

Condit Hydroelectric Project Decommissioning

FERC Project No. 2342

WOODY DEBRIS ANNUAL MONITORING REPORT 2012



Prepared by:



RIVERBEND ENGINEERING, LLC

And



Prepared for:



December 19, 2012

Woody Debris Annual Monitoring Report – 2012

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1.0 Introduction

1.1 Project Description

PacifiCorp Energy owns and operated the Condit Hydroelectric Project, which was completed in 1913 on the White Salmon River in Skamania County and Klickitat County, Washington. In 1991, PacifiCorp Energy filed an application with the Federal Energy Regulatory Commission (FERC) for a new license authorizing the continued operation and maintenance of the project. PacifiCorp Energy evaluated the economic impacts of the FERC recommendations contained within the Final Environmental Impact Statement and determined that the mandatory conditions of the proposed new license would render the project uneconomic to operate. After consultation and negotiations with project stakeholders, the Condit Settlement Agreement was executed to resolve all issues in the proceeding for relicensing the project. Removal of the dam and other environmental measures were the primary components of the settlement. The Condit dam was breached October 26, 2011, and the hydroelectric project facilities were removed during 2012 as outlined in the Project Removal Design Report (PacifiCorp Energy 2011a), 12 supporting management plans, regulatory orders and permits.

A specific Woody Debris Management Plan was developed, (PacifiCorp Energy, 2011b) to address woody debris issues that might be encountered in the decommissioning process. This plan identified general goals and procedures for: 1) monitoring the river for the presence of woody debris and debris jams prior to the dam breach event; 2) monitoring the movement and deposition of woody debris and the formation of debris jams after the breach event; 3) removal of woody debris jams that create an impediment to fish migration or that create a significant hazard to public safety; and 4) the construction of new woody debris structures in the margins of the river in locations where such structures would be beneficial for riparian habitat establishment. This annual monitoring report addresses these topics in the context of post-dam-removal conditions observed in the fall of 2012.

1.2 Regulatory Requirements

The FERC issued the Order Accepting Surrender of License, Authorizing Removal of Project Facilities, and Dismissing Application for New License (FERC, December 16, 2010 ; followed by the Order on Rehearing, Denying Stay, and Dismissing Extension of Time Request (FERC, April 21, 2011) under which the decommissioning project has been conducted. In addition, in response to submittal of the Woody Debris Management Plan for the project, the FERC issued the Order Modifying and Approving Woody Debris Management Plan (FERC, April 29, 2011) which requires PacifiCorp Energy to submit an annual woody debris monitoring report by December 31 of each year.

The project is also conducted per the Washington Department of Ecology Section 401 Water Quality Certification Order No. 8049 of October 12, 2010. The 401 certification establishes 1) an "*Interim Limit*" to manage and monitor woody debris; 2) to remove large woody debris from the reservoir for offsite disposal and/or use for approved habitat enhancement projects; and 3) to

conduct surveys in the White Salmon River canyon below the dam to identify and dislodge woody debris that may be hindering fish passage or present a threat to public safety. No woody debris jam removal activities may take place until consultation with the Washington Department of Ecology (Ecology), Washington Department of Fish and Wildlife and the National Marine Fisheries Service has been completed. The 401 certification also requires annual monitoring reports which are due by December 31 of each year.

A Section 404 permit was issued for this project by the US Army Corps of Engineers, Regulatory Division, May 13, 2011. The 404 permit requires that PacifiCorp Energy implement the Woody Debris Management Plan as approved by the FERC.

2.0 Monitoring of Woody Debris Conditions

Calendar year 2012 constituted stage three of woody debris monitoring as described in the Woody Debris Management Plan (PacifiCorp, 2011b). Since the breach of the dam, natural processes and active sediment management activities have returned the former reservoir area to approximately pre-dam conditions. As predicted, it took approximately one year after the breach of the dam to reach the end of stage three.

2.1 Reservoir Reach

The reservoir reach of the White Salmon River begins in the vicinity of the confluence of Buck Creek, which was approximately the upstream limit of the reservoir, and extends to the dam site. Woody debris naturally occurs in the White Salmon River watershed. However, observations during the draining of the reservoir revealed a distinction that much of the woody debris that had been buried in reservoir sediments, especially at the downstream end of the reservoir was sawn logs. This is assumed to be a legacy of the logging operations conducted in the river basin and particularly at the historic mill site at Condit Creek. During the decommissioning activities in 2012, reservoir sediments and some woody debris continued to be mobilized into the river and transported downstream. On occasion during the winter of 2011-2012, logs accumulated at the entrance to the dam breach tunnel. While the logs never significantly restricted flow through the tunnel, using a cable yarder rigged with a grapple, the logs were removed to prevent development of a logjam at the dam site during the demolition phase. With this occasional log removal at the tunnel entrance, the majority of woody debris that was buried in reservoir sediments, and new material coming down from the watershed, was able to make its way through the breach tunnel and down the White Salmon River. In September 2012, at the conclusion of decommissioning activities, only a few transient pieces of wood were observed in the reservoir reach. No naturally formed woody debris jams were observed. The lack of natural wood accumulation is consistent with the form of the river that emerged as the reservoir sediments were eroded: a moderately steep and incised river channel, with few alluvial floodplain deposition zones.

2.2 Canyon Reach

The canyon reach of the White Salmon River begins at the former dam site and extends down to the backwater area just upstream of the confluence with the Columbia River. This reach of the river is also moderately steep and incised, with few alluvial floodplain deposition zones. This reach is effective at transporting woody debris, except for one location where the rock walls of the canyon form a narrow opening for the river. This river constriction is referred to as "The Narrows". A woody debris jam formed at The Narrows on breach day, and some of the woody debris was "blown out" that same day as the river backed up behind it. During the winter of 2012 additional woody debris was caught at this location. The woody debris jam as it existed in July 2012 is shown in the photo below.



Large woody debris jam at The Narrows. Creates an extreme hazard for boating. July, 2012.

Downstream of the U.S. Fish and Wildlife Service facility at the Big White Salmon Ponds a significant pile of woody debris has accumulated on river left, at a location where the river channel widens and a bedrock outcrop controls the channel bed form (see photo on the cover of this report). This debris accumulation is a significant volume of wood; however the depositional form does not show any anchoring to the channel bed or river banks. Therefore, this woody debris is expected to re-mobilize during future high flow events, with the quantity of wood mobilized in any event dependent upon the stage of the river.

2.3 White Salmon River Embayment

The White Salmon River just above the confluence with the Columbia River is the first significant sediment deposition zone below Condit dam. It is also an area subject to backwater inundation when the operations of Bonneville Dam require raising the water level in the Columbia River. Many logs from the former reservoir area were observed to accumulate in this

embayment area in the weeks after the dam breach. Many more logs were flushed through to the Columbia River, and the majority of logs moving downriver during the decommissioning time period have continued through to the Columbia River. All of the woody debris observed in the embayment area has been isolated pieces; no logjams have formed. Because the gradient of the river flattens in this short reach, and because the width of the active channel increases, there are quite a few transient logs observed in this reach.

3.0 Removal of Woody Debris Jams

3.1 Reservoir Reach and Dam Site

After the breach of the dam many pieces of woody debris were exposed in the eroding reservoir sediments, and some new woody debris was transported into the reservoir reach from the upstream watershed. All of this woody debris behaved in a transient manner. The debris moved when mobilized by the river flow, but has not accumulated into any organized debris jams. Woody debris was not found to inhibit bank stabilization within the former reservoir area and removal actions were not required to facilitate bank stabilization. At the dam, long tree trunks occasionally lodged across the entrance to the breach tunnel. This woody debris would minimally impede the flow of the river, but through natural processes and occasional removal of logs, there was never a significant accumulation of debris at the tunnel entrance.

3.2 Canyon Reach

Consultation with stakeholders regarding the need to remove the logjam at The Narrows based on public safety considerations was completed during August 2012 per the consultation record in Appendix A. After a delay related to risk of wildfires on the project site and diversion of construction crew members to fighting fires nearby, removal efforts commenced on September 12, 2012, stopped on September 15, to reduce the possibility of disturbing fall Chinook during the spawning period, and then were concluded in the later part of October 2012 under a regulatory extension of time. Due to the height of the canyon walls in The Narrows, direct access to the logjam with heavy equipment was infeasible. In addition, swift water and the threat of submerged entrapment made it infeasible to safely access this logjam from a boat. Therefore, a cable yarder was rigged across the canyon using excavators to anchor cables, steel slings to hoist logs and a bulldozer to provide the pulling power necessary to dislodge the complex tangle of logs. This removal effort opened the waterway to allow for boater passage. Given the history of logjams in The Narrows, PacifiCorp Energy and the boating community recognize that naturally occurring woody debris has the potential to lodge at this location in the future. However, PacifiCorp Energy does not believe it has an ongoing requirement to remove naturally-formed logjams.



Logjam at The Narrows September, 2012. Cable yarder and wire slings were used to pull out logs.



The Narrows upon completion of removal work with a couple of remaining logs on river left that could not be removed. Open water on river right allows for safe boater passage.

During the removal of the logjam in The Narrows, some woody debris that was dislodged moved downstream approximately 150 feet and a secondary woody debris jam began to form. At this secondary location several embedded logs were sawn off at water level with a chain saw

operated from a tethered inflatable raft. In addition, two logs at this location that were lodged across the river channel above the normal water surface were removed using the chain saw.

3.3 White Salmon River Embayment

There has been no active removal of woody debris from the White Salmon River embayment reach. Transient pieces of wood have aggregated together from time to time in the embayment and on the sand bars in the Columbia River just below the mouth of the White Salmon River. However, these woody debris pieces have not become permanently lodged in river bed sediments, and will continue to move downstream when the river flows increase.

4.0 Constructed Woody Debris Structures

Seven Engineered Log Jam Structures (ELJs) were constructed within the reservoir reach in the locations shown and as described in Appendix B. In the original Woody Debris Management Plan, the construction of woody debris jams (or ELJs) was anticipated as a means to improve riparian habitat. Once the reservoir sediments had eroded down to the old river bed profile it became evident that both the reservoir and the canyon reaches were primarily transport reaches, where woody debris jams were not likely to form in alluvial sediments, but where constructed woody debris structures would be beneficial in trapping sediments on surfaces adjacent to the active river channel and in reducing the velocity of overbank floodwaters to reduce erosion of riparian areas. The locations of the ELJs were selected to enhance the establishment of riparian vegetation on low benches next to the river.



ELJs constructed at the side of the White Salmon River.

5.0 Extended Monitoring of Woody Debris

Calendar year 2013 marks the beginning of stage four monitoring as described in the Woody Debris Management Plan (PacifiCorp Energy, 2011b). Stage four monitoring is intended to identify woody debris from the reservoir that may create fish passage barriers or hazards to public safety. Given that sediment management activities to establish stable slopes have been completed and seeding of herbaceous cover has occurred, the likelihood of woody debris being released from the project area is very low. While not considered likely, if woody debris were to be released from the project area, it would result from a major bank failure as a result of a major flood event. General project monitoring during 2013 will include observations on woody debris. Monitoring will be conducted periodically and will also be conducted following river flows exceeding the five-year recurrence interval. If monitoring activities identify the need for active management measures for woody debris, consultation will be conducted on the proposed measures.

Specifically, the monitoring efforts during stage four will focus on field observations of:

- Woody debris movement and accumulation within the Condit project limits
- To the extent feasible, assessment of the source of woody debris, whether released from within the project area or from upstream areas in the river basin.
- Locations where debris has accumulated
- Potential hazards to boater traffic
- Potential barriers to fish passage
- Integrity of the ELJs and identification of potential maintenance work
- Success of riparian forest revegetation efforts in the proximity of the ELJs

Reporting on the results of large woody debris monitoring and the performance of the ELJs will occur on an annual basis. Based on the results of woody debris monitoring during stage four, PacifiCorp will evaluate whether the project area is a viable source of woody debris in the river and whether ongoing woody debris monitoring and management are necessary. When justified based on monitoring results, PacifiCorp will propose to the Washington Department of Ecology and the Federal Energy Regulatory Commission that monitoring be discontinued.

6.0 References

Federal Energy Regulatory Commission (FERC), 2010, Order Accepting Surrender of License, Authorizing Removal of Project Facilities, and Dismissing Application for New License, Project Nos. 2342-005 & 2342-011, December 16, 2010.

FERC, 2011a, Order on Rehearing, Denying Stay, and Dismissing Extension of Time Request, Project No. 2342-021, April 21, 2011.

FERC, 2011b, Order Modifying and Approving Woody Debris Management Plan, Project No. 2342-025, April 29, 2011.

PacifiCorp Energy, 2011a, Project Removal Design Report, March 15, 2011.

PacifiCorp Energy, 2011b, Woody Debris Management Plan, March 15, 2011.

Washington Department of Ecology, 2010, Condit Dam Decommissioning Project 401 Water Quality Certification Order No. 8049, October 12, 2010.

US Department of the Army, 2011, Section 404 Permit, Corps of Engineers Action No. NWP-2004-523, May 13, 2011.

APPENDIX A

CONSULTATION RECORD

From: Poindexter, Arianne
To: [Scott Carlon](#); [Loree Randall](#); [Howe, David \(DFW\)](#); [Curt Dreyer \(CurtD@co.klickitat.wa.us\)](#); ["davem@co.klickitat.wa.us"](#)
Cc: [Olson, Todd](#); [Weatherly, Briana](#); [Hickey, Thomas](#); [Howison, Russ](#); [Shrier, Frank](#)
Subject: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Wednesday, August 15, 2012 3:28:00 PM
Attachments: [20120810 Log Jam Removal Plan.pdf](#)
Importance: High

Per Paragraph (B) of the Federal Energy Regulatory Commission Order Modifying and Approving Woody Debris Management Plan issued on April 29, 2011, and Section 4.3.4 (3) of the State of Washington Department of Ecology 401 Water Quality Certification Order No. 8049, PacifiCorp is required to consult with Washington Department of Ecology, Washington State Department of Fish and Wildlife, National Marine Fisheries Service, and Klickitat County prior to removal of any log jam. Attached is a proposal to address a log jam in the Narrows of the White Salmon River between the dam and powerhouse. PacifiCorp requests your comments and approval by no later than August 24, 2012. Assuming that approval is given on the 24th, the contractor will immediately initiate work towards a completion of work by August 31, 2012. There is a chance the work could extend into early September. Please indicate in your reply any conditions to your approval.

Arianne Poindexter
Hydro Resources
825 NE Multnomah, Suite 1500
Portland, OR 97232
(503) 813-5513

Log Jam Removal on the White Salmon River at the Narrows

Condit Dam was breached on October 26, 2011. During that event a large amount of woody debris that was impounded by the dam was released into the White Salmon River. Much of that woody debris was made up of negative buoyant saw logs. It was observed that as the debris made its way down the river, it collected in the reach commonly referred to as The Narrows. Debris stacked up until enough pressure was built up behind it causing the blockage to release, leaving behind a tangled log and debris jam. Water flowed over and through the blockage throughout the winter high flow events, changing only slightly. Currently, the log jam does not pose a fish passage barrier but does present a significant hazard to boaters if not removed. (See attached photos) In addition, the subsequent winter flows will likely transport additional woody debris into the log jam causing it to grow and become more difficult to remove.

JR Merit plans to remove the log jam one time, with agency approval, in order to encourage the passage of woody debris not yet transported downriver and provide safe boater usage of the river through that reach of the river.

The plan to remove the log jam is as follows:

- From the flow line alignment we propose to utilize a cable logging system installed across the river and over the top of the log jam comprised of a skyline, main line, and a haul back line. See attached drawing.
- From the skyline, a carriage with log tongs suspended below will be utilized to grab key logs in the jam. This method may allow the jam to fall apart and flow on downstream. If that does not happen then the method of grabbing logs until the jam falls apart will be employed.
- Logs will be placed back in the river to be transported downstream, hauled up onto the east bank of the river and secured, or bucked up into manageable size and put back into the river.
- Should the log tongs prove ineffective we will replace the tong with several chokers. This method would require personnel to be in the water to attach the chokers to the logs. We have set up and are prepared to utilize the services of trained and experienced river guides for this work if needed.



Photo 1. White Salmon River. Log jam in the Narrows. July 2012



Photo 2. White Salmon River. Log jam in the Narrows. July 2012

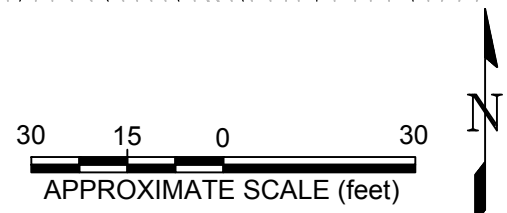


Photo 3. White Salmon River. Log jam in the Narrows. July 2012

ATTACHED IMAGES: XRef: CONDIT-2D TOPO
ATTACHED XREFS: CAD FILE: L:\2012\CADD\117312\ LAYOUT: 1
RIVERSIDE, CA
PLOTTED: 09 Aug 2012, 11:08am, dfahrney



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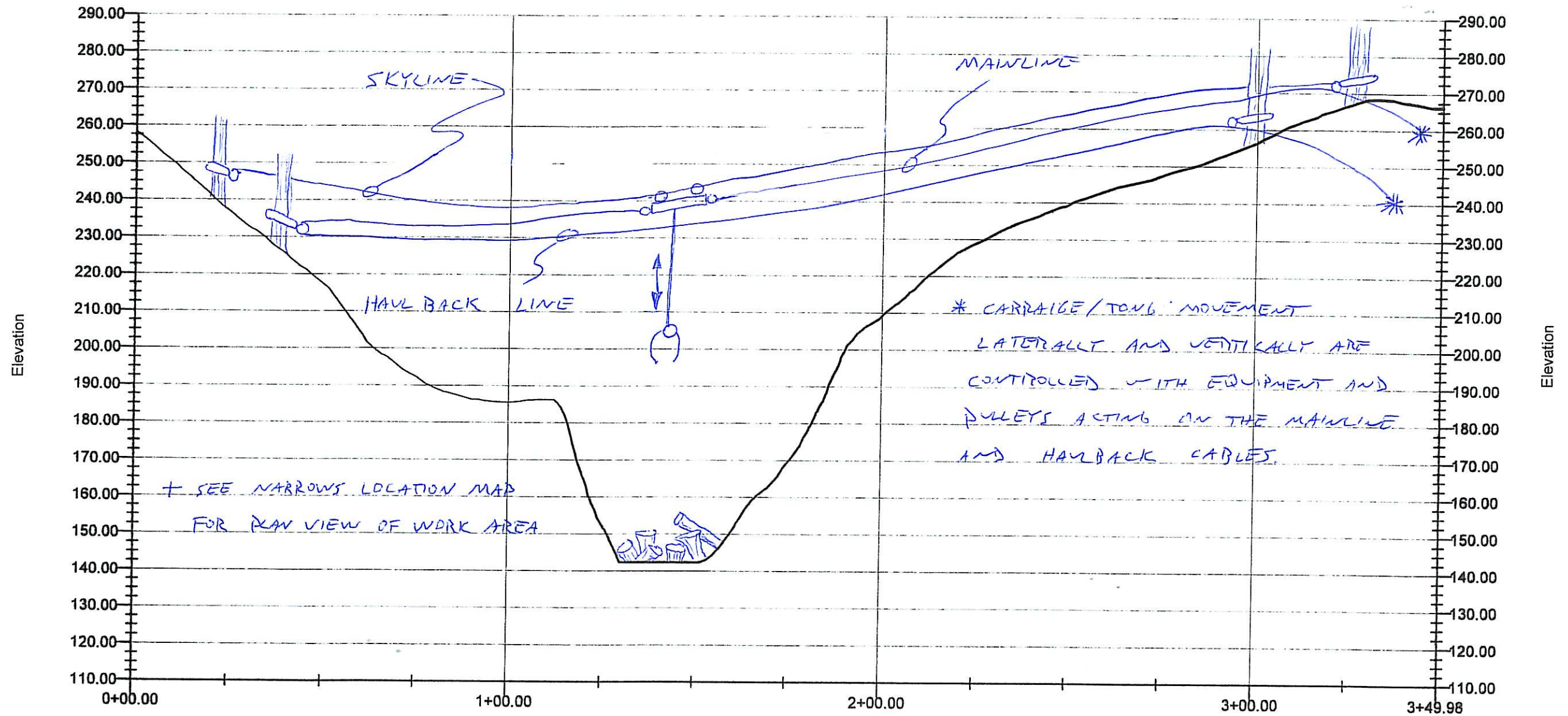




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PROJECT NO.	117312
DRAWN:	08/2012
DRAWN BY:	DMF
CHECKED BY:	PS
FILE NAME:	2173_DEC2011_2-2FT.dwg

CROSS-SECTION LOCATION MAP	
CONDIT DAM DECOMMISSIONING KLICKITAT, WASHINGTON	



30 15 0 30
APPROXIMATE SCALE (feet)

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PROJECT NO.	117312
DRAWN:	08/2012
DRAWN BY:	DMF
CHECKED BY:	PS
FILE NAME:	2173_DEC2011_2-2FT.dwg

CROSS-SECTION

CONDIT DAM DECOMMISSIONING
KLICKITAT, WASHINGTON

PLATE

2

From: [Hickey, Thomas](#)
To: [Howe, David \(DFW\)](#)
Cc: [Olson, Todd](#); [Nelson, Travis W \(DFW\)](#); [Dammers, Wolfgang H \(DFW\)](#); [Weinheimer, John \(DFW\)](#); [Poindexter, Arianne](#)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Monday, August 20, 2012 12:50:16 PM

Dave – thanks for the review. We will let you know the schedule for the work once we complete this consultation.

Tom

From: Howe, David (DFW) [mailto:David.Howe@dfw.wa.gov]
Sent: Friday, August 17, 2012 4:32 PM
To: Poindexter, Arianne
Cc: Olson, Todd; Hickey, Thomas; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW); Weinheimer, John (DFW)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

In addition, if you could notify us when the removal will occur. We have crews doing fish surveys on the lower White Salmon on Aug. 21. Thanks.

Dave

From: Howe, David (DFW)
Sent: Friday, August 17, 2012 10:42 AM
To: 'Poindexter, Arianne'
Cc: 'todd.olson@pacificorp.com'; 'Hickey, Thomas'; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

I have reviewed the plan with our District Fish Biologist Wolf Dammers and don't have any concerns. Looks mainly like wood without a root wad and not a very large amount, so we don't foresee any real impacts with this, as long as this is done before we see Tule Fall Chinook showing up (generally mid-September). Let me know if you have any questions. Thanks.

Dave Howe
Washington Dept. of Fish & Wildlife
Region 5 Habitat Program Manager
(360) 906-6729



From: Poindexter, Arianne [<mailto:Arianne.Poindexter@PacifiCorp.com>]
Sent: Wednesday, August 15, 2012 3:29 PM
To: Scott Carlon; Randall, Loree' (ECY); Howe, David (DFW); Curt Dreyer (CurtD@co.klickitat.wa.us); davem@co.klickitat.wa.us
Cc: Olson, Todd; Weatherly, Briana; Hickey, Thomas; Howison, Russ; Shrier, Frank
Subject: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Importance: High

Per Paragraph (B) of the Federal Energy Regulatory Commission Order Modifying and Approving Woody Debris Management Plan issued on April 29, 2011, and Section 4.3.4 (3) of the State of Washington Department of Ecology 401 Water Quality Certification Order No. 8049, PacifiCorp is required to consult with Washington Department of Ecology, Washington State Department of Fish and Wildlife, National Marine Fisheries Service, and Klickitat County prior to removal of any log jam. Attached is a proposal to address a log jam in the Narrows of the White Salmon River between the dam and powerhouse. PacifiCorp requests your comments and approval by no later than August 24, 2012. Assuming that approval is given on the 24th, the contractor will immediately initiate work towards a completion of work by August 31, 2012. There is a chance the work could extend into early September. Please indicate in your reply any conditions to your approval.

Arianne Poindexter
Hydro Resources
825 NE Multnomah, Suite 1500
Portland, OR 97232
(503) 813-5513

From: [Scott Carlon](#)
To: [Poindexter, Arianne](#); [Olson, Todd](#)
Cc: [Loree Randall](#); [Howe, David \(DFW\)](#); [Curt Dreyer \(CurtD@co.klickitat.wa.us\)](#); [davem@co.klickitat.wa.us](#); [Weatherly, Briana](#); [Hickey, Thomas](#); [Howison, Russ](#); [Shrier, Frank](#)
Subject: Re: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Monday, August 20, 2012 3:36:27 PM

Todd/Arianne: NMFS has no objection to removing the debris jam as proposed. Given that most of the debris are smooth-cut logs, there may not be much much value in returning them to the stream. NMFS does not object to leaving the smooth-cut logs out of the stream once removed. Feel free to email or call (503.231.2379) if you have any questions.

Thank you,

Scott

On Wed, Aug 15, 2012 at 3:28 PM, Poindexter, Arianne
<Arianne.Poindexter@pacificorp.com> wrote:

Per Paragraph (B) of the Federal Energy Regulatory Commission Order Modifying and Approving Woody Debris Management Plan issued on April 29, 2011, and Section 4.3.4 (3) of the State of Washington Department of Ecology 401 Water Quality Certification Order No. 8049, PacifiCorp is required to consult with Washington Department of Ecology, Washington State Department of Fish and Wildlife, National Marine Fisheries Service, and Klickitat County prior to removal of any log jam. Attached is a proposal to address a log jam in the Narrows of the White Salmon River between the dam and powerhouse. PacifiCorp requests your comments and approval by no later than August 24, 2012. Assuming that approval is given on the 24th, the contractor will immediately initiate work towards a completion of work by August 31, 2012. There is a chance the work could extend into early September. Please indicate in your reply any conditions to your approval.

Arianne Poindexter

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Portland, OR 97232

(503) 813-5513

From: [Randall, Loree" \(ECY\)](#)
To: [Scott Carlon](#); [Poindexter, Arianne](#); [Olson, Todd](#)
Cc: [Howe, David \(DFW\)](#); [Curt Dreyer \(CurtD@co.klickitat.wa.us\)](#); [davem@co.klickitat.wa.us](#); [Weatherly, Briana](#); [Hickey, Thomas](#); [Howison, Russ](#); [Shrier, Frank](#)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Tuesday, August 21, 2012 6:36:43 AM

Ecology also has not comments and approves the removing of the debris jam .

Thanks

Loree'

From: Scott Carlon [mailto:scott.carlon@noaa.gov]
Sent: Monday, August 20, 2012 3:36 PM
To: Poindexter, Arianne; Olson, Todd
Cc: Randall, Loree' (ECY); Howe, David (DFW); Curt Dreyer (CurtD@co.klickitat.wa.us); davem@co.klickitat.wa.us; Weatherly, Briana; Hickey, Thomas; Howison, Russ; Shrier, Frank
Subject: Re: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

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Scott

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<Arianne.Poindexter@pacificorp.com> wrote:

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Arianne Poindexter
Hydro Resources
825 NE Multnomah, Suite 1500
Portland, OR 97232
(503) 813-5513

From: [Dave McClure](#)
To: [Poindexter, Arianne](#); [Curt Dreyer](#)
Cc: [Olson, Todd](#); [Weatherly, Briana](#); [Hickey, Thomas](#); [Howison, Russ](#)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Thursday, August 23, 2012 10:14:37 AM

Arianne,

I have no comments regarding the proposal, other than to note that no permits are required from Klickitat County Planning Department for the proposed log jam removal project.
Thank you for the opportunity to comment.

David McClure

-----Original Message-----

From: Poindexter, Arianne [mailto:Arianne.Poindexter@PacifiCorp.com]
Sent: Wednesday, August 22, 2012 10:24 AM
To: Curt Dreyer; Dave McClure
Cc: Olson, Todd; Weatherly, Briana; Hickey, Thomas; Howison, Russ
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

Hello Curt and Dave,
I wanted to check in with you and see if you are on track to respond by Friday.
Thanks for your attention to this matter.

Arianne

From: Poindexter, Arianne
Sent: Wednesday, August 15, 2012 3:29 PM
To: Scott Carlon; Loree Randall; Howe, David (DFW); Curt Dreyer (CurtD@co.klickitat.wa.us); 'davem@co.klickitat.wa.us'
Cc: Olson, Todd; Weatherly, Briana; Hickey, Thomas; Howison, Russ; Shrier, Frank
Subject: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Importance: High

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Arianne Poindexter
Hydro Resources
825 NE Multnomah, Suite 1500

Portland, OR 97232
(503) 813-5513

From: [Hickey, Thomas](#)
To: [Howe, David \(DFW\)](#); [Poindexter, Arianne](#)
Cc: [Olson, Todd](#); [Nelson, Travis W \(DFW\)](#); [Dammers, Wolfgang H \(DFW\)](#); [Weinheimer, John \(DFW\)](#)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Date: Thursday, September 06, 2012 6:51:21 PM

FYI, latest today is that the key crew leader and some of the crew members are also members of the local fire district and are responding to the fire. So, this will get pushed to next week.

Tom

From: Howe, David (DFW) [<mailto:David.Howe@dfw.wa.gov>]
Sent: Thursday, September 06, 2012 8:55 AM
To: Poindexter, Arianne
Cc: Olson, Todd; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW); Weinheimer, John (DFW); Hickey, Thomas
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

Thank you Arianne.

From: Poindexter, Arianne [<mailto:Arianne.Poindexter@PacifiCorp.com>]
Sent: Thursday, September 06, 2012 8:49 AM
To: Howe, David (DFW)
Cc: Olson, Todd; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW); Weinheimer, John (DFW); Hickey, Thomas
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

Dave,
Please be advised that work to remove the log jam will take place this week. Mobilization has begun to the site with removal scheduled for Friday.

Arianne

From: Hickey, Thomas
Sent: Monday, August 20, 2012 12:50 PM
To: Howe, David (DFW)
Cc: Olson, Todd; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW); Weinheimer, John (DFW); Poindexter, Arianne
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

Dave – thanks for the review. We will let you know the schedule for the work once we complete this consultation.

Tom

From: Howe, David (DFW) [<mailto:David.Howe@dfw.wa.gov>]
Sent: Friday, August 17, 2012 4:32 PM
To: Poindexter, Arianne
Cc: Olson, Todd; Hickey, Thomas; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW); Weinheimer, John (DFW)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

In addition, if you could notify us when the removal will occur. We have crews doing fish surveys on the lower White Salmon on Aug. 21. Thanks.

Dave

From: Howe, David (DFW)
Sent: Friday, August 17, 2012 10:42 AM
To: 'Poindexter, Arianne'
Cc: 'todd.olson@pacificorp.com'; 'Hickey, Thomas'; Nelson, Travis W (DFW); Dammers, Wolfgang H (DFW)
Subject: RE: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon

I have reviewed the plan with our District Fish Biologist Wolf Dammers and don't have any concerns. Looks mainly like wood without a root wad and not a very large amount, so we don't foresee any real impacts with this, as long as this is done before we see Tule Fall Chinook showing up (generally mid-September). Let me know if you have any questions. Thanks.

Dave Howe
Washington Dept. of Fish & Wildlife
Region 5 Habitat Program Manager
(360) 906-6729



From: Poindexter, Arianne [<mailto:Arianne.Poindexter@PacifiCorp.com>]
Sent: Wednesday, August 15, 2012 3:29 PM
To: Scott Carlon; Randall, Loree' (ECY); Howe, David (DFW); Curt Dreyer (CurtD@co.klickitat.wa.us); davem@co.klickitat.wa.us
Cc: Olson, Todd; Weatherly, Briana; Hickey, Thomas; Howison, Russ; Shrier, Frank
Subject: Condit - ACTION REQUIRED: Log Jam Removal on the White Salmon
Importance: High

Per Paragraph (B) of the Federal Energy Regulatory Commission Order Modifying and Approving Woody Debris Management Plan issued on April 29, 2011, and Section 4.3.4 (3) of the State of Washington Department of Ecology 401 Water Quality Certification Order No. 8049, PacifiCorp is required to consult with Washington Department of Ecology, Washington State Department of Fish and Wildlife, National Marine Fisheries Service, and Klickitat County prior to removal of any log jam. Attached is a proposal to address a log jam in the Narrows of the White Salmon River between the dam and powerhouse. PacifiCorp requests your comments and approval by no later than August 24, 2012. Assuming that approval is given on the 24th, the contractor will immediately initiate work towards a

completion of work by August 31, 2012. There is a chance the work could extend into early September. Please indicate in your reply any conditions to your approval.

Arianne Poindexter
Hydro Resources
825 NE Multnomah, Suite 1500
Portland, OR 97232
(503) 813-5513

APPENDIX B

ENGINEERED LOG JAM STRUCTURES

Condit Hydroelectric Project Decommissioning

FERC Project No. 2342

ENGINEERED LOG JAM STRUCTURES



Prepared by:



RIVERBEND ENGINEERING, LLC

And



Prepared for:



November 13, 2012

Engineered Log Jam Structures

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4.0 Log Jam Structures, As-Built Drawings

1.0 Introduction

1.1 Document Description

This document and its associated drawings describe the materials and construction methods used at each of the seven Engineered Log Jam (ELJ) structures, constructed on the banks of the White Salmon River within the former reservoir area. The attached drawings show the locations of each of the ELJ's, the typical construction details, and photographs of the construction methods.

2.0 Construction Methods and Materials at Each Location

2.1 Structure No. 1, Upstream End of Area 2, STA 27+40

At this location bedrock was uncovered just below the gravel surface on the side bar of the river. This log jam structure was built on top of exposed bedrock and was anchored to the bedrock with steel anchors epoxied into the bedrock. The footprint of this structure is approximately 30 ft by 40 ft. Total height of the structure is approximately 5 ft at the river's edge, and slopes up to a depth of approximately 10 ft at the upper end. Because of the bedrock anchoring system, the large boulders are used primarily to buttress the surface logs and prevent them from rotating in a flood event. The location was selected to protect the graded riparian bench just downstream, and because the bedrock outcrop was already collecting some woody debris and boulders. The structure was laid out to appear more like an accumulation of debris pushed up by the river, than a constructed grid of woody mass. Nesting of large wood pieces in multiple directions makes the structure resistant to rotation or flotation.

2.2 Structure No. 2, Downstream End of Area 3, STA 30+00

Bedrock was not encountered at this location, but the substrate was too dense to allow installation of a "post anchor root wad". A "footer" log was placed below water level near the upstream face of the structure, to support multiple root wads facing upstream. Then several layers of logs were set on top, with the root wads facing either upstream or towards the river channel. Each successive layer was cable-connected to the layer below, so that the entire wood structure will behave as a single mass should uplift forces occur in a flood event. The footprint of this structure is approximately 25 ft by 40 ft. Total height of the structure is approximately 10 ft. Several of the transverse logs were buried deep into the riverbank for added stability, and several of the longitudinal

logs are angled downward into the river bed to resist horizontal movement. The location of this ELJ is on the inside of a bend in the river, where shear stresses will be considerably less than on the opposite side of the river in a flood event.

2.3 Structure No. 3, Area 3, Near Mill Creek, STA 43+10

This structure is anchored to a bedrock outcrop at the level of the river. Steel cables were anchored to the bedrock with epoxy anchors, and the bottom layer of logs was securely cabled to the bedrock. The second layer of wood was placed with the root wads oriented upstream and towards the river, and these logs were cable connected to the lower layer. Large boulders were placed between the logs to buttress them and to prevent rotation during a flood event. The upper layers of wood were placed in a more random pattern to more closely resemble woody debris accumulation by natural recruitment. Cable connections and nested placements have secured the upper layers of wood. The footprint of this structure is approximately 30 ft by 30 ft. Total height of the structure is approximately 8 ft. At this location we expect the structure to accumulate wood from the river during larger flow events, since the structure is on the outside of a mild bend in the river.

2.4 Structure No. 4, Area 4, Next to the Un-Named Tributary Stream, STA 50+60

Excavation for this structure did not encounter bedrock. Anchoring against uplift forces was accomplished by cables epoxy-anchored to large boulders, and by compacted backfill of the structure once completed. The footprint of this structure is approximately 40 ft by 40 ft. Total height of the structure is approximately 8 ft. A sill log was buried below water level, perpendicular to the direction of river flow. On top of that log a row of about 8 logs was placed with the root wads facing upstream. Gaps in this second row were filled with large boulders, and the cable anchors were installed. A third layer of trees was placed on top, with the root wads facing the river. Approximately 6 vertical anchor logs were installed in gaps in the structure, with the trunks angled downstream into the river bed. A fourth layer of logs was placed on top, transverse to the previous layer. And then the top layer was cable anchored to the layers below. This method of nested placement and cable anchoring ensures that the structure will hold together as a single unit in a flood event. With the anchoring mass of 20+ large boulders weighing 3000 – 5000 lbs each, and the vertical anchor logs, the likelihood of this structure moving is very small.

2.5 Structure No. 5, Area 5, At the Downstream End, STA 58+90

The footprint of this structure is approximately 40 ft by 40 ft, and the shape is fairly rectangular. Excavation for this structure did not encounter bedrock. Anchoring against uplift forces was accomplished by cables epoxy-anchored to large boulders, and by compacted backfill of the structure once completed. Total height of the structure is approximately 10 ft. Several sill logs were buried below water level, perpendicular to the direction of river flow. On top of the sill logs a row of about 10 logs was placed with the root wads facing upstream. Gaps in this second row were filled with large boulders, and the cable anchors were installed. A third layer of trees was placed on top, with the root wads facing the river. A fourth layer of logs was placed on top, transverse to the previous layer. And then the top layer was cable anchored to the layers below. This method of nested placement and cable anchoring ensures that the structure will hold together as a single unit in a flood event. With the anchoring mass of 25+ large boulders weighing 3000 – 5000 lbs each, the likelihood of this structure moving is very small.

2.6 Structure No. 6, Area 5, Just Upstream from Structure No. 5, STA 61+30

No bedrock was encountered at this location. A “footer” log was placed below water level near the upstream face of the structure, which supports the second layer of multiple root wads facing upstream. Then several layers of logs were set on top, with the root wads facing either upstream or towards the river channel. Each successive layer was cable-connected to the layer below, so that the entire wood structure will behave as a single mass should uplift forces occur in a flood event. The footprint of this structure is approximately 25 ft by 40 ft. Total height of the structure is approximately 10 ft. Several vertical anchor logs were installed, angling downward into the river bed to resist horizontal movement. Approximately 20 large boulders weighing 3000 – 5000 lbs each provide mass for vertical anchoring of the structure. These boulders were anchored to the wood structure with steel cables, epoxy anchored into the boulders. The upper surface of this structure has logs placed in a semi random orientation, which provides a more natural look to the structure.

2.7 Structure No. 7, Area 5, Center Section, STA 75+00

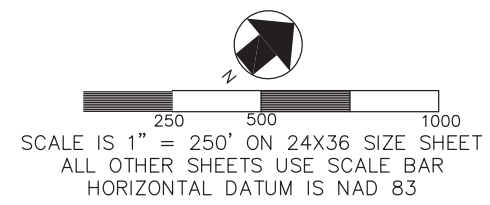
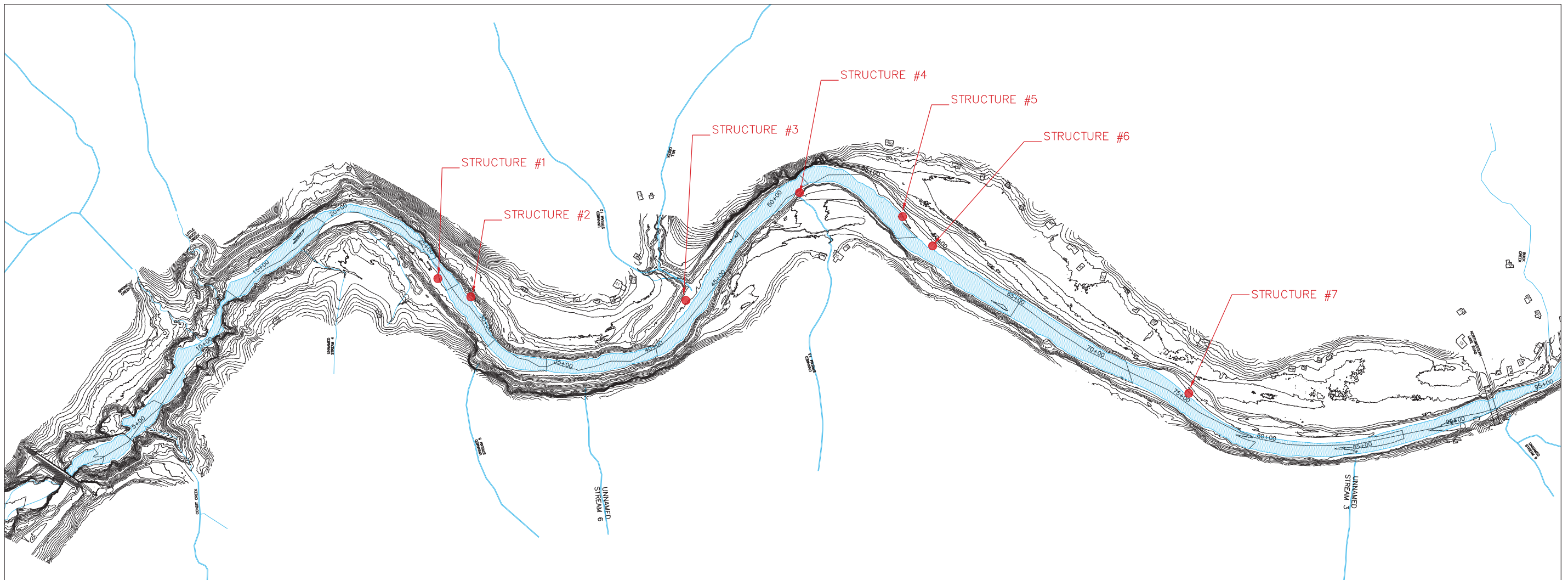
The footprint of this structure is approximately 25 ft by 40 ft, and the shape is more triangular than rectangular. Excavation for this structure did not encounter bedrock. Anchoring against uplift forces was accomplished by cables epoxy-anchored to large boulders, and by compacted backfill of the structure once completed. Total height of the structure is approximately 8 ft. Several sill logs were buried below water level, perpendicular to the direction of river flow. On top of the sill logs a row of

logs was placed with the root wads facing upstream. Gaps in this second row were filled with large boulders, and the cable anchors were installed. A third layer of trees was placed on top, with the root wads facing the river. A fourth layer of logs was placed on top, transverse to the previous layer. And then the top layer was cable anchored to the layers below. The entire structure was backfilled with soil, and the soil was compacted. This method of nested placement and cable anchoring ensures that the structure will hold together as a single unit in a flood event. With the anchoring mass of 20 large boulders weighing 3000 – 5000 lbs each, the likelihood of this structure moving is very small.

3.0 Conclusions

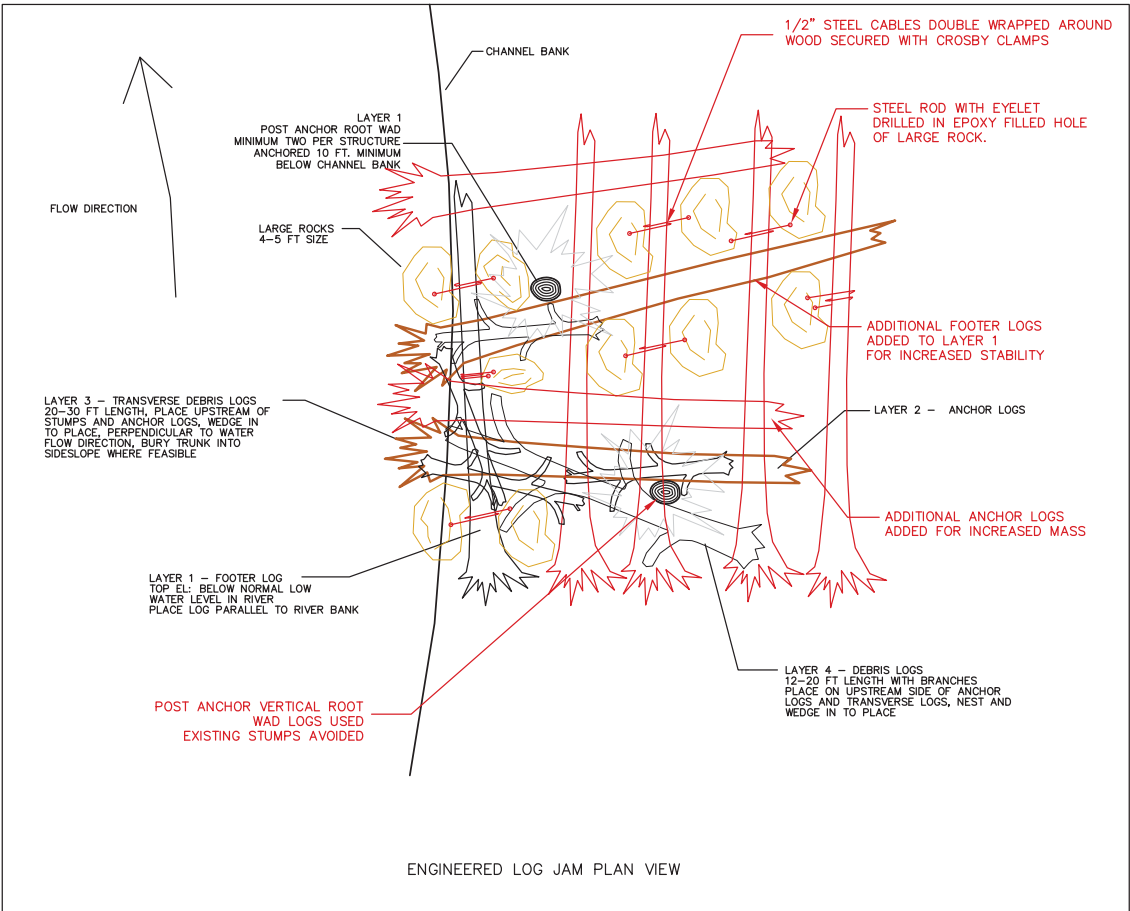
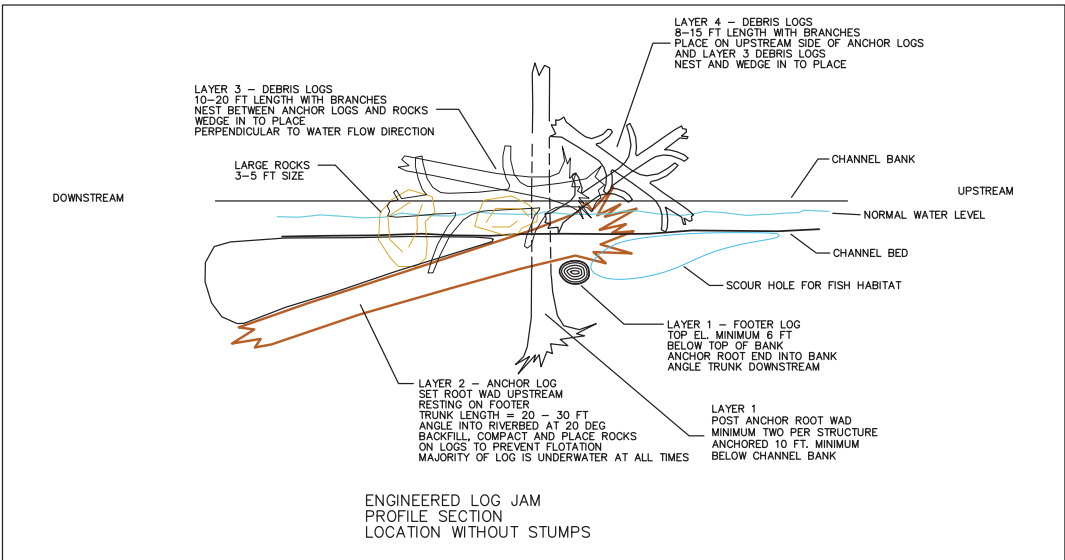
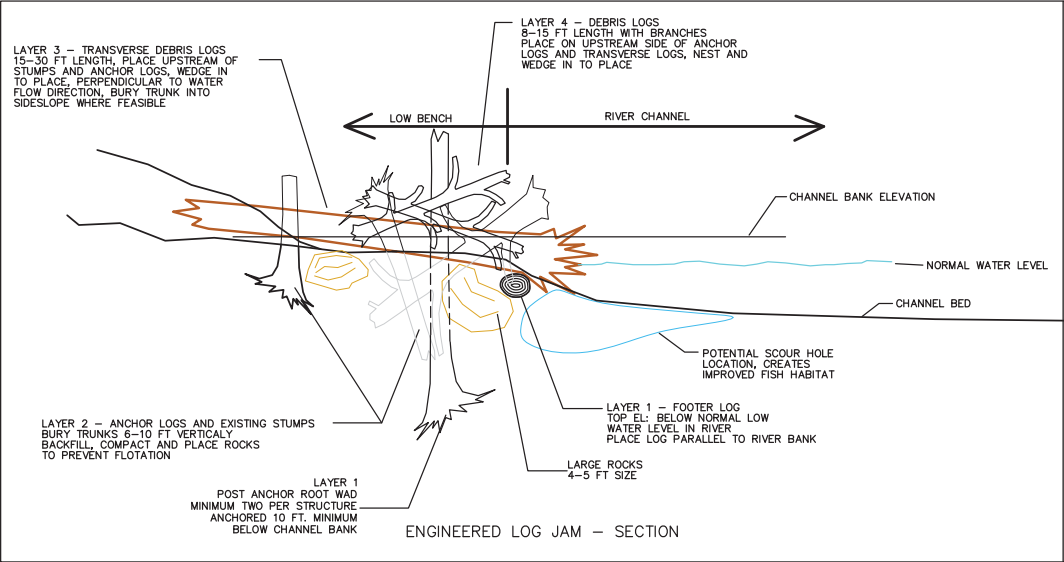
3.1 Conclusions

A total of seven Engineered Log Jams were constructed in the former reservoir area. Each structure was built using the construction methods and materials described above. The typical construction details shown in the construction drawings were the starting point for each structure, with subsequent variations necessary due to variations in the size & shape of the large wood pieces, and because of variations in the actual site conditions. As discussed in the Woody Debris Management Plan (PacifiCorp Energy, 2012) the purpose of these ELJ structures is to assist in the restoration of riparian benches next to the active river channel. On this project the ELJ's are not intended to create in-stream habitat. Geomorphically speaking, this reach of the White Salmon River is a "transport reach", where woody debris moves downriver with little accumulation. This is also a reach of the river where recreational boating occurs, so the ELJ's have been purposefully located on the margins of the river where they can be avoided by boat traffic. Each ELJ has been securely anchored to the river bed & bank, using key logs, heavy rock anchors and cabled connections to bedrock where feasible. These anchoring measures are intended to prevent the ELJ structure from moving during a flood event. They will, however, create improved streambank stability in the immediate downstream area, which will assist in the re-establishment of appropriate riparian vegetation along the banks of the White Salmon River.



● ENGINEERED LOG JAM
WOODY DEBRIS
STRUCTURE LOCATIONS

 	CONDIT DAM DECOMMISSIONING		1
	WOODY DEBRIS PLAN AS BUILT PLAN SET		OF
	Scale: 1" = 100 ft		3
 102 3rd Street Pagosa Springs, CO 81147 Tel: 970.264.1195 FAX: 970.264.1196 www.riverrestoration.com	10/21/12		



NOTE: STEEL CABLE CONNECTIONS MAYBE REQUIRED TO TIE WOOD SECTIONS TOGETHER



CONDIT DAM DECOMMISSIONING		
AS BUILT PLAN SET WOODY DEBRIS PLAN CONSTRUCTION DETAILS		2
		OF
		3
Scale: 1" = 100 ft	10/21/2012	



STRUCTURE #3



CONNECTION DETAIL



STRUCTURE #3



CONNECTION DETAIL



STRUCTURE #7



STRUCTURES #3 AND #4



STRUCTURES #5 AND #6



CONDIT DAM DECOMMISSIONING		
AS BUILT PLAN SET WOODY DEBRIS PLAN CONSTRUCTION PHOTOS		3
		OF
		3
Scale: 1" = 100 ft	10/21/2012	