Grant County
PUBLIC UTILITY DISTRICT

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January 11, 2016

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

RE: **Priest Rapids Hydroelectric Project No.2114-164**
License Compliance Filing – Article 401(a)(10) and (25) – 2015 Bull Trout Monitoring and Evaluation Plan Annual Report

Dear Ms. Bose,

Please find enclosed the 2015 Bull Trout Monitoring and Evaluation Annual Report consistent with the Requirements of Article 401(a)(10) and Article 401(a)(25) of the Priest Rapids Hydroelectric Project License, Washington Department of Ecology's (WDOE's) 401 Water Quality Certification Condition 6.2(5)(b), and U.S. Fish and Wildlife Service's (USFWS) Incidental Take Statement Term and Condition 2.

On June 4, 2009, the Federal Energy Regulatory Commission (FERC) issued an Order modifying and approving Public Utility District No. 2 of Grant County, Washington's (Grant PUD's) Bull Trout Monitoring and Evaluation Plan (BTMEP). Under this Order, Grant PUD is required to file annually with FERC by February 1, beginning 2010 and concluding 2014, an Annual Bull Trout Monitoring and Evaluation Report. On September 19, 2009, Grant PUD filed its Bull Trout Hydrologic and Water Quality Study Plan requesting that due to the similarities of Bull Trout Hydrologic and Water Quality Study Plan and the BTMEP that FERC consider Grant PUD combining the objectives of the Bull Trout Hydrologic Water Quality Study Plan with the approved Bull Trout Monitoring Plan. On February 17, 2010, FERC issued an Order modifying and approving Grant PUD's Bull Trout Hydrologic and Water Quality Study Plan. Under this Order, Grant PUD is required to include the water quality monitoring results with the Bull Trout Monitoring and Evaluation Annual Report. On April 10, 2014, Grant PUD submitted its updated BTMEP and on October 23, 2014, FERC issued an Order modifying and approving Grant PUD's updated BTMEP. Under this Order, Grant PUD is required to file annually with FERC by February 1, beginning 2015 and concluding 2019, an Annual Bull Trout Monitoring and Evaluation Report.

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This report includes monitoring results from the previous year including the number of bull trout observed or incidentally taken. On November 30, 2015, Grant PUD distributed this draft annual report for review and comment to the Priest Rapids Fish Forum including the WDOE, U.S. Fish & Wildlife Service (USFWS), Washington Department of Fish & Wildlife (WDFW), Colville Confederated Tribes, Yakama Nation, the Columbia River Inter-Tribal Fish Commission, Bureau of Indian Affairs, and the Confederated Tribes of the Umatilla Indian Reservation. No comments were received after a 30 day comment and review period.

FERC staff with any questions should contact Tom Dresser at 509-754-5088, ext. 2312.

Respectfully,

Ross Hendrick
License Compliance Manager

Enclosures: 2015 Bull Trout Monitoring and Evaluation Plan Annual Report

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2015 Bull Trout Monitoring and Evaluation Report for the Priest Rapids Project

By
Public Utility District No. 2 of Grant County, Washington
Priest Rapids Hydroelectric Project
FERC Project Number 2114

January 2016

Executive Summary

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates Wanapum and Priest Rapids dams on the Columbia River, known collectively as the Priest Rapids Hydroelectric Project (Project), operated under the terms and conditions of the Federal Energy Regulatory Commission (FERC) Hydroelectric Project License No. 2114. The following is a report on Grant PUD's bull trout monitoring and evaluation program, in accordance with the Bull Trout Monitoring and Evaluation Plan (BTMEP) and the Bull Trout Hydrologic and Water Quality Study Plan (BTWQP); note that the reporting requirements for these two plans have been combined into one report. The goal of the BTMEP and BTWQP is to, on a yearly basis, monitor and evaluate bull trout (*Salvelinus confluentus*) presence in the Project and collect hydrologic and water quality data related to Project operations and acclimation activities. This information and these data are collected in order to evaluate the potential Project-related impacts on bull trout and to specify the basis for identifying measures Grant PUD will implement to address any Project-related impacts to bull trout.

The following summarizes results from 2015 efforts, followed by details in the main body of the document.

Bull Trout Observations

In 2015, four bull trout were observed passing the Priest Rapids Dam fish ladder count station and six bull trout were observed passing the Wanapum fish ladder count station between April 15 and November 15. While a total of four bull trout were observed ascending the fish ladders at Priest Rapids dam, no PIT-tagged bull trout were detected in 2015 at full duplex PIT tag detectors at Priest Rapids Dam. No bull trout were observed during any phase of juvenile bypass activities, gatewell dipping, turbine maintenance activities, fishway maintenance activities, White Sturgeon Program activities, Hanford Reach Fall Chinook Protection Program, hatchery activities, or any other activities in the Project. During screw trap operations in 2015, nine bull trout were collected in the White River and one bull trout was collected in Nason Creek. During 2015 electrofishing efforts on Nason Creek, the Washington State Department of Fish and Wildlife (WDFW) and Yakama Nation (YN) collected eight bull trout.

Hydrologic and Water Quality Monitoring

Grant PUD, in coordination with the Priest Rapids Fish Forum (PRFF) and U.S. Fish and Wildlife Service (USFWS) agreed to monitor and report daily averages of Project elevation (feet), discharge (thousand cubic feet per second (kcfs)), temperature (°Celsius) and total dissolved gas (TDG; percent saturation (%SAT)). Project operations/water quality daily averages are reported in Appendix A of this report.

Table of Contents

List of Figures

List of Tables

List of Appendices

1.0 Introduction

The Public Utility District No. 2 of Grant County, Washington (Grant PUD) owns and operates two hydroelectric dams on the Columbia River; Wanapum and Priest Rapids, known collectively as the Priest Rapids Hydroelectric Project (Project), operated under the terms and conditions of the Federal Energy Regulatory Commission (FERC) Hydroelectric Project License No. P-2114.

Grant PUD operates the Project through the coordinated operation of a seven-dam system and other Columbia Basin entities with current operational agreements with the fishery agencies and other operators to provide protection and enhancement for a range of fisheries and other resources within and downstream of the project. These agreements include the Hanford Reach Fall Chinook Protection Program Agreement, the Hourly Coordination Agreement, and the Priest Rapids Project Salmon and Steelhead Settlement Agreement. The Project is also subject to the provisions of the FERC license and related laws and regulations, as well as to the requirements (incorporated by reference in the license) of the Biological Opinion for the Priest Rapids Project issued by the National Marine Fisheries Service (NMFS) for its effects on anadromous salmon, the Clean Water Act Section 401 Water Quality Certification (WQC) issued by the Washington Department of Ecology (WDOE), and the Biological Opinion for the Project issued by the United States Fish and Wildlife Service (USFWS; 2007) regarding the effects of the Project on bull trout (*Salvelinus confluentus*).

A 401 WQC was issued by the WDOE on April 3, 2007, and amended March 6, 2008, for the operation of the Project. A new license for the Project was issued by FERC on April 17, 2008 (FERC 2008). Under FERC License Article 401(a)(10) and the 401 WQC (Section 6.2 (5)(b)), Grant PUD was required, in consultation with the Priest Rapids Fish Forum (PRFF), to develop and submit for approval a Bull Trout Monitoring and Evaluation Plan (BTMEP) within one year of issuance of the license. The BTMEP was implemented upon FERC approval on June 4, 2009. In accordance with the BTMEP, Grant PUD monitored for bull trout during all Project related activities where bull trout could potentially be seen or encountered in 2015. In addition, in accordance with FERC License Article 401(a)(25) and Reasonable and Prudent Measure 2 of the USFWS Bull Trout Biological Opinion for the Project (USFWS 2007), Grant PUD, in consultation with the Priest Rapids Fish Forum (PRFF), developed the Bull Trout Hydrologic and Water Quality Study Plan (BTWQP). The BTWQP was implemented upon FERC approval on February 17, 2010. The goal of the BTMEP and BTWQP is to, on a yearly basis, monitor and evaluate bull trout presence in the Project and collect hydrologic and water quality data related to Project operations. This information and these data are collected in order to evaluate the potential Project-related impacts on bull trout and to specify the basis for identifying measures Grant PUD will implement to address any Project-related impacts to bull trout.

The following sections present a summary of the results from Grant PUD's 2015 monitoring efforts under the BTMEP and BTWQP (note that FERC approved the combination of both reporting requirements into a single report with approval of the BTWQP on February 17, 2010).

2.0 Bull Trout Observations at the Priest Rapids Project

Monitoring for bull trout at the Priest Rapids Project occurs annually through: video fish count system monitoring at each dam, juvenile fish bypass work, sweeping fish during fishway and turbine maintenance, gatewell dipping, Hanford Reach Fall Chinook Protection Program implementation, Off-Ladder Adult Fish Trap (OLAFT) operations, and Northern Pikeminnow

predation control program. Semi-annual programs like the resident fish monitoring and White Sturgeon Program may also provide bull trout information during years those programs are implemented.

The primary means Grant PUD uses to monitor bull trout at the Project is through video fish count systems at fish ladders. Grant PUD monitors fish passage 24 hours a day using videotape imagery of passage in each ladder at Priest Rapids and Wanapum Dams between April 15 and November 15 of every year. Staff records and reports passage of: Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Oncorhynchus kisutch*), Sockeye salmon (*Oncorhynchus nerka*), steelhead (*Oncorhynchus mykiss*), American Shad (*Alosa sapidissima*), White Sturgeon (*Acipenser transmontanus*), Pacific Lamprey (*Entosphenus tridentatus*) and bull trout. Observations made at the Priest Rapids count stations (Table 1) and Wanapum Dam count stations (Table 2) in 2015 show all bull trout passage through the ladders that occurred between April 15 and November 15. Four bull trout were observed passing the Priest Rapids Dam fish ladder count station and six bull trout were observed passing the Wanapum fish ladder count station.

Table 1 Bull trout observations at Priest Rapids Dam Fish Count Station in 2015.

Date	Time	Ladder	Number	Estimated Total Length (inches)
6/4/2015	13:29	Right	1	19
6/19/2015	15:11	Right	1	19
7/10/2015	6:44	Right	1	14
7/6/2015	6:49	Left	1	24

Table 2 Bull trout observations at Wanapum Dam Fish Count Station in 2015.

Date	Time	Ladder	Number	Estimated Total Length (inches)
6/12/2015	13:28	Left	1	20
6/15/2015	21:12	Left	1	19
6/17/2015	20:44	Left	1	18
6/22/2015	19:17	Left	1	17
7/4/2015	16:32/20:52	Left	2	16/13

Table 3 shows the number of bull trout that use the right-bank and left-bank fish ladders at both Priest Rapids and Wanapum dams from 2007 through 2015. Figure 1 through Figure 10 provide photographs, location and date of each bull trout observed passing Priest Rapids and Wanapum Dam's fish count stations. No PIT-tagged bull trout were detected at the Priest Rapids Dam fish count stations in 2015.

Table 3 Number of bull trout Passing Priest Rapids and Wanapum Dam's Fish Count Station's from 2007 through 2015.

Year	Priest Rapids Dam		Wanapum Dam	
	Left Bank	Right Bank	Left Bank	Right Bank
2007	0	1	1	0
2008	2	3	0	0
2009	5	1	3	0
2010	5	2	5	2
2011	5	3	9	3
2012	4	1	2	1
2013	9	1	10	1
2014	1	2	Unknown*	Unknown*
2015	1	3	6	0
Note:* The fish count station at Wanapum Dam was inoperable.				

No bull trout were observed during any phase of juvenile bypass activities, gatewell dipping, turbine maintenance activities, fishway and turbine maintenance activities, OLAFT operation, Northern Pikeminnow predation control activities, White Sturgeon Program activities, Hanford Reach Fall Chinook Protection Program, hatchery activities, or any other activities in the Project in 2015.

Daily fish passage through Priest Rapids and Wanapum dams can be viewed at the following link: http://www.grantpud.org/environment/fish-wildlife/fish-counts

Figure 1 **A bull trout with an estimated length of 26 inches passing Priest Rapids right bank count station on June 4, 2015 at 13:29.**

Figure 2 **A bull trout with an estimated length of 20 inches passing Wanapum left bank count station on June 12, 2015 at 13:28.**

Figure 3 **A bull trout with an estimated length of 19 inches passing Wanapum left bank count station on June 15, 2015 at 21:12.**

Figure 4 **A bull trout (lower left) with an estimated length of 12 inches passing Wanapum left bank count station on June 17, 2015 at 20:44.**

Figure 5 **A bull trout with an estimated length of 19 inches passing Priest Rapids right bank count station on June 19, 2015 at 15:11.**

Figure 6 **A bull trout with an estimated length of 17 inches passing Wanapum left bank count station on June 22, 2015 at 19:17.**

Figure 7 **A bull trout with an estimated length of 16 inches passing Wanapum left bank count station on July 4, 2015 at 16:32.**

Figure 8 **A bull trout with an estimated length of 13 inches passing Wanapum left bank count station on July 4, 2015 at 20:52.**

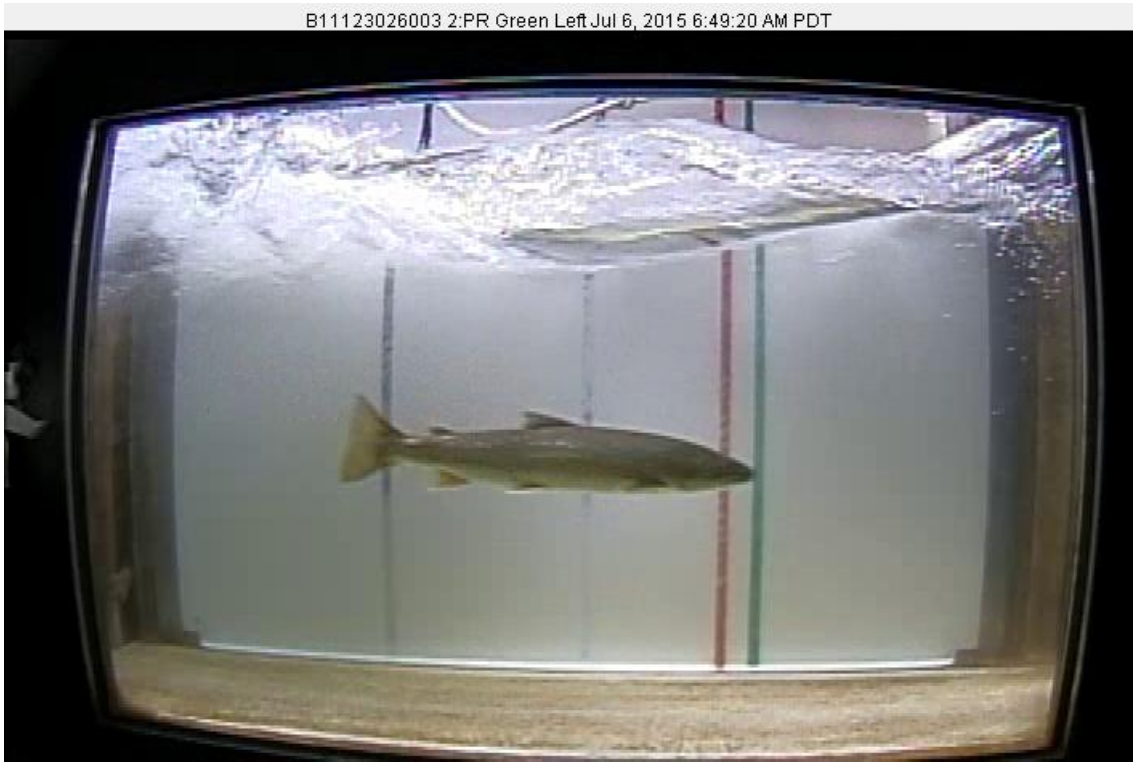

Figure 9 **A bull trout with an estimated length of 24 inches passing Priest Rapids left bank count station on July 6, 2015 at 6:49.**

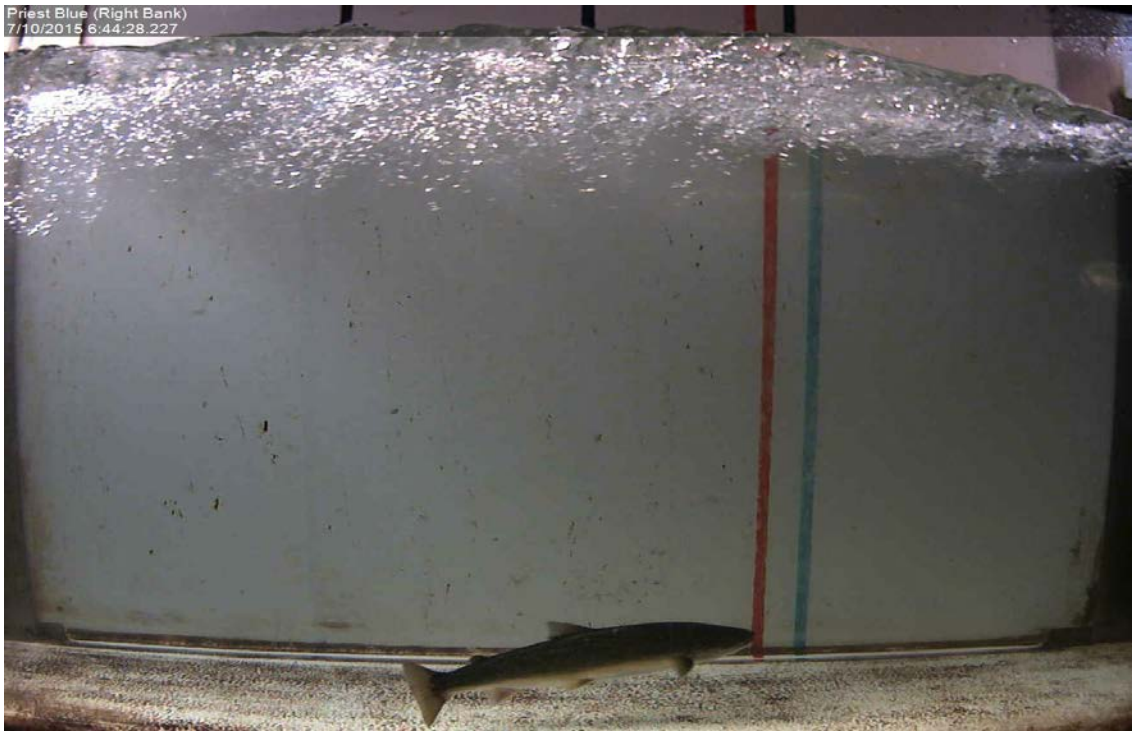

Figure 10 **A bull trout with an estimated length of 14 inches passing Priest Rapids right bank count station on July 10, 2015 at 6:44.**

3.0 Bull Trout Observations and Handling on Nason Creek and White River

Grant PUD monitors the White River and Nason Creek, through the Yakama Nation (YN) operation of screw traps, as part of Grant PUD's spring Chinook hatchery supplementation program. A map showing the location of the screw traps is provided in Figure 11 below. The YN operates screw traps for spring Chinook salmon and records incidental trapping of bull trout in the White River and Nason Creek. During screw trap operations in 2015, The YN identified one bull trout collected from Nason Creek and nine collected from the White River (see Table 4 for more details). Fork length and life stage was recorded for each fish captured.

Table 4 Bull trout data from Nason Creek and White River screw traps.

Nason Creek	Date	Species	Fork Length (mm)	Stage
	7/6/2015	Bull Trout	180	SA
White River	**Date**	**Species**	**Fork Length (mm)**	**Stage**
	4/2/2015	Bull Trout	28	J
	7/26/2015	Bull Trout	67	J
	8/4/2015	Bull Trout	110	J
	8/14/2015	Bull Trout	76	J
	10/8/2015	Bull Trout	195	SA
	10/14/2015	Bull Trout	172	SA
	10/15/2015	Bull Trout	178	SA
	10/15/2015	Bull Trout	220	SA
	10/16/2015	Bull Trout	158	SA

Note: *Actual data provided to Grant PUD included varying references to life stages. A "J" is used in this table to indicate juvenile life stages. "SA" is used to denote the sub-adult life stage, consistent with previous Grant PUD reports for fish between 127 and 330 mm.

Grant PUD also conducted short-term spring Chinook acclimation activities at one location in the White River Basin between March and May 2015. Fish were acclimated in tanks on the bank at Grant PUD's Bridge Site located at river mile 2. Water was pumped from the White River to the acclimation tanks via a "pump-basket" set-up with water being returned via outflow pipes. Grant PUD conducted water quality monitoring above and below the surface water intake and outfall locations. Parameters collected included dissolved oxygen, pH and total phosphorus. Results of the data collection efforts indicated no negative impacts to water quality. No bull trout were observed during the setup, operation, or demobilization of the acclimation site.

In 2015, Grant PUD contracted with the Washington Department of Fish and Wildlife (WDFW) and the YN to collaboratively conduct an electrofishing study that focused on collecting and tagging juvenile spring Chinook salmon on Nason Creek. WDFW and YN staff used a backpack electroshocker to collect and PIT tag juvenile spring Chinook salmon throughout September at representative sites throughout Nason Creek. In addition to spring Chinook salmon the WDFW and YN also captured and PIT tagged eight bull trout. All bull trout were released in close proximity to their collection site unharmed. Table 5 includes a list of all bull trout captured and PIT-tagged on Nason Creek during the electrofishing study.

Table 5 Bull trout captured and PIT tagged on Nason Creek.

Nason Creek	Date	Capture Type	Species	Stage*	Length	Pit Tag
	9/23/2015	Remote: Electrofish	BLC	SA	201	3DD.003B9DE0B5
	9/23/2015	Remote: Electrofish	BLC	J	79	3DD.003B9DE085
	9/23/2015	Remote: Electrofish	BLC	SA	201	3DD.003B9DE0B6
	9/23/2015	Remote: Electrofish	BLC	SA	165	3DD.003BA44BF3
	9/25/2015	Remote: Electrofish	BLC	SA	189	3DD.003BA44C4A
	9/25/2015	Remote: Electrofish	BLC	SA	219	3DD.003BA44BFF
	9/29/2015	Remote: Electrofish	BLC	SA	187	3DD.003BDD60D8
	9/30/2015	Remote: Electrofish	BLC	SA	213	3DD.003BDD60DC

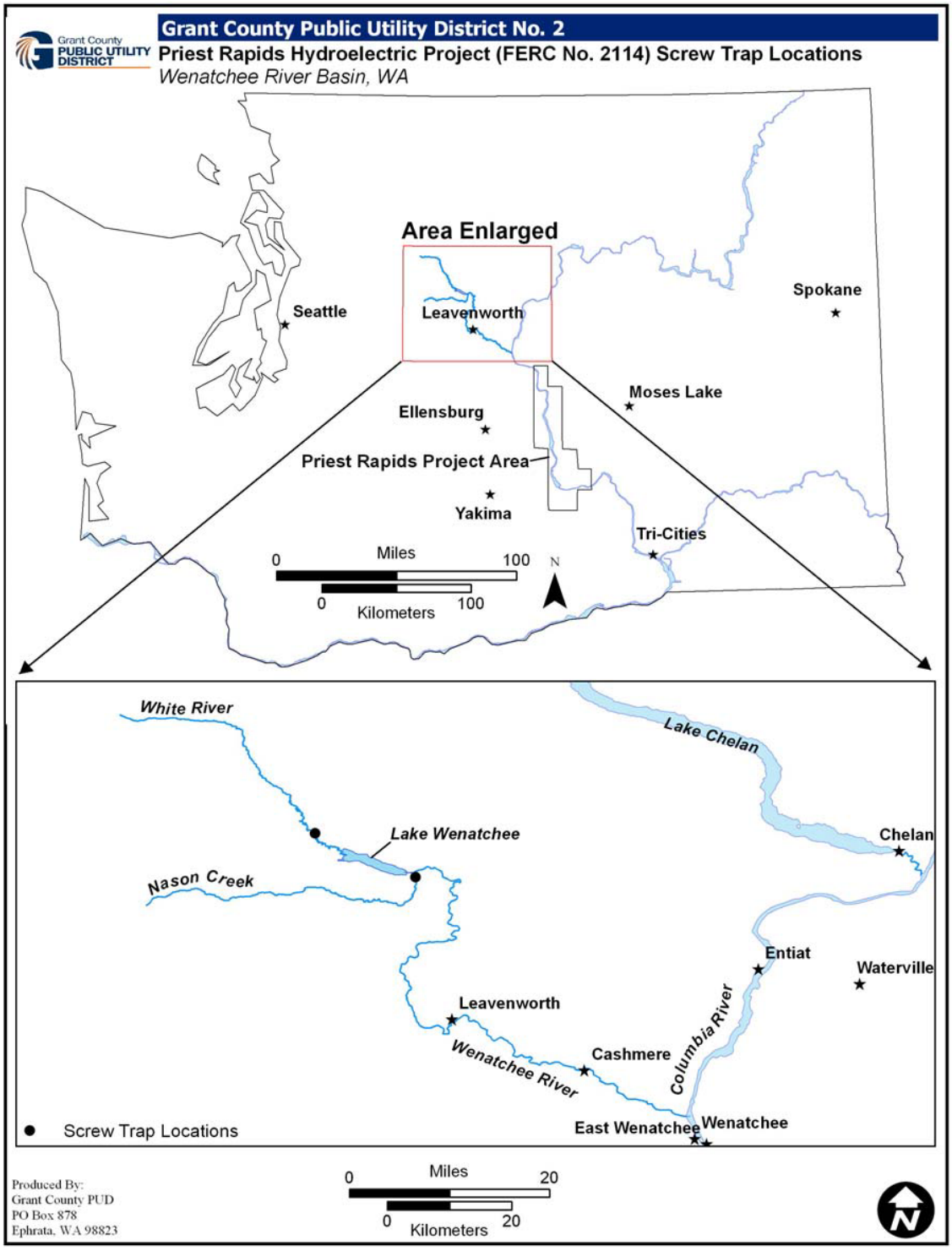

Figure 11 Screw Trap Locations on the White River and Nason Creek.

4.0 Hydrologic and Water Quality Monitoring

In the 2014 5-year Bull Trout Monitoring and Evaluation Plan, Grant PUD, in coordination with USFWS, agreed to monitor changes in Project elevation, discharge, temperature and total dissolved gas and report daily average values. Appendix A contains a listing of daily averages as recorded throughout the Project (Keeler 2015).

5.0 Summary

In 2015, bull trout monitoring occurred throughout all Grant PUD programs in accordance with the BTMEP, BTWQP, and Bull Trout Biological Opinion for the Project (USFWS 2007). Based on the number of bull trout encountered, Grant PUD did not exceed the total annual "take" limits based on the Biological Opinion for the Project (USFWS 2007), and no lethal take was documented as a result of Grant PUD's 2015 operations. Table 6 below provides a summary of bull trout "take" in 2015 as defined by the Biological Opinion (USFWS 2007).

Table 6 Summary of 2015 reporting period take on bull trout.

Project Element	Type of Take	Lethal Take		Non-lethal Take	
		Adult	Juvenile/Sub-Adult	Adult	Juvenile/Sub-Adult
Turbine Operations	Harm or Harass	0	0	0	0
Juvenile Fish Bypass	Harm or Harass	0	0	0	0
Spill Operations	Harm or Harass	0	0	0	0
Adult Fishways	Harass	0	0	10	0
Hydrograph Variation	Harm or Harass	0	0	0	0
Predator Control	Harm or Harass	0	0	0	0
White River Supplementation Program	Harass	0	0	0	10*
Nason Creek Electrofishing	Harass	0	0	0	8
	TOTAL	0	0	10	18

Note: *This number includes bull trout collected from the Nason Creek screw trap (1 of the 10 fish) noted in Table 4.

List of Literature

Federal Energy Regulatory Commission, Order Issuing New License for Public Utility District No. 2 of Grant County, Docket Number P-2114-116 (April 17, 2008).

Keeler, C. 2015. Summary of 2015 Annual Fish-Spill Season and Total Dissolved Gas Monitoring. Prepared for Public Utility District No. 2 of Grant County, Washington. October, 2015.

National Marine Fisheries Service (NMFS). 2008. Endangered Species Act – Section 7 Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation for the New License for the Priest Rapids Hydroelectric Project, FERC Project No. 2114. Portland, Oregon.

United States Department of Interior Fish and Wildlife Service (USFWS). 2007. USFWS Biological Opinion on the Effects of the Priest Rapids Hydroelectric Project Relicensing on Bull Trout (FERC No. 2114). Spokane, Washington. USFWS Reference: 13260- 2006 -P-0008, 13 260-2001-F-0062.

Appendix A
Project Operations/Water Quality Daily Average Data.

Table A-1 Wanapum Daily Averages.

	Wanapum Forebay			Wanapum Tailrace			
Date	Elevation (ft)	TDG (%SAT)	Temp (°C)	Elevation (ft)	Discharge (kcfs)	TDG (%SAT)	Temp (°C)
04/16/15	565.5	103.9	8.1	489.9	113.3	103.3	7.7
04/17/15	567.6	105.1	8.3	490.7	120.3	104.6	7.9
04/18/15	569.3	105.8	8.9	491.1	96.3	104.8	8.3
04/19/15	567.8	108.4	9.6	489.7	108.4	107.7	8.5
04/20/15	566.7	109.2	9.3	489.8	104.9	110.5	8.7
04/21/15	567.6	110.2	9.5	489.9	116.3	111.3	9.0
04/22/15	568.5	106.1	9.2	490.7	90.2	109.9	9.1
04/23/15	567.9	106.8	9.3	488.8	99.8	109.7	9.1
04/24/15	568.2	107.7	9.5	489.8	108.1	110.6	9.3
04/25/15	569.4	107.1	9.5	490.5	98.9	110.7	9.4
04/26/15	569.4	106.4	9.7	489.9	99.4	109.2	9.4
04/27/15	568.3	107.7	10.5	490	105.0	108.8	9.6
04/28/15	566.9	108.7	10.6	490	110.8	109.8	10.0
04/29/15	567.3	105.2	10.0	490.4	77.2	108.3	9.9
04/30/15	567.2	105.8	10.3	488.2	95.9	107.3	9.9
05/01/15	567.4	108.3	10.5	489.3	117.6	110.4	10.1
05/02/15	569.6	108.8	10.9	490.6	112.1	109.3	10.3
05/03/15	570.4	110.3	11.3	490.7	119.9	110.4	10.4
05/04/15	570.6	110.0	10.9	491.3	126.7	110.3	10.6
05/05/15	569.2	108.4	10.7	491.4	109.4	109.3	10.7
05/06/15	568	108.0	10.6	490.1	98.5	110.0	10.6
05/07/15	567.8	108.9	11.0	489.5	100.5	111.2	10.7
05/08/15	567	109.6	11.4	489.7	88.0	111.6	11.1
05/09/15	566.5	109.7	11.9	488.7	87.9	110.2	11.2
05/10/15	568	110.8	12.0	488.7	81.3	110.2	11.2
05/11/15	568.4	110.9	11.8	488.8	92.1	111.0	11.2
05/12/15	569.7	110.4	11.4	489.2	122.1	112.8	11.3
05/13/15	570.9	109.0	11.2	490.9	135.7	111.2	11.2
05/14/15	570.5	109.0	11.4	491.8	145.0	110.7	11.2
05/15/15	570.1	110.2	11.6	492.3	128.5	111.8	11.3
05/16/15	568.3	108.2	11.4	491.1	92.7	110.5	11.5
05/17/15	568.3	108.1	11.7	488.3	116.5	109.1	11.5
05/18/15	570.5	109.0	11.9	490.8	131.4	110.2	11.6
05/19/15	569.8	104.1	11.9	491.6	124.6	112.1	11.9

05/20/15	570	110.2	12.6	490.6	135.0	111.9	12.4
05/21/15	570.2	111.7	13.4	491.6	146.1	112.3	12.9
05/22/15	570.9	111.3	13.7	492	136.5	110.9	13.3
05/23/15	570.4	110.4	13.8	492	142.0	110.6	13.6
05/24/15	570.9	109.8	13.6	492.3	142.4	111.3	13.6
05/25/15	570.9	109.6	13.7	492.3	141.4	111.5	13.5
05/26/15	570.4	109.8	14.0	492.1	142.9	111.5	13.7
05/27/15	570.6	110.1	14.2	492.1	146.8	110.5	13.9
05/28/15	569.7	110.3	14.5	492.5	133.0	110.2	14.1
05/29/15	569.4	111.4	15.0	491.6	135.9	110.9	14.3
05/30/15	570.1	111.7	14.9	491.9	123.0	112.3	14.5
05/31/15	570.6	111.1	15.1	491.2	128.8	112.9	14.6
06/01/15	570.9	110.2	15.0	491.6	142.2	112.6	14.7
06/02/15	570.7	106.7	14.7	492.2	111.8	110.6	14.7
06/03/15	568.6	106.1	14.9	490.3	110.2	110.2	14.7
06/04/15	568.4	108.3	15.1	489.9	120.9	111.0	14.8
06/05/15	568.1	111.4	15.6	490.8	112.1	112.9	15.0
06/06/15	569.1	111.9	16.0	490.6	127.7	113.1	15.3
06/07/15	570.2	111.1	15.9	491.6	134.4	113.0	15.6
06/08/15	570.4	111.6	16.4	491.9	128.5	113.3	15.9
06/09/15	570.1	111.2	16.5	491.6	146.4	113.1	16.1
06/10/15	570.1	110.5	16.4	492.4	117.1	112.9	16.2
06/11/15	568.6	108.2	16.2	490.8	117.4	111.8	16.3
06/12/15	569	106.7	16.3	490.7	100.6	111.4	16.4
06/13/15	569.5	107.4	16.8	490	123.8	110.9	16.5
06/14/15	570.6	109.3	17.0	491.5	118.4	112.1	16.7
06/15/15	570.2	111.0	17.5	491.1	137.9	112.7	16.7
06/16/15	570.4	111.3	17.0	491.9	138.4	112.4	16.8
06/17/15	569.2	109.2	17.1	491.7	94.1	111.5	16.9
06/18/15	567.8	110.6	17.5	489.4	83.7	112.2	17.1
06/19/15	569	109.1	17.3	489.3	82.4	111.7	17.1
06/20/15	569.9	107.7	17.3	489.4	83.4	111.2	17.0
06/21/15	570.5	108.8	17.5	489.5	83.9	112.5	17.1
06/22/15	571	107.4	17.0	489.8	91.4	111.9	16.9
06/23/15	570.6	108.1	17.2	490	119.5	111.4	16.9
06/24/15	570.3	109.3	17.6	491.3	101.3	111.1	17.1
06/25/15	568.2	110.1	17.9	490	109.8	110.7	17.3
06/26/15	567.9	112.2	17.9	490.4	110.9	111.6	17.7
06/27/15	568.6	113.2	18.1	490.6	125.3	112.3	18.1

06/28/15	569.1	113.4	18.5	491.4	108.9	112.6	18.3
06/29/15	569.7	112.1	18.9	490.7	133.6	112.4	18.4
06/30/15	569	111.0	18.7	491.8	118.4	111.5	18.3
07/01/15	569.4	112.5	18.8	491.1	119.0	112.1	18.4
07/02/15	570.7	114.1	18.7	491.3	135.7	112.4	18.7
07/03/15	569.8	112.4	19.4	492	109.6	111.4	18.9
07/04/15	568.9	111.7	19.6	490.7	108.0	111.4	19.2
07/05/15	570	111.3	19.8	490.7	128.1	111.3	19.5
07/06/15	570.1	111.1	19.8	491.8	113.1	110.9	19.6
07/07/15	569.2	110.6	19.8	490.9	98.6	109.6	19.6
07/08/15	567.8	112.5	20.4	489.8	111.5	110.8	19.7
07/09/15	568	113.6	20.4	490.5	113.7	110.7	19.7
07/10/15	567.3	110.9	20.2	490.5	83.3	109.9	19.8
07/11/15	566.5	108.7	20.0	488.6	72.6	110.0	19.7
07/12/15	566.9	107.3	19.9	488.1	72.6	109.2	19.6
07/13/15	567.5	107.1	19.9	488.2	109.9	109.1	19.7
07/14/15	568.5	108.3	20.0	490.5	107.3	109.2	19.7
07/15/15	567.9	107.1	19.7	490.3	112.0	109.9	19.5
07/16/15	569.2	106.6	19.4	490.7	120.7	109.7	19.3
07/17/15	569	107.3	19.7	491.1	122.3	109.7	19.1
07/18/15	569.1	108.2	19.9	491.2	107.7	110.6	19.2
07/19/15	569.1	110.1	19.6	490.5	113.0	111.5	19.2
07/20/15	569.2	109.1	19.3	490.8	109.4	110.9	19.3
07/21/15	569.1	108.3	19.1	490.6	99.6	111.4	18.9
07/22/15	568.1	106.8	19.1	489.9	84.3	110.3	18.7
07/23/15	568.2	107.3	19.5	489.1	105.1	110.5	19.0
07/24/15	568.5	106.5	19.6	490.3	101.1	110.3	19.2
07/25/15	569.1	106.6	19.6	490.2	103.6	111.5	19.4
07/26/15	570.3	106.0	19.5	490.5	98.4	110.4	19.2
07/27/15	569.5	104.4	19.3	490.1	95.5	109.3	19.0
07/28/15	569.2	104.8	19.6	489.9	108.2	109.5	19.1
07/29/15	569.5	106.0	20.0	490.7	117.8	110.2	19.4
07/30/15	569.2	107.4	20.2	491.1	118.0	111.4	19.5
07/31/15	569	110.0	20.3	491	109.1	111.8	19.6
08/01/15	568.2	110.4	20.4	490.4	107.3	111.9	19.8
08/02/15	568.3	107.7	20.4	490.3	75.1	112.4	20.0
08/03/15	569	109.0	20.3	488.8	113.0	111.9	20.1
08/04/15	569.4	108.2	20.2	490.9	105.2	111.7	20.0
08/05/15	569.3	106.9	19.9	490.7	116.6	110.7	19.7

08/06/15	570.2	107.1	19.9	491.1	122.7	110.5	19.6
08/07/15	570.5	108.5	20.2	491.1	133.7	110.5	19.8
08/08/15	568.3	108.9	20.3	491.6	106.2	111.5	20.0
08/09/15	567.8	108.2	20.5	490.2	104.2	110.3	20.1
08/10/15	567.7	110.1	20.8	489.9	113.2	111.4	20.2
08/11/15	568	110.5	20.7	490.3	110.9	111.1	20.2
08/12/15	568	111.2	21.0	490.4	111.8	111.8	20.3
08/13/15	568.4	110.2	20.6	490.6	126.2	110.2	20.5
08/14/15	568.9	107.8	20.7	491.5	124.8	108.0	20.5
08/15/15	569.8	104.1	20.3	491.7	124.4	104.3	20.2
08/16/15	569.7	104.9	20.4	491.6	121.0	103.9	20.1
08/17/15	569	104.3	20.5	491.4	122.5	105.0	20.3
08/18/15	569.4	107.9	20.5	491.4	123.5	105.1	20.3
08/19/15	570.1	106.8	20.7	491.7	129.6	105.5	20.3
08/20/15	570.2	105.1	20.4	492	137.3	104.8	20.2
08/21/15	569.7	103.1	20.2	492.3	122.4	102.7	20.0
08/22/15	569.9	104.3	20.6	491.5	133.2	102.7	20.1
08/23/15	569.6	106.0	20.5	492	127.8	105.0	20.0
08/24/15	569	104.9	20.2	491.7	111.8	104.5	19.8
08/25/15	567.8	103.9	20.2	490.6	122.6	102.9	19.7
08/26/15	568.6	104.0	20.4	491.2	126.2	102.9	19.8
08/27/15	569.3	103.6	20.1	491.5	121.9	102.7	19.8
08/28/15	568.1	103.4	20.0	491.1	112.4	N/A	N/A
08/29/15	567.3	103.1	19.8	490.5	82.3	N/A	N/A
08/30/15	567.4	101.4	19.5	489	87.1	N/A	N/A
08/31/15	568.5	101.3	19.4	489.5	88.8	N/A	N/A
09/01/15	568.8	102.4	19.5	489.5	99.4	N/A	N/A
09/02/15	570.4	102.0	19.5	490.7	88.0	N/A	N/A
09/03/15	570	101.1	19.5	490.3	87.6	N/A	N/A
09/04/15	569.6	100.6	19.5	490.2	73.4	N/A	N/A
09/05/15	568.1	99.7	19.2	489.1	64.2	N/A	N/A
09/06/15	568.5	99.7	19.0	488.5	66.5	N/A	N/A
09/07/15	568.8	99.4	19.0	488.9	72.3	N/A	N/A
09/08/15	568.6	99.8	18.7	489.2	64.3	N/A	N/A
09/09/15	567.5	100.4	18.8	488.5	71.7	101.3	18.6
09/10/15	567.5	100.8	19.1	488.8	84.0	101.3	18.7
09/11/15	567.5	101.3	19.5	489.4	87.7	101.8	19.0
09/12/15	568.8	102.5	19.4	489.5	93.3	102.9	19.1
09/13/15	569.1	100.5	19.0	490	51.1	103.7	18.9

09/14/15	568.6	100.2	18.7	487.7	80.7	101.5	18.5
09/15/15	570.1	99.8	18.5	489.7	70.7	101.2	18.3
09/16/15	568.1	99.6	18.6	488.7	75.5	101.1	18.3
09/17/15	568	99.4	18.5	488.8	62.8	101.1	18.4
09/18/15	567.8	100.2	18.4	488	76.1	100.9	18.3
09/19/15	568	98.6	18.5	488.8	49.8	101.4	18.4
09/20/15	568.3	100.1	18.7	487.4	55.8	102.3	18.5
09/21/15	569.7	101.2	18.9	487.7	84.1	102.1	18.6
09/22/15	570.7	101.3	18.7	489.7	92.1	101.7	18.5
09/23/15	570.7	101.0	18.6	490.2	85.9	101.4	18.5
09/24/15	569.6	100.8	18.6	489.8	91.5	101.1	18.4
09/25/15	569.6	101.0	18.4	490	85.3	101.3	18.3
09/26/15	568.6	99.7	18.1	489.5	51.0	100.7	18.0
09/27/15	568.5	99.7	18.1	487.7	80.9	100.4	17.8
09/28/15	570.3	100.2	18.0	489.3	98.0	100.6	17.9
09/29/15	569.9	100.5	18.1	490.5	86.9	100.8	17.8
09/30/15	569.4	101.1	18.0	489.8	80.5	100.8	17.6
10/01/15	568.9	99.8	17.9	489.4	88.2	100.6	17.6
10/02/15	568.9	99.3	17.6	490	72.9	100.7	17.5
10/03/15	569.9	99.3	17.3	489.2	81.5	100.2	17.3
10/04/15	569.2	99.3	17.4	489.4	66.6	100.1	17.2
10/05/15	568.6	97.7	17.4	488.6	89.0	100.2	17.2
10/06/15	569.3	97.6	17.3	489.6	79.6	99.7	17.0
10/07/15	568.2	97.1	17.2	489.1	69.5	99.3	17.0
10/08/15	567.7	97.0	17.1	488.4	72.7	99.3	17.0
10/09/15	567	99.0	17.2	488.3	64.6	99.9	16.9
10/10/15	566.2	99.0	17.0	487.7	37.7	100.5	16.9
10/11/15	566.5	98.8	16.8	485.8	51.6	99.9	16.7
10/12/15	566.8	99.6	16.7	486.7	66.1	100.0	16.6
10/13/15	568.7	99.3	16.7	488.8	82.8	100.2	16.6
10/14/15	569.9	99.1	16.6	489.7	97.7	99.5	16.5
10/15/15	569	98.8	16.5	490.1	92.6	99.3	16.4
10/16/15	567.6	99.6	16.5	489.6	81.2	99.7	16.3
10/17/15	567	100.6	16.3	489	71.1	100.4	16.1
10/18/15	566.7	99.5	16.1	488	57.3	100.0	16.0
10/19/15	566.4	99.5	16.1	486.5	66.5	100.0	15.9
10/20/15	567	99.1	16.1	487.4	75.5	99.1	15.9
10/21/15	566.9	98.9	16.0	488.1	78.2	99.0	15.8
10/22/15	567.4	98.8	15.9	488.5	85.8	99.0	15.8

10/23/15	567.9	98.9	15.8	488.8	85.6	99.0	15.7
10/24/15	568.7	99.0	15.6	489	81.2	99.3	15.6
10/25/15	568.2	99.1	15.4	488.7	65.6	101.3	15.3
10/26/15	567.7	99.0	15.2	487	71.6	99.3	15.2
10/27/15	567.7	98.4	15.1	487.9	87.0	98.9	15.0
10/28/15	569.6	98.5	14.9	489	89.5	98.9	14.8
10/29/15	569.2	98.5	14.8	489.4	73.8	98.8	14.7
10/30/15	567.3	99.5	14.7	488.6	73.7	99.6	14.7
10/31/15	567.9	99.6	14.6	488.2	71.0	99.8	14.5
11/01/15	567.5	99.1	14.4	487.7	55.1	99.4	14.3
11/02/15	567.2	98.8	14.2	486	86.4	99.0	14.1
11/03/15	567.9	98.8	14.0	488.7	90.0	98.9	13.9
11/04/15	567.5	97.6	13.9	489	83.4	98.2	13.8
11/05/15	567.4	97.2	13.5	488.8	88.5	97.4	13.3
11/06/15	567.2	96.1	13.1	489.5	98.3	96.4	13.0
11/07/15	567.4	97.0	13.0	489.6	88.0	97.3	12.9
11/08/15	567.4	98.1	13.1	489.2	96.9	98.3	13.0
11/09/15	568.4	97.8	13.1	489.4	100.1	98.2	13.0
11/10/15	569	96.9	13.0	490	92.5	97.4	12.9
11/11/15	568.4	96.7	12.9	489.6	85.9	97.2	12.8
11/12/15	568.2	96.7	12.6	488.9	93.7	97.1	12.5
11/13/15	569.1	98.1	12.5	490.3	99.0	98.5	12.4
11/14/15	569.3	98.9	12.5	489.5	97.6	99.6	12.5
11/15/15	569.8	98.8	12.5	490.1	104.7	98.8	12.4

Table A-2 Priest Rapids Daily Averages.

	Priest Rapids Forebay			Priest Rapids Tailrace			
Date	Elevation (ft)	TDG (%SAT)	Temp (°C)	Elevation (ft)	Discharge (kcfs)	TDG (%SAT)	Temp (°C)
04/16/15	484.8	103.0	8.3	407.9	113.6	102.8	7.8
04/17/15	485.9	104.9	8.8	408.9	116.1	104.4	8.1
04/18/15	486.2	104.2	8.8	409	110.1	104.3	8.4
04/19/15	485.2	106.0	9.1	408.6	105.8	107.3	8.7
04/20/15	484.3	108.3	9.2	408.3	100.2	109.5	9.0
04/21/15	485.9	110.0	9.3	407.4	118.4	112.4	9.2
04/22/15	486.3	107.1	9.4	408.4	92.2	110.7	9.4
04/23/15	485.2	107.5	9.5	406.3	99.8	111.4	9.3
04/24/15	486.2	108.0	9.5	407	106.1	111.8	9.4
04/25/15	486.7	108.0	9.7	407.4	99.9	111.7	9.5
04/26/15	486.6	107.2	9.7	406.9	102.6	111.2	9.6
04/27/15	486.4	108.7	10.0	407.2	105.7	111.4	9.9
04/28/15	485.7	109.6	10.4	407.5	108.6	112.3	10.2
04/29/15	486.2	107.1	10.4	407.7	82.7	111.1	10.3
04/30/15	485.2	106.2	10.5	405.4	89.5	110.4	10.3
05/01/15	485.2	107.9	10.6	406	120.3	111.1	10.4
05/02/15	485.8	108.6	10.7	408.6	105.8	111.8	10.5
05/03/15	486.5	108.6	10.9	407.4	119.3	112.4	10.7
05/04/15	487.2	110.5	10.8	408.5	132.5	112.4	10.8
05/05/15	486.3	108.8	10.8	409.6	111.2	110.9	10.8
05/06/15	485.5	107.7	10.8	408	93.9	109.9	10.8
05/07/15	485.5	109.2	10.8	406.7	103.6	111.4	10.8
05/08/15	485.9	110.9	11.1	407.4	87.2	112.1	11.1
05/09/15	485.2	111.3	11.6	405.9	83.6	112.2	11.5
05/10/15	485.2	111.6	11.7	405.5	83.0	113.4	11.7
05/11/15	486	110.7	11.6	405.5	86.9	112.9	11.6
05/12/15	485.8	110.4	11.4	405.8	120.8	112.3	11.5
05/13/15	486.3	111.3	11.2	408.6	133.7	112.3	11.2
05/14/15	486.7	110.7	11.3	409.6	141.8	112.1	11.3
05/15/15	486.7	110.5	11.4	410.3	146.6	112.6	11.5
05/16/15	485.6	108.9	11.8	410.5	87.0	110.7	11.8
05/17/15	483.5	108.9	11.7	406	102.6	111.9	11.8
05/18/15	486.7	109.4	11.8	407	136.3	111.5	11.8
05/19/15	486.5	110.9	12.0	409.9	121.1	111.8	12.0
05/20/15	485.2	111.8	12.4	408.8	137.0	112.7	12.4

05/21/15	486.2	112.5	12.8	409.9	140.3	113.0	12.8
05/22/15	486	112.0	13.4	410.2	134.4	113.0	13.4
05/23/15	486.8	109.9	13.7	409.7	138.7	112.0	13.7
05/24/15	487	109.9	13.9	410	141.7	111.9	13.9
05/25/15	487	110.2	13.9	410.3	141.8	111.7	13.8
05/26/15	486.7	110.4	13.7	410.3	139.5	111.9	13.7
05/27/15	486.5	110.6	13.9	410.1	148.2	112.4	14.0
05/28/15	486.8	110.0	14.2	410.8	128.7	112.1	14.3
05/29/15	486.2	110.5	14.5	409.4	133.6	112.5	14.5
05/30/15	486.7	111.0	14.8	409.7	122.4	112.9	14.8
05/31/15	486.7	111.5	14.9	408.8	125.2	113.0	14.9
06/01/15	486.9	112.2	14.8	409	143.2	113.6	14.9
06/02/15	487	109.7	14.8	410.3	124.3	111.8	14.9
06/03/15	485.9	108.2	14.9	409	102.3	110.5	14.9
06/04/15	484.9	108.4	15.0	407.3	115.9	111.4	14.9
06/05/15	486	110.4	15.3	408.1	108.1	112.9	15.2
06/06/15	486.6	112.1	15.6	407.6	125.2	113.5	15.5
06/07/15	487.1	112.2	15.8	409	133.5	113.7	15.8
06/08/15	487	112.3	16.1	409.5	126.8	113.9	16.1
06/09/15	487	111.9	16.3	409	145.3	113.5	16.4
06/10/15	486.9	110.8	16.5	410.4	118.3	112.5	16.4
06/11/15	486.4	108.4	16.4	408.6	114.7	111.5	16.5
06/12/15	486.5	107.3	16.6	408.1	96.8	112.3	16.6
06/13/15	486.8	107.6	16.5	406.6	122.4	112.3	16.4
06/14/15	487.3	110.0	16.8	408.5	117.6	112.6	16.7
06/15/15	487.1	111.9	17.0	408.4	133.4	113.5	17.0
06/16/15	487	111.4	17.0	409.4	142.1	112.8	17.0
06/17/15	486.3	109.7	17.2	410.3	93.9	112.5	17.1
06/18/15	486	109.7	17.5	406.5	82.3	114.1	17.3
06/19/15	486.6	108.3	17.3	405.1	81.2	114.1	17.4
06/20/15	487	108.1	17.5	405	80.4	114.3	17.3
06/21/15	487.1	110.2	17.4	404.9	83.0	114.7	17.4
06/22/15	487.4	110.0	17.5	405.1	89.9	114.2	17.3
06/23/15	487.3	109.3	17.2	405.8	121.8	113.1	17.2
06/24/15	487.1	109.5	17.2	408.4	103.3	112.7	17.2
06/25/15	486.2	109.4	17.4	407	106.7	112.9	17.4
06/26/15	486	110.3	17.8	407.3	107.3	113.6	17.8
06/27/15	486.4	111.5	18.3	407.3	123.2	113.6	18.2
06/28/15	486.6	111.8	18.8	408.8	105.7	114.2	18.6

06/29/15	486.9	110.1	18.8	407.3	133.8	112.9	18.8
06/30/15	486.6	109.4	18.8	409.7	117.1	113.1	18.9
07/01/15	486.8	110.1	18.8	408.1	114.4	114.3	18.9
07/02/15	487.2	111.6	18.8	407.7	136.2	113.8	18.9
07/03/15	486.8	111.4	19.2	409.9	107.6	113.8	19.1
07/04/15	486.9	110.8	19.5	407.5	105.1	113.8	19.4
07/05/15	487.2	110.2	19.5	407.2	127.1	112.9	19.5
07/06/15	487.2	110.9	19.8	409	113.8	113.3	19.8
07/07/15	486.7	109.8	20.0	407.9	100.4	112.4	19.8
07/08/15	486	110.8	20.1	406.9	109.3	113.6	20.0
07/09/15	486.1	112.7	20.1	407.5	114.8	113.9	20.1
07/10/15	485.7	111.2	20.3	407.9	83.4	113.0	20.2
07/11/15	485.3	108.8	20.1	405.4	71.8	112.6	20.0
07/12/15	485.4	107.6	20.1	404.2	69.1	113.7	19.9
07/13/15	485.7	107.4	19.7	403.8	110.2	111.9	19.8
07/14/15	486.1	107.3	19.8	407.4	104.3	111.7	19.7
07/15/15	486	107.3	19.8	407.2	109.8	111.0	19.8
07/16/15	486.5	107.4	19.5	407.5	119.6	111.5	19.5
07/17/15	486.6	107.4	19.3	408.2	119.9	111.8	19.2
07/18/15	486.6	109.3	19.4	408.2	106.6	113.4	19.4
07/19/15	486.4	111.2	19.6	407	112.8	113.7	19.5
07/20/15	486.6	110.1	19.6	407.6	108.4	113.4	19.6
07/21/15	486.6	108.7	19.5	407.3	100.8	111.9	19.4
07/22/15	486.2	107.8	19.2	406.9	81.3	113.2	19.1
07/23/15	486.2	107.3	19.1	405.1	104.6	112.1	19.1
07/24/15	486.4	107.7	19.4	407.1	98.5	112.6	19.3
07/25/15	486.6	107.7	19.5	406.5	100.4	112.5	19.5
07/26/15	487.1	108.0	19.4	406.7	98.9	111.8	19.4
07/27/15	486.8	105.9	19.2	406.8	94.0	111.5	19.1
07/28/15	486.7	105.6	19.2	406.3	106.7	111.8	19.0
07/29/15	487	109.0	19.6	407	117.2	112.4	19.5
07/30/15	486.5	109.3	19.9	407.9	118.5	112.7	19.8
07/31/15	486.6	110.4	20.1	408.1	109.4	112.9	20.0
08/01/15	486.2	110.0	20.1	407.6	107.1	112.8	20.0
08/02/15	486.1	110.5	20.5	407.2	69.7	114.6	20.2
08/03/15	486.6	108.7	20.1	404	113.0	112.2	20.1
08/04/15	486.8	108.5	20.2	407.7	106.7	112.2	20.2
08/05/15	487.1	107.5	20.1	407.3	113.2	112.0	20.1
08/06/15	487	107.3	19.8	407.7	126.5	110.7	19.7

08/07/15	486	108.5	19.8	409	130.9	111.0	19.8
08/08/15	485.9	109.2	20.2	409.5	107.6	112.1	20.1
08/09/15	485.9	108.4	20.3	407.4	101.6	111.8	20.2
08/10/15	485.7	109.4	20.4	406.8	112.0	111.8	20.3
08/11/15	485.1	109.7	20.5	407.8	109.8	112.2	20.5
08/12/15	485.9	109.9	20.6	407.6	106.3	113.1	20.6
08/13/15	486.1	109.3	20.8	407.5	123.8	112.3	20.7
08/14/15	486.4	107.8	20.8	408.5	121.9	110.0	20.8
08/15/15	487	104.8	20.6	409.1	123.1	104.6	20.6
08/16/15	486.8	103.2	20.3	409.4	120.4	102.9	20.2
08/17/15	486.6	103.9	20.4	409.3	118.5	103.8	20.3
08/18/15	486.7	105.0	20.6	409.1	120.8	104.7	20.5
08/19/15	487.1	105.8	20.7	409.3	126.8	105.4	20.6
08/20/15	487.1	104.7	20.6	410	136.8	104.5	20.5
08/21/15	486.9	102.3	20.2	410.7	119.8	102.5	20.2
08/22/15	486.9	100.8	20.1	409.3	132.5	101.0	19.9
08/23/15	486.8	103.3	20.3	410.2	128.3	103.3	20.2
08/24/15	486.6	103.9	20.3	409.9	113.3	104.2	20.1
08/25/15	485.8	101.4	20.0	408.7	119.8	103.2	19.9
08/26/15	485.9	102.1	20.1	409.2	125.4	102.9	20.0
08/27/15	486.4	102.6	20.1	409.7	124.6	102.6	20.0
08/28/15	485.9	102.5	20.0	409.6	110.6	102.6	20.0
08/29/15	485.7	102.4	19.9	408.4	82.1	102.7	19.8
08/30/15	485.6	100.6	19.6	406	90.7	101.0	19.5
08/31/15	486.2	100.6	19.4	406.7	80.2	100.9	19.3
09/01/15	486.4	101.4	19.4	405.6	97.9	101.9	19.4
09/02/15	487.5	101.0	19.4	407.3	90.1	101.9	19.3
09/03/15	487.5	99.9	19.2	406.8	91.4	101.2	19.1
09/04/15	487.2	99.9	19.0	406.6	72.0	101.3	18.9
09/05/15	486.8	99.4	18.8	405.2	63.4	100.7	18.7
09/06/15	486.7	98.7	18.7	404.2	65.0	100.3	18.6
09/07/15	487	98.8	18.8	404.4	73.9	100.4	18.7
09/08/15	486.9	99.2	18.8	405.2	65.1	100.5	18.8
09/09/15	486.1	99.4	18.8	404.4	78.9	101.0	18.9
09/10/15	486.1	99.6	18.9	405.2	83.6	100.8	18.9
09/11/15	486.3	99.4	19.1	406.1	85.6	101.2	18.9
09/12/15	486	101.3	19.2	406.1	93.5	102.3	19.2
09/13/15	486.6	100.6	19.1	406.8	50.5	102.3	19.1
09/14/15	486.2	100.4	18.7	402.9	81.1	101.2	18.6

09/15/15	486.8	99.0	18.2	405.9	73.3	100.2	18.1
09/16/15	486.1	99.5	18.1	405.3	74.0	99.9	18.0
09/17/15	485.8	100.2	18.2	405.3	59.4	100.4	18.2
09/18/15	485.6	99.7	18.3	403.8	78.1	100.3	18.2
09/19/15	485.8	100.7	18.3	405.6	49.3	101.0	18.3
09/20/15	485.7	101.2	18.4	402.8	52.3	101.8	18.5
09/21/15	485.6	101.1	18.5	403	81.5	101.5	18.5
09/22/15	486.9	101.0	18.6	405.6	91.7	101.6	18.6
09/23/15	487.1	100.9	18.5	406.9	88.3	100.8	18.4
09/24/15	486.8	100.9	18.5	406.6	90.6	101.0	18.4
09/25/15	486.8	100.7	18.4	406.7	87.0	101.1	18.3
09/26/15	486.4	99.7	18.2	406.5	54.3	100.6	18.1
09/27/15	486.1	99.0	17.8	403.3	74.5	102.3	17.7
09/28/15	486.6	100.0	17.7	405	97.2	100.2	17.6
09/29/15	487.1	100.6	17.8	407.5	89.3	100.7	17.7
09/30/15	486.5	100.7	17.8	406.7	79.1	100.9	17.8
10/01/15	486.5	100.2	17.7	405.8	87.1	101.1	17.7
10/02/15	487	99.6	17.5	406.3	71.8	100.6	17.5
10/03/15	486.8	99.6	17.4	404.9	83.2	100.3	17.3
10/04/15	486.6	99.6	17.2	406.1	66.7	100.3	17.2
10/05/15	486.4	99.6	17.2	404.6	86.0	100.3	17.1
10/06/15	486.4	100.0	17.2	406.3	83.0	100.1	17.1
10/07/15	486.1	99.3	17.1	406.2	70.6	99.7	17.0
10/08/15	485.8	99.0	17.0	404.9	72.2	99.5	17.0
10/09/15	485.4	99.3	17.0	405.2	65.8	100.1	17.0
10/10/15	484.9	99.7	17.0	404.4	40.8	100.7	17.0
10/11/15	484.1	98.5	16.9	401.7	44.1	102.0	16.8
10/12/15	484.6	99.3	16.7	402	65.5	100.2	16.7
10/13/15	486.5	99.3	16.6	404.3	79.7	100.3	16.6
10/14/15	486.8	99.2	16.5	405.6	109.4	99.7	16.4
10/15/15	486.4	99.3	16.4	408.3	80.1	99.8	16.4
10/16/15	485.7	99.5	16.3	405.8	84.3	100.0	16.3
10/17/15	485.7	100.0	16.3	406.1	79.7	100.4	16.2
10/18/15	484.9	99.4	16.2	405.8	57.7	100.0	16.2
10/19/15	483.5	99.4	16.0	403.6	68.1	99.8	16.0
10/20/15	484.1	98.5	15.9	404.7	67.4	99.2	15.9
10/21/15	484.8	99.0	15.9	404.5	78.2	99.4	15.8
10/22/15	485.1	98.6	15.7	405.6	80.5	99.1	15.6
10/23/15	484.9	98.6	15.6	405.7	79.9	99.3	15.5

10/24/15	485.5	99.0	15.5	405.7	86.3	99.2	15.4
10/25/15	485.1	99.2	15.3	406.3	68.2	99.5	15.2
10/26/15	483.6	99.8	15.2	404.6	70.3	99.6	15.1
10/27/15	484.5	99.1	15.1	405	78.2	99.2	15.0
10/28/15	485.3	98.7	14.8	405.6	88.8	99.1	14.8
10/29/15	485.8	98.6	14.7	406.5	82.2	99.1	14.7
10/30/15	485.7	99.4	14.6	406	73.5	99.7	14.6
10/31/15	485.1	99.6	14.6	405.2	71.7	99.8	14.6
11/01/15	484.2	99.1	14.4	405.2	59.9	99.1	14.4
11/02/15	483	98.7	14.2	403.4	81.2	98.8	14.2
11/03/15	484.9	98.2	13.8	405.5	87.9	98.5	13.8
11/04/15	485	97.9	13.6	406.6	83.7	98.1	13.5
11/05/15	485	97.9	13.5	406.4	86.4	98.2	13.5
11/06/15	485.7	96.6	13.2	406.5	88.7	97.0	13.2
11/07/15	485.1	97.2	12.8	406.7	91.7	97.9	12.8
11/08/15	485.2	98.0	12.8	406.9	87.9	98.2	12.8
11/09/15	485	97.7	12.8	406.5	97.0	98.0	12.8
11/10/15	486	97.1	12.7	407.3	95.9	97.9	12.7
11/11/15	485.7	97.1	12.6	407.2	83.9	97.6	12.6
11/12/15	485.2	97.0	12.4	406.2	90.5	97.5	12.4
11/13/15	486.1	98.2	12.3	407.6	101.6	100.4	12.3
11/14/15	485.1	99.1	12.4	407.1	96.0	100.4	12.4
11/15/15	485.5	98.8	12.3	407.5	101.4	99.8	12.2