved across the river	A25 has been moved upstream and to river left to improve flow deflection to the new AL7 inlet.	A25 has been moved upstream and to river left to improve flow deflection to the new AL7 inlet.
	4	11/20/2014	A24/A26	Tech Team	Relocate initiation of significant lateral migration at complex A26-A24, move upstream to possibly connect to AL7. Keep first scallop associated with A26, consider using ELJs primarily for habitat vs hydraulic effect in this area. Concern is of significant risk in this area because of homes on river left.	The A26 and associated LWM jams have been redesigned to reduce the potential for flow deflection risk associated with the homes on river left. The structures will still create flow deflection towards the proposed AL7 inlet but with reduced hydraulic effect. A jam located on the right bank inlet of AL7-B will act to improve inlet flows at this location. It is our intent to look closely at the effects of the proposed LWM jams during the 2D modeling during the 30% design phase.	The A26-A26.8 series has been redesigned to address stakeholder concerns.
	5	11/20/2014	AL8	Tech Team	AL8-enhance existing channel at very upper end only, some cover added	We encourage the Tech Team to reconsider staying with the original proposal, if the goal is to provide habitat at lowest flows and a suitable spoil site is available. At 80 cfs in October, this site was a mud puddle. And, like the other Project Area F elements, these provide the last opportunity to access floodplain habitat before fish reach the steep, confined Lower Entiat.	AL8 has been modified to reduce the extent of excavation while maximizing habitat improvement (depth).

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	6	11/20/2014	PS8	Tech Team	PS8-add some cover at outlet, but no excavation. Low sustainability, difficult access, possible negative hyporheic impacts.	We understand the Q2 model results show PS8 is inundated. However, the primary design focus has been creation/improvement of low flow winter habitat. This is one of just four proposed perennial channels so we would strongly encourage keeping it. We see this as relatively easy construction access compared to other right bank sites, and, if the excavator crosses to build LWM structure A28, the access to PS8 is a non-issue. Existing vegetation is low quality. Construction level of effort is likely on the order of a single day for an excavator, and excavated material could be side cast on the hillslope. Biggest sustainability risks, from our perspective, would be beaver damming the area and reed canary grass growing back in. These seem justified given the potential small investment in construction and promising long-term benefits. Is the Tech Team seeing other sustainability risks? What is the negative hyporheic impact the Tech Team is anticipating?	PS8 has remained per Design Team recommendation.
	7	112/5/14	A24/A25	Mike Cushman	(Upstream treatments) Comments from the landowner thus far support treatments A24.5-A24.7. It was not clear as to their willingness for the ELJ's (A24 and A25). The District would like to know if the Tech team still saw value or need for such large scale treatments. In conjunction with A24, A25 seems a bit much due to the possible hydraulic effects, potential long-term maintenance need, and recreational use issues. Also, see CCD general comment about habitat treatments below.	The A24 and A25 structures have been redesigned per Tech Team and CCD comments.	The A24 and A25 structures have been redesigned per Tech Team and CCD comments.

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	8	112/5/14	A26	Mike Cushman	(Downstream treatments in front of residences) Concerns were expressed about the possible increase to flood risk in areas that are already inundated frequently. The Phillips (A26.6-A26.8) had these concerns, but felt possible bank treatments could be considered if they were to extend all along the bank up to A26.1 and increased the top of bank elevation to reduce flooding in this area. The side channel seemed like a good idea to the left bank landowners, but see comments from CDLT. The other comments I heard from landowners here was that this area is already a productive spawning ground with two large pools already in existence. They couldn't understand why the concepts would disturb these already functional areas to create new ones. The upstream landowner from Phillips (Thompson) has subdivided his property and the downstream meadow from the residence in now under new ownership as well as the associated right bank property upstream from CDLT. These new owners have not responded at this time, but it is my understanding that they plan to build along 190' of the left bank river front property in 2-3 years.	The LWM structures A26 - A26.8 have been redesigned to reduce the hydraulic effect/response and to minimize the increase of flood risk and flow deflection to river right. Additional hydraulic modeling of proposed conditions during the 30% desing phase will further inform this design approach. The ICF Team intends to work directly with the CCD and the landowners to explain the intended and expected effects of these structures during this next design phase.	The A26-A26.8 series has been redesigned to address stakeholder concerns.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
Gray Reach - Project Area F	9	112/5/14	General - E/F	Mike Cushman	CCD general comment – Fully acknowledging and appreciating the goals and objectives as identified, the District is not 100% convinced that the hydraulic goal of increasing lateral migration in these projects is as appropriate as other upstream project areas. The issues related to private ownership limits this potential, as well as the narrowing in the valley floor, and proximity to the grade control of the Potato Moraine. Installation of large structures with a design life of 25 to 50 years have a greater potential long-term maintenance need and/or risk. The District will need assurances to satisfy landowners in these areas that funding will be available to respond to maintenance needs, as they arise. As an alternative, in support of the IMW study, CCD would support "short-term" habitat treatments (single large trees or smaller habitat structures) with less hydraulic effects that further the goals and objectives of that study. "The ability of an effectiveness monitoring program to successfully detect watershed-scale changes in fish populations brought about by restoration actions requires the ability of the monitoring scientists to control, or at least strongly influence, the timing, location and magnitude of restoration activities" (2009 IMW Implementation Strategy, page 12). The IMW study quotes the need to influence the quantity and quality of habitats to provide the opportunity to monitor a response. As such, the District sees value in boosting habitat quantity and quality to support the IMW and it would appear that there are some opportunities here other than influencing long-term channel migration processes and possible boosts to flood plain connection – again, in this area disconnection is not as much of a problem as it is further upstream. These types of natural processes will continue regardless of the restoration efforts, especially when the right flood event occurs, and through the installation of single key-piece habitat logs. Other long term restoration activities should include riparian planting to realize benefits to channel migration and water quality.	The ICF Team has revised the design approach of the A24, A25, A26-A26.9 structures to reduce the hydraulic effects and potential for forced channel migration and erosion, while maintaining the structure goals of creating and maintaining local habitat complexity and improving the hydraulic connection to the AL 7 inlets.	The ICF Team has revised the design approach of the A24, A25, A26-A26.9 structures per stakeholder feedback.
	10	12/12/2014	A26.6/A26.8	Mike Cushman	Reassess and/or remove these structures from in front of house.	The A26.6 - A26.8 structures have been adjusted in association with revisions to the A26 - A26.2 structures.	The A26-A26.8 series has been redesigned to address stakeholder concerns.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	11	12/12/2014	AL7	Mike Cushman	Agree to include new AL7 inlet near RM 16.7.	Comment noted. The ICF Team will move forward with this concept for the Final Concept Plan.	AL7-A has been included per Tech Team recommendation.
	12	12/12/2014	AL7	Mike Cushman	Keep proposed AL7 inlet location across from Philips.	Comment noted. The ICF Team will move forward with this concept for the Final Concept Plan.	AL7-B inlet has been maintained.
	13	112/5/14	General - F	Mike Cushman	This landowner is still abroad (Enlow). I have not been able to discuss proposed left bank treatments. As soon as he returns I will provide comments. It is my understanding that CDLT has also reached out to this landowner to discuss possible acquisition. See CDLT comments related to work proposed on their property. The district is supportive of any effort to enhance or create off-channel habitat, perennial or seasonal. Also, the upstream neighbor (Phillips) expressed concerns regarding how the WDFW project was left unmaintained after completion. They felt this area should be improved as the described value of that project was never achieved. I have yet to confirm the desire to improve this area with Mr. Enlow (downstream landowner), for reasons as described above. The district also considers enhancements in these areas appropriate as they addresses the objective to maintain channel sinuosity. It is also a geomorphically appropriate area to contain woody debris along the bend. See CCD general comment	Structure A27.1 has been added and will build upon the failed WDFW barb at RM 16.4.	A27.1 has been added per CCD request.
	14	12/10/2014	A23/A24	RTT	It appears that A24 will deflect flow to the right and then A25 will deflect it back left, towards the road. Are we confident that we can “fine tune” the amount of flow deflected so it does not create problems for the road?	The A24 and A25 structures have been redesigned per Tech Team and CCD comments. The new location for A25 will work to deflect flows towards the new AL7-A inlet, while A24 has been adjusted to minimize resulting hydraulic effects on river left bank.	A24 and A25 have been revised per Tech Team recommendations.

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Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	15	12/10/2014	AL7/A26	RTT	Deflector A26 will deflect flow to the right, but it looks like it will intercept AL7 excavation. Should the excavation not occur in that area?	The excvation of the AL7-B inlet is necessary to allow annual inlet flows at this location. We consider this a pilot channel that will "daylight" flows to the exisiting AL7-B approximately 500' downstream from the inlet. The new A26 structure location will force flows into the inlet of AL7-B.	A26 has been relocated to river right to better defelct flows into the AL7-B inlet.
	16	12/10/2014	A27.4/B82	RTT	There are seven structures on the left bank in close proximity to each other. Most appear as habitat features, with some deflection too. Is this set up primarily for bank protection or habitat?	This series of structures will provide both habitat and protection. The current stream bank is lacking riparian vegetation with lawn up to the top of bank and actively slumping slopes. The wood structures will provide necessary stability to allow the establishment of woody riparian vegetation.	No changes have been made to the B79-B82 series.
	17	12/11/2014	PS8/AL8	D Morgan - CDLT	Like side channel work on both sides; like narrower channel at PS8; consider adding LWD and brush inside AL8 which as depicted appears to be wide channel; consider adding LWD to main channel near lower connection of PS8 and AL8; esp at AL8 the bank profile and ownership may be favorable and this could help ingress/ egress; have not discussed details about spoils yet; re: RCG in Area F, need to discuss but lean towards taking a chance even if uncertain about ability to reduce	LWM has been added to AL8 and the AL8 excavation has been narrowed. No additional LWM has been added to the PS8 outlet location, but the ICF Team will re-evaluate this area once the proposed conditions 2D modeling ins complete during 30% design.	LWM added to AL8. Spoil quantities will be estimated in 30% design phase to help inform discussions.
	18	12/11/2014	General - F	D Morgan - CDLT	Enloe is potentially interested in selling to CDLT; if we acquired property, house removal would have to be part of the project (CDLT will not own real estate); inundation map suggests potential for significant floodplain reconnection, additional project elements, and biological benefit if house removed; the upstream neighbor (Phillips) would also consider selling to CDLT; assume Enlow is higher priority/ Phillips by itself probably can't make for habitat restoration project; before we look for funding/ support will be helpful if you provide more detail on additional habitat actions/ biological benefits of this scenario; please advise	At the request of the Executive Team the ICF Team can work with the CDLT and the CCD through the Design Team process to explore what habitat actions would be appropriate if a change in ownership were to occur.	Comment noted.

Entiat River Gray and Stormy Reaches - Concept Design Comments
Responses Prepared by Reclamation, ICF, NSD, CH2M HILL
Gray Reach - Project Area F
6-Jan-15

Reach	Comment No.	Comment Date	Element No.	Author	Comment	ICF Team Response	Final Concept Decision
	19	12/11/2014	AL7/A26.1	D Morgan - CDLT	Like this approach; directs energy onto previously disturbed floodplain (probably haying) on CDLT rather than pvt property opposite CDLT; AL7 shows signs of having been active off channel habitat including beavers not long ago; presumably won't require much excavation to recreate; request old barbed wire fences in vicinity be removed as part of project; re: upper end of AL7, if landowner is opposed to excavation, consider modifying location to keep it all on CDLT; re: outlet maintenance, CDLT won't do maintenance itself but may allow others; generally encourages features that will be self-sustaining or at least long-term	Comment noted. The A26 structure series has been redesigned to address Tech Team and landowner concerns/inputs, but the AL7-B inlet has remained as previously designed. The ICF Team is expecting to "fine tune" this AL7-B inlet during the 30% design phase and additional adjustments to the A26 structure series are also made.	The A26-A26.8 series has been redesigned to address stakeholder concerns.
	20	12/9/2014	General - F	Design Team	Prepare alternative concept that assumes that the Phillips property has been purchased by the CDLT and the house is removed, and that the Enloe property has been purchased by the CDLT but the residence remains.	At the request of the Executive Team the ICF Team can work with the CDLT and the CCD through the Design Team process to explore what habitat actions would be appropriate if a change in ownership were to occur.	Comment noted.
	21	12/9/2014	A26/A26.1	Design Team	Reconfigure location of these jams to reduce risk to Philips property and to remove the need for the A26.5/A26.8 jam series.	These adjustments will be made to the Final Conceptual Plans and then further refined through the 30% design process.	The A26-A26.8 series has been redesigned to address stakeholder concerns.
	22	12/9/2014	PS8	Design Team	Keep PS8 in the concept plans.	Comment noted. The ICF Team will move forward with this concept for the Final Concept Plan.	PS8 has remained per Design Team recommendation.
	23	12/9/2014	AL7	Design Team	Include new inlet to AL7 as proposed by Technical Team.	Comment noted and acted on. New inlet profile shared with Design Team on December 9, 2014, and incorporated into Final Concept Plan.	New inlet added (AL7-A); previous inlet retained and renamed (AL7-B).

PRCC Habitat Funds
Project Specification Sheet

Date submitted: February 3, 2015

Project Sponsor: Chelan-Douglas Land Trust
Mickey Fleming Lands Project Manager
P.O. Box 4461
Wenatchee, WA 98807
509- 667-9708, mickey@cdlandtrust.org

Project Liaison: David Duvall, Grant PUD

Project Title: Lower Nason Side Channel RM 2.4

Project Type: Land acquisition

Location: 73 acres, streambank and side channel on lower Nason Creek, a tributary of the Wenatchee River, a tributary of the Columbia River.

Requested funding amount from PRCC Habitat Subcommittee: $177,000

Short description: Grant PUD acquired 62.71 acres with habitat funds in 2007. Under this proposal CDLT would take ownership. The GPUD property includes an historic side channel that connects to 10 acres at the rear of property owned by the McCartys, who are willing to sell for the appraised price of $105,000. (Note: the McCartys own 20 acres including a B&B located near the highway, all up for sale. When the B&B sells they will move out of the area. This proposal would split the property and CDLT would buy only the lower 10.) By unifying these parcels in ownership by CDLT, they can be managed together with significant potential for habitat restoration (Figure 1). These properties are surrounded by large areas of undeveloped forest (Figure 2).

Project description and justification:

Nason Creek is #1 Priority for both Protection and Restoration under the Upper Columbia Biological Strategy (2014). Side channel habitat is a primary consideration in this reach. The Bureau of Reclamation's 2011 Lower Nason Assessment shows a "hypothetical channel", (aka the 1936 channel) running through these properties as shown by LiDAR (Figure 1). Anecdotes suggest this oxbow was altered for stock watering at a dairy which operated in the area long ago. The earliest aerial photos we were able to obtain (1949 and 1969) corroborate this.

Currently it is a perennially inundated pond, up to approximately 1300' long, as wide as 30', with depth unknown, which during annual high flows is barely separated from Nason Creek by what appears to be a small dike at the downstream end (GPUD property; Figures 3, 4). The situation is probably similar on the upstream end (ie- McCarty) but due to dense vegetation, a mosaic of species and ages, it is difficult to determine

precisely what was altered long ago. Due to canopy closure especially on McCarty, in the aerial photos the area of open water is partially obscured. Even during low flows there are secondary swales with standing water and other channel scars throughout the area. Mr McCarty estimates that on the upstream end the distance between Nason Creek and the wetted oxbow is 50'.

The property is an excellent candidate for a combination of habitat protection and follow-up restoration work. Possible future restoration would excavate the high ground and reconnect the oxbow on one or both ends, primarily for increased juvenile rearing habitat and secondarily for high flow refugia for all life stages. To create a perennially flowing side channel it is possible that isolated humps of high ground would need to be removed to connect to the lower areas, after which flowing water would maintain the connections. Because the 1936 channel crosses the property line, both GPUD and McCarty properties would need to be included. The upstream landowner with frontage next to McCarty is interested in cooperating with this restoration, but it is not required. CCNRD is a logical partner for the oxbow reconnection and they are ready to assist. In 2008 Ben Lenz took Mike Kane to visit the oxbow, and in 2009 McCarty contacted Mike when the nearby N2 oxbow reconnection project was underway.

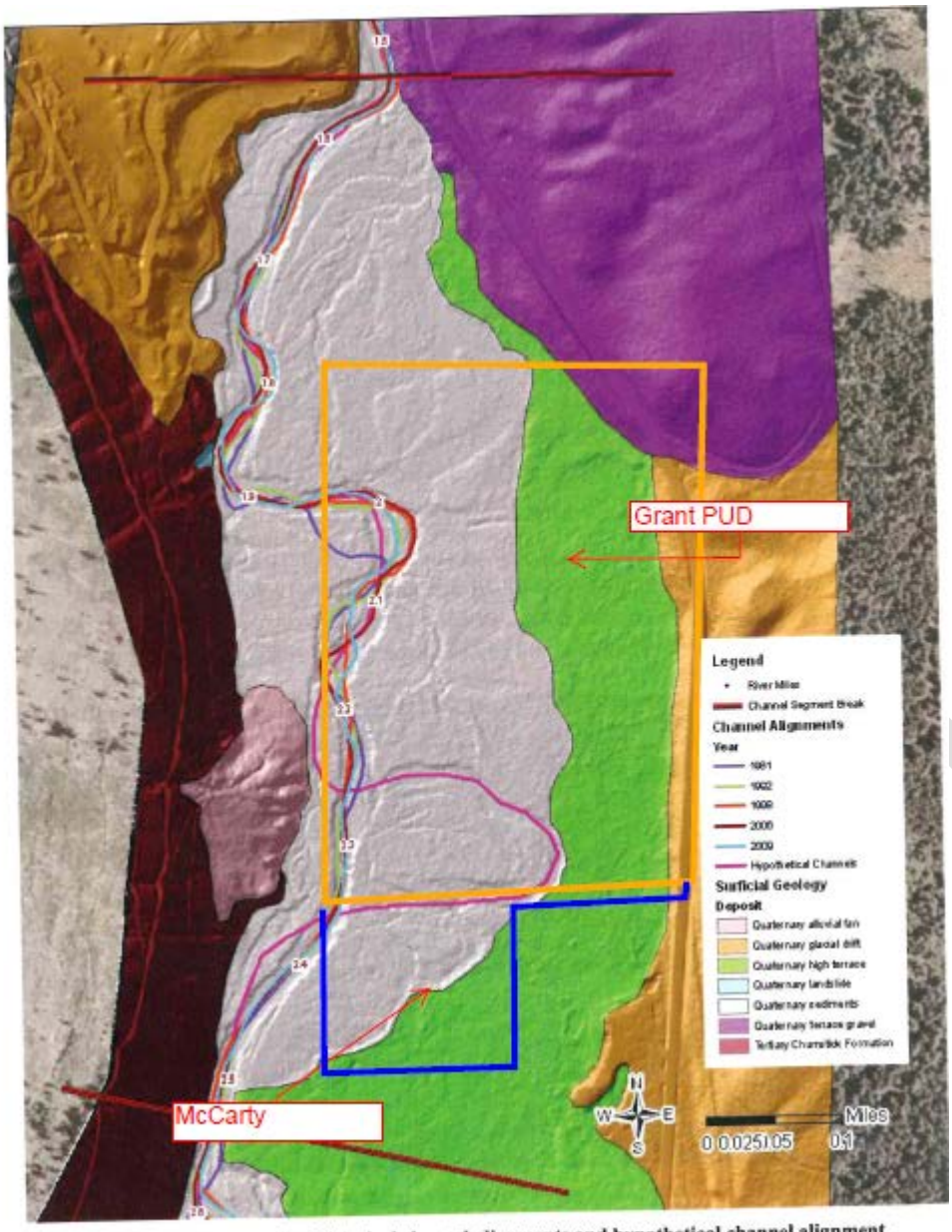

Figure 18. Channel Segment B: Historical channel alignments and hypothetical channel alignment interpreted from 2006 LiDAR hillshade

Figure 1. Bureau of Reclamation (2011) shows "hypothetical channel" close to current location of actual side channel disconnected by a small dike on Grant PUD property at downstream end.

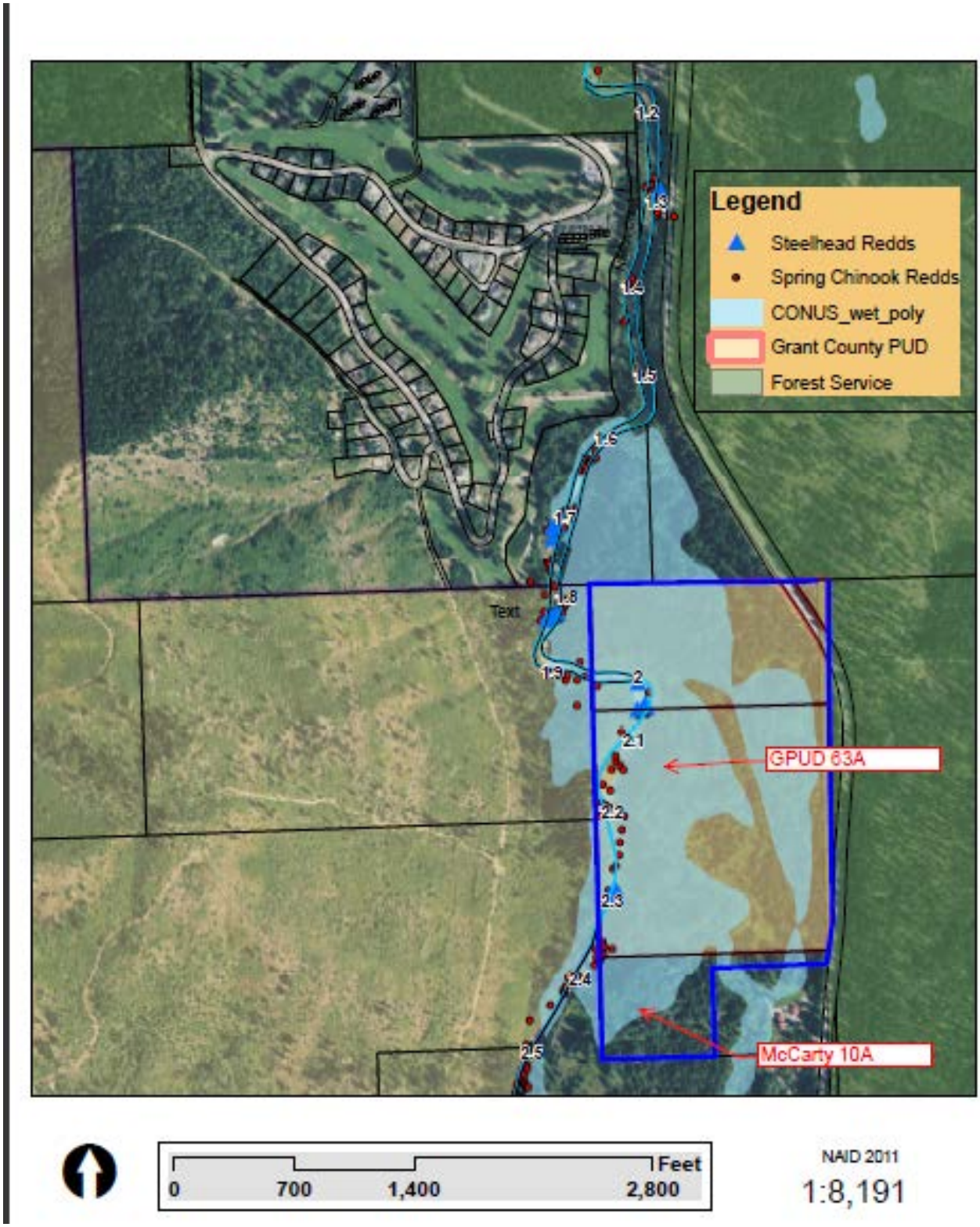

Figure 2. Vicinity map: Forest Service to east, Longview/Weyerhauser to west, Kahler Glen to north. As part of the Community Lands Plan, efforts are underway to bring the Longview/Weyerhauser lands opposite GPUD into public ownership.

Figure 3. Side Channel

Figure 4. Side channel in foreground; mainstem in background.

Project cost:

Item	Cost	Landowner contribution	PRCC Request
Fee Purchase 10A Acquisition	105,000		105,000
Conveyance of GPUD 63 A to CDLT	0		0
Incidentals	18,000		18,000
Stewardship Contribution	47,000	8,000	39,000
Administration	15,000		15,000
TOTAL	**185,000**		**177,000**

Estimated Timeline: (Populate the table so that the committee can foresee the projected timeline).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Appraisal	done											
Review			2015									
Environmental Assessment					2015							
Closing							2015					
Stewardship Plan											2015	

Final comments and instructions:

Provide contact information for the following if applicable: contracting, financial, legal, project manager, as well as the contract signatory (if different than the project sponsor).

Please include an electronic copy of this specification sheet in Word format to the PRCC Habitat Subcommittee Facilitator and PRCC Habitat Subcommittee Liaison Representative when submitting your proposal.

The comments in parenthesis above are to assist the sponsor in providing the necessary information needed for proposal review and contracting purposes and can be deleted in the final proposal.

Disclaimer: *Any habitat proposals presented to the PRCC Habitat Subcommittee for review should meet the terms and conditions outlined in the 2008 NMFS Biological Opinion, the Priest Rapids Salmon and Settlement Agreement, and the FERC-ordered Habitat Plan issued on March 5, 2010. For more information, please contact a member of the PRCC Habitat Subcommittee.*

Budget for McCarty/ GPUD Acquisition

Land		
McCarty property (10A)	105,000	
GPUD property (63A)	0	
Subtotal land	**105,000**	
Incidental Costs		
Appraisal (Nov. '14 by PRCC approved apprasier Larry Rees for CDLT)	3000	
Appraisal review (not yet done)	1500	
Boundary Line Adjustment		
Survey work billed Jan. '15	2156	
Est. Survey BLA plat and legal descriptions	1000	
Community Development BLA filing fees	500	
Recording survey and BLA	250	
Environmental Assessment (73A)	3000	
Legal - BLA, Deed, Covenant to GPUD	1000	
Title Insurance (both properties)	1200	
Closing costs and recording	1300	
Contingency	3000	
Subtotal Incidentals	**17,906**	
Staff Time including Stewardship Plan	**15,000**	
Stewardship Endowment Contribution	47,000	
	(8,000)	McCarty contribution
Subtotal Stewardship	**39,000**	
TOTAL PROJECT	**176,906**	
Round		

PRCC Habitat Subcommittee
Project Specifications Sheet

Date Submitted: January, 15th 2015

Project Sponsor:

Aaron Penvose
Trout Unlimited's Washington Water Project
103 Palouse Street, Suite #14
Wenatchee, WA 98801
Telephone: 509-881-7689
Email: apenvose@tu.org

Project Liaison: Justin Yeager and Kate Terrell

Project Title: Barkley Irrigation Company Permanent Point of Diversion Change and Pressurization- CONSTRUCTION

Project Type: Instream Flow & Habitat Improvement**:** Permanent change in point of diversion change for Barkley Irrigation Company

Location:
Current: Methow River near Winthrop, Washington. The Barkley diversion is located in WRIA 48 on the Methow River within Section 12, T34N, R21E.,W.M at approximate river mile 48.5, on river-left.

New: Downstream approximately 2 rivers mile from historic diversion side-channel on river-left. See attached map for bearings.

Requested funding amount from PRCC Habitat Sub-Committee: $ 699,999.00

Short description:
The objective of this project is to eliminate and reduce mortality of listed species in the mainstem Methow River, the Barkley Irrigation Company (Barkley) diversion side-channel and within the first two miles of the Barkley Ditch. This is important because historically mortality was potentially caused by excavation of the river bed, in the side-channel and within the tail out of the Barkley pool in order to create sufficient water for irrigators on the Barkley Ditch. Additionally, each year mortality occurred upstream of the fish screen on the current system, which is over 0.5 mile downstream of the headgate and the open canal attracts juvenile fish. This reach of the ditch has been annually de-fished by WDFW at the end of the season, but it is difficult to capture all fish and there is still direct mortality each fall.

As the funders of the Design and Engineering component, Priest Rapids Coordinating Committee (PRCC) is aware that, Trout Unlimited's Washington Water Project (TU-

WWP) and our partners have successfully reached agreement with Barkley Irrigation Company to move their surface intake downstream and create a permanent pump station. All signs show great progress towards the solution that will reduce mortality, improve efficiency and provide the Barkley with a long term solution to their current irrigation infrastructure issues.

Fantastic cooperation with Barkley, TU-WWP, US Bureau of Reclamation (Reclamation) and the Methow Conservancy (MC), commensurate concurrence on a permanent solution has been made that will benefit both the irrigators and the ESA listed fish and Pacific lamprey. After dozens of complex meetings, numerous iterations of the alternatives analysis by BOR and hours of cooperative dialogue, a concluding decision was made in December 2013, which was cemented by the board of directors vote at the annual shareholder meeting in March 2014, all after a tour of the similar and successfully completed Lower Wenatchee Instream Flow (Pioneer) Project in Wenatchee. **The Barkley Directors have decided to move forward with a pressurized system downstream of their current diversion. The new system would be designed like the Pioneer, functioning on demand. The proposed system will deliver water under pressure to all shareholders from a new pumping facility, on a parcel directly adjacent to where the temporary pump station is currently located (Okanogan Parcel 3421240001) and will deliver water to the last Barkley shareholder. In addition to design and construction, this will require land acquisition of the property to move forward.**

Project description:
Historically, each July as the river began to approach summer low flows, the Barkley would use a large bulldozer; drive it up the side-channel ("cleaning it up along the way") and ultimately creating a large earthen wing-dam (Exhibit A). This work has gone on for over 50 years and Barkley is permitted to do this work through a perpetual HPA with the State of Washington. The impact of this activity on threatened and endangered fish and other species of concern is significant.

Thanks to the support of the PRCC over the past three years, TU-WWP, Barkley and our project partners have worked to change their approach to irrigation. We have pooled resources and have eliminated mortality from side channel work and wing-dam construction in the river through the installation of the Barkley temporary pump-and–dump-station. However, Barkley continues to use the current diversion for as long as they can during the irrigation season, which still creates stranding behind the headgate forebay within approximately .5 miles of the ditch, annually. Juvenile spring Chinook, steelhead, adult bull trout and high numbers of Pacific Lamprey ammocoetes are found in the canal during salvage operations each fall. The temporary solution is very labor intensive and requires significant coordination. The Barkley partnership has provided enormous support to help improve the situation over the last two years and has resulted in minimized diversion impacts. However from a practical stand point, this is not a sustainable over the long term.

As such, the project partners and the Barkley have been working extensively on a long-term solution that will provide irrigators with reliable water and will not substantially increase costs to the company, thereby insuring viable irrigation and agriculture in the area served by the Barkley.

The ditch currently delivers water through a gravity system to users irrigating nearly 600 acres. The proposed project would replace the gravity diversion with a pressurized system. The goal of the Barkley project is to reduce diversion of water from the Methow River to increase summer flows while providing long term water reliability for the BIC and to allow future habitat improvement projects to proceed around the former diversion. These projects will enhance conditions for listed anadromous species including steelhead, spring Chinook, and bull trout.

Several design alternatives were considered, including a variety of pump options (both on-demand pressurized pipe and pump-and-dump), gravity-fed piping systems, and switching all users to a series of groundwater wells.

The pump-and-dump system would allow for removal of diversion structures but would also entail continued use of the open ditch and large quantity of water removed from the mainstem Methow River. Gravity-fed piping systems would eliminate some of the open ditch, but would still require a large quantity of water. Groundwater wells would generate water savings but require consensus from dozens of individual users, most of who are satisfied with their current method of water delivery.

In the end, the on-demand pressurized pipe made the most ecological, financial, and technological sense. The on-demand system generates the most water savings, requires minimal instream maintenance in the future, eliminates the use of the open ditch, creates the best habitat conditions for listed salmonids, and provides by far the most reliable, sophisticated, and maintenance-free irrigation delivery system. Furthermore, overall cost of proposed project implementation is comparable or less than the aforementioned alternatives. The BIC chose this option after being presented with all feasible alternatives and visiting a similar project implemented by TU for the Pioneer Water User's Association in 2013.

The new pump station is located on the east side of the Methow River approximately 1.5 miles downstream of the historic diversion. We are currently working with our design and engineer firm to develop the pump station details, including electrical controls, size and number of pumps, site grading and access, and piping required. In addition, we will be designing and installing mainline piping from the connection point with the pump station to the current ditch terminus near "Mill Hill" (see exhibit B). The existing ditch is estimated to be about 26,000 feet in length. Design and construction will include pipe type and sizes, route selection, road crossing details, turnouts, metering requirements, estimated annual pumping cost, etc.

The benefits:

- Eliminate mortality from annual excavation of the Barkley side channel and mainstem push-up dam by moving the point of diversion (POD).

- Eliminate stranding and mortality in the upper 0.5 miles of the Barkley ditch annually by moving the point of diversion and decommissioning the headworks.
- Reconnect Bear Creek to the mainstem Methow River by decommissioning upper 0.5 miles of the Barkley ditch.
- Improve instream flow by over 26 cfs for 2 miles of the mainstem Methow River and side channels by moving the POD downstream.
- Permanently enhance instream flows by 6-10 cfs by improving the efficiency of the Barkley irrigation system.
- Enhance instream flows by up to an additional 16 cfs through savings from the new pressurized pump station and on-demand irrigation system.

This project addresses impacts to habitat and reduces or eliminates harm and injury to individual fish of the following species and life stages:

- Upper Columbia River spring Chinook: adult holding, adult spawning, juvenile rearing
- Upper Columbia River steelhead: juvenile rearing
- Summer Chinook: adult holding and spawning
- Columbia River bull trout: adult and sub-adult holding and foraging
- Pacific lamprey: ammocoetes and possibly spawning areas
- Westslope cutthroat: adult foraging and juvenile rearing
- Coho salmon: juvenile rearing
- Also whitefish, suckers and sculpins

Past construction of a wing-dam and cleaning of the intake channel to divert water into the Barkley Ditch has impacted important habitat for adult spring Chinook pre-spawning holding and rearing habitat for juvenile salmon and steelhead. These impacts have occurred at the diversion wing-dam, in over 1,000 feet of Methow River side channel and within 2,500 feet of the Barkly canal, upstream of the fish screen, where the Barkley cleans and clears the ditch for water delivery, prior to the fish screen.

TU has made significant progress in moving this project towards final completion, including facilitating the selection of the preferred permanent solution to the Barkley diversion and irrigation supply. Once implemented, this solution will provide multiple benefits, including protection and restoration of habitat complexity, provide off-channel habitat and will reduce or eliminate the injury and mortality that occurs when the canal is turned off each fall; instream flow will increase by 20 cfs from the historic diversion to the new pump station; and provide substantial additional benefits from the conversion to a modernized, on-demand pump station downstream! Instream flow benefits will depend on instantaneous use by the Barkley, which will vary. Another noteworthy benefit of this project will be the reconnection of Bear Creek to the mainstem Methow River.

Project cost:

Permanent POD Conversion Project Construction Cost		
Item	*Description*	*TOTAL COST*
1	Pump Station, Intake Structure, Site Development	$ 1,150,000.00
2	Pipeline	$ 1,150,800.00
3	Tree Removal and Flume Demolition	$ 103,000.00
4	Reconnecting Bear Creek and Headgate Demo	$ 140,379.00
5	Engineering and Design Services (10% of Construction)	$ 299,380.00
6	Operation and maintenance endowment	$ 450,000.00
Total Budget		$ 3,293,559.00
Secured	Tributary Committee	$300,000.00
Secured	PRCC	$299,380.00
Secured	SRFB	$723,732.00
Pending	PRCC-HSC	$350,000.00
Pending	PRCC-NNI	$349,999.00
Pending	BPA	$1,270,448.00
Total Requested		$3,293,559

Estimated Timeline:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
30% Design												X
Permitting					X							
80% Design				X								
Construction Start 2015										X		
Construction Completion 2016				X								

Attachments: Exhibit A – Wing-Dam Construction Photo
Exhibit B – Project Location Map
Exhibit C – Headworks photo

Exhibit A
Wing Dam Construction

Exhibit B
Project Location

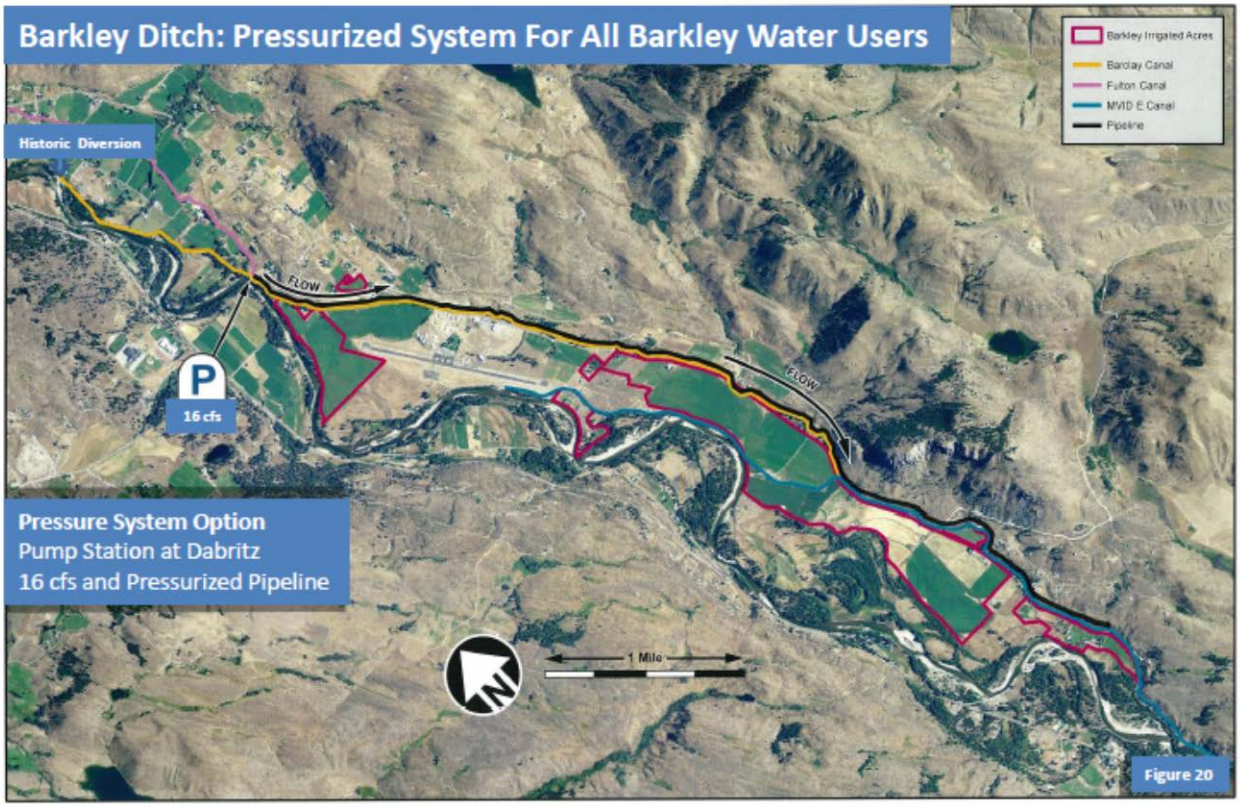

Exhibit C

Barkley Irrigation Proposal Questions

1. What will be the pipe capacity of the pressurized system?
16 cfs is the target peak flow for the design, we anticipate that peak Qi will likely be less than 14.

2. Will there be any expansion of irrigators or irrigated acres?
We will be going through a water right change process and as a result will be doing extent and validity of the right. TU is certain that under no circumstances will there be an expansion of irrigators or irrigated acres. Usually we see the opposite occur, a decrease in acreage as a result of a water right change.

3. Will the water savings be trusted?
Yes, but we have not determined our approach on the water savings, we will either do a mitigation banking strategy or construct the project, then determine the savings after several years of operation, essentially subtract the total use before from the total use after to derive the number.

4. Do you know that amount of leakage in the canals?
We are estimating 30-40%. We have some data, but it is not comprehensive and we intend to refine the numbers this coming irrigation season.

5. In the spec sheet there is mention of "require land acquisition of the property to move forward". Has the land been acquired?
The land for the new pump station is currently in the process of title change from an out of state landowner to the Methow Conservancy. The goal is to take ownership and permanently restrict the use of the property for use by Barkley on the deed, then either provide permanent easement or transfer to Barkley.

If not, is the land acquisition cost contained within the line item budget?
The cost of acquiring the property are within budget item one and are estimated at less than 100k.

6. Regarding the reconnection of Beaver Creek. Will the result of this project ensure there is perennial flow in Beaver Creek?
No, this project doesn't help nor hinder flow in Bear Creek. Currently Bear Creek is disconnected from the Methow River because it flows directly into the Barkley Ditch. The goal is to reconnect Bear Creek to the Methow, by eliminating this section of ditch, and moving the new pump plant downstream.

If so, how much available habitat will become available to anadromous salmonids as a result of this project?
By reconnecting Bear to the Methow there is currently .2 miles of unimpeded habitat. Then the culvert at the twisp-wintrhop road causes problems, however as a result of our efforts on Barkley folks are already working to address the passage issues on Bear Creek in hopes our project goes forward. TU is also working with the Methow Watershed Council to try to improve flows in Bear Creek.

Does Beaver Creek discharge directly into the main-stem of the Methow River?
Not currently, but will upon completion of this project.

Trash Rack at Wanapum Left-Bank Fishway Exit

The trash rack is in place at all times during normal fishway operation/fish passage season. The basic design is that the upper portion of the trash rack is solid to prevent debris from entering the fishladder exit pool. With the Wanapum Reservoir at the current elevation (558'-562'), the solid plating is not doing the job and we are experiencing high accumulations of tumble weeds, sticks, flotsam, etc. within the exit pool.

Grating/open area (in which fish pass through) at the bottom of the trash rack is 6' (top to bottom under normal operations). In this photograph, we can see that most of the opening is under the water surface (~5' 2").

To preclude debris loading into the fish ladder exit pool, Grant PUD will be installing an additional plate of steel, which would overlap the current solid plate on the outside of the trash rack.

This plating is temporary and will be installed and removed without a ladder outage. It would also be removed prior to the next interim refill stage and/or back to normal pool (571.5').

This new temporary plating would decrease the current opening from 6' to 3'.

NOTE: The reservoir level in photo is 561', which leaves a 10" gap for debris to enter. At 558' that gap opens to ~3' 10".

Fishladder Exit Pool- Wanapum Left-Bank Fishway Exit (Debris Loading)

Example of the type of debris that is making it through the trash rack at the Wanapum Fishways and accumulating in the fish ladder exit pools. Concern is that this type of debris could make it down to the crowders in front of the fish counting stations, which could result in necessary extended outages over the next 3 months, prior to getting the reservoir back up to normal operation (571.5').